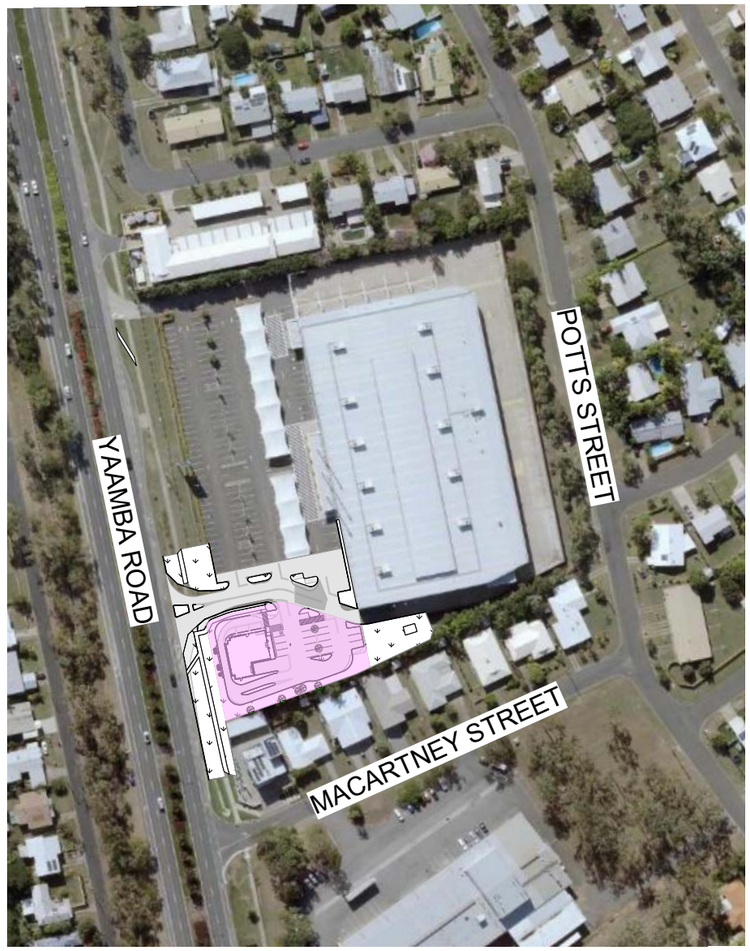


Food pad location shaded pink

1 **Aerial**

1 : 2500

NORTH

DEVELOPMENT SUMMARY

For GFA and parking commentary please refer to Reel Planning report

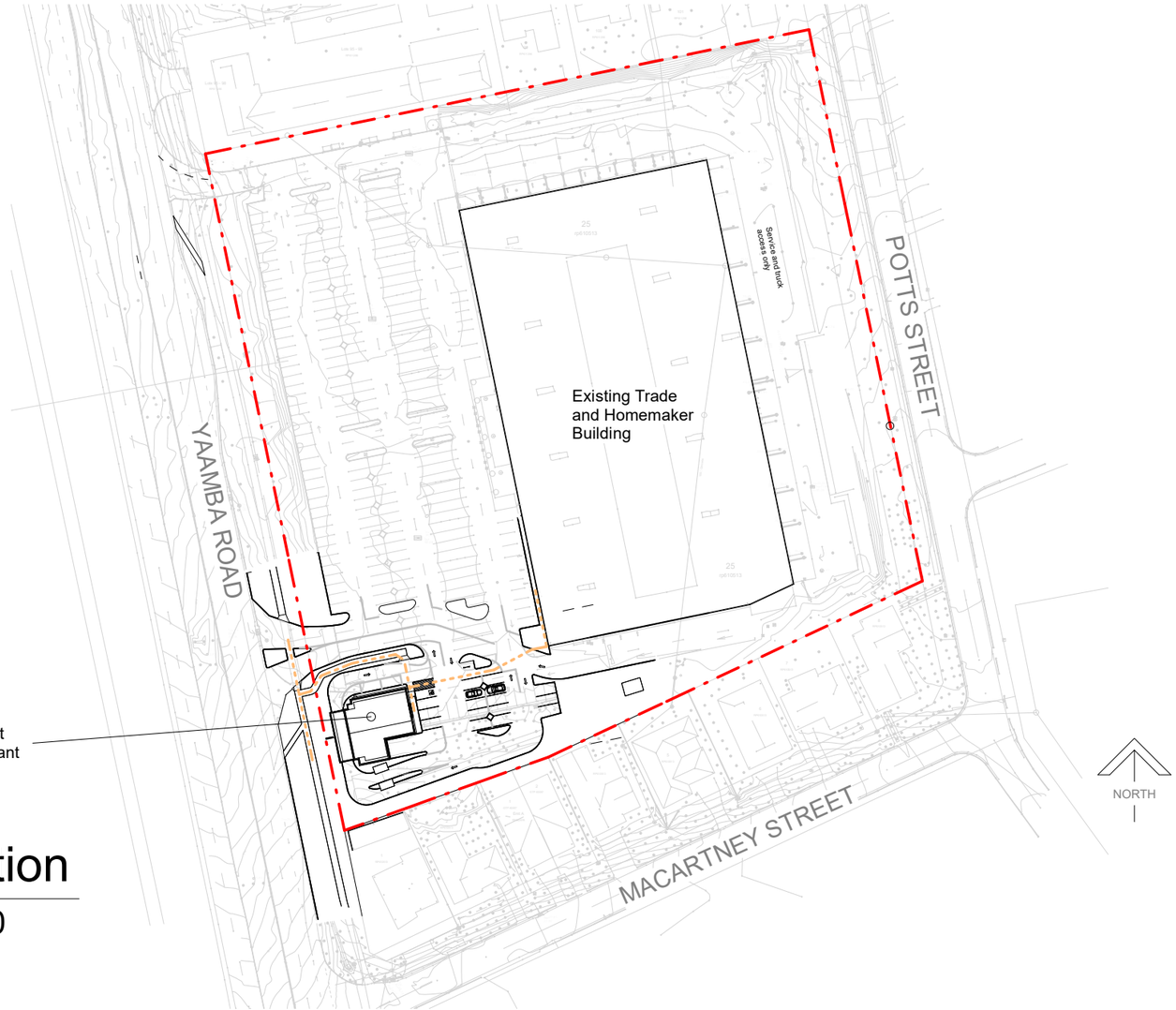
ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

These plans are approved subject to the current conditions of approval associated with

Development Permit No.: D/106-2020

Dated: 7 April 2021



2 **Location**

1 : 1500

19/03/2021 8:03:00 AM

TULIP DESIGN QLD

Tulip Design Queensland, 39 Tulip Street, Cooroy QLD 4563
W: www.tdq.com.au T: 0426 439 395 E:robert@tdq.com.au

Rev	Description	Date
A	Issue for Approval	07.08.20
B	Carpark shade trees added	24.08.20
C	Cycle ramp added	19.03.21

Norman Gardens - Food Pad

Brownfield Nominees Pty Ltd

Location Plan

Project number	2003	Drawing number	Rev
Date	July 2020	A1.01	C
Drawn by	Rcl		
Checked by	-	Scale @ A3	As indicated

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

These plans are approved subject to the current conditions of approval associated with

Development Permit No.: D/106-2020

Dated: 7 April 2021

Existing parking at grade

Existing carpark layout shown ghosted

Existing building

A2.01 2

A2.01 1

bike rack

waiting bays

Pad mount transformer (existing)

Awning over pick up windows

Restaurant
247m²
RL 31.6 approx

Service area

A2.02 2

Indicative pylon location

cycle ramp

easement

3000

2000

6001

13518

6529

Site boundary

Landscape buffer

Site boundary

A2.02 1

Emt A

Top 32.08

Top31.17

Top30.54

NORTH

19/03/2021 8:03:11 AM

TULIP DESIGN QLD

Tulip Design Queensland, 39 Tulip Street, Cooroy QLD 4563
W: www.tdq.com.au T: 0426 439 395 E:robert@tdq.com.au

Rev	Description	Date
A	Preliminary Issue	29.07.20
B	Issue for Approval	07.08.20
C	Carpark shade trees and landscape beds added	24.08.20
D	Additional landscape bed added	24.08.20
E	Cycle ramp added	19.03.21

Norman Gardens - Food Pad

Brownfield Nominees Pty Ltd

Site Plan

Project number	2003	Drawing number	Rev
Date	July 2020	A1.02	E
Drawn by	Rcl		
Checked by	-	Scale @ A3	1 : 300

1 East
1 : 100

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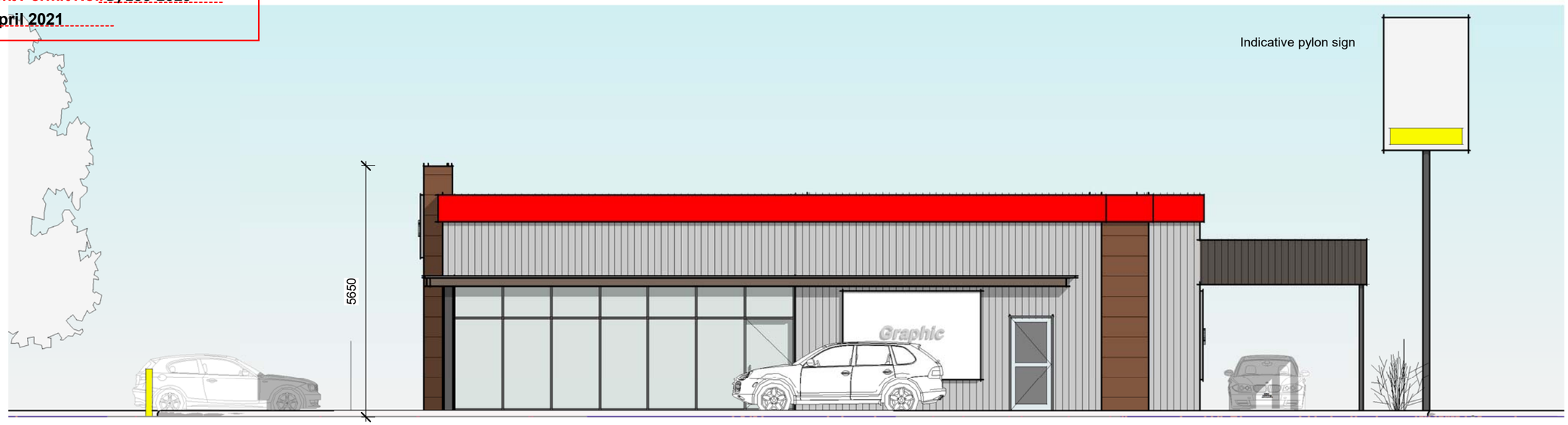
APPROVED PLANS

These plans are approved subject to the current conditions of approval associated with

Development Permit No.: D/106-2020

Dated: 7 April 2021



2 North
1 : 100

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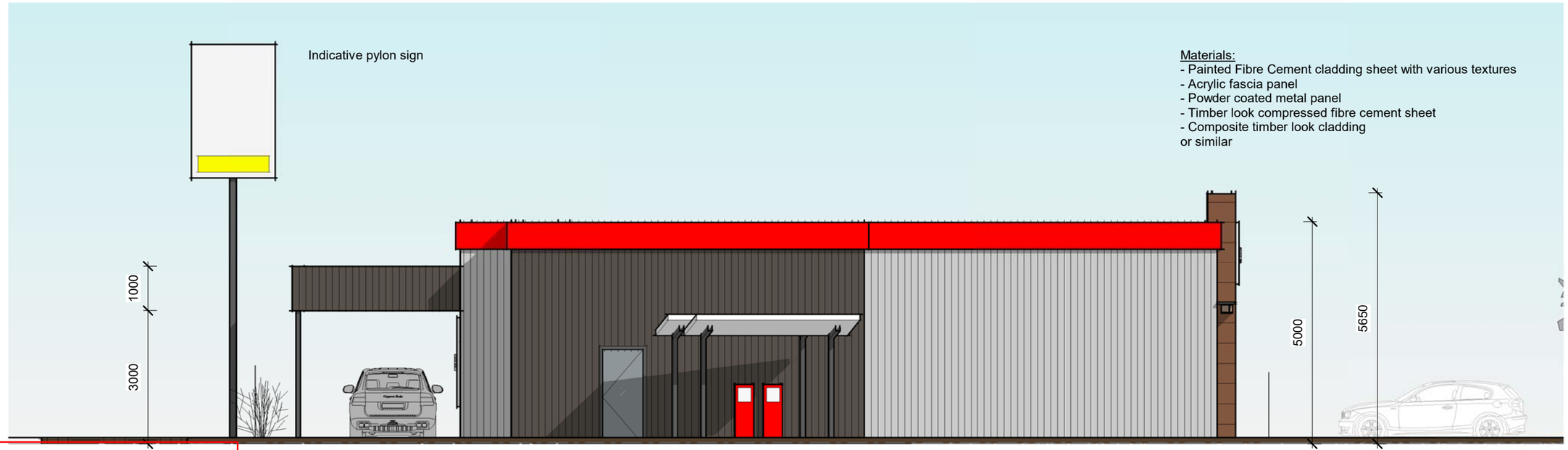
Rev	Description	Date
A	Issue for Approval	07.08.20

Norman Gardens - Food Pad

Brownfield Nominees Pty Ltd

Elevations - Sheet 1

Project number	2003	Drawing number	Rev
Date	July 2020	A2.01	A
Drawn by	Rcl		
Checked by	-	Scale @ A3	1 : 100



1 South
1 : 100

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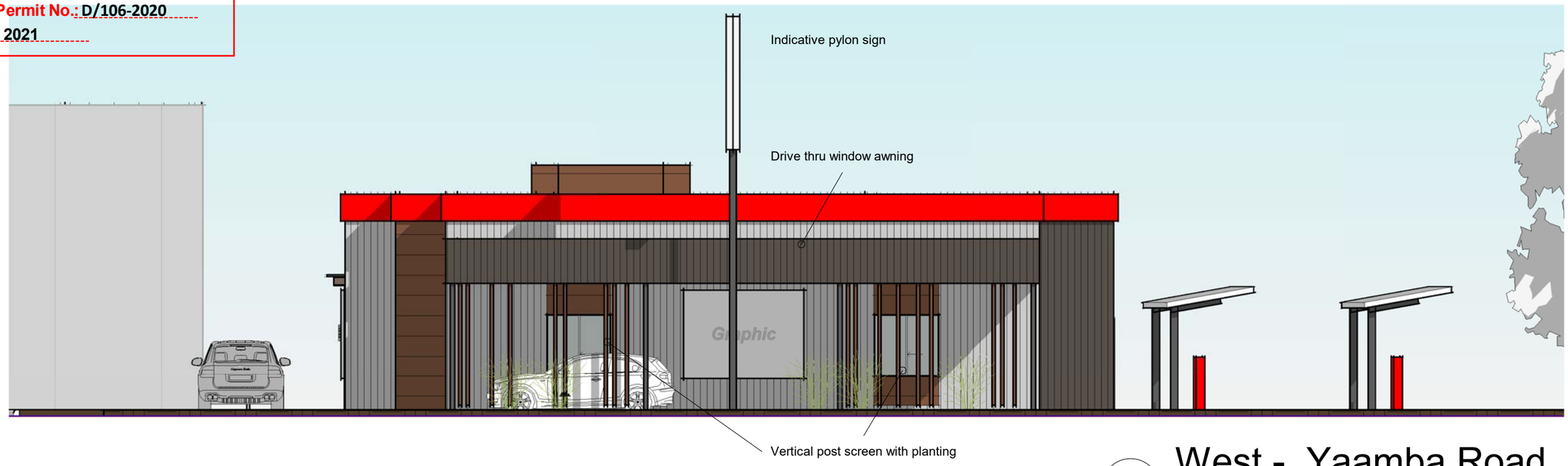
APPROVED PLANS

These plans are approved subject to the current conditions of approval associated with

Development Permit No.: D/106-2020

Dated: 7 April 2021



2 West - Yaamba Road
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24/08/2020 1:59:23 PM

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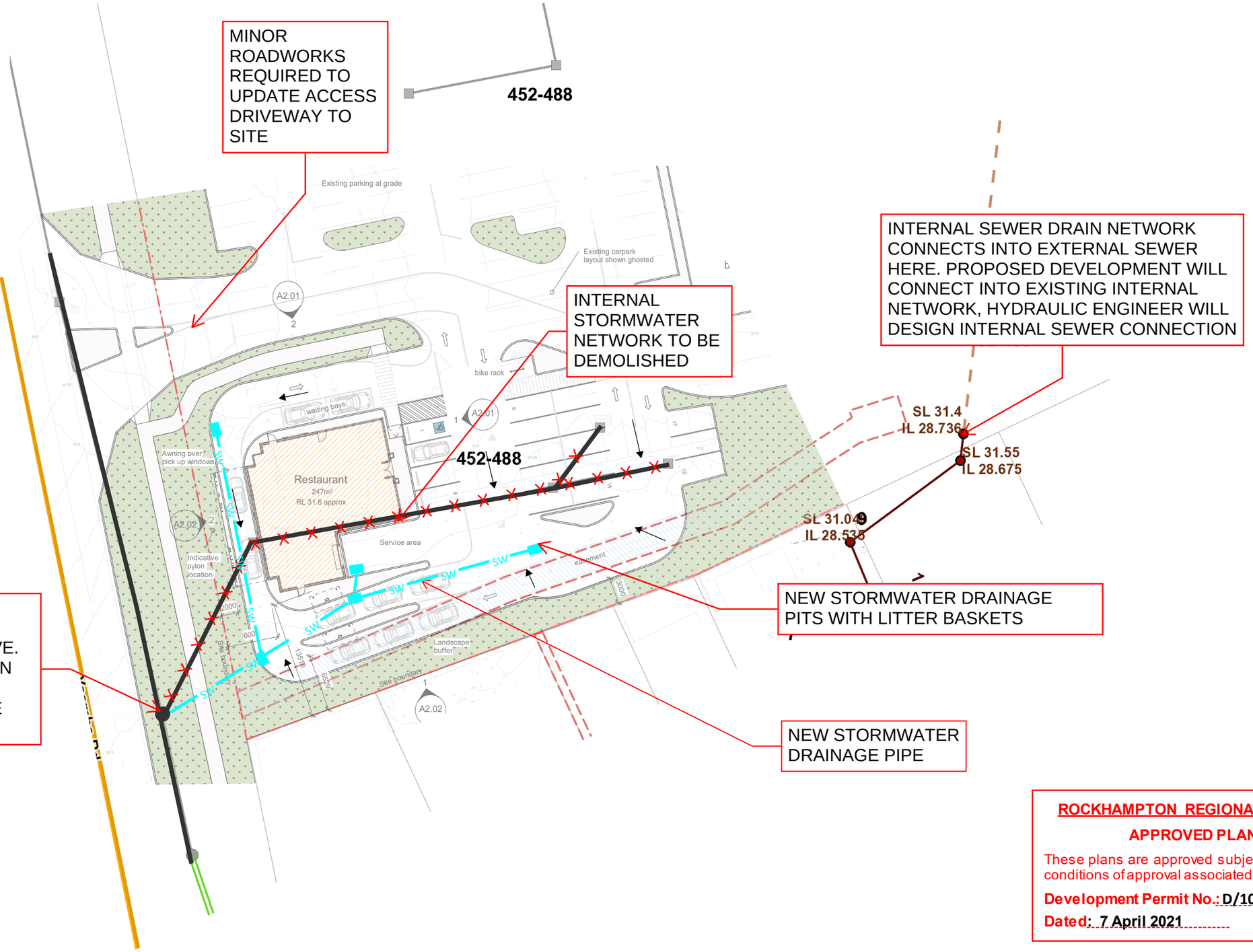
Rev	Description	Date
A	Issue for Approval	07.08.20

Norman Gardens - Food Pad

Brownfield Nominees Pty Ltd

Elevations - Sheet 2

Project number	2003	Drawing number	Rev
Date	July 2020	A2.02	A
Drawn by	Rcl		
Checked by	-	Scale @ A3	1 : 100



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APPROVED PLANS

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Development Permit No.: D/106-2020

Dated: 7 April 2021

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PROJECT

ROCKHAMPTON FAST FOOD, COMMERCIAL DEVELOPMENT

SUBJECT

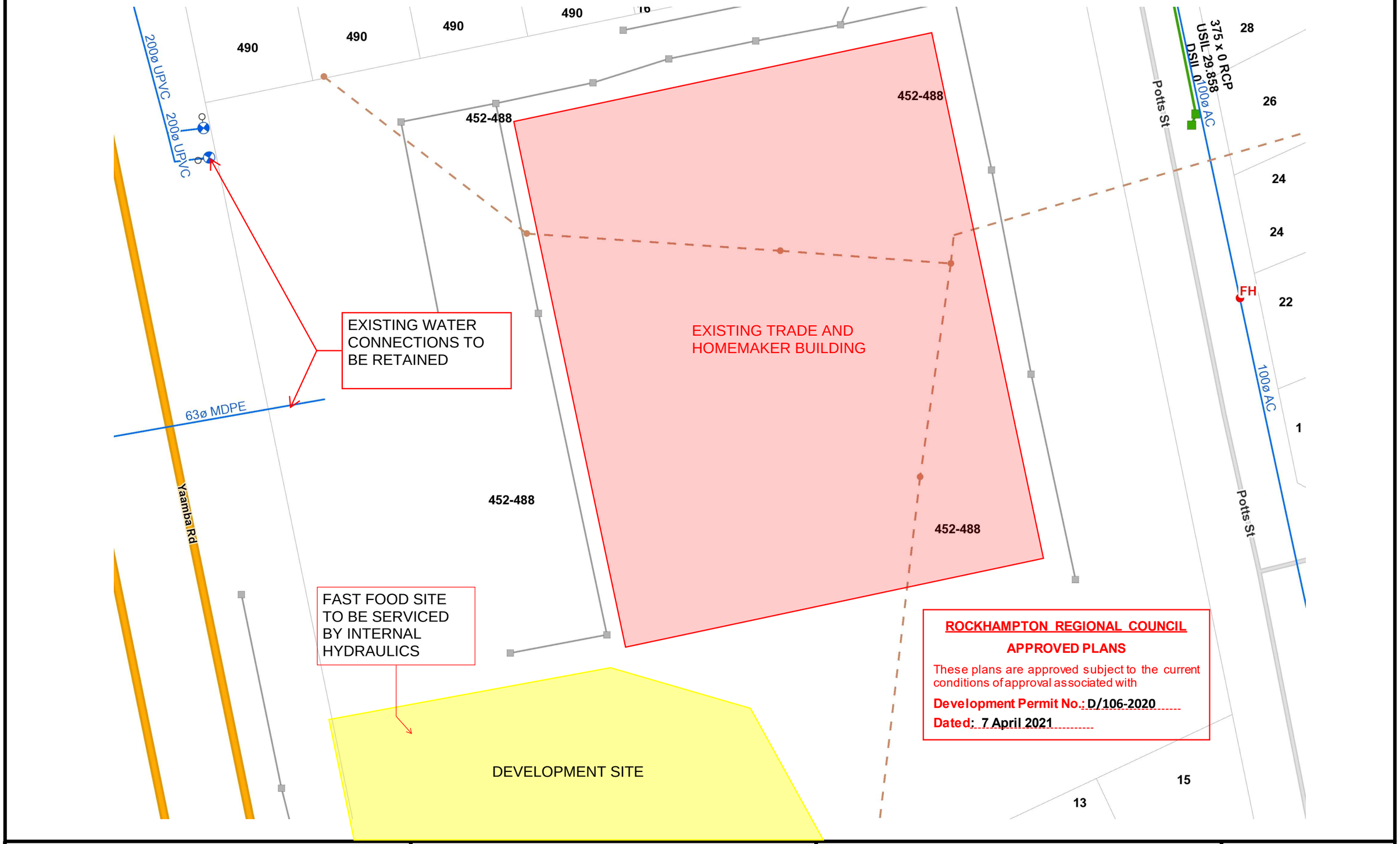
ENGINEERING PLAN DRAWING - STORMWATER, ROADWORKS AND SEWER CONNECTION

PROJECT No.

DRAWING No. REVISION

0 10 20 30 40 50

ORIGINAL SIZE A3



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PROJECT

ROCKHAMPTON FAST FOOD, COMMERCIAL DEVELOPMENT

SUBJECT

ENGINEERING PLAN DRAWING - WATER CONNECTION

PROJECT No.

20254

DRAWING No. REVISION

0 10 20 30 40 50

ORIGINAL SIZE A3

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

These plans are approved subject to the current conditions of approval associated with

Development Permit No.: D/106-2020

Dated: 7 April 2021

Traffic Engineering Report

Proposed Food and Drink Outlet

At 452-488 Yaamba Road, Norman Gardens

On behalf of Brownfield Nominees Pty Ltd

About TTM

For 30 years, we've been at the centre of the Australian development and infrastructure industry. Our unique combination of acoustics, data, traffic and waste services is fundamental to the success of any architectural or development project.

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Revision Record

No.	Author	Reviewed/Approved	Description	Date
1.	D. Grummitt	D. Grummitt (RPEQ 19356)	DA Report	16/09/2020
2.				
3.				
4.				

Contents

Table Index

Figure Index

1. Introduction

1.1. Background

TTM Consulting Pty Ltd (TTM) has been engaged by Brownfield Nominees Pty Ltd to prepare a traffic engineering report investigating a proposed food & drink outlet development at 452-488 Yaamba Road, Norman Gardens.

It is understood this report will accompany a Material Change of Use Development Application to be lodged with Rockhampton Regional Council (RRC) with referral to the State Assessment Referral Agency (SARA).

1.2. Scope

The scope of the transport aspects investigated includes:

- Reviewing the prevailing traffic and transport conditions surrounding the site.
- Identifying parking supply required to cater for development demands.
- Assessing the parking layout to provide efficient and safe internal circulation and manoeuvring.
- Assessing the access configuration to provide efficient and safe manoeuvring between the site and the public road network for cars, service vehicles, cyclists, and pedestrians.
- Identifying the service vehicle needs for the site
- Assessing the internal service vehicle layouts to provide efficiency and safety for on-site service vehicle operation
- Reviewing access to a suitable level of public and active transport provisions.
- Identification of likely traffic volumes and traffic distribution from the development.
- Identification of likely traffic impacts of development on the surrounding road network.

The development plans have been assessed against the following guidelines and planning documents:

- Rockhampton Regional Council Planning Scheme (2015), specifically:
  - Access, Parking and Transport Code (APT Code)
- Queensland State Development and Assessment Provisions (SDAP), specifically:
  - State Code 1: Development in a state-controlled road environment
- Australian Standards for Parking Facilities, specifically:
  - Part 1: Off-street car parking (AS2890.1:2004)

- Part 2: Off-street commercial vehicle facilities (AS2890.2:2019)
- Part 3: Bicycle parking (AS2890.3:2015)
- Part 6: Off-street parking for people with disabilities (AS2890.6:2009).

- Department of Transport and Main Roads 'Guide to Traffic Impact Assessment' (GTIA)
- Austroads' 'Guide to Road Design' (GRD)

1.3. Site Location & Existing Use

The site is located at 452-488 Yaamba Road, Norman Gardens, as shown in Figure 1.1. It has a single road frontage to Yaamba Road and is described as Lot 25 on RP610513.

The site is subject to a development approval for a Retail Showroom granted in December 2003 (Council reference: D-1004/2000). Condition 10 of the approval requires provision of a minimum of 197 car parking spaces and a maximum of 284 car parking spaces.

Consistent with the above-mentioned development approval the site currently contains a large format retail showroom development (approximately 8,300m² GFA) that has approximately 270 on-site car parking spaces and is accessed via a northern left-in-only access and southern left-in / left-out access to Yaamba Road.

The site was initially tenanted by Hardware House and more recently by Bunnings. Since the relocation of Bunnings in 2018 the site has been vacant.

Figure 1.1: Site location
Source: Nearmap 2020

2. The Proposed Development

2.1. Development Profile

The development seeks approval for Material Change of Use (MCU) for a Food and Drink Outlet with a gross floor area of 247m^2 having a drive-through facility.

The proposed development will be constructed within the south-western corner of the site with the existing retail showroom building being retained. Modification of the existing on-site car parking area and southern vehicular site access is proposed.

A copy of the proposed development plans is included in **Appendix A.**

2.2. Parking

The proposed development requires the removal of fifty (50) existing on-site car parking spaces associated with the existing Retail Showroom development. This results in a provision of approximately 220 spaces available to the existing Retail Showroom use. This consequential car parking provision exceeds the currently conditioned minimum requirement of 197 spaces and satisfies the minimum requirement for *Showroom* or *Hardware and Trade Supplies* uses as identified in Council's *Access, Parking and Transport Code* (1 space per 40m^2 GFA, equating to 208 spaces).

A total of seventeen (17) car parking spaces is proposed for the Food and Drink Outlet, including one (1) PWD space. Two (2) waiting bays are provided within the drive-through facility. The drive-through facility has a queuing capacity of twelve (12) cars.

A secure bicycle parking rack, capable of accommodating two (2) bicycles, is provided within the car parking area adjacent the proposed building.

Further details regarding the car and bicycle parking provisions is included in Section 4.

2.3. Access

The existing southern left-in / left-out vehicular site access crossover to Yaamba Road is proposed to be reconstructed approximately 15m north of its current location. The existing northern access is proposed to be retained unchanged.

A new pedestrian site access is proposed to be located on the southern side of the above-mentioned southern vehicular site access.

Further details regarding the proposed access arrangements is included in Section 5.

2.4. Servicing

The development is designed to accommodate vehicles up to the size of a Heavy Rigid Vehicle (HRV). All service vehicles are able to enter and exit the site in a forward gear.

Further details regarding the proposed servicing arrangements is included in Section 6.

3. Site Travel Environment

3.1. Active Transport Facilities and Services

3.1.1. Public Transport

An indented bus bay is located on the Yaamba Road site frontage which currently services Bus Route 410 which operates between the city centre and Parkhurst to the north of the site. The service currently operates hourly from approximately 8am to 5pm Monday to Friday.

3.1.2. Pedestrian and Cyclist Network

A formal (concrete) pedestrian footpath exists along the Yaamba Road site frontage. The nearest formal pedestrian crossings of Yaamba Road include:

- Underpass of Yaamba Road north of the Farm Street intersection
- Signalised crossing of Yaamba Road at the Richardson Road intersection south of the site

On-road cyclist facilities are limited to cycle lanes on both sides of Yaamba Road. Off-road facilities are limited to the north side of Farm Street, west of Yaamba Road, where a 2.5m shared off-road path exists. Figure 3.1 below presents Council's planned cycle network.

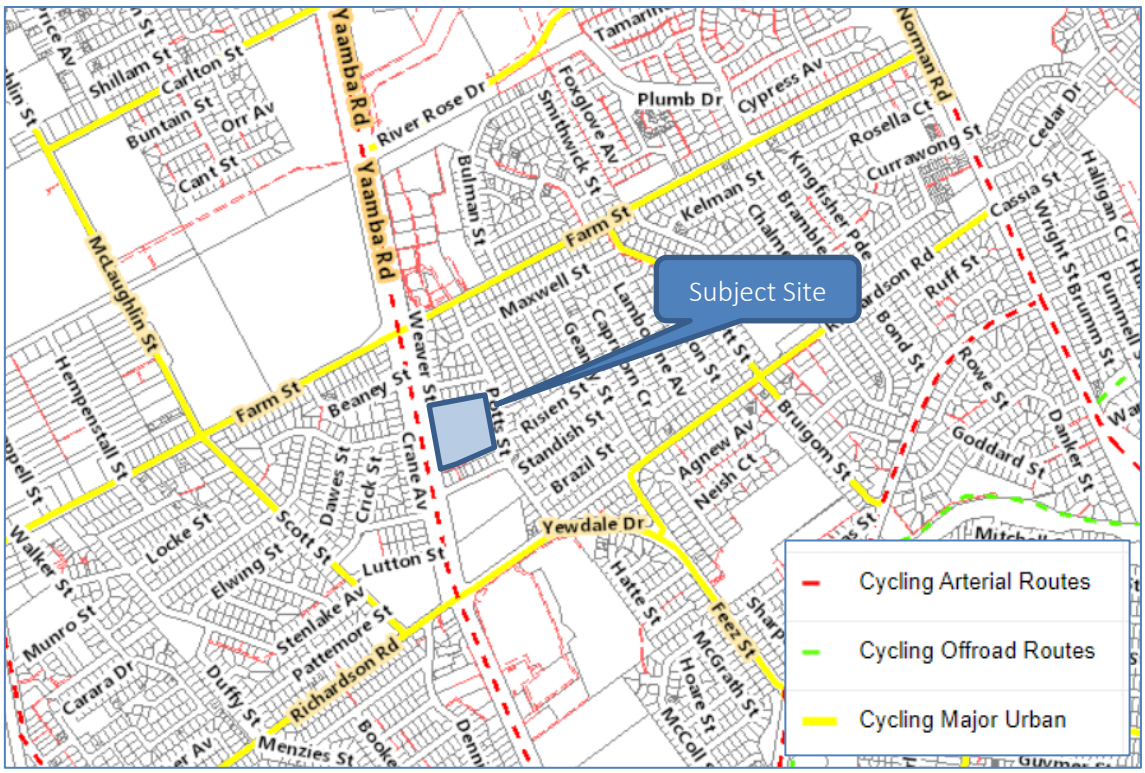


Figure 3.1: Council Bicycle Network

3.2. The Road Network

3.2.1. Road Hierarchy

The majority of roads within and surrounding the project area are administered by the Council, the exception being Yaamba Road (Bruce Highway) which is administered by the Department of Transport and Main Roads (DTMR). The hierarchy and characteristics of roads in the immediate vicinity of the site are shown below in Table 3.1. Figure 3.2 presents the current road hierarchy.

Table 3.1: Local Road Hierarchy & Characteristics

Road	Speed Limit	Lanes	Classification
Yaamba Road (Bruce Highway)	70kph	4 (divided)	Highway / Urban Arterial
Farm Street	60kph	2 (undivided)	Urban Sub-arterial
Richardson Road / Yewdale Drive	60kph	4 (divided)	Urban Sub-arterial
Macartney Street	50kph	2 (undivided)	Urban Access Street

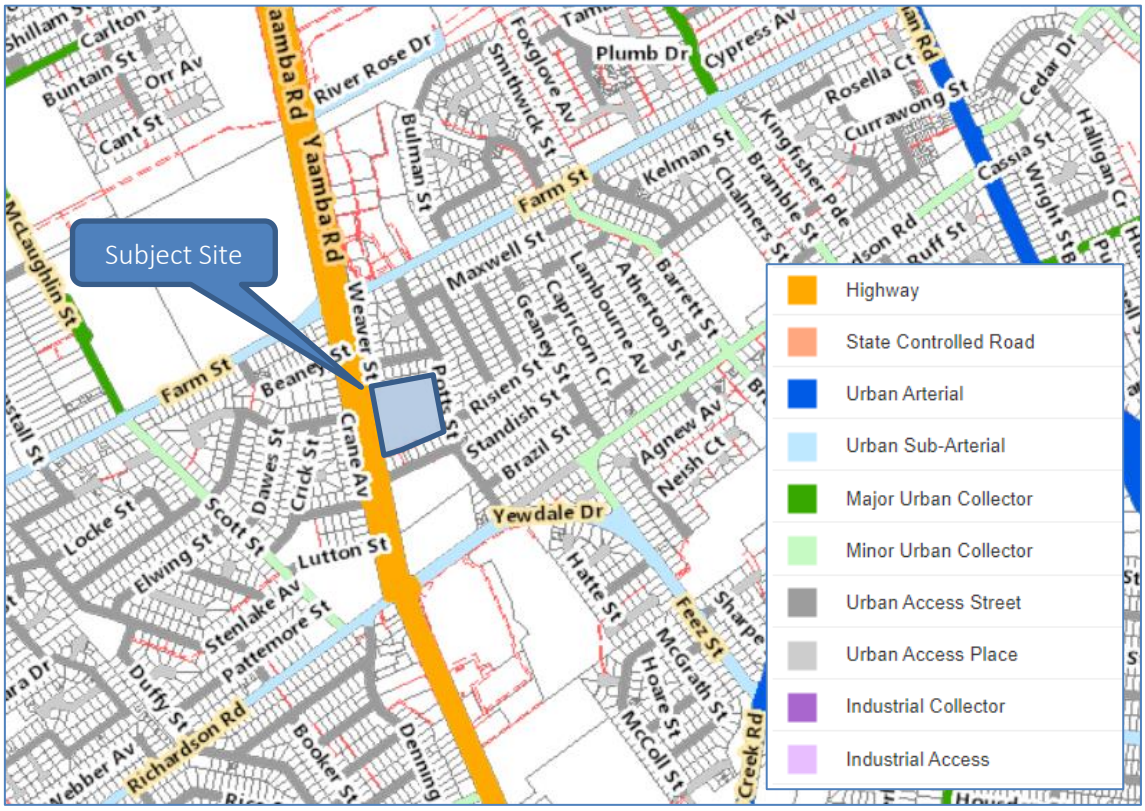


Figure 3.2: Council Road Hierarchy

The intersections of Yaamba Road / Farm Street and Yaamba Road / Richardson Road / Yewdale Drive are signalised, with U-turns permitted on the southern and northern approaches, respectively. The intersection of Yaamba Road / Macartney Street is priority controlled.

3.2.2. Existing Traffic Volumes

TTM Data conducted traffic movement surveys at the following locations on Thursday 14th May 2015, from 2-6pm, Friday 15th May 2015 from 6-9am and on Saturday 16th May 2015 from 9am-3pm:

- Yaamba Rd / Farm St signalised intersection;
- Yaamba Rd / Richardson Rd / Yewdale Drive signalised intersection;
- Yaamba Rd / Macartney St intersection;
- Existing northern site access on Yaamba Rd; and
- Existing southern site access on Yaamba Rd.

The road peak hours were found to be generally 4-5pm on the Thursday, 8-9am on the Friday and 11am-12pm on the Saturday. Traffic volume diagrams detailing the results of the survey are contained in Appendix C.

3.3. Transport Planning

3.3.1. Council

Review of the *Local Government Infrastructure Plan* indicates there are no planned transport infrastructure projects or upgrades in the local area that would affect, or be affected by, the proposed development.

3.3.2. State

The Department of Transport and Main Roads is continuing the planning and preservation of land for the Rockhampton Ring Road. Whilst this major transport infrastructure project does not directly impact the proposed development, when completed it will likely result in a reduction of traffic demand on Yaamba Road (Bruce Highway) and a consequential improvement in traffic operations along this key road route.

4. Parking Arrangements

4.1. Parking Supply

4.1.1. Car parking

Table 9.3.1.3.2 of the RRC's 'APT Code' provides guidance on the minimum car parking space requirements for the land-use under consideration. Table 4.1 sets out the minimum parking requirements.

Table 4.1: APT Code Parking Supply Requirement

Land Use	Council Requirement	Extent	Requirement	Provision
Food and drink outlet	One (1) space per fifteen (15) square metres of gross floor area for seating areas (including outdoor seating areas); and On-site queuing space for at least ten (10) vehicles where involving a drive through facility.	247m² GFA	17 car spaces and 10-car drive-through facility queue capacity	17 car spaces and 12-car drive-through facility queue capacity

According to the Disability (Access to Premises - Buildings) Standards 2010, a BCA Class 6 building such as a food and drink outlet requires a minimum of 1 PWD space per 50 standard spaces.

As detailed in Table 4.1, the development scheme proposes a total of 17 car parking spaces, including one (1) PWD space, which meets the required 'APT Code' provision. On this basis, the car parking supply is considered acceptable.

The proposed development requires the removal of fifty (50) existing car parking spaces associated with the existing Retail Showroom development. This results in a provision of approximately 220 spaces available to the existing Retail Showroom use. This consequential car parking provision exceeds the currently conditioned minimum requirement of 197 spaces and satisfies the minimum requirement for *Showroom* or *Hardware and Trade Supplies* uses as identified in Council's *Access, Parking and Transport Code* (1 space per 40m^2 GFA, equating to 208 spaces). Therefore, the proposed reduction of existing on-site car parking supply for the existing Retail Showroom building is appropriate and acceptable.

4.1.2. Bicycle Parking

Table SC6.4.7.1 – Bicycle parking facilities provision rates of Council's Bicycle Network Planning Scheme Policy requires parking for Food and Drink Outlet as summarised in Table 4.2. Parking and access facilities are to be provided in accordance with AS 2890.3:2015.

Table 4.2: Council Bicycle Parking Supply Requirement

Land Use	Council Requirement	Extent	Requirement
Food and Drink Outlet	1 space per 100m² GFA for employees (Class 1 or 2) 1 space per 50m² GFA for visitors (Class 3)	247m² GFA	3 employee spaces 5 visitor spaces

Notes:

Class 1 is High security level with fully-enclosed individual locker

Class 2 is Medium security level with lockable enclose, shelter or compound fitted with class 3 facilities where the cyclist is responsible for locking the bicycle within the communal enclosure.

Class 3 is Low security level with bicycle rails or racks to which both the bicycle frame and wheels can be locked.

The development plan includes a bicycle rail located adjacent the proposed pedestrian path at the northern end of the central car parking module capable of accommodating two bicycles.

Consistent with bicycle parking arrangements at typical fast food restaurants provision of Class 3 (low security level) parking is considered to be appropriate for the proposal. It is recommended that four bicycle rails (8 spaces) are provided at the proposed location which will require minor kerb/landscape layout amendment.

4.2. Parking Layout

Council's 'APT Code' requires the design and layout of parking areas to be in accordance with the Australian Standards AS2890.1 and AS2890.2. Table 4.3 identifies the characteristics of the proposed parking area with respect to the Council requirements. The last column identifies the compliance of each design aspect. The proposed car parking area layout complies with the applicable design standard and is therefore acceptable.

Table 4.3: Parking Design Requirements

Design Aspect	TAPS PSP Provision	Proposed Provision	Compliance
Car Parking			
Parking space length: • Staff space (Class 1) • Visitor space (Class 3A) • PWD space (Class 5)	 5.4m (min) 5.4m (min) 5.4m (min)	 5.4m (min) 5.4m (min) 5.4m (min)	 AS2890.1 Compliant AS2890.1 Compliant AS2890.6 Compliant
Parking space width: • Staff space (Class 1) • Visitor space (Class 3A) • PWD space (Class 5) 'Shared Area'	 2.4m (min) 2.7m (min) 2.4m + 2.4m 'Shared Area'	 2.7m (min) 2.7m (min) 2.4m + 2.4m 'Shared Area'	 AS2890.1 Compliant AS2890.1 Compliant AS2890.6 Compliant
Aisle Width: • Parking aisle • 2-way Circulation road/ramp • 1-way Circulation road/ramp	 6.2m (min) 5.5m (min) 3.0m (min)	 7.2m (min) 6.5m (min) 3.0m (min)	 AS2890.1 Compliant AS2890.1 Compliant AS2890.1 Compliant
Parking envelope clearance	Located as per Figure 5.2 of AS2890.1	Located as per Figure 5.2 of AS2890.1	AS2890.1 Compliant
Maximum Gradient: • PWD parking	 1:40 (2.5%)	 Generally Flat	 AS2890.6 Compliant

Design Aspect	TAPS PSP Provision	Proposed Provision	Compliance
• Parking aisle Ramp	1:20 (5.0%) 1:6 (16.7%)	Generally Flat Generally Flat	AS2890.1 Compliant AS2890.1 Compliant
Blind Aisle Extension	1.0m extension to aisle width beyond final space	Not applicable	Not applicable.
Height Clearance: • Passenger Vehicle Minimum • Service Vehicle Minimum Over PWD space	 2.3m (min) 4.5m (min) 2.5m (min)	 >2.3m (min) >4.5m (min) >2.5m (min)	 AS2890.1 Compliant AS2890.2 Compliant AS2890.6 Compliant

5. Site Access Arrangements

5.1. Vehicular Access

5.1.1. Access Crossover

The existing southern left-in / left-out vehicular site access crossover to Yaamba Road is proposed to be reconstructed approximately 15m north of its current location. The existing northern access is proposed to be retained unchanged.

Table 5.1 summarises the design and location requirements and the proposed provisions for the relocated southern access.

Table 5.1: Typical Vehicle Site Access Requirements for the Southern Crossover

Design Aspect	AS2890 Requirement	Proposed Provision	Compliance
Category	4	4	Compliant
Crossover Width	6-8m entry / 1-3m separator / 6-8m exit	5.5m entry / 1.2m separator / 5.0m exit	Alternate Solution
Minimum Intersection Separation	6m from tangent point of kerb	63m	Compliant
Pedestrian Visibility Splays	2m x 2.5m	2m x 2.5m (minimum)	Compliant
Sight Distance	Ideally 83m, minimum 65m	130m (minimum)	Compliant
Gradient of first 6m	1:20 (5%)	Generally Flat	Compliant

The proposed arrangements comply with the design requirements however an alternate solution is proposed for the crossover width. The design widths of the entry and exit components of the access have been minimised to reduce pedestrian crossing distances but are adequate to accommodate the swept path requirements of the relevant design vehicles as demonstrated in TTM drawing number 19BRT0086-03A (**Appendix B**).

5.1.2. External Works

The proposed relocated site access crossover, approximately 15m north of the existing site access location, necessitates reconfiguration of existing pavement marking associated with the existing left turn deceleration lane, on-road cycle lane and bus zone.

TTM drawing number 19BRT0086-04A (**Appendix B**) presents the recommended pavement marking treatment that should be provided along the frontage of the site and north of the existing left-in-only site access. This treatment is consistent with existing treatments at adjacent intersections and property accesses and is in accordance with DTMR standard drawing TC1780_2. As demonstrated in the proposed design a 70m Type AUL left turn deceleration length is effectively achieved for the left turn lane for the proposed relocated access.

5.2. Active Transport Access

It is proposed that pedestrian and cyclist access to the development will be facilitated via a dedicated path that connects to the existing external network with site access being located on the southern side of the proposed relocated southern vehicular site access.

The site access links to a proposed internal pedestrian and cyclist path on the southern side of the site access road which provides for convenient and safe connection to the proposed building entrance.

6. Service Vehicle Arrangements

6.1. Service Vehicle Requirements

Council's 'APT Code' refers to 'AS2890.2' with respect to service vehicles and areas. 'AS2890.2' provides no commentary regarding the number of service bays required. As such, the servicing demands has been based on past experience with food and drink outlets.

The expected service vehicle uses of the proposed development include:

- Heavy Rigid Vehicle (HRV) sized goods delivery; and
- Refuse Collection Vehicle (RCV).

6.2. Proposed Servicing Arrangements

To cater for the servicing demands of the proposed development a designated service vehicle bay is proposed on the south side of the proposed building designed with a 15m length and 5m width. As demonstrated in TTM drawing number 19BRT0086-03A (Appendix B) the proposed design layout of the development can accommodate the relevant design vehicles of the proposed development ensuring all such vehicles can enter and exit the site in a forward direction.

Additionally, the design layout enables a 19m articulated vehicle (design vehicle for the existing retail showroom building) to exit the site via the proposed relocated left-in / left-out site access, noting that the service vehicle arrangements for the existing building are such that vehicles enter the site via the existing left-in access and circulate the site in a clockwise direction.

Overall, the proposed servicing arrangements are considered suitable for the development site.

7. Traffic Impact Assessment

7.1. Scope of Impact Assessment

In accordance with the Department of Transport and Main Roads' 'Guide to Traffic Impact Assessment' (GTIA), the potential traffic impacts of the proposal have been considered as summarised in Table 7.1.

Table 7.1: Scope of Traffic Impact Assessment

Intersection / Site Access	Assessment Year
Yaamba Rd / Farm St intersection	Opening Year (2021)
Yaamba Rd / Richardson Rd intersection	Opening Year (2021)
Yaamba Rd / Macartney St intersection	Opening Year (2021)
Yaamba Rd southern site access	10-year Design Horizon (2031)

Potential impacts of the proposed development beyond the above-mentioned intersections would be insignificant and do not necessitate detailed impact analysis.

Traffic impacts have been assessed for the weekday AM, weekday PM and Saturday midday road peak hour periods.

This analysis incorporates a 1.0% per annum increase in the background traffic volume for a period of 6 years from the most recent survey. This analysis has been performed for the AM, PM, and Weekend peak hour periods.

7.2. Without Development (Base) Traffic Volumes

7.2.1. Existing Site Traffic Demands

Whilst the existing retail warehouse building is currently unoccupied, it is acknowledged that a business is lawfully permitted to occupy the building and commence operations. The surveys undertaken by TTM in 2015 captured the traffic generating potential of the previous Bunnings use, which occupied the site at the time. To ensure that the following assessment accounts for any lawful future occupation of the site, the surveyed Bunnings volumes have been included in the Base scenarios.

7.2.2. Future Base Traffic Volumes

TTM Data conducted traffic movement surveys at the Yaamba Road / Farm Street intersection in 2011 on Thursday 11th August, from 3-6pm, and Saturday 13th August, from 10am-1pm. Figure 7.1 below summarises the surveyed 2011 and 2015 intersection volumes, the change in volumes over the 4 year period, and the annual average compound traffic growth rate for each movement. The comparison indicates the following:

- For the Thursday period most movements experienced a decline in traffic volumes with the exception of the through and left turn from Yaamba Road north approach and the Farm Street west approach.
- For the Saturday period there was a decline in traffic volumes on some movements with moderate increases on movements to and from Farm Street east generally.

Based on this, and the observed growth rates, it is considered appropriate that an annual average compound growth rate of 1% is applied for the purposes of estimating future background traffic growth on the local road network. This rate has been applied in the determination of the 2021 and 2031 Base traffic volumes. Traffic volumes diagrams are presented in **Appendix C**.

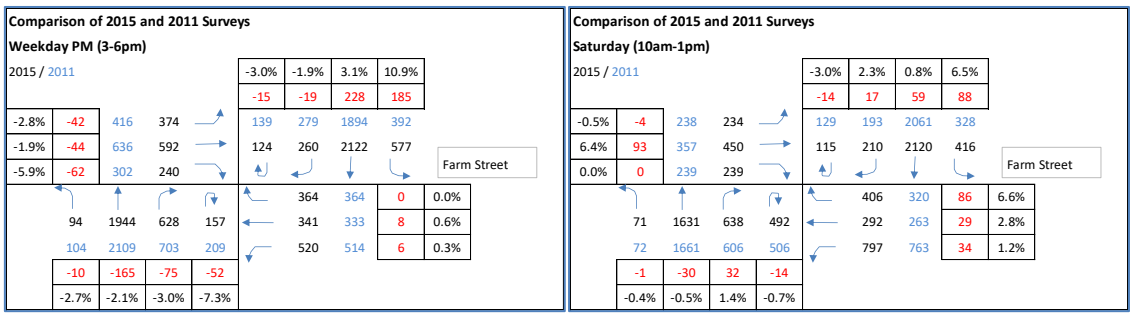


Figure 7.1: Historical Traffic Growth at Yaamba Rd / Farm St Intersection (Comparison of 2011 & 2015 Survey Data)

7.3. Development Traffic

7.3.1. Estimated Trip Generation

Due to the relatively small scale of the proposed development it is unlikely that this tenancy would be occupied by a large food and drink franchise e.g. McDonalds. Instead, the proposed development is expected to attract smaller fast food franchises like Hungry Jacks, KFC, or Red Rooster.

Reference is made to traffic generation surveys undertaken on behalf of the NSW RMS of regional and metropolitan fast food outlets in NSW (Trip Generation and Parking Demand Surveys of Fast Food Outlets Analysis Report, Bitzios Consulting, 2016). Of the above-mentioned three franchises the study identified that Hungry Jacks outlets typically generated the highest quantity of trips.

For the purposes of this assessment the highest 85th percentile generation rates for the three assessable peak hour periods of all surveyed sites has been adopted, and include:

- Weekday AM peak hour = 18 trips per hour per 100m^2 GFA (equating to 44 trips per hour)
- Weekday PM peak hour = 36 trips per hour per 100m^2 GFA (equating to 90 trips per hour)
- Weekday AM peak hour = 39 trips per hour per 100m^2 GFA (equating to 96 trips per hour)

7.3.2. Estimated Trip Segmentation

Not all trips associated with the development will be new trips on the road network. Other trip types would include diverted drop-in trips and undiverted (or pass-by) drop-in trips. For the purposes of this assessment trips types have been categorised as either 'new trips' or 'pass-by trips.'

Due to the location of the subject site and restricted site accessibility, due to the left-in / left-out site access arrangement, the proportion of pass-by trips would be relatively high. Consistent with the findings of the above-mentioned NSW RMS trip generation study the proportion of pass-by trips associated with the proposed development is assumed to be 75% on weekdays and 55% on weekends.

7.3.3. Estimated Trip Distribution

The peak hourly in:out proportional splits are assumed to be 50:50. All pass-by trips are assumed to occur from the southbound traffic flow on Yaamba Road at the site frontage. The direction distribution of new trips is assumed to be as summarised in Table 7.2.

Table 7.2: Direction Distribution of Development Generated New Trips

Direction	Percentage of Trips
North (Yaamba Rd)	15%
East (Farm St)	35%
East (Yewdale Dr)	5%
South (Yaamba Rd)	5%
West (Richardson Rd)	20%
West (Farm St)	20%

The estimated development traffic volumes on the surrounding road network are presented in **Appendix C.**

7.4. Warrants for Impact Assessment

In accordance with DTMR's Guide to Traffic Impact Assessment the traffic demands associated with the proposed development have been assessed against the 2021 base traffic demands to determine where development traffic exceeds 5%. Calculations for each movement on the local road network are presented in Appendix C. The analysis indicates that the impacts of the development need to be assessed as follows:

- Yaamba Rd / Farm St intersection – weekday PM peak hour (southbound U-turn)
- Yaamba Rd / Richardson Rd intersection – all three peak hours (northbound U-turn & right turn from north approach)
- Yaamba Rd / Macartney St intersection – all three peak hours (left turn into Macartney St)
- Yaamba Rd / South site access – all three peak hours

The following sections summarise the analysis of the above-mentioned intersections.

7.5. Analysis of Yaamba Road / Farm Street Intersection

7.5.1. SIDRA Analysis

The existing intersection configuration has been analysed for the 2021 weekday PM peak hour period using SIDRA 8 analysis software. Table 7.3 summarises the analysis outputs and detailed analysis output summaries are presented in **Appendix D**.

The analysis indicates that the proposed development would have an insignificant and negligible impact on the performance of the intersection with marginal increase in degree of saturation, average delay, and queuing. Notably, the 95th percentile queue length on the right turn lane on Yaamba Road south approach increases by 3m (133m total) due to the proposed development which is comfortably accommodated within the 160m queue length capacity of the turn lane.

No mitigating upgrade works are required at the intersection as a consequence of the proposed development.

Table 7.3: Summary of Sidra Outputs (Yaamba Road / Farm Street Signalised Intersection)

Case	Degree of Saturation	Average/ Worst Delay	Worst Level of Service	95th Percentile Critical Queue (m)			
				South	East	North	West
PM Peak							
PM Base Case 2021	93.0	41.2 / 78.2	E	130	72	172	144
PM Project Case 2021	93.3	41.3 / 78.2	E	133	72	173	145

Note: South approach queue length refers to right turn / U-turn lane.

7.6. Analysis of Yaamba Road / Richardson Road Intersection

7.6.1. SIDRA Analysis

The existing intersection configuration has been analysed for the 2021 peak hour periods using SIDRA 8 analysis software. Table 7.3 summarises the analysis outputs and detailed analysis output summaries are presented in **Appendix D**.

The analysis indicates that the proposed development would have an insignificant and negligible impact on the performance of the intersection with marginal increase in degree of saturation, average delay, and queuing. Notably, the 95th percentile queue length on the right turn lane on Yaamba Road north approach increases by up to 5m (74m total) due to the proposed development which is comfortably accommodated within the 85m queue length capacity of the turn lane.

No mitigating upgrade works are required at the intersection as a consequence of the proposed development.

Table 7.4: Summary of Sidra Outputs (Yaamba Road / Richardson Road Signalised Intersection)

Case	Degree of Saturation	Average/ Worst Delay	Worst Level of Service	95th Percentile Critical Queue (m)			
				South	East	North	West
AM Peak							
AM Base Case 2021	92.5	37.4 / 79.7	E	110	126	65	131
AM Project Case 2021	92.5	37.5 / 80.0	E	110	126	67	132
PM Peak							
PM Base Case 2021	91.0	32.4 / 77.3	E	122	97	70	139
PM Project Case 2021	91.3	33.0 / 77.7	E	129	97	72	140
Saturday Peak							
SAT Base Case 2021	92.1	37.9 / 77.0	E	182	82	69	111
SAT Project Case 2021	92.6	38.2 / 77.9	E	182	82	74	113

Note: North approach queue length refers to right turn / U-turn lane.

7.7. Analysis of Yaamba Rd / Macartney St Intersection

7.7.1. Turn Warrant Assessment

The proposed development would increase the volume of left turning traffic into Macartney Street from Yaamba Road. A Type BAL turn treatment currently exists at the intersection. A turn lane treatment warrant analysis has been undertaken in accordance with DTMR's 'Supplement to Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersection (Aug 2014)' to determine if the proposed development traffic demands warrants a change to the existing turn treatment.

Table 7.5 and Figure 7.2 detail the parameters and turn lane treatment types required at the proposed development site access based on the estimated 2031 base and project scenario peak hour traffic volumes.

The assessment indicates that the base and project scenario volumes would warrant a Type AUL(s) treatment (short left turn lane). Importantly, the proposed development does not significantly increase the demand on the left turn movement and results almost identical data plots to the base scenario data plots. This indicates that no change to the existing turn treatment is warranted by the proposed development.

Table 7.5: Turn Lane Warrant Assessment – Yaamba Road / Macartney Street Intersection

Case	AM Peak Hour			PM Peak Hour			SAT Peak Hour		
	Q_M	Q_L	Treatment	Q_M	Q_L	Treatment	Q_M	Q_L	Treatment
Base	636	22	AUL(s)	558	37	AUL(s)	636	60	AUL(s)
Project	638	24	AUL(s)	561	41	AUL(s)	643	68	AUL(s)

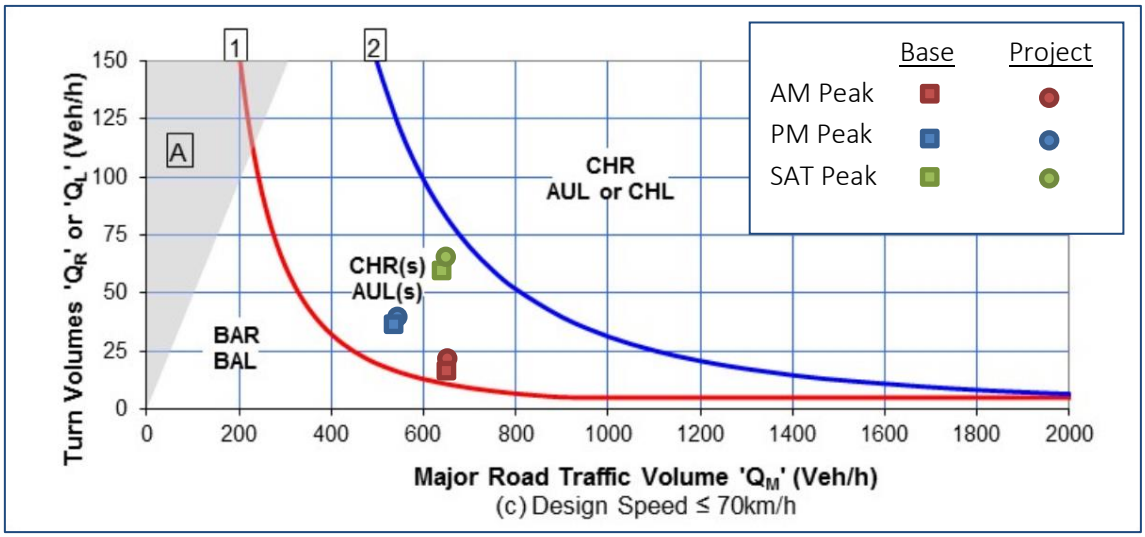


Figure 7.2: Left-turn Warrant Treatment Analysis – Yaamba Road / Macartney Street Intersection

7.7.2. SIDRA Analysis

The existing intersection configuration has been analysed for the 2021 peak hour periods using SIDRA 8 analysis software. Table 7.3 summarises the analysis outputs and detailed analysis output summaries are presented in **Appendix D**.

The analysis indicates that the proposed development would have an insignificant and negligible impact on the performance of the intersection with marginal increase in degree of saturation, average delay, and queuing.

No mitigating upgrade works are required at the intersection as a consequence of the proposed development.

Table 7.6: Summary of Sidra Outputs (Yaamba Road / Macartney Street Intersection)

Case	Degree of Saturation	Average/ Worst Delay	Worst Level of Service	95th Percentile Critical Queue (m)	
				East	North
AM Peak					
AM Base Case 2021	35.3	0.5 / 8.7	A	2	0
AM Project Case 2021	35.4	0.5 / 8.7	A	2	0
PM Peak					
PM Base Case 2021	31.9	0.4 / 8.1	A	1	0
PM Project Case 2021	32.2	0.5 / 8.1	A	1	0
SAT Peak					
SAT Base Case 2021	36.1	0.5 / 8.5	A	1	0
SAT Project Case 2021	36.7	0.5 / 8.5	A	1	0

7.8. Analysis of Yaamba Road / Southern Site Access Intersection

7.8.1. Turn Warrant Assessment

The proposed development would increase the volume of left turning traffic into the site access from the existing Yaamba Road auxiliary left-turn lane. Consequently, a turn lane warrant analysis has been undertaken in accordance with DTMR's 'Supplement to Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersection (Aug 2014)' to determine if the proposed arrangements are acceptable.

Table 7.7 and Figure 7.3 detail the parameters and turn lane treatment types required at the proposed development site access based on the estimated 2031 peak hour traffic volumes.

The assessment indicates that a Type AUL(s) turn treatment (short left turn lane) is warranted.

The configuration at the existing site access effectively includes a Type AUL (full length left turn lane) treatment. It is recommended that this arrangement be retained but works are undertaken to modify the existing pavement marking on Yaamba Road to include provision of a shared turn lane / cycle lane consistent with the treatments that have been installed on Yaamba Road at adjacent intersections and property accesses. The recommended treatment is presented in TTM drawing number 19BRT0086-04A (Appendix B).

Table 7.7: Turn Lane Warrant Assessment – Yaamba Road / Southern Site Access Intersection

AM Peak Hour			PM Peak Hour			SAT Peak Hour		
Q_M	Q_L	Treatment	Q_M	Q_L	Treatment	Q_M	Q_L	Treatment
600	26	AUL(s)	477	45	AUL(s)	445	56	AUL(s)

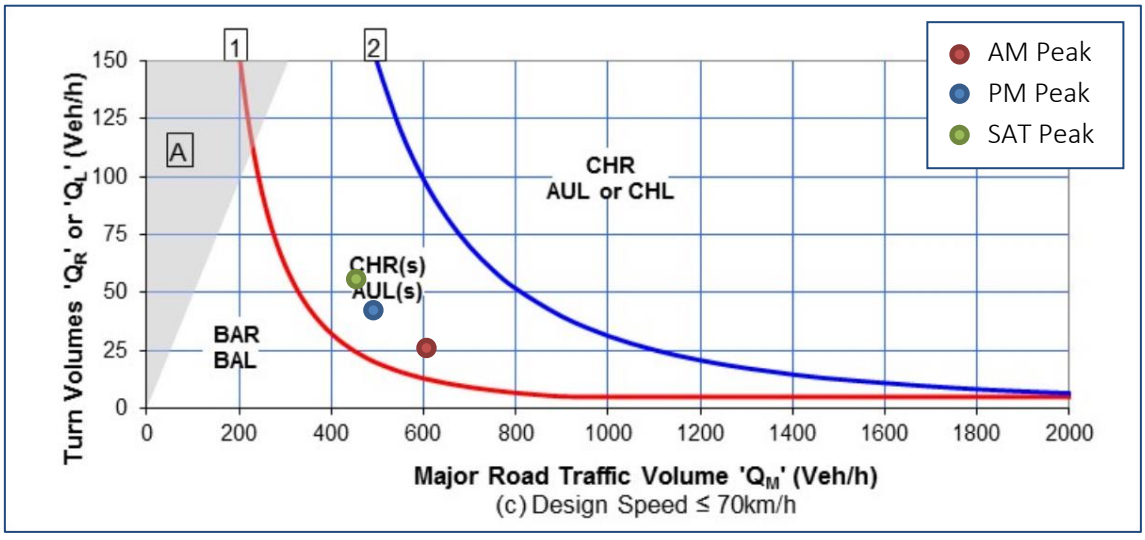


Figure 7.3: Left-turn Warrant Treatment Analysis – Yaamba Road / Southern Site Access Intersection

7.8.2. SIDRA Analysis

The existing intersection configuration has been analysed for the 2031 peak hour periods using SIDRA 8 analysis software. Table 7.3 summarises the analysis outputs and detailed analysis output summaries are presented in Appendix D.

The analysis indicates that the proposed development would have an insignificant and negligible impact on the performance of the access intersection with marginal increase in degree of saturation, average delay, and queuing.

The site access would operate acceptably with inclusion of the proposed development.

Table 7.8: Summary of Sidra Outputs (Yaamba Road / Southern Site Access Intersection)

Case	Degree of Saturation	Average/ Worst Delay	Worst Level of Service	95th Percentile Critical Queue (m)	
				East (access)	North
AM Peak					
AM Base Case 2031	36.9	0.6 / 9.1	A	3	0
AM Project Case 2031	36.5	0.8 / 9.2	A	4	0
PM Peak					
PM Base Case 2031	30.3	1.1 / 8.3	A	5	0
PM Project Case 2031	29.4	1.5 / 8.3	A	7	0
SAT Peak					
SAT Base Case 2031	46.3	2.8 / 9.6	A	21	0
SAT Project Case 2031	50.6	3.2 / 9.8	A	25	0

7.9. Conclusions

The traffic impact assessment indicates that no mitigating upgrade works are required at any intersections on the local road network.

External road works are required along the Yaamba Road site frontage and include modification of the existing pavement markings associated with the proposed relocated southern site access. These works include provision of a shared left turn lane / cycle lane treatment, consistent with existing treatments elsewhere on the local road network, that extends to include both site accesses and the existing bus stop / bay located on the site frontage.

8. Code Assessments

Responses to the following Council and State Codes are presented **Appendices E and F**:

- Council Access, Parking and Transport Code
- State Code 1: Development in a State-Controlled Road Environment

9. Summary and Conclusions

9.1. Proposed Development

The development seeks approval for Material Change of Use (MCU) for a Food and Drink Outlet with a gross floor area of 247m^2 having a drive-through facility.

The proposed development will be constructed within the south-western corner of the site with the existing retail showroom building being retained. Modification of the existing on-site car parking area and southern vehicular site access is proposed.

9.2. Car Parking Arrangements

A total of 17 car parking spaces, including one (1) PWD space, is proposed for the proposed Food and Drink Outlet satisfies the planning scheme acceptable solution requirement.

The proposed development requires the removal of fifty (50) existing car parking spaces associated with the existing Retail Showroom development. This results in a provision of approximately 220 spaces available to the existing Retail Showroom use. This consequential car parking provision exceeds the currently conditioned minimum requirement of 197 spaces and satisfies the minimum requirement for *Showroom* or *Hardware and Trade Supplies* uses as identified in Council's *Access, Parking and Transport Code* (1 space per 40m^2 GFA, equating to 208 spaces). Therefore, the proposed reduction of existing on-site car parking supply for the existing Retail Showroom building is appropriate and acceptable.

The proposed car parking area layout satisfies Council's design standards and is suitable for the development.

9.3. Bicycle Parking Arrangements

The development plan includes a single bicycle rail capable of accommodating two bicycles. The planning scheme acceptable solution requirement is to provide parking for eight bicycles including three employee spaces and five visitor spaces.

Consistent with bicycle parking arrangements at typical fast food restaurants provision of Class 3 (low security level) parking is considered to be appropriate for the proposal. It is recommended that four bicycle rails (8 spaces) are provided at the proposed location which will require minor kerb/landscape layout amendment.

9.4. Site Access Arrangements

The existing southern left-in / left-out vehicular site access crossover to Yaamba Road is proposed to be reconstructed approximately 15m north of its current location. The existing northern access is proposed to be retained unchanged. The design and location of the proposed southern access is in accordance with Council and State design standards.

Modification of the existing pavement marking along the Yaamba Road site frontage, inclusive of turn lanes associated with both site accesses, is recommended to be undertaken generally in accordance with TTM drawing number 19BRT0086-04A (Appendix B).

A new pedestrian site access is proposed to be located on the southern side of the above-mentioned southern vehicular site access. Its design and location satisfy applicable design standards.

9.5. Service Vehicle Arrangements

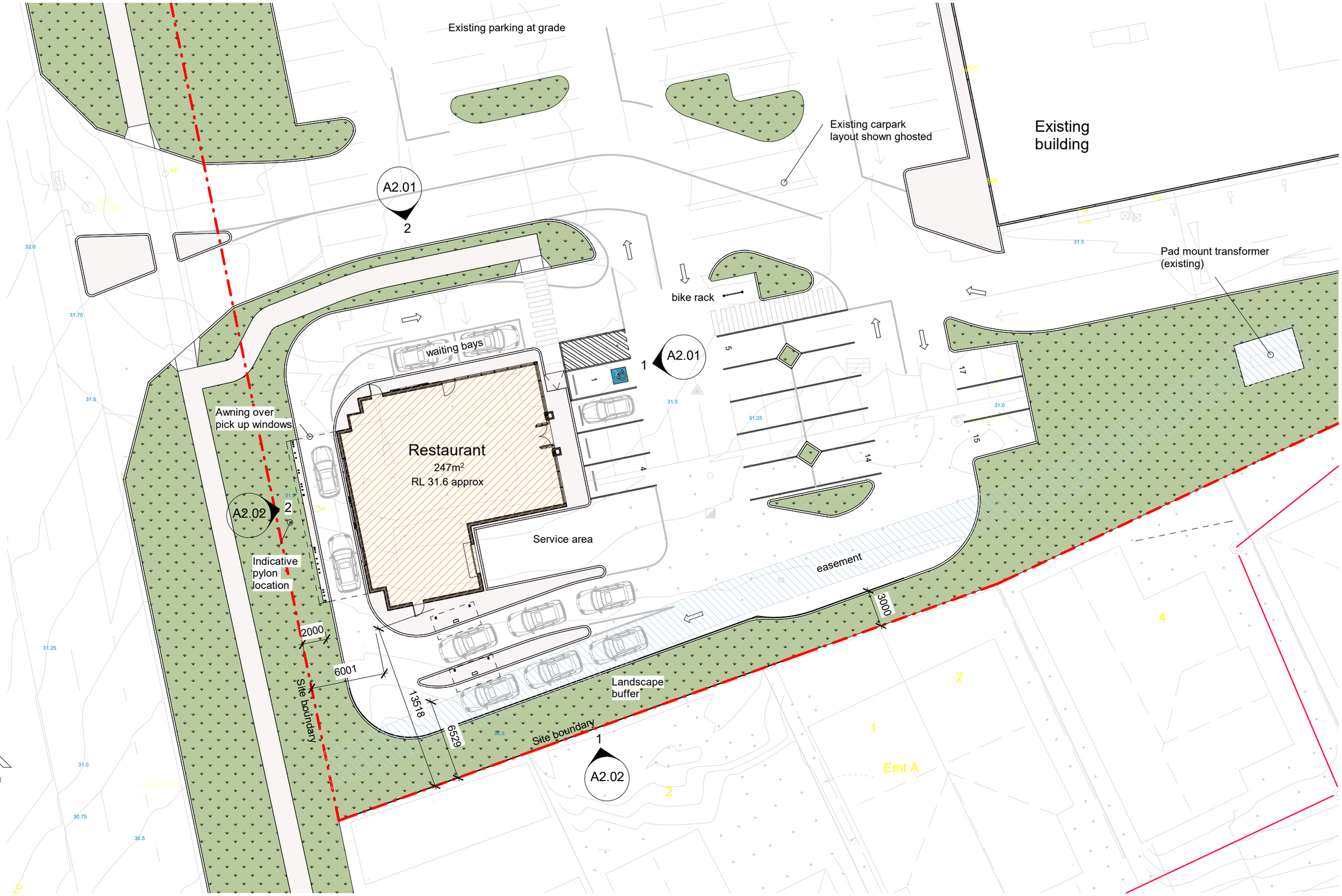
The proposed development design layout provides for all necessary service vehicles in accordance with Council requirements and the operational requirements of the development.

9.6. Traffic Impact Assessment

Assessment of the potential traffic impacts of the proposed development indicates that no mitigating upgrade works are required at any intersections on the local road network.

External road works are required along the Yaamba Road site frontage and include modification of the existing pavement markings associated with the proposed relocated southern site access. These works include provision of a shared left turn lane / cycle lane treatment, consistent with existing treatments elsewhere on the local road network, that extends to include both site accesses and the existing bus stop / bay located on the site frontage. The recommended arrangement is presented in TTM drawing number 19BRT0086-04A (Appendix B).

Appendix A Development Plans



TULIP DESIGN QLD

Tulip Design Queensland, 39 Tulip Street, Cooroy QLD 4563
W: www.tdq.com.au T: 0426 439 395 E:robert@tdq.com.au

Rev	Description	Date
A	Preliminary Issue	29.07.20
B	Issue for Approval	07.08.20
C	Carpark shade trees and landscape beds added	24.08.20
D	Additional landscape bed added	24.08.20

Norman Gardens - Food Pad

Brownfield Nominees Pty Ltd

Site Plan

Project number	2003	Drawing number	Rev
Date	July 2020	A1.02	D
Drawn by	Rcl		
Checked by	-	Scale @ A3	1 : 300

Appendix B TTM Drawings

Existing parking at grade

Existing carpark layout shown ghosted

Existing building

Prime mover and semi-trailer (19 m)

Pad mount transformer (existing)

bike rack

waiting bays

Awning over pick up windows

Restaurant
247m²
RL 31.6 approx

Service area

Indicative pylon location

easement

Site boundary

Landscape buffer

2000

6001

13518

6529

3000

Top Pit 31.98
Inv 30.78

Top 31.54

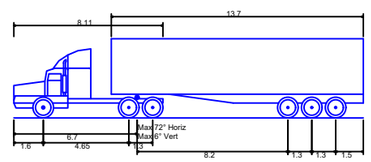
Top 31.76

25
rp610513

RP610513

GTP 60067

Emt A
RP842976



Prime mover and semi-trailer (19 m)

Overall Length	19.000m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.540m
Track Width	2.500m
Lock to lock time	6.00s
Kerb to Kerb Turning Radius	12.500m

DAVID GRUMMITT
SENIOR ASSOCIATE DIRECTOR
RPEQ 19356

APPROVED 11 Sep 2020

REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
A	11-09-20	ORIGINAL ISSUE	DG	DG	DG

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SCALE 1:400 AT ORIGINAL SIZE

NORTH

CLIENT
BROWNFIELD NOMINEES PTY LTD

TTM CONSULTING PTY LTD
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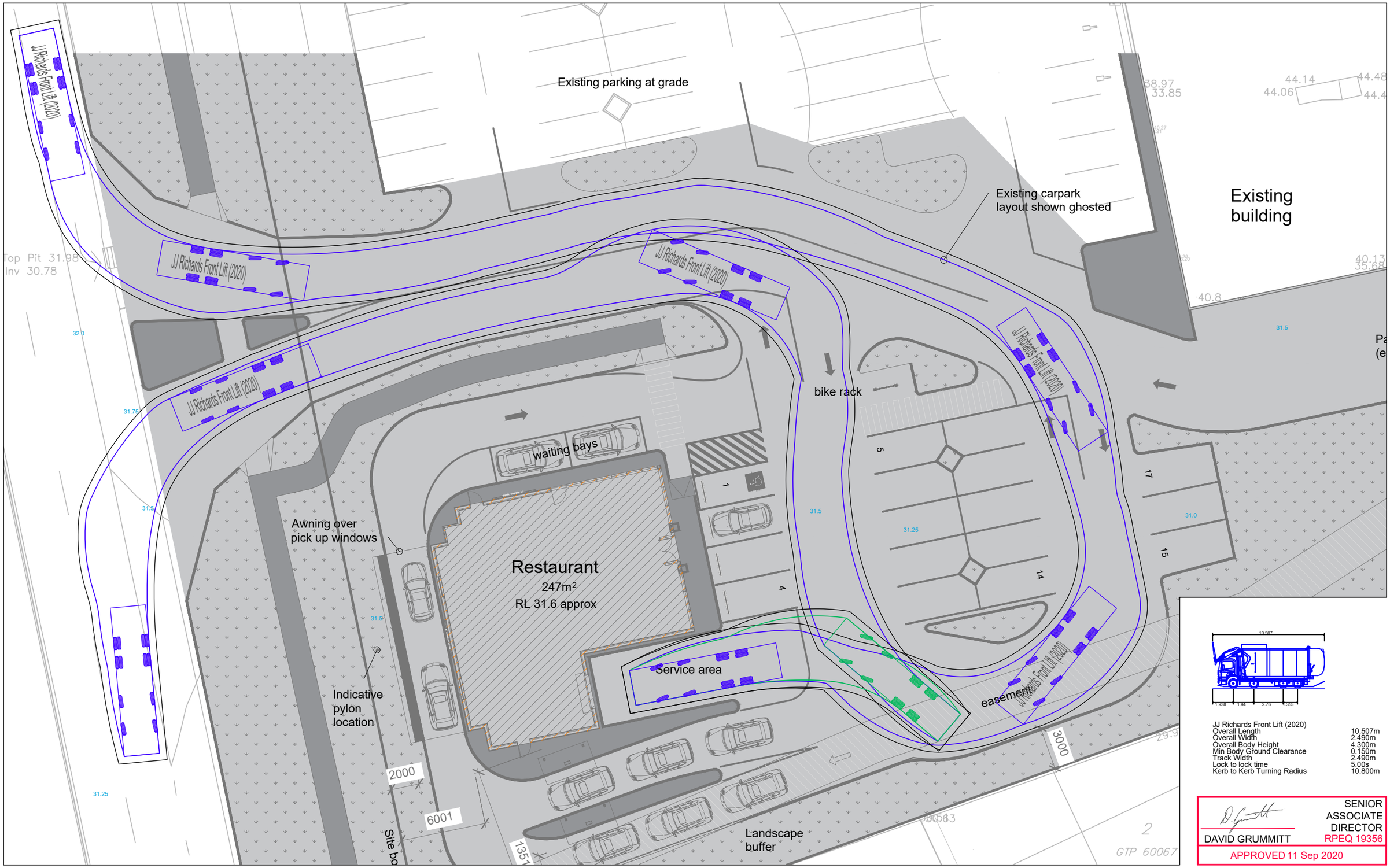
PROJECT
452 YAAMBA ROAD, NORMAN GARDENS

DRAWING TITLE
PROPOSED FAST FOOD PAD SITE
VEHICLE SWEPT PATH ANALYSIS
19m ARTICULATED VEHICLE

PROJECT NUMBER	19BRT00086
ORIGINAL SIZE	A3
DRAWING NUMBER	19BRT0086-03
REVISION	A
DATE	11 Sep 2020
SHEET	1 OF 4



JJ Richards Front Lift (2020)

Overall Length	10.507m
Overall Width	2.490m
Overall Body Height	4.300m
Min Body Ground Clearance	0.150m
Track Width	2.490m
Lock to lock time	5.00s
Kerb to Kerb Turning Radius	10.800m

SENIOR ASSOCIATE DIRECTOR
DAVID GRUMMITT RPEQ 19356
APPROVED 11 Sep 2020

REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
A	11-09-20	ORIGINAL ISSUE	DG	DG	DG

SCALE 0 2.5 5 7.5 10 12.5m
SCALE 1:250 AT ORIGINAL SIZE

NORTH

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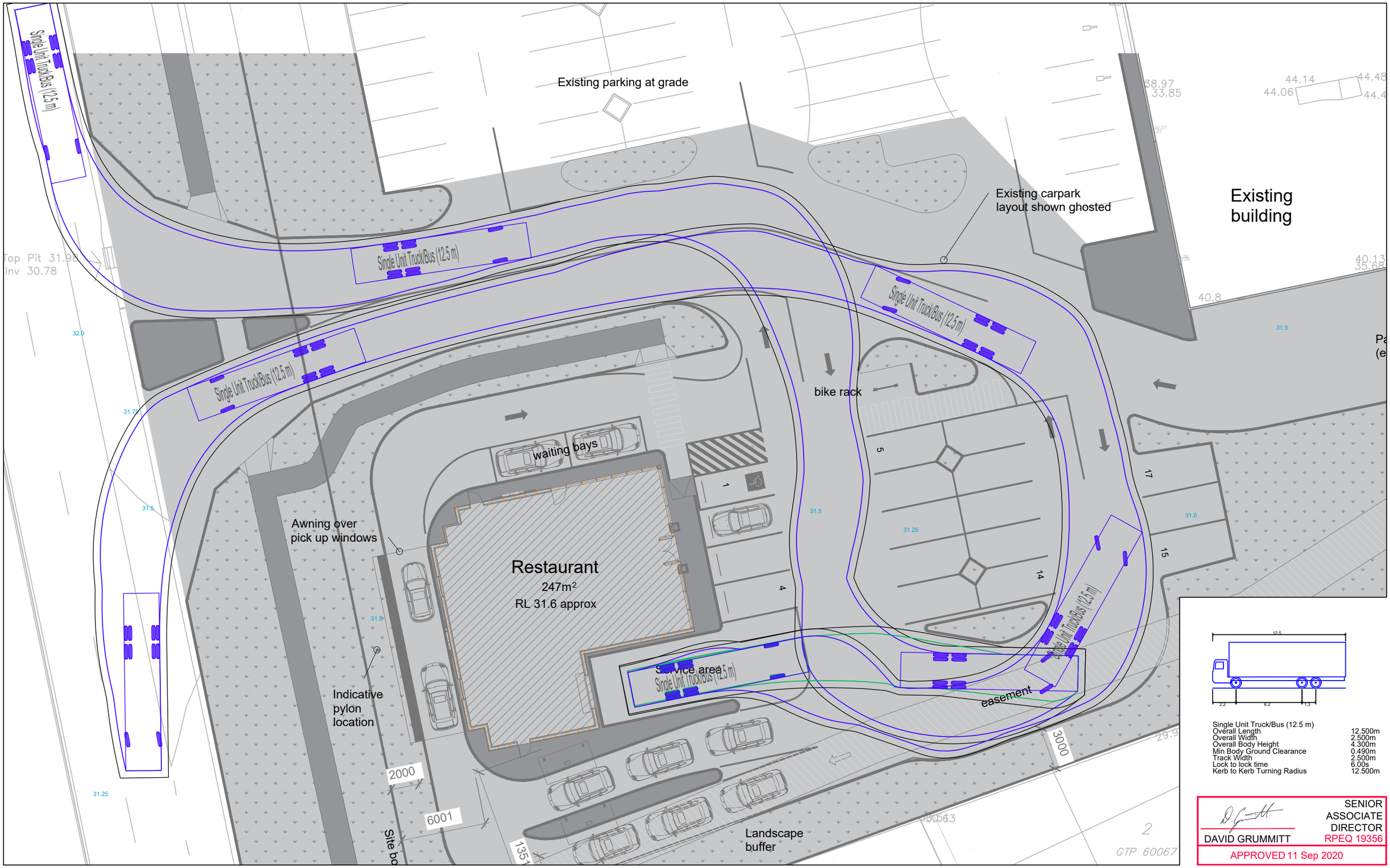
PROJECT
452 YAAMBA ROAD, NORMAN GARDENS

DRAWING TITLE
PROPOSED FAST FOOD PAD SITE
VEHICLE SWEPT PATH ANALYSIS
FRONT-LOADING REFUSE COLLECTION VEHICLE

PROJECT NUMBER	ORIGINAL SIZE
19BRT00086	A3
DRAWING NUMBER	REVISION
19BRT0086-03	A
DATE	SHEET
11 Sep 2020	2 OF 4



Single Unit Truck/Bus (12.5 m)

Overall Length	12.500m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.490m
Track Width	2.500m
Lock to lock time	6.00s
Kerb to Kerb Turning Radius	12.500m

DAVID GRUMMITT
SENIOR ASSOCIATE DIRECTOR
RPEQ 19356

APPROVED 11 Sep 2020

REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
A	11-09-20	ORIGINAL ISSUE	DG	DG	DG

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SCALE 1:250 AT ORIGINAL SIZE

NORTH

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PROJECT
452 YAAMBA ROAD, NORMAN GARDENS

DRAWING TITLE
PROPOSED FAST FOOD PAD SITE
VEHICLE SWEPT PATH ANALYSIS
12.5m HEAVY RIGID VEHICLE

PROJECT NUMBER	ORIGINAL SIZE
19BRT00086	A3
DRAWING NUMBER	REVISION
19BRT0086-03	A
DATE	SHEET
11 Sep 2020	3 OF 4

Existing carpark
layout shown ghosted

Existing
building

bike rack

waiting bays

Awning over
pick up windows

Restaurant
247m²
RL 31.6 approx

Service area

Indicative
pylon
location

Landscape
buffer

easement

Site boundary

Site boundary

2000

6001

13518

6529

3000

Passenger vehicle (5.2 m)

Overall Length	5.200m
Overall Width	1.940m
Overall Body Height	1.804m
Min Body Ground Clearance	0.295m
Track Width	1.840m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	6.300m

DAVID GRUMMITT
SENIOR ASSOCIATE DIRECTOR
RPEQ 19356

APPROVED 11 Sep 2020

REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
A	11-09-20	ORIGINAL ISSUE	DG	DG	DG

SCALE 0 2.5 5 7.5 10 12.5m
SCALE 1:250 AT ORIGINAL SIZE

NORTH

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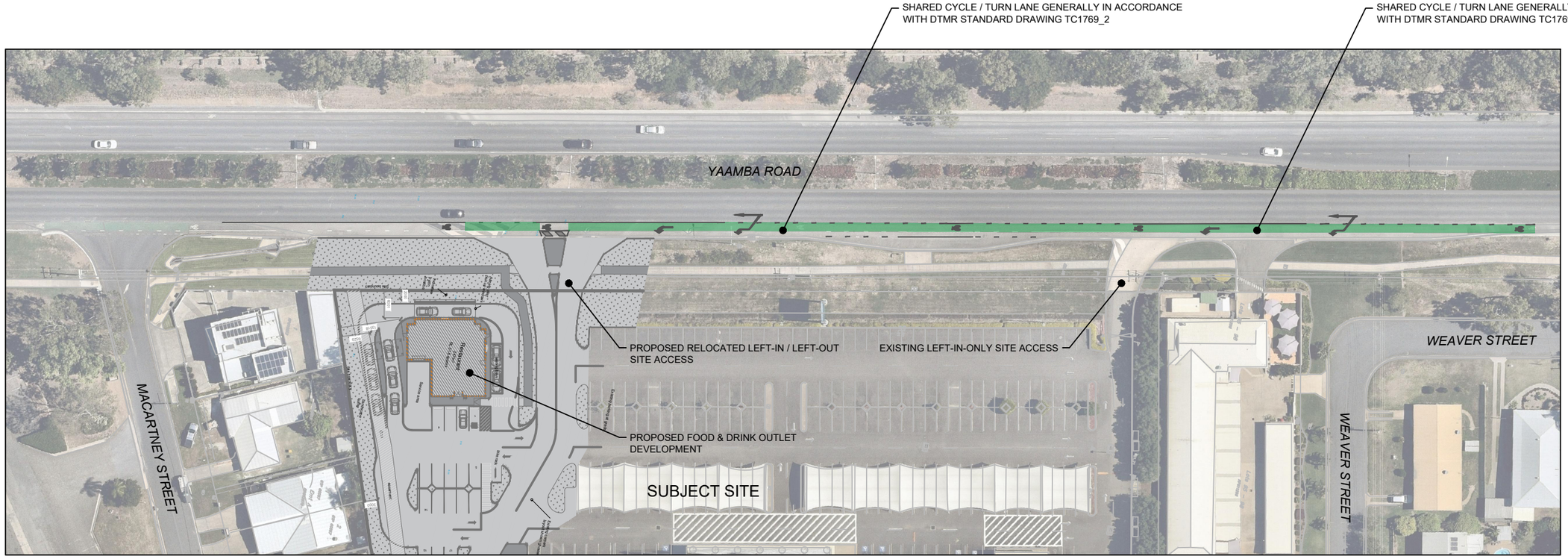
E: ttmbris@ttmgroup.com.au W: www.ttmgroup.com.au

PROJECT
452 YAAMBA ROAD, NORMAN GARDENS

DRAWING TITLE
PROPOSED FAST FOOD PAD SITE
VEHICLE SWEPT PATH ANALYSIS
5.2m PASSENGER VEHICLE (LARGE CAR)

PROJECT NUMBER	19BRT00086
ORIGINAL SIZE	A3
DRAWING NUMBER	19BRT0086-03
REVISION	A
DATE	11 Sep 2020
SHEET	4 OF 4



DAVID GRUMMITT
SENIOR ASSOCIATE DIRECTOR
RPEQ 19356
APPROVED 14 Sep 2020

REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
A	14-09-20	ORIGINAL ISSUE	DG	DG	DG

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NORTH

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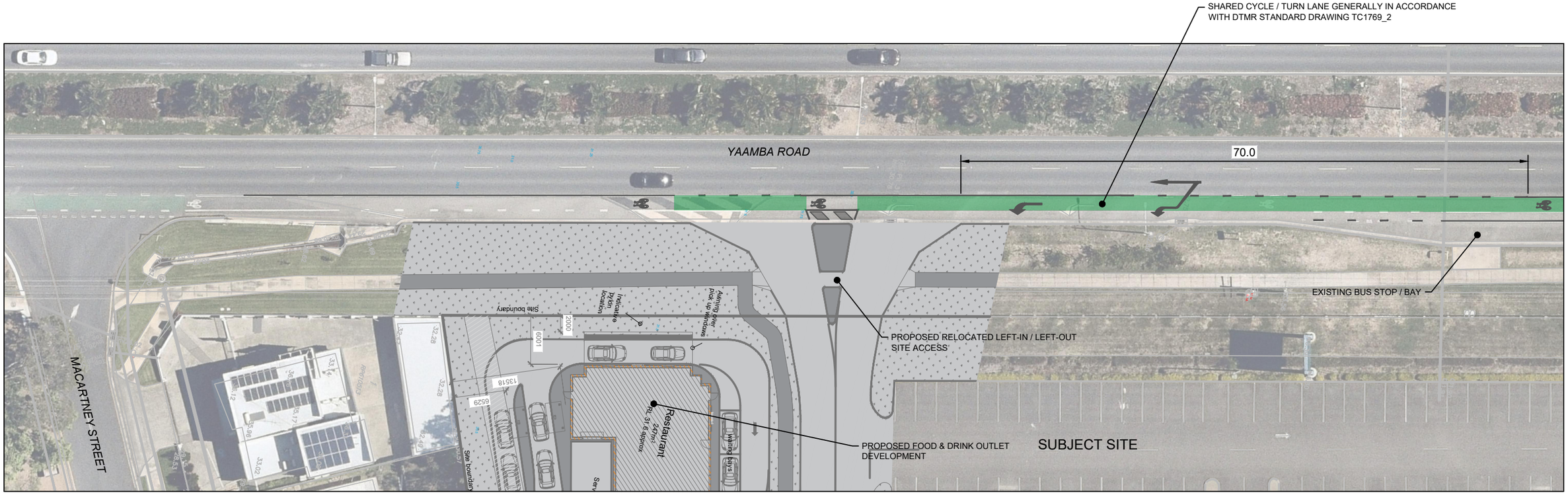
PROJECT
452 YAAMBA ROAD, NORMAN GARDENS

DRAWING TITLE
YAAMBA ROAD SITE ACCESS WORKS
PRELIMINARY FUNCTIONAL LAYOUT PLAN
SITE PLAN

PROJECT NUMBER	ORIGINAL SIZE
19BRT00086	A3
DRAWING NUMBER	REVISION
19BRT0086-04	A
DATE	SHEET
14 Sep 2020	1 OF 3



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SENIOR ASSOCIATE DIRECTOR
RPEQ 19356
APPROVED 14 Sep 2020

REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
A	14-09-20	ORIGINAL ISSUE	DG	DG	DG

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SCALE 1:500 AT ORIGINAL SIZE
NORTH
CLIENT: BROWNFIELD NOMINEES PTY LTD

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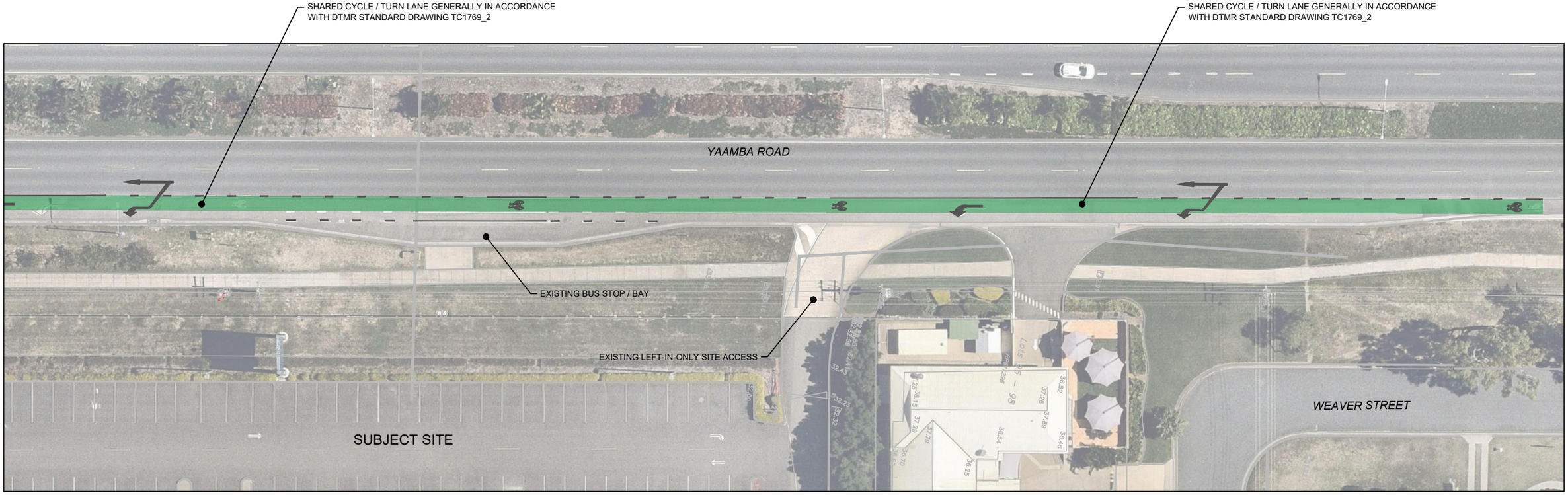
ABN 65 010 868 621
LEVEL 8, 369 Ann Street, BRISBANE, QLD, 4000
P.O. BOX 12015, BRISBANE, QLD, 4003
T: (07) 3327 9500 F: (07) 3327 9501
E: ttmbris@ttmgroup.com.au W: www.ttmgroup.com.au

PROJECT: **452 YAAMBA ROAD, NORMAN GARDENS**
DRAWING TITLE: **YAAMBA ROAD SITE ACCESS WORKS**
PRELIMINARY FUNCTIONAL LAYOUT PLAN
SOUTHERN SECTION

PROJECT NUMBER	ORIGINAL SIZE
19BRT00086	A3
DRAWING NUMBER	REVISION
19BRT0086-04	A
DATE	SHEET
14 Sep 2020	2 OF 3

REFER SHEET 2 FOR EXTENSION



DAVID GRUMMITT
SENIOR ASSOCIATE DIRECTOR
RPEQ 19356

APPROVED 14 Sep 2020

REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
A	14-09-20	ORIGINAL ISSUE	DG	DG	DG

SCALE 0 5 10 15 20 25m
SCALE 1:500 AT ORIGINAL SIZE

NORTH

CLIENT
BROWNFIELD NOMINEES PTY LTD

TTM CONSULTING PTY LTD
ABN 65 010 868 621
LEVEL 8, 369 Ann Street, BRISBANE, QLD, 4000
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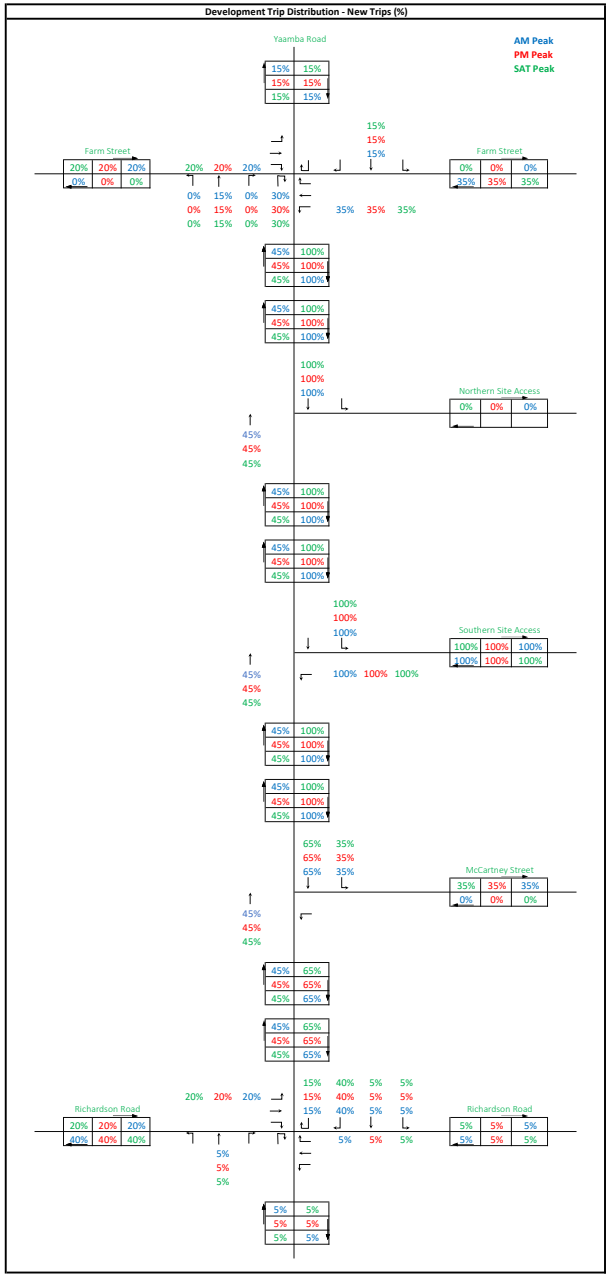
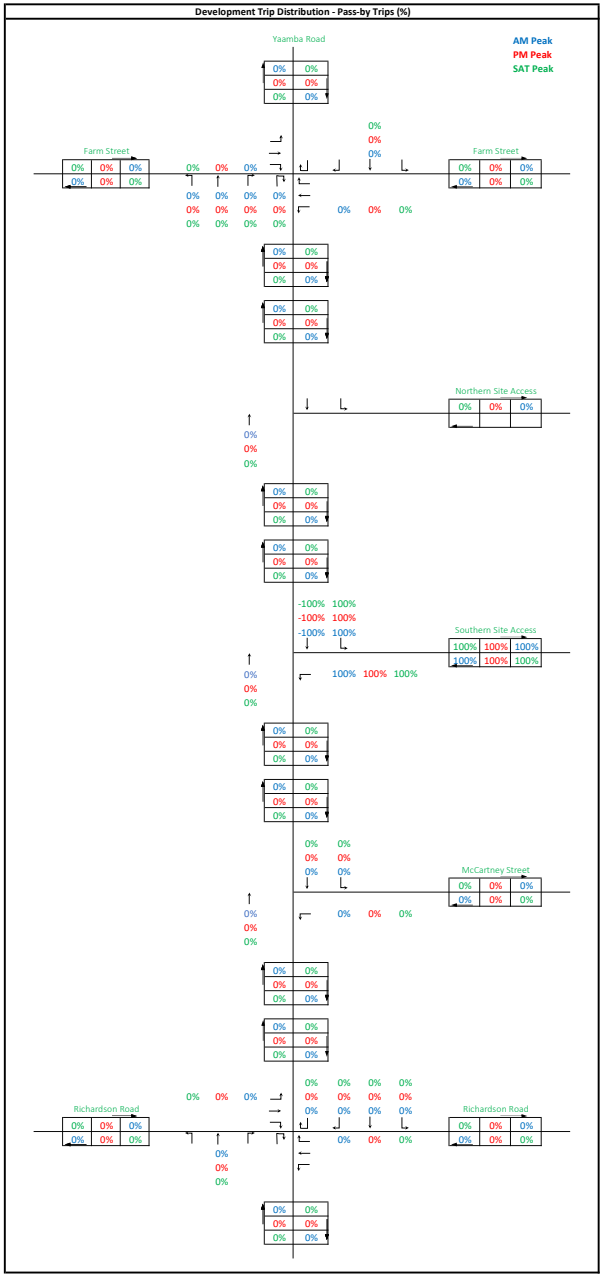
PROJECT
452 YAAMBA ROAD, NORMAN GARDENS

DRAWING TITLE
YAAMBA ROAD SITE ACCESS WORKS
PRELIMINARY FUNCTIONAL LAYOUT PLAN
NORTHERN SECTION

PROJECT NUMBER	ORIGINAL SIZE
19BRT00086	A3
DRAWING NUMBER	REVISION
19BRT0086-04	A
DATE	SHEET
14 Sep 2020	3 OF 3

Appendix C Traffic Volumes Diagrams

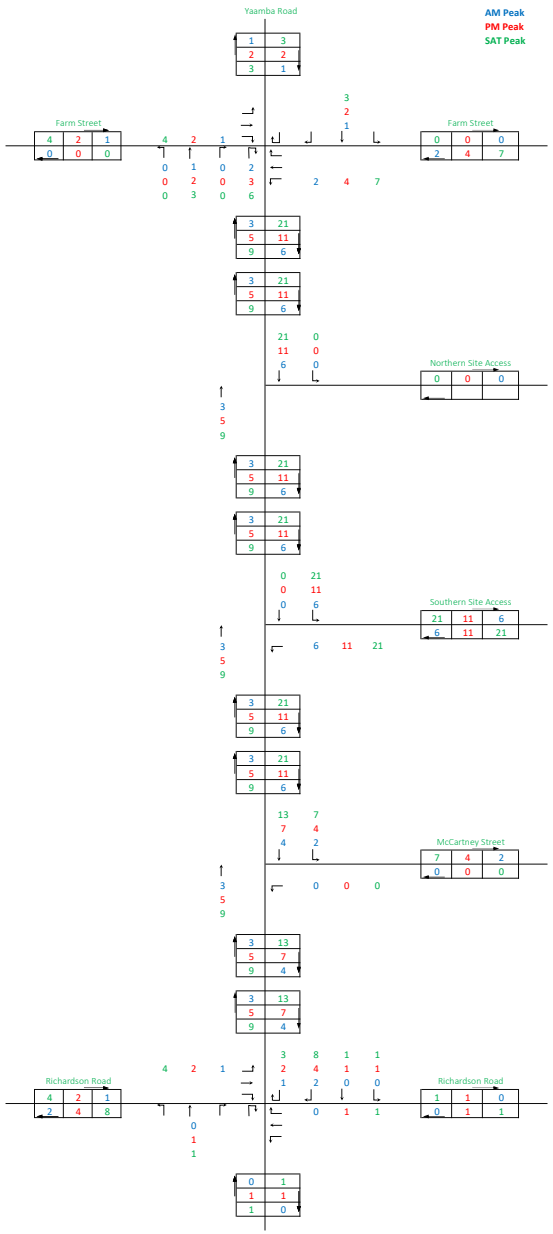




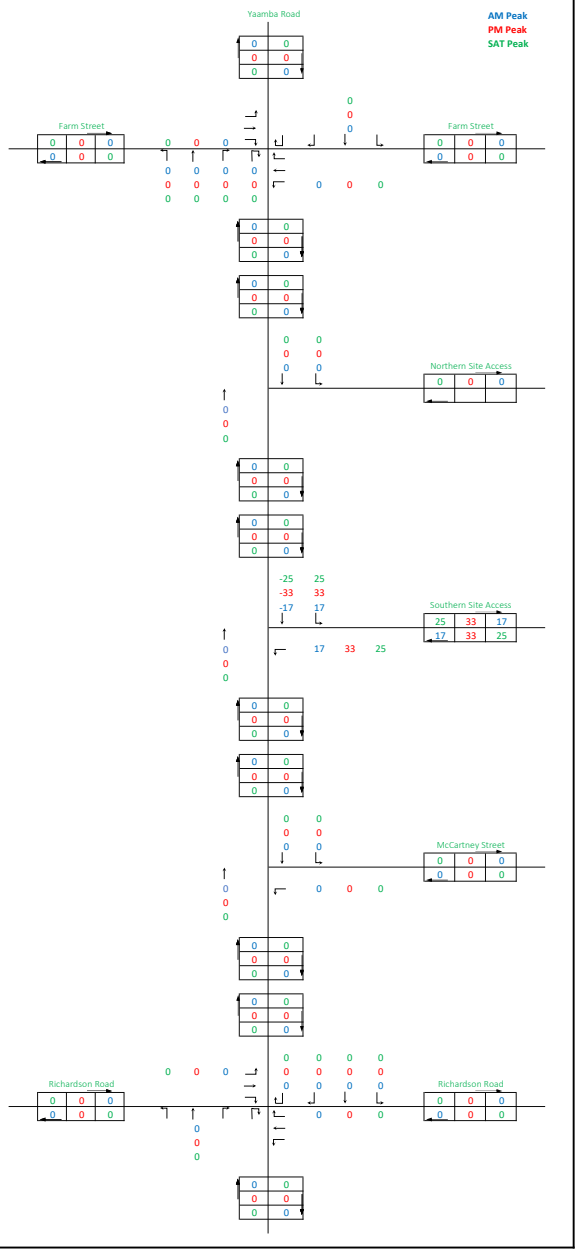
Direction Distribution of New Trips

Direction	%
North (Yaamba Rd)	15%
East (Farm St)	35%
East (Yewdale Dr)	5%
South (Yaamba Rd)	5%
West (Richardson Rd)	20%
West (Farm St)	20%
	100%

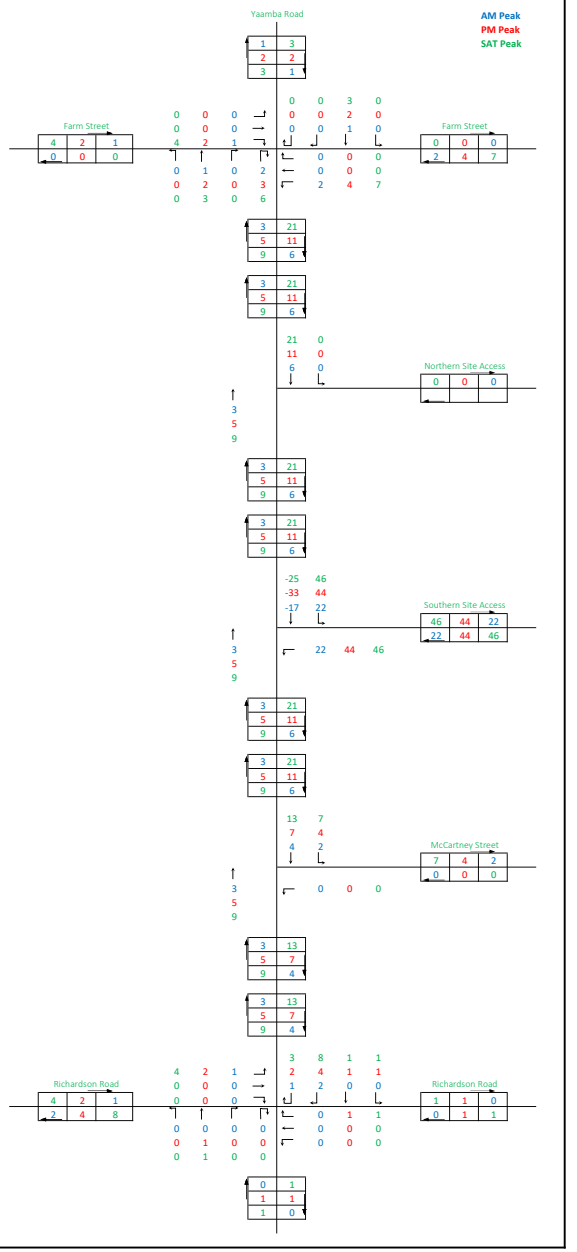
Development Trip Generation - New Trips

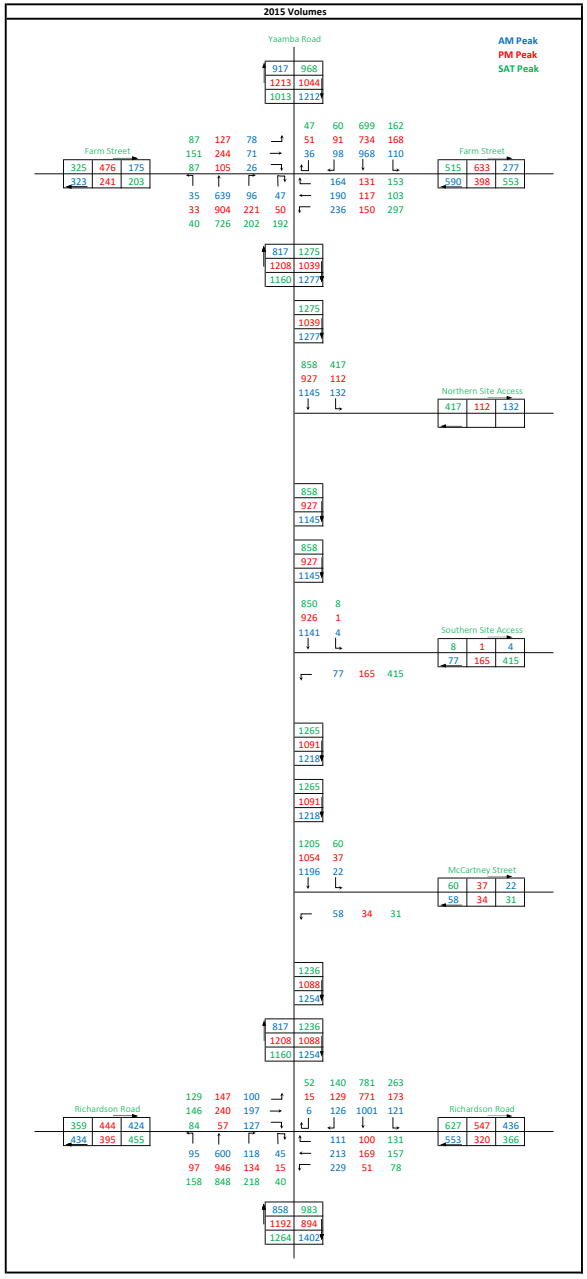


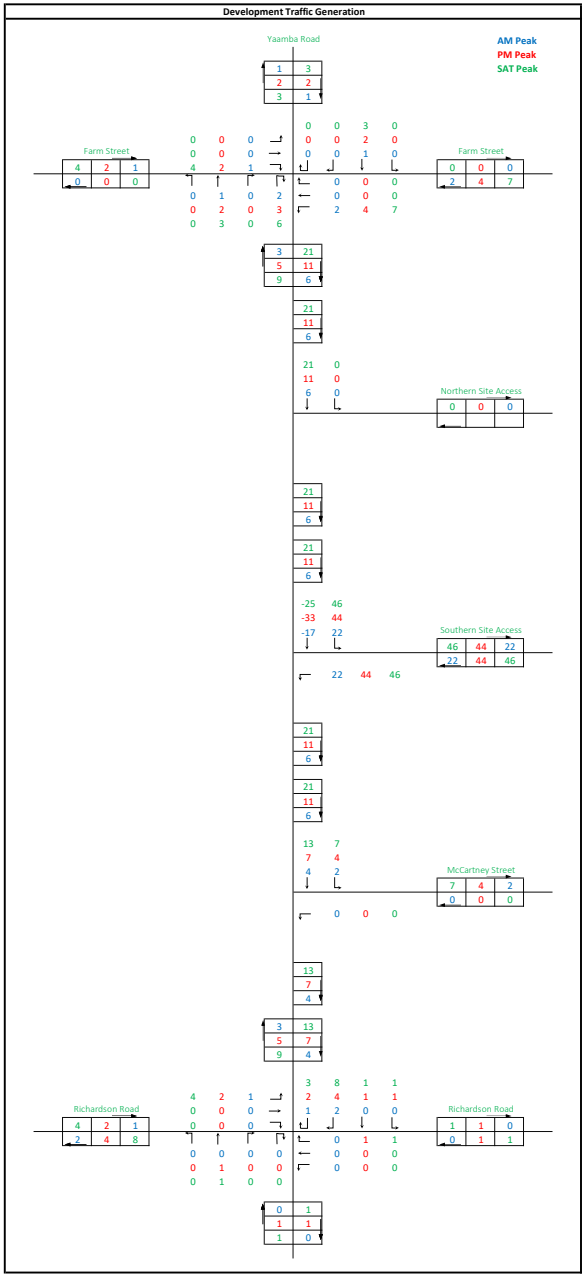
Development Trip Generation - Pass-by Trips

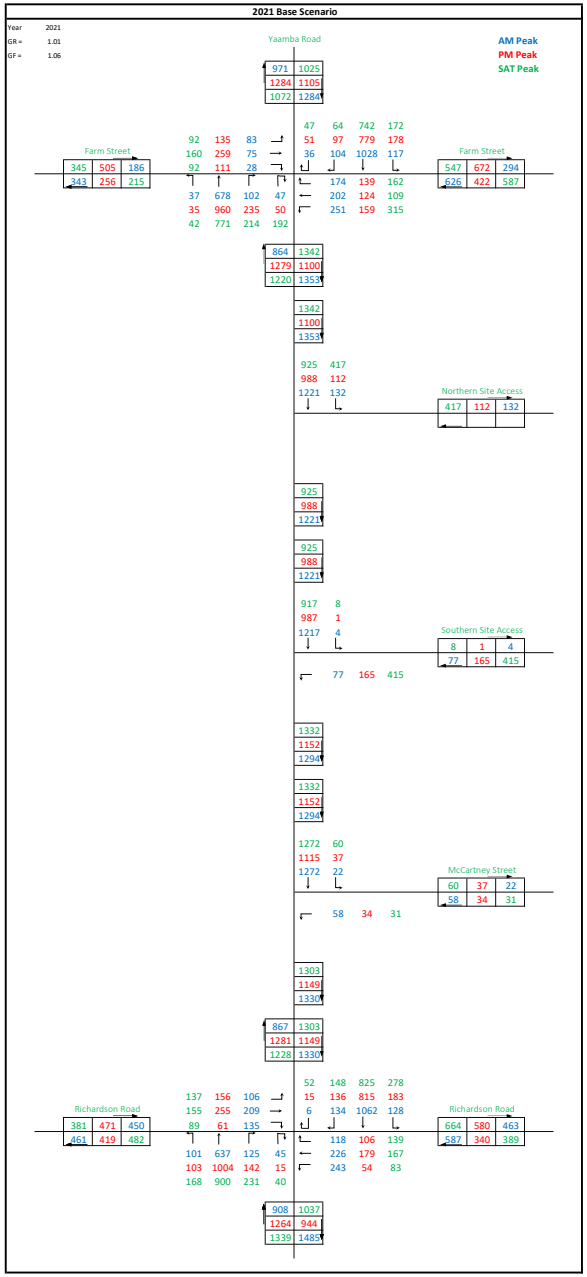


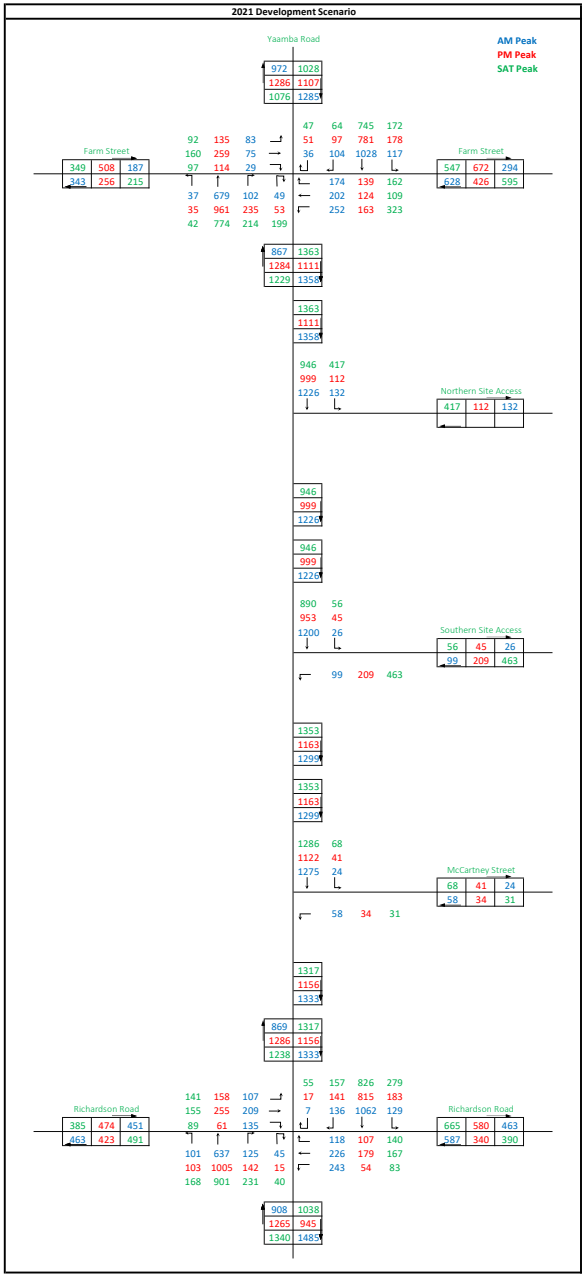
Development Trip Generation

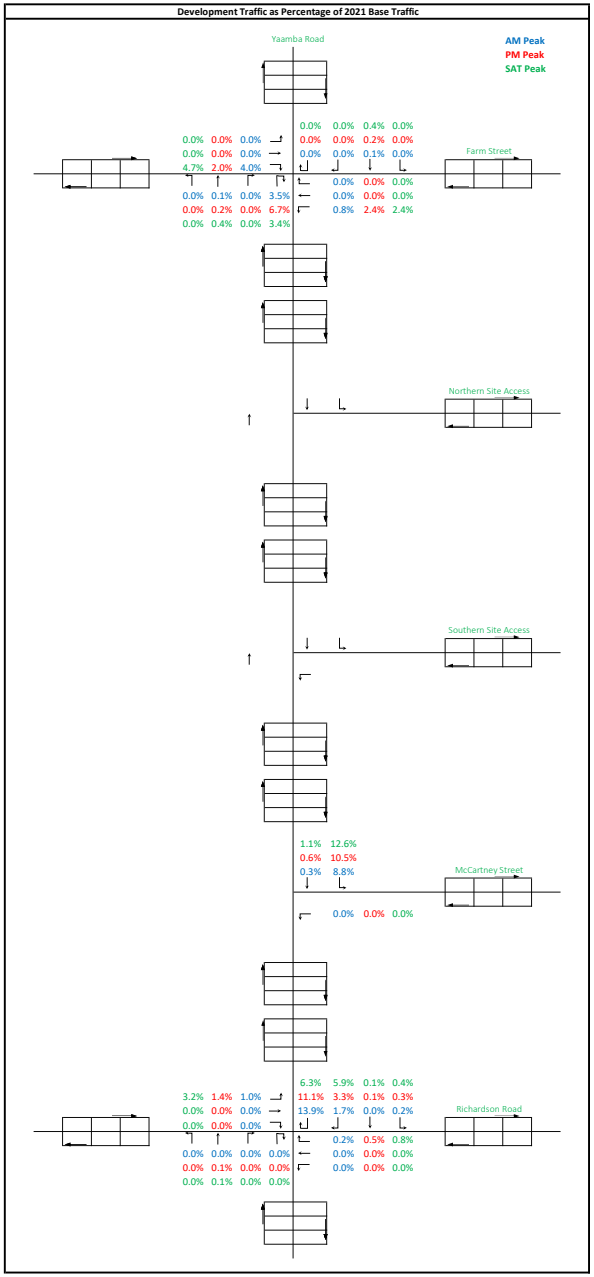


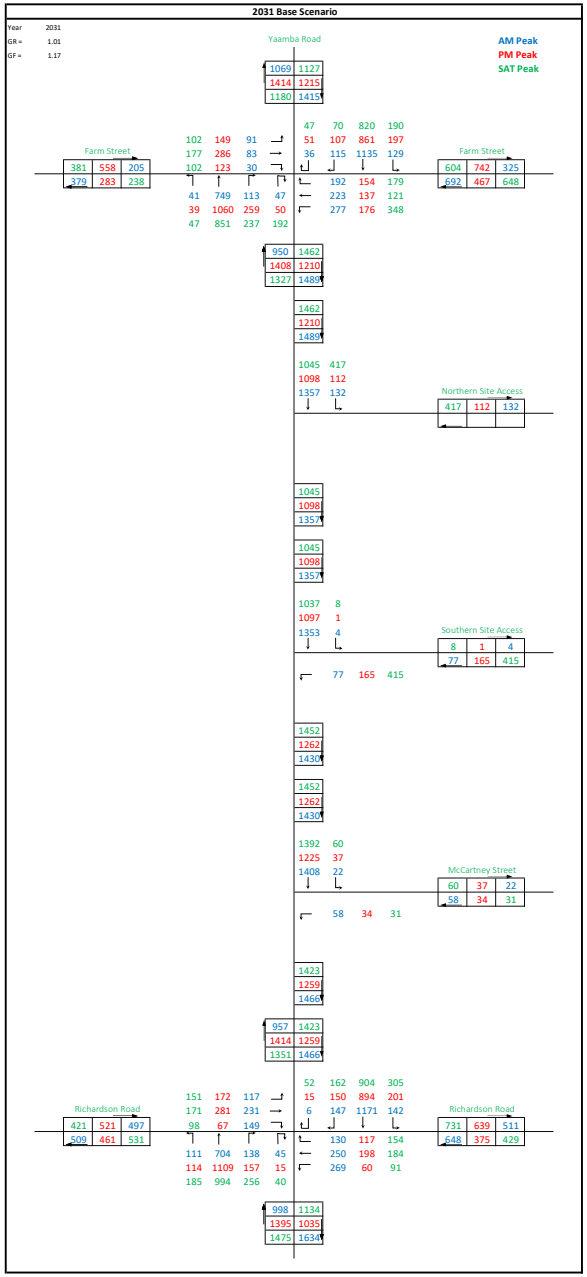

2015 Volumes
AM Peak
PM Peak
SAT Peak
Yaamba Road
Farm Street
Farm Street
Northern Site Access
Southern Site Access
McCartney Street
Richardson Road
Richardson Road

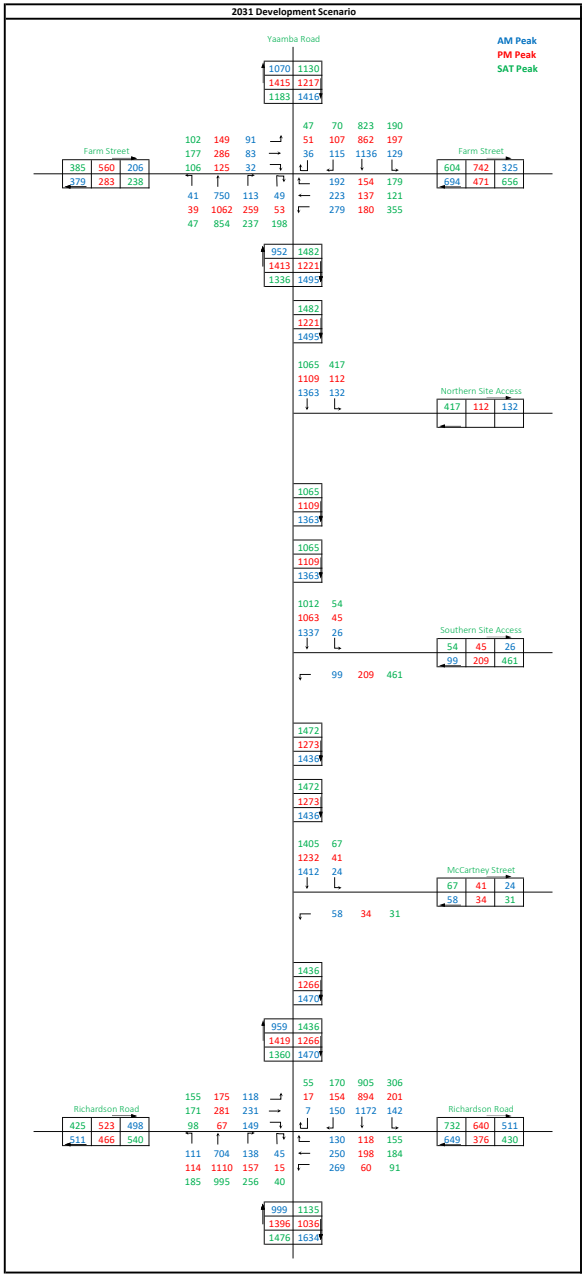

Development Traffic Generation
AM Peak
PM Peak
SAT Peak
Yaamba Road
Farm Street
Farm Street
Northern Site Access
Southern Site Access
McCartney Street
Richardson Road
Richardson Road


2021 Base Scenario
Year 2021
GR = 1.01
GF = 1.06
AM Peak
PM Peak
SAT Peak
Yaamba Road
Farm Street
Farm Street
Northern Site Access
Southern Site Access
McCartney Street
Richardson Road
Richardson Road


2021 Development Scenario
AM Peak
PM Peak
SAT Peak
Yaamba Road
Farm Street
Farm Street
Northern Site Access
Southern Site Access
McCartney Street
Richardson Road
Richardson Road


Development Traffic as Percentage of 2021 Base Traffic
AM Peak
PM Peak
SAT Peak
Yaamba Road
Farm Street
Northern Site Access
Southern Site Access
McCartney Street
Richardson Road


2031 Base Scenario
Year 2031
GR = 1.01
GF = 1.17
AM Peak
PM Peak
SAT Peak
Yaamba Road
Farm Street
Northern Site Access
Southern Site Access
McCartney Street
Richardson Road

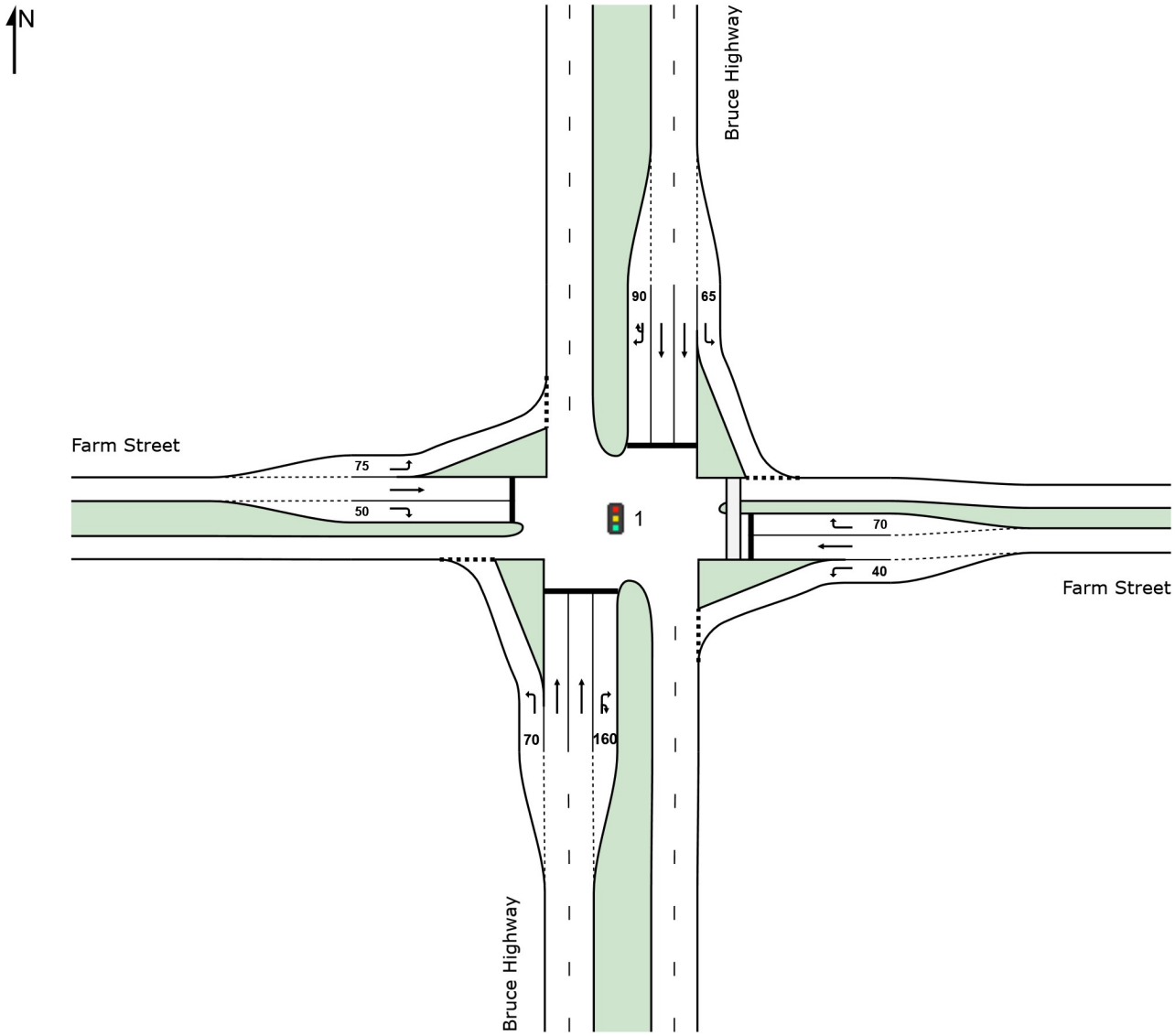

2031 Development Scenario
AM Peak
PM Peak
SAT Peak
Yaamba Road
Farm Street
Northern Site Access
Southern Site Access
McCartney Street
Richardson Road

Appendix D SIDRA Analysis Outputs

SITE LAYOUT

Site: 1 [2021 PM Base]

Bruce Hwy / Farm St - Existing Intersection
2021 Weekday PM Peak Hour - Base Volumes
Optimised Phase Times
Site Category: (None)
Signals - Fixed Time Coordinated



PHASING SUMMARY

Site: 1 [2021 PM Base]

Bruce Hwy / Farm St - Existing Intersection
2021 Weekday PM Peak Hour - Base Volumes
Optimised Phase Times
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 130 seconds (Site Optimum Cycle Time - Minimum Delay)

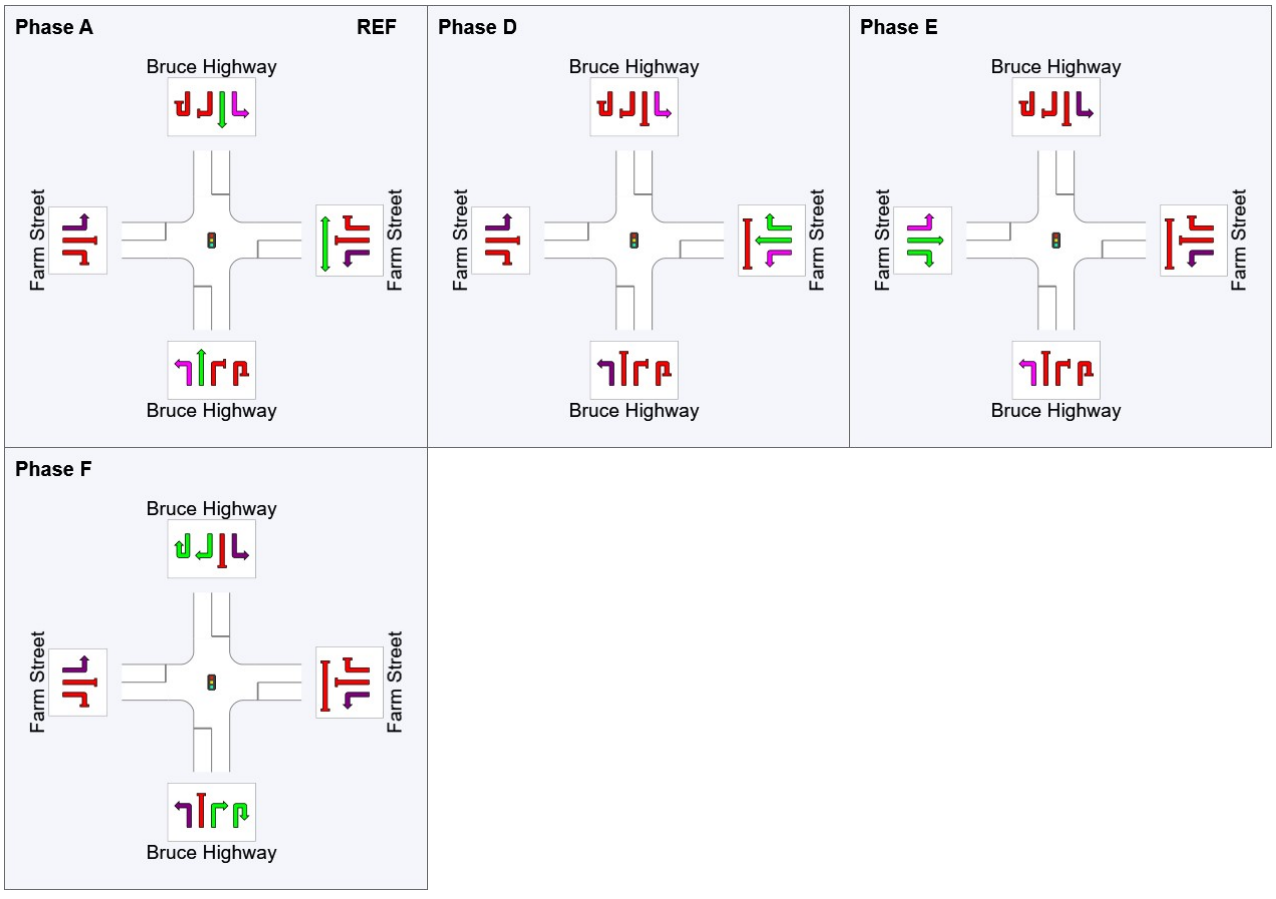
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Green Split Priority has been specified
Phase Sequence: DTMR Phasing (Actual)
Reference Phase: Phase A
Input Phase Sequence: A, D, E, F
Output Phase Sequence: A, D, E, F

Phase Timing Summary

Phase	A	D	E	F
Phase Change Time (sec)	0	50	68	96
Green Time (sec)	44	12	22	28
Phase Time (sec)	50	18	28	34
Phase Split	38%	14%	22%	26%

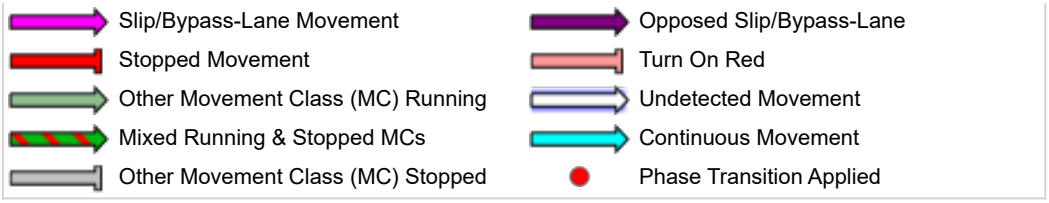
See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency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

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

Normal Movement Permitted/Opposed



LANE SUMMARY

Site: 1 [2021 PM Base]

Bruce Hwy / Farm St - Existing Intersection
2021 Weekday PM Peak Hour - Base Volumes
Optimised Phase Times
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 130 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Bruce Highway													
Lane 1	37	2.9	1396	0.026	100	6.8	LOS A	0.0	0.3	Short	70	0.0	NA
Lane 2	499	4.8	631[1]	0.791	100	28.1	LOS C	24.8	180.5	Full	500	0.0	0.0
Lane 3	511	4.8	647	0.791	100	28.3	LOS C	25.8	188.1	Full	500	0.0	0.0
Lane 4	300	1.1	379	0.791	100	61.7	LOS E	18.4	130.3	Short	160	0.0	NA
Approach	1347	3.9		0.791		35.1	LOS D	25.8	188.1				
East: Farm Street													
Lane 1	167	1.9	838	0.200	100	14.2	LOS B	3.9	27.9	Short	40	0.0	NA
Lane 2	131	3.2	178	0.733	100	66.1	LOS E	8.6	61.7	Full	500	0.0	0.0
Lane 3	146	0.0	170	0.862	100	78.2	LOS E	10.3	72.0	Short	70	0.0	NA
Approach	444	1.7		0.862		50.5	LOS D	10.3	72.0				
North: Bruce Highway													
Lane 1	187	1.7	1140	0.164	100	14.1	LOS B	4.2	29.7	Short	65	0.0	NA
Lane 2	394	7.6	543[1]	0.725	100	38.7	LOS D	20.9	155.6	Full	500	0.0	0.0
Lane 3	426	7.6	588[1]	0.725	100	39.6	LOS D	23.1	172.4	Full	500	0.0	0.0
Lane 4	156	8.1	341	0.457	100	55.0	LOS E	8.7	65.2	Short	90	0.0	NA
Approach	1163	6.7		0.725		37.3	LOS D	23.1	172.4				
West: Farm Street													
Lane 1	142	10.4	659	0.216	100	19.7	LOS B	4.4	33.2	Short	75	0.0	NA
Lane 2	273	0.8	293[1]	0.930	100	76.6	LOS E	20.4	144.0	Full	500	0.0	0.0
Lane 3	117	3.6	303	0.385	100	58.0	LOS E	6.7	48.2	Short	50	0.0	NA
Approach	532	4.0		0.930		57.3	LOS E	20.4	144.0				
Intersection	3486	4.6		0.930		41.2	LOS D	25.8	188.1				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

PHASING SUMMARY

Site: 1 [2021 PM Project]

Bruce Hwy / Farm St - Existing Intersection
2021 Weekday PM Peak Hour - Project Volumes
Optimised Phase Times
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 130 seconds (Site Optimum Cycle Time - Minimum Delay)

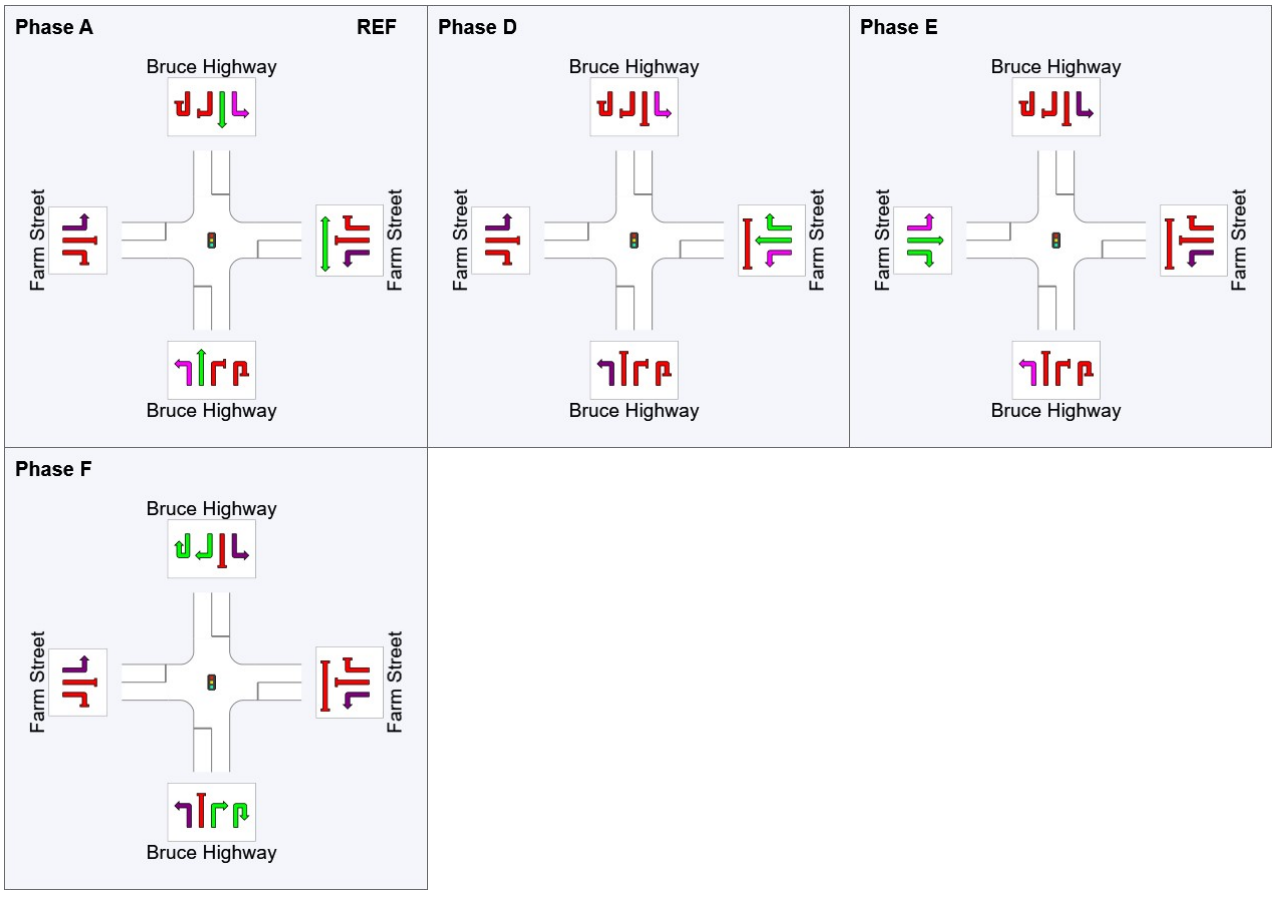
Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Green Split Priority has been specified
Phase Sequence: DTMR Phasing (Actual)
Reference Phase: Phase A
Input Phase Sequence: A, D, E, F
Output Phase Sequence: A, D, E, F

Phase Timing Summary

Phase	A	D	E	F
Phase Change Time (sec)	0	50	68	96
Green Time (sec)	44	12	22	28
Phase Time (sec)	50	18	28	34
Phase Split	38%	14%	22%	26%

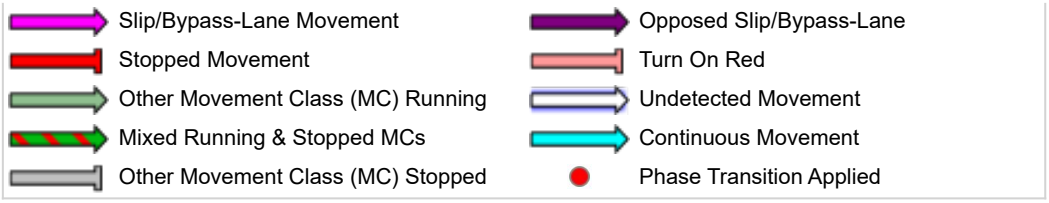
See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency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

Output Phase Sequence



REF: Reference Phase
VAR: Variable Phase

Normal Movement Permitted/Opposed



LANE SUMMARY

Site: 1 [2021 PM Project]

Bruce Hwy / Farm St - Existing Intersection
2021 Weekday PM Peak Hour - Project Volumes
Optimised Phase Times
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 130 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Bruce Highway													
Lane 1	37	2.9	1396	0.026	100	6.8	LOS A	0.0	0.3	Short	70	0.0	NA
Lane 2	500	4.8	631[1]	0.791	100	28.1	LOS C	24.8	180.9	Full	500	0.0	0.0
Lane 3	512	4.8	647	0.791	100	28.3	LOS C	25.9	188.5	Full	500	0.0	0.0
Lane 4	303	1.0	378	0.802	100	62.3	LOS E	18.8	132.8	Short	160	0.0	NA
Approach	1352	3.9		0.802		35.3	LOS D	25.9	188.5				
East: Farm Street													
Lane 1	172	1.8	833	0.206	100	14.6	LOS B	4.1	29.4	Short	40	0.0	NA
Lane 2	131	3.2	178	0.733	100	66.1	LOS E	8.6	61.7	Full	500	0.0	0.0
Lane 3	146	0.0	170	0.862	100	78.2	LOS E	10.3	72.0	Short	70	0.0	NA
Approach	448	1.6		0.862		50.3	LOS D	10.3	72.0				
North: Bruce Highway													
Lane 1	187	1.7	1140	0.164	100	14.1	LOS B	4.2	29.7	Short	65	0.0	NA
Lane 2	395	7.6	543[1]	0.727	100	38.8	LOS D	21.0	156.4	Full	500	0.0	0.0
Lane 3	427	7.6	587[1]	0.727	100	39.6	LOS D	23.2	172.8	Full	500	0.0	0.0
Lane 4	156	8.1	341	0.457	100	55.0	LOS E	8.7	65.2	Short	90	0.0	NA
Approach	1165	6.7		0.727		37.3	LOS D	23.2	172.8				
West: Farm Street													
Lane 1	142	10.4	658	0.216	100	19.7	LOS B	4.4	33.2	Short	75	0.0	NA
Lane 2	273	0.8	292[1]	0.933	100	77.4	LOS E	20.5	144.7	Full	500	0.0	0.0
Lane 3	120	3.5	303	0.395	100	58.1	LOS E	6.9	49.6	Short	50	0.0	NA
Approach	535	3.9		0.933		57.7	LOS E	20.5	144.7				
Intersection	3500	4.5		0.933		41.3	LOS D	25.9	188.5				

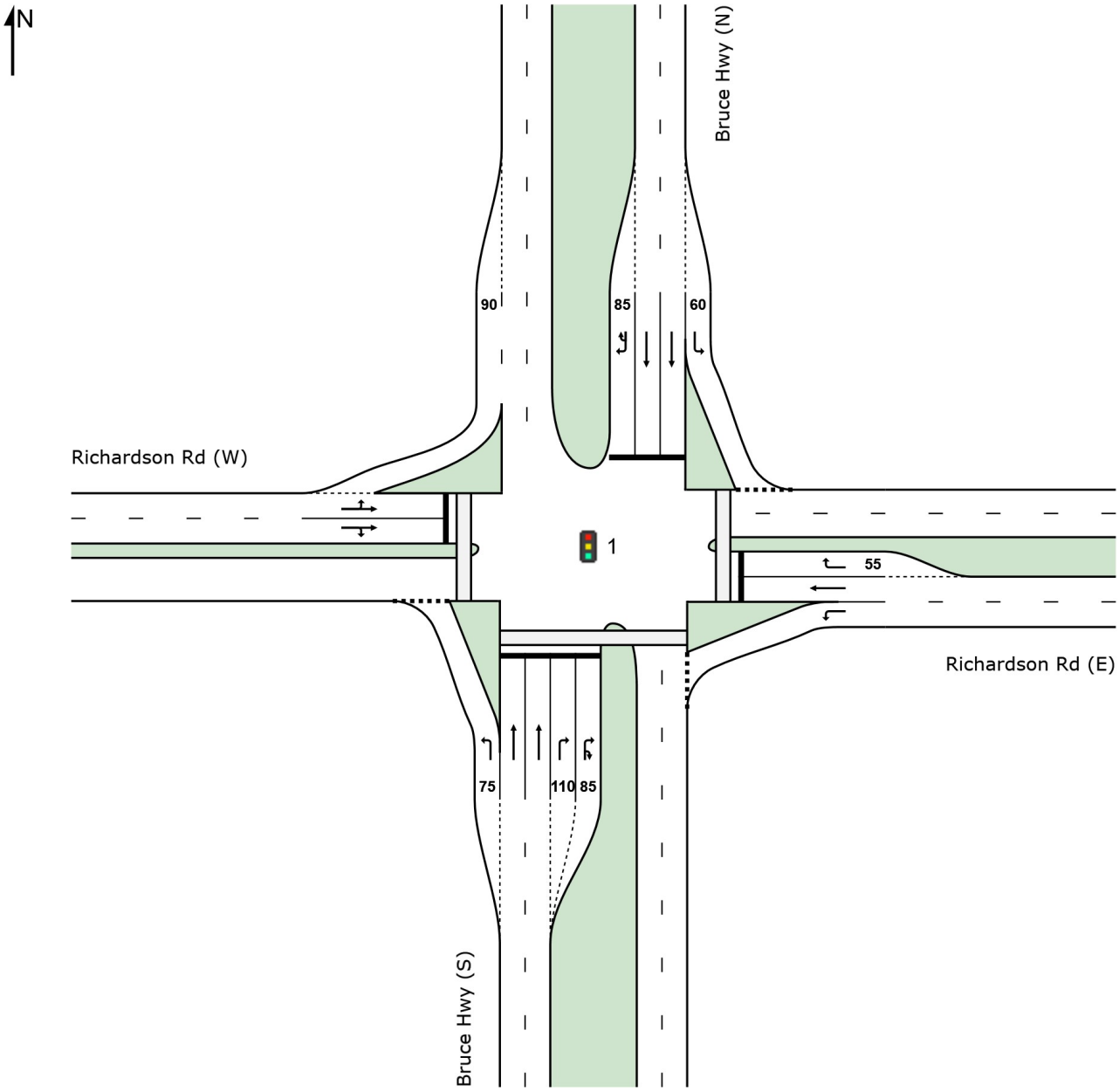
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

SITE LAYOUT

Site: 1 [2021 AM Base]

Bruce Hwy / Richardson Rd - Existing Intersection
2021 Weekday AM Peak Hour - Base Volumes
Optimised Phase Times
Site Category: (None)
Signals - Fixed Time Coordinated



PHASING SUMMARY

Site: 1 [2021 AM Base]

Bruce Hwy / Richardson Rd - Existing Intersection
2021 Weekday AM Peak Hour - Base Volumes
Optimised Phase Times
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 130 seconds (Site Optimum Cycle Time - Minimum Delay)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Green Split Priority has been specified
Phase Sequence: DTMR Phasing (Actual)
Reference Phase: Phase A
Input Phase Sequence: A, B, C, D
Output Phase Sequence: A, B, C, D

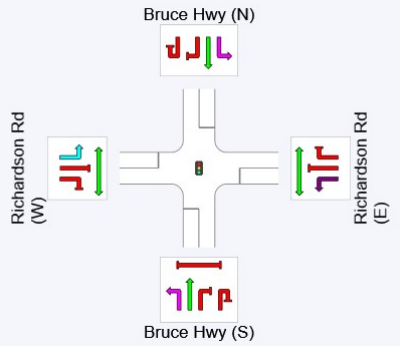
Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	0	62	86	109
Green Time (sec)	56	18	17	15
Phase Time (sec)	62	24	23	21
Phase Split	48%	18%	18%	16%

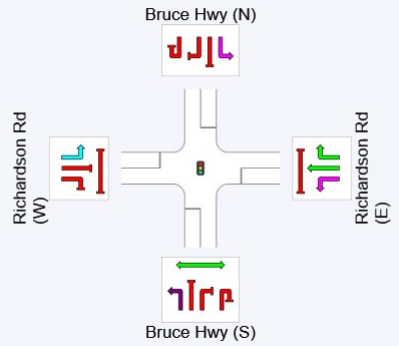
See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency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

Output Phase Sequence

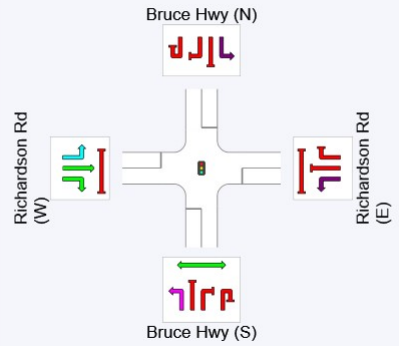
Phase A **REF**



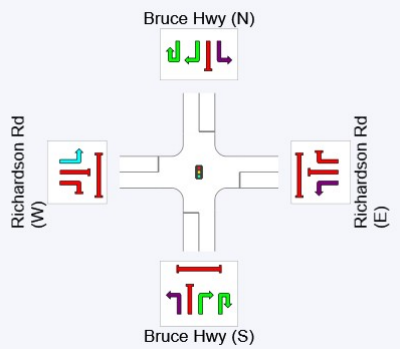
Phase B



Phase C

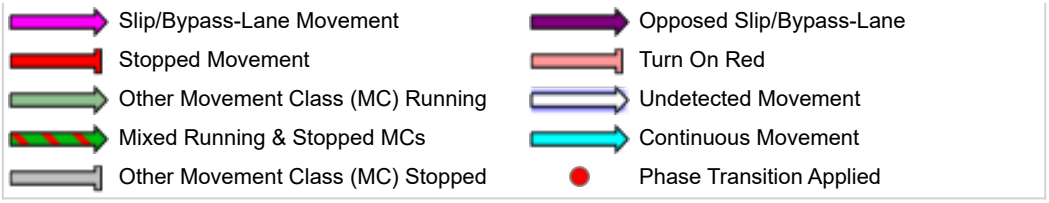


Phase D



REF: Reference Phase
VAR: Variable Phase

Normal Movement Permitted/Opposed



LANE SUMMARY

Site: 1 [2021 AM Base]

Bruce Hwy / Richardson Rd - Existing Intersection
2021 Weekday AM Peak Hour - Base Volumes
Optimised Phase Times
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 130 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Bruce Hwy (S)													
Lane 1	106	8.9	827	0.129	100	26.8	LOS C	3.9	29.0	Short	75	0.0	NA
Lane 2	335	8.9	802	0.418	100	27.3	LOS C	14.6	109.9	Full	500	0.0	0.0
Lane 3	335	8.9	802	0.418	100	27.3	LOS C	14.6	109.9	Full	500	0.0	0.0
Lane 4	97	1.6	214	0.453	100	65.9	LOS E	5.9	41.9	Short	110	0.0	NA
Lane 5	82	0.7	181	0.453	100	67.0	LOS E	5.0	35.4	Short	85	0.0	NA
Approach	956	7.5		0.453		34.6	LOS C	14.6	109.9				
East: Richardson Rd (E)													
Lane 1	256	0.4	763	0.335	100	15.2	LOS B	6.9	48.4	Full	500	0.0	0.0
Lane 2	238	1.8	257[1]	0.925	100	77.4	LOS E	17.8	126.2	Full	500	0.0	0.0
Lane 3	124	1.7	257	0.484	100	62.5	LOS E	7.4	52.8	Short	55	0.0	NA
Approach	618	1.2		0.925		48.6	LOS D	17.8	126.2				
North: Bruce Hwy (N)													
Lane 1	135	3.1	1397	0.096	100	6.8	LOS A	0.2	1.1	Short	60	0.0	NA
Lane 2	541	3.5	779[1]	0.695	100	15.4	LOS B	18.0	129.8	Full	500	0.0	0.0
Lane 3	576	3.5	830	0.695	100	15.8	LOS B	20.3	146.7	Full	500	0.0	0.0
Lane 4	147	0.7	212	0.694	100	68.9	LOS E	9.3	65.2	Short	85	0.0	NA
Approach	1400	3.2		0.695		20.4	LOS C	20.3	146.7				
West: Richardson Rd (W)													
Lane 1	247	2.9	270	0.915	100	78.0	LOS E	18.3	131.2	Full	500	0.0	0.0
Lane 2	227	1.0	248	0.915	100	79.7	LOS E	16.8	118.4	Full	500	0.0	0.0
Approach	474	2.0		0.915		78.8	LOS E	18.3	131.2				
Intersection	3447	3.8		0.925		37.4	LOS D	20.3	146.7				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

PHASING SUMMARY

Site: 1 [2021 AM Project]

Bruce Hwy / Richardson Rd - Existing Intersection
2021 Weekday AM Peak Hour - Project Volumes
Optimised Phase Times
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 130 seconds (Site Optimum Cycle Time - Minimum Delay)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Green Split Priority has been specified
Phase Sequence: DTMR Phasing (Actual)
Reference Phase: Phase A
Input Phase Sequence: A, B, C, D
Output Phase Sequence: A, B, C, D

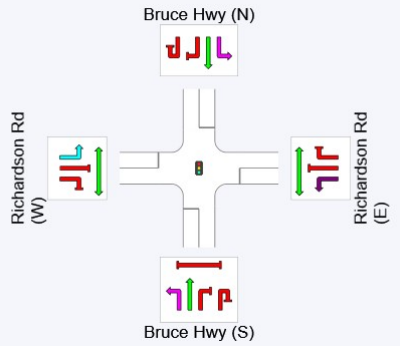
Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	0	62	86	109
Green Time (sec)	56	18	17	15
Phase Time (sec)	62	24	23	21
Phase Split	48%	18%	18%	16%

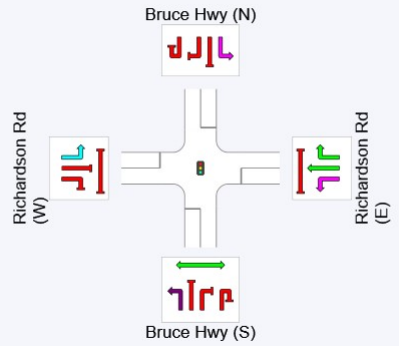
See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency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

Output Phase Sequence

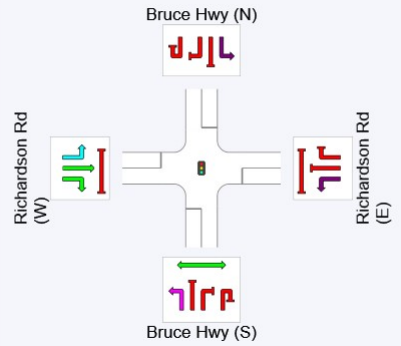
Phase A REF



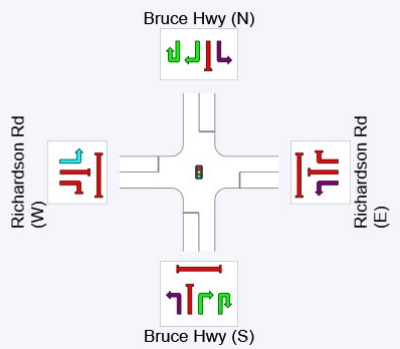
Phase B



Phase C

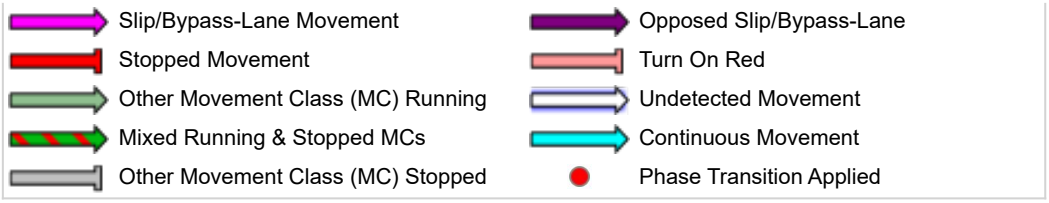


Phase D



REF: Reference Phase
VAR: Variable Phase

Normal Movement Permitted/Opposed



LANE SUMMARY

Site: 1 [2021 AM Project]

Bruce Hwy / Richardson Rd - Existing Intersection
2021 Weekday AM Peak Hour - Project Volumes
Optimised Phase Times
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 130 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Bruce Hwy (S)													
Lane 1	106	8.9	827	0.129	100	26.8	LOS C	3.9	29.0	Short	75	0.0	NA
Lane 2	335	8.9	802	0.418	100	27.3	LOS C	14.6	109.9	Full	500	0.0	0.0
Lane 3	335	8.9	802	0.418	100	27.3	LOS C	14.6	109.9	Full	500	0.0	0.0
Lane 4	97	1.6	214	0.453	100	65.9	LOS E	5.9	41.9	Short	110	0.0	NA
Lane 5	82	0.7	181	0.453	100	67.0	LOS E	5.0	35.4	Short	85	0.0	NA
Approach	956	7.5		0.453		34.6	LOS C	14.6	109.9				
East: Richardson Rd (E)													
Lane 1	256	0.4	763	0.335	100	15.2	LOS B	6.9	48.4	Full	500	0.0	0.0
Lane 2	238	1.8	257[1]	0.925	100	77.4	LOS E	17.8	126.2	Full	500	0.0	0.0
Lane 3	124	1.7	257	0.484	100	62.5	LOS E	7.4	52.8	Short	55	0.0	NA
Approach	618	1.2		0.925		48.6	LOS D	17.8	126.2				
North: Bruce Hwy (N)													
Lane 1	136	3.1	1398	0.097	100	6.8	LOS A	0.2	1.1	Short	60	0.0	NA
Lane 2	541	3.5	779[1]	0.695	100	15.4	LOS B	18.0	129.8	Full	500	0.0	0.0
Lane 3	577	3.5	830	0.695	100	15.8	LOS B	20.4	146.7	Full	500	0.0	0.0
Lane 4	151	0.7	212	0.710	100	69.2	LOS E	9.5	67.0	Short	85	0.0	NA
Approach	1404	3.1		0.710		20.5	LOS C	20.4	146.7				
West: Richardson Rd (W)													
Lane 1	247	2.9	270	0.916	100	78.4	LOS E	18.4	131.9	Full	500	0.0	0.0
Lane 2	227	1.0	248	0.916	100	80.0	LOS E	16.8	118.9	Full	500	0.0	0.0
Approach	475	2.0		0.916		79.1	LOS E	18.4	131.9				
Intersection	3453	3.8		0.925		37.5	LOS D	20.4	146.7				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

PHASING SUMMARY

Site: 1 [2021 PM Base]

Bruce Hwy / Richardson Rd - Existing Intersection
2021 Weekday PM Peak Hour - Base Volumes
Optimised Phase Times
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 130 seconds (Site Optimum Cycle Time - Minimum Delay)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Green Split Priority has been specified
Phase Sequence: DTMR Phasing (Actual)
Reference Phase: Phase A
Input Phase Sequence: A, B, C, D
Output Phase Sequence: A, B, C, D

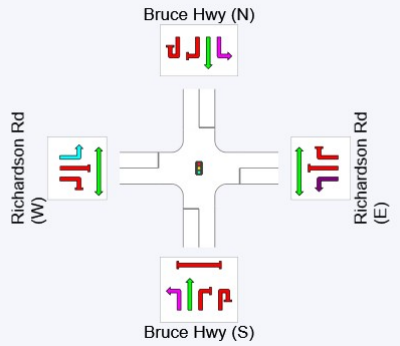
Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	0	63	83	106
Green Time (sec)	57	14	17	18
Phase Time (sec)	63	20	23	24
Phase Split	48%	15%	18%	18%

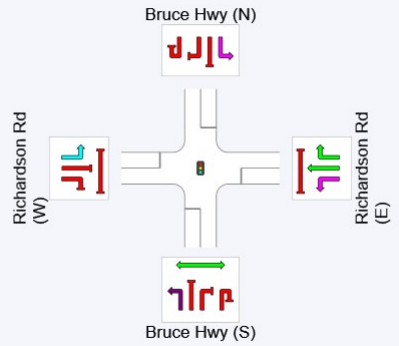
See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency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

Output Phase Sequence

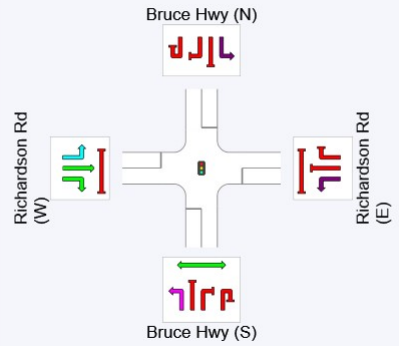
Phase A **REF**



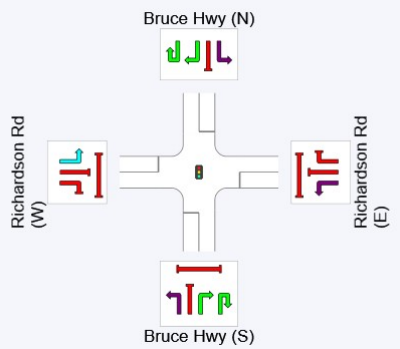
Phase B



Phase C

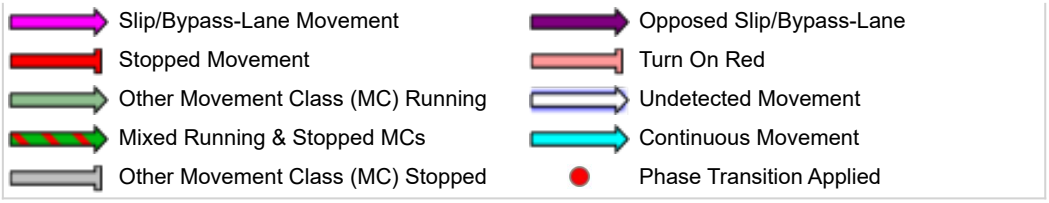


Phase D



REF: Reference Phase
VAR: Variable Phase

Normal Movement Permitted/Opposed



LANE SUMMARY

Site: 1 [2021 PM Base]

Bruce Hwy / Richardson Rd - Existing Intersection
2021 Weekday PM Peak Hour - Base Volumes
Optimised Phase Times
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 130 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Bruce Hwy (S)													
Lane 1	108	1.0	1366	0.079	100	6.8	LOS A	0.1	0.9	Short	75	0.0	NA
Lane 2	528	5.9	832	0.635	100	14.5	LOS B	16.6	122.4	Full	500	0.0	0.0
Lane 3	528	5.9	832	0.635	100	14.5	LOS B	16.6	122.4	Full	500	0.0	0.0
Lane 4	85	4.2	252	0.337	100	62.1	LOS E	4.8	34.7	Short	110	0.0	NA
Lane 5	80	3.4	238	0.337	100	62.4	LOS E	4.5	32.6	Short	85	0.0	NA
Approach	1331	5.2		0.635		19.8	LOS B	16.6	122.4				
East: Richardson Rd (E)													
Lane 1	57	3.7	897	0.063	100	8.3	LOS A	0.7	5.0	Full	500	0.0	0.0
Lane 2	188	2.2	209	0.901	100	75.2	LOS E	13.6	97.3	Full	500	0.0	0.0
Lane 3	112	2.8	198	0.563	100	67.0	LOS E	7.0	49.8	Short	55	0.0	NA
Approach	357	2.7		0.901		62.0	LOS E	13.6	97.3				
North: Bruce Hwy (N)													
Lane 1	193	3.3	1368	0.141	100	6.8	LOS A	0.2	1.7	Short	60	0.0	NA
Lane 2	429	6.5	829	0.518	100	13.5	LOS B	11.6	85.9	Full	500	0.0	0.0
Lane 3	429	6.5	829	0.518	100	13.5	LOS B	11.6	85.9	Full	500	0.0	0.0
Lane 4	159	4.0	245	0.649	100	65.6	LOS E	9.7	69.9	Short	85	0.0	NA
Approach	1209	5.7		0.649		19.3	LOS B	11.6	85.9				
West: Richardson Rd (W)													
Lane 1	266	1.3	292	0.910	100	77.3	LOS E	19.6	138.9	Full	500	0.0	0.0
Lane 2	231	0.3	254	0.910	100	76.7	LOS E	16.9	118.7	Full	500	0.0	0.0
Approach	497	0.8		0.910		77.0	LOS E	19.6	138.9				
Intersection	3394	4.5		0.910		32.4	LOS C	19.6	138.9				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

PHASING SUMMARY

Site: 1 [2021 PM Project]

Bruce Hwy / Richardson Rd - Existing Intersection
2021 Weekday PM Peak Hour - Project Volumes
Optimised Phase Times
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 130 seconds (Site Optimum Cycle Time - Minimum Delay)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Green Split Priority has been specified
Phase Sequence: DTMR Phasing (Actual)
Reference Phase: Phase A
Input Phase Sequence: A, B, C, D
Output Phase Sequence: A, B, C, D

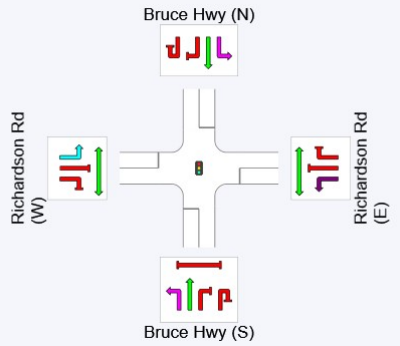
Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	0	62	82	105
Green Time (sec)	56	14	17	19
Phase Time (sec)	62	20	23	25
Phase Split	48%	15%	18%	19%

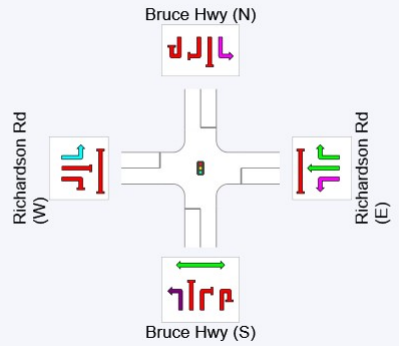
See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency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

Output Phase Sequence

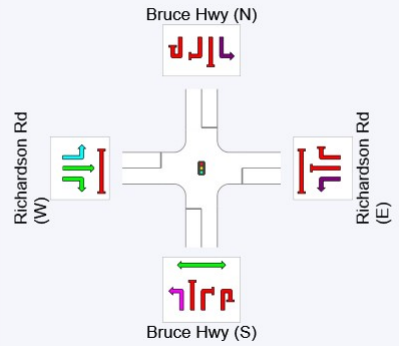
Phase A **REF**



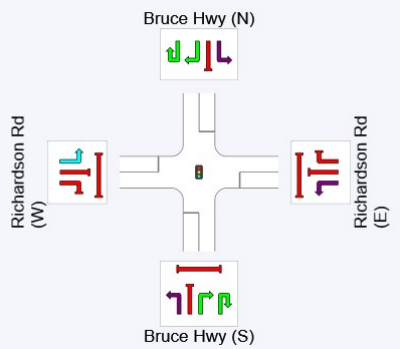
Phase B



Phase C

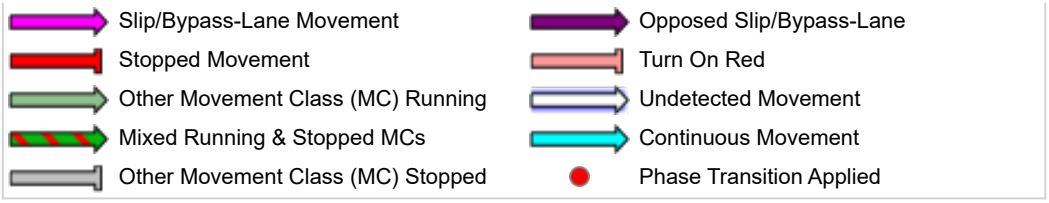


Phase D



REF: Reference Phase
VAR: Variable Phase

Normal Movement Permitted/Opposed



LANE SUMMARY

Site: 1 [2021 PM Project]

Bruce Hwy / Richardson Rd - Existing Intersection
2021 Weekday PM Peak Hour - Project Volumes
Optimised Phase Times
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 130 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Bruce Hwy (S)													
Lane 1	108	1.0	1359	0.080	100	6.9	LOS A	0.1	0.9	Short	75	0.0	NA
Lane 2	529	5.9	818	0.647	100	15.4	LOS B	17.5	128.5	Full	500	0.0	0.0
Lane 3	529	5.9	818	0.647	100	15.4	LOS B	17.5	128.5	Full	500	0.0	0.0
Lane 4	85	4.2	266	0.319	100	61.0	LOS E	4.7	34.1	Short	110	0.0	NA
Lane 5	80	3.4	252	0.319	100	61.3	LOS E	4.5	32.1	Short	85	0.0	NA
Approach	1332	5.2		0.647		20.4	LOS C	17.5	128.5				
East: Richardson Rd (E)													
Lane 1	57	3.7	901	0.063	100	8.3	LOS A	0.7	5.0	Full	500	0.0	0.0
Lane 2	188	2.2	209	0.901	100	75.2	LOS E	13.6	97.3	Full	500	0.0	0.0
Lane 3	113	2.8	198	0.569	100	67.0	LOS E	7.0	50.3	Short	55	0.0	NA
Approach	358	2.6		0.901		62.0	LOS E	13.6	97.3				
North: Bruce Hwy (N)													
Lane 1	193	3.3	1364	0.141	100	6.8	LOS A	0.2	1.7	Short	60	0.0	NA
Lane 2	429	6.5	814	0.527	100	14.4	LOS B	12.2	90.1	Full	500	0.0	0.0
Lane 3	429	6.5	814	0.527	100	14.4	LOS B	12.2	90.1	Full	500	0.0	0.0
Lane 4	166	3.8	258	0.645	100	64.6	LOS E	10.0	72.4	Short	85	0.0	NA
Approach	1217	5.6		0.645		20.0	LOS C	12.2	90.1				
West: Richardson Rd (W)													
Lane 1	267	1.3	293	0.913	100	77.7	LOS E	19.8	140.2	Full	500	0.0	0.0
Lane 2	231	0.3	254	0.913	100	77.1	LOS E	17.0	119.4	Full	500	0.0	0.0
Approach	499	0.8		0.913		77.5	LOS E	19.8	140.2				
Intersection	3405	4.5		0.913		33.0	LOS C	19.8	140.2				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

PHASING SUMMARY

Site: 1 [2021 Sat Base]

Bruce Hwy / Richardson Rd - Existing Intersection
2021 Saturday Peak Hour - Base Volumes
Optimised Phase Times
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 120 seconds (Site Optimum Cycle Time - Minimum Delay)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Green Split Priority has been specified
Phase Sequence: DTMR Phasing (Actual)
Reference Phase: Phase A
Input Phase Sequence: A, B, C, D
Output Phase Sequence: A, B, C, D

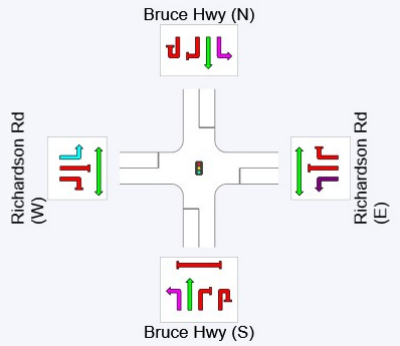
Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	0	47	65	83
Green Time (sec)	41	12	12	31
Phase Time (sec)	47	18	18	37
Phase Split	39%	15%	15%	31%

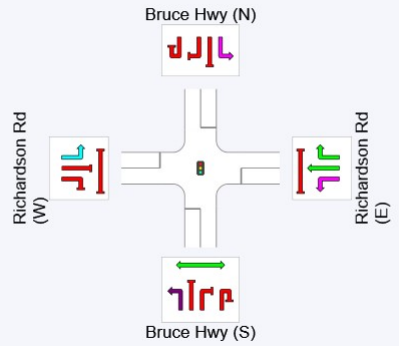
See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency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

Output Phase Sequence

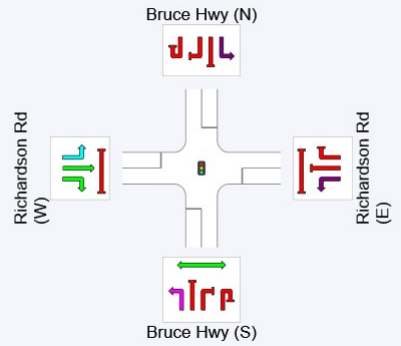
Phase A REF



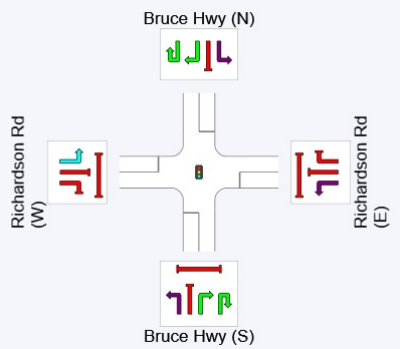
Phase B



Phase C

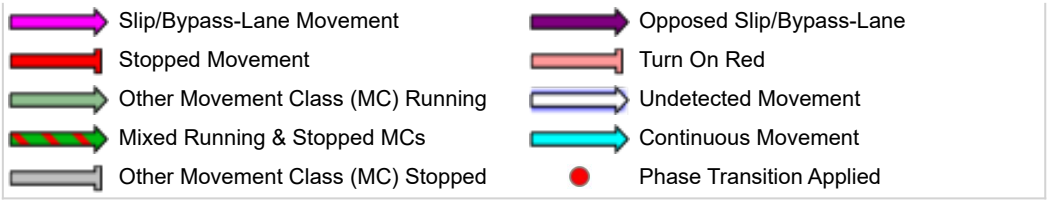


Phase D



REF: Reference Phase
VAR: Variable Phase

Normal Movement Permitted/Opposed



LANE SUMMARY

Site: 1 [2021 Sat Base]

Bruce Hwy / Richardson Rd - Existing Intersection
2021 Saturday Peak Hour - Base Volumes
Optimised Phase Times
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 120 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Bruce Hwy (S)													
Lane 1	177	3.0	1298	0.136	100	9.7	LOS A	2.3	16.5	Short	75	0.0	NA
Lane 2	454	2.3	610[1]	0.744	100	36.9	LOS D	23.0	163.9	Full	500	0.0	0.0
Lane 3	494	2.3	663	0.744	100	37.5	LOS D	25.5	182.0	Full	500	0.0	0.0
Lane 4	149	0.9	482	0.310	100	45.2	LOS D	7.1	49.8	Short	110	0.0	NA
Lane 5	136	0.6	438	0.310	100	45.6	LOS D	6.4	45.3	Short	85	0.0	NA
Approach	1409	2.1		0.744		35.4	LOS D	25.5	182.0				
East: Richardson Rd (E)													
Lane 1	87	1.2	922	0.095	100	11.3	LOS B	1.5	10.8	Full	500	0.0	0.0
Lane 2	176	0.0	197	0.892	100	69.5	LOS E	11.7	82.0	Full	500	0.0	0.0
Lane 3	146	0.7	187	0.784	100	68.0	LOS E	9.1	64.0	Short	55	0.0	NA
Approach	409	0.5		0.892		56.5	LOS E	11.7	82.0				
North: Bruce Hwy (N)													
Lane 1	293	0.4	1335	0.219	100	6.8	LOS A	0.4	2.5	Short	60	0.0	NA
Lane 2	412	2.9	595[1]	0.691	100	23.2	LOS C	16.0	115.0	Full	500	0.0	0.0
Lane 3	457	2.9	661	0.691	100	23.9	LOS C	18.9	135.9	Full	500	0.0	0.0
Lane 4	211	0.0	446	0.472	100	47.6	LOS D	9.9	69.4	Short	85	0.0	NA
Approach	1372	1.9		0.691		23.7	LOS C	18.9	135.9				
West: Richardson Rd (W)													
Lane 1	224	0.9	244	0.921	100	76.4	LOS E	15.7	110.5	Full	500	0.0	0.0
Lane 2	177	0.0	192	0.921	100	77.0	LOS E	12.2	85.7	Full	500	0.0	0.0
Approach	401	0.5		0.921		76.6	LOS E	15.7	110.5				
Intersection	3592	1.7		0.921		37.9	LOS D	25.5	182.0				

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

PHASING SUMMARY

Site: 1 [2021 Sat Project]

Bruce Hwy / Richardson Rd - Existing Intersection
2021 Saturday Peak Hour - Project Volumes
Optimised Phase Times
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 120 seconds (Site Optimum Cycle Time - Minimum Delay)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Green Split Priority has been specified
Phase Sequence: DTMR Phasing (Actual)
Reference Phase: Phase A
Input Phase Sequence: A, B, C, D
Output Phase Sequence: A, B, C, D

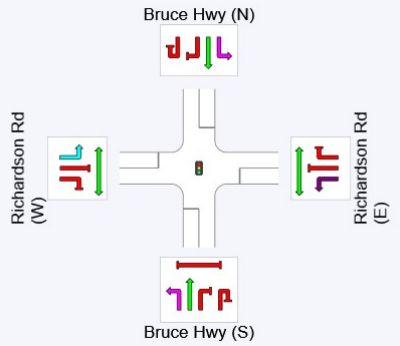
Phase Timing Summary

Phase	A	B	C	D
Phase Change Time (sec)	0	47	65	83
Green Time (sec)	41	12	12	31
Phase Time (sec)	47	18	18	37
Phase Split	39%	15%	15%	31%

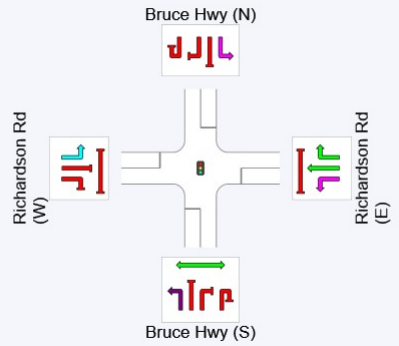
See the Phase Information section in the Detailed Output report for more detailed information including input values of Yellow Time and All-Red Time, and information on any adjustments to Intergreen Time, Phase Time and Green Time values in cases of Pedestrian Actuation, Phase Actuation and Phase Frequency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

Output Phase Sequence

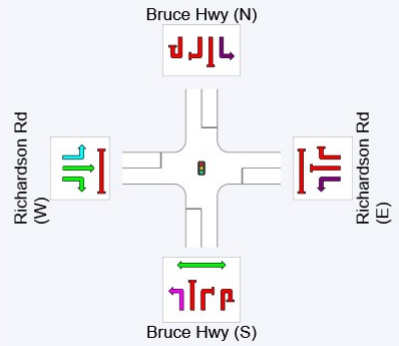
Phase A REF



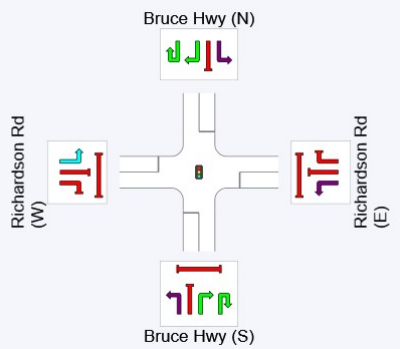
Phase B



Phase C

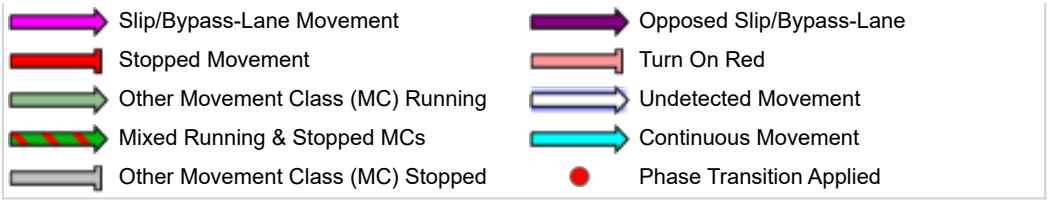


Phase D



REF: Reference Phase
VAR: Variable Phase

Normal Movement Permitted/Opposed



LANE SUMMARY

Site: 1 [2021 Sat Project]

Bruce Hwy / Richardson Rd - Existing Intersection
2021 Saturday Peak Hour - Project Volumes
Optimised Phase Times
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 120 seconds (Site Optimum Cycle Time - Minimum Delay)

Lane Use and Performance

	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Bruce Hwy (S)													
Lane 1	177	3.0	1291	0.137	100	9.9	LOS A	2.4	17.2	Short	75	0.0	NA
Lane 2	454	2.3	609[1]	0.745	100	36.9	LOS D	23.0	164.2	Full	500	0.0	0.0
Lane 3	494	2.3	663	0.745	100	37.6	LOS D	25.5	182.4	Full	500	0.0	0.0
Lane 4	149	0.9	482	0.310	100	45.2	LOS D	7.1	49.8	Short	110	0.0	NA
Lane 5	136	0.6	438	0.310	100	45.6	LOS D	6.4	45.3	Short	85	0.0	NA
Approach	1411	2.1		0.745		35.5	LOS D	25.5	182.4				
East: Richardson Rd (E)													
Lane 1	87	1.2	922	0.095	100	11.3	LOS B	1.5	10.8	Full	500	0.0	0.0
Lane 2	176	0.0	197	0.892	100	69.5	LOS E	11.7	82.0	Full	500	0.0	0.0
Lane 3	147	0.7	187	0.789	100	68.2	LOS E	9.2	64.6	Short	55	0.0	NA
Approach	411	0.5		0.892		56.6	LOS E	11.7	82.0				
North: Bruce Hwy (N)													
Lane 1	294	0.4	1334	0.220	100	6.8	LOS A	0.4	2.5	Short	60	0.0	NA
Lane 2	412	2.9	595[1]	0.693	100	23.2	LOS C	16.0	115.1	Full	500	0.0	0.0
Lane 3	458	2.9	661	0.693	100	23.9	LOS C	19.0	136.3	Full	500	0.0	0.0
Lane 4	222	0.0	446	0.498	100	47.9	LOS D	10.6	74.0	Short	85	0.0	NA
Approach	1385	1.9		0.693		23.9	LOS C	19.0	136.3				
West: Richardson Rd (W)													
Lane 1	228	0.9	246	0.926	100	77.4	LOS E	16.0	112.9	Full	500	0.0	0.0
Lane 2	178	0.0	192	0.926	100	77.9	LOS E	12.4	86.8	Full	500	0.0	0.0
Approach	405	0.5		0.926		77.6	LOS E	16.0	112.9				
Intersection	3612	1.7		0.926		38.2	LOS D	25.5	182.4				

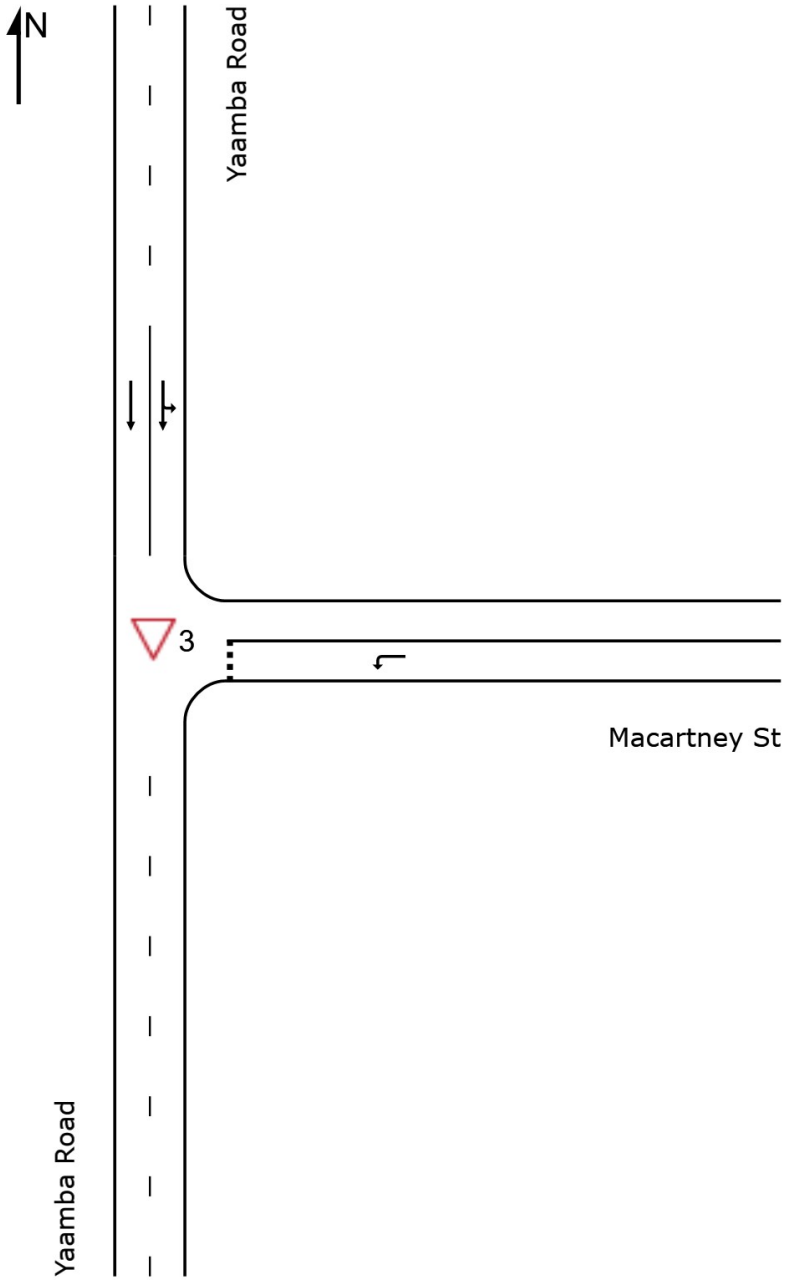
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.

SITE LAYOUT

Site: 3 [2021 AM Base]

Yaamba Rd / Macartney St
2021 AM Peak Hour
Base Case
Site Category: (None)
Giveway / Yield (Two-Way)



MOVEMENT SUMMARY

Site: 3 [2021 AM Base]

Yaamba Rd / Macartney St
2021 AM Peak Hour
Base Case
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Macartney St												
4	L2	61	2.0	0.077	8.7	LOS A	0.3	2.0	0.56	0.76	0.56	51.2
Approach		61	2.0	0.077	8.7	LOS A	0.3	2.0	0.56	0.76	0.56	51.2
North: Yaamba Road												
7	L2	23	0.0	0.353	5.6	LOS A	0.0	0.0	0.00	0.02	0.00	58.1
8	T1	1339	3.0	0.353	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.8
Approach		1362	2.9	0.353	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.8
All Vehicles		1423	2.9	0.353	0.5	NA	0.3	2.0	0.02	0.04	0.02	59.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 3 [2021 AM Project]

Yaamba Rd / Macartney St
2021 AM Peak Hour
Project Case
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Macartney St												
4	L2	61	2.0	0.077	8.7	LOS A	0.3	2.0	0.56	0.76	0.56	51.2
Approach		61	2.0	0.077	8.7	LOS A	0.3	2.0	0.56	0.76	0.56	51.2
North: Yaamba Road												
7	L2	25	0.0	0.354	5.6	LOS A	0.0	0.0	0.00	0.02	0.00	58.1
8	T1	1342	3.0	0.354	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.8
Approach		1367	2.9	0.354	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.8
All Vehicles		1428	2.9	0.354	0.5	NA	0.3	2.0	0.02	0.04	0.02	59.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 3 [2021 PM Base]

Yaamba Rd / Macartney St
2021 PM Peak Hour
Base Case
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Macartney St												
4	L2	36	4.8	0.041	8.1	LOS A	0.2	1.1	0.52	0.70	0.52	51.5
Approach		36	4.8	0.041	8.1	LOS A	0.2	1.1	0.52	0.70	0.52	51.5
North: Yaamba Road												
7	L2	39	0.0	0.319	5.6	LOS A	0.0	0.0	0.00	0.04	0.00	58.0
8	T1	1174	5.7	0.319	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.7
Approach		1213	5.5	0.319	0.2	NA	0.0	0.0	0.00	0.02	0.00	59.7
All Vehicles		1248	5.5	0.319	0.4	NA	0.2	1.1	0.01	0.04	0.01	59.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 3 [2021 PM Project]

Yaamba Rd / Macartney St
2021 PM Peak Hour
Project Case
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Macartney St												
4	L2	36	4.8	0.041	8.1	LOS A	0.2	1.1	0.52	0.70	0.52	51.5
Approach		36	4.8	0.041	8.1	LOS A	0.2	1.1	0.52	0.70	0.52	51.5
North: Yaamba Road												
7	L2	43	0.0	0.322	5.6	LOS A	0.0	0.0	0.00	0.04	0.00	57.9
8	T1	1181	5.7	0.322	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.7
Approach		1224	5.5	0.322	0.2	NA	0.0	0.0	0.00	0.02	0.00	59.7
All Vehicles		1260	5.5	0.322	0.5	NA	0.2	1.1	0.01	0.04	0.01	59.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 3 [2021 SAT Base]

Yaamba Rd / Macartney St
2021 SAT Peak Hour
Base Case
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Macartney St												
4	L2	33	3.2	0.040	8.5	LOS A	0.1	1.1	0.54	0.72	0.54	51.3
Approach		33	3.2	0.040	8.5	LOS A	0.1	1.1	0.54	0.72	0.54	51.3
North: Yaamba Road												
7	L2	63	0.0	0.361	5.6	LOS A	0.0	0.0	0.00	0.05	0.00	57.8
8	T1	1339	2.0	0.361	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	59.7
Approach		1402	1.9	0.361	0.3	NA	0.0	0.0	0.00	0.03	0.00	59.6
All Vehicles		1435	1.9	0.361	0.5	NA	0.1	1.1	0.01	0.04	0.01	59.4

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 3 [2021 SAT Project]

Yaamba Rd / Macartney St
2021 SAT Peak Hour
Project Case
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

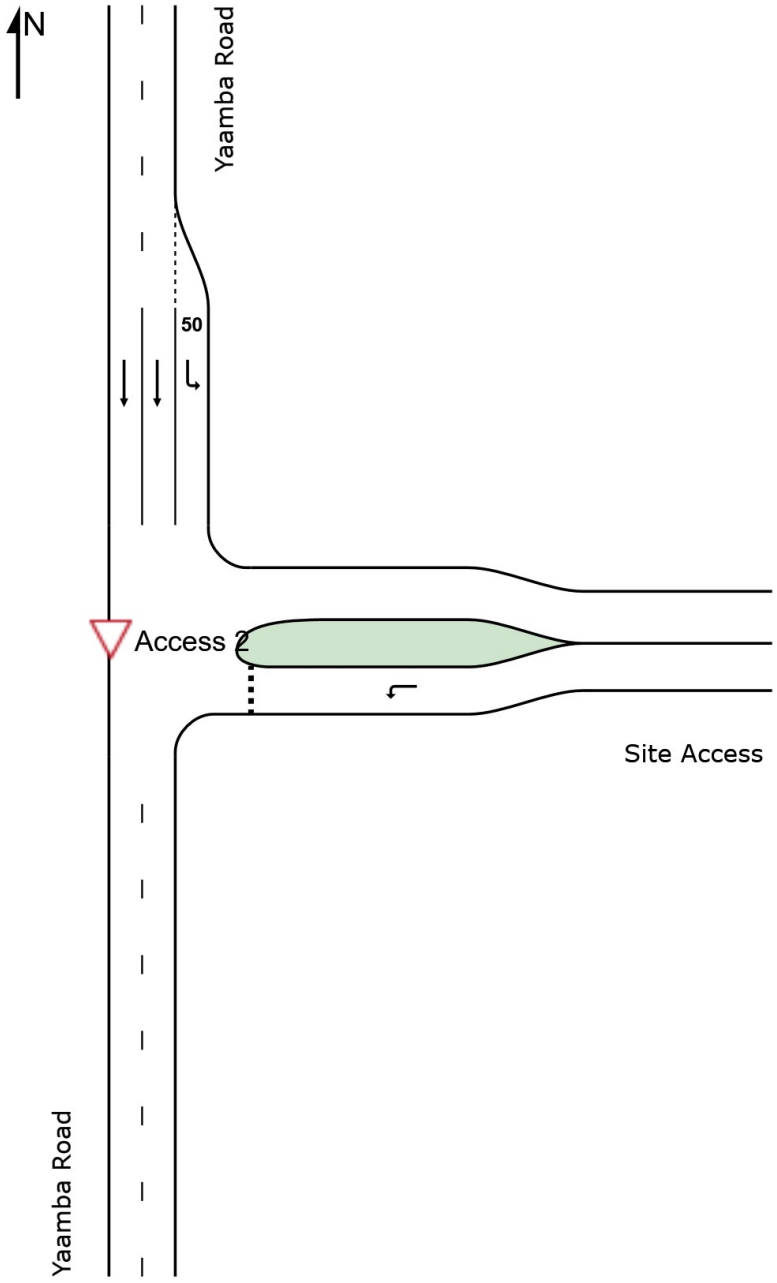
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Macartney St												
4	L2	33	3.2	0.040	8.5	LOS A	0.1	1.1	0.54	0.72	0.54	51.3
Approach		33	3.2	0.040	8.5	LOS A	0.1	1.1	0.54	0.72	0.54	51.3
North: Yaamba Road												
7	L2	71	0.0	0.367	5.6	LOS A	0.0	0.0	0.00	0.06	0.00	57.8
8	T1	1353	2.0	0.367	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	59.6
Approach		1423	1.9	0.367	0.3	NA	0.0	0.0	0.00	0.03	0.00	59.6
All Vehicles		1456	1.9	0.367	0.5	NA	0.1	1.1	0.01	0.05	0.01	59.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: Access 2 [2031 AM Base]

Yaamba Rd / Southern Site Access
2031 AM Peak Hour
Base Case
Site Category: (None)
Giveway / Yield (Two-Way)



MOVEMENT SUMMARY

Site: Access 2 [2031 AM Base]

Yaamba Rd / Southern Site Access
2031 AM Peak Hour
Base Case
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Site Access												
4	L2	81	0.0	0.108	9.1	LOS A	0.4	2.8	0.58	0.80	0.58	50.9
Approach		81	0.0	0.108	9.1	LOS A	0.4	2.8	0.58	0.80	0.58	50.9
North: Yaamba Road												
7	L2	4	0.0	0.002	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	53.6
8	T1	1424	3.4	0.369	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		1428	3.4	0.369	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.9
All Vehicles		1509	3.2	0.369	0.6	NA	0.4	2.8	0.03	0.04	0.03	59.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: Access 2 [2031 AM Project]

Yaamba Rd / Southern Site Access
2031 AM Peak Hour
Project Case
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Site Access												
4	L2	104	0.0	0.138	9.2	LOS A	0.5	3.6	0.58	0.81	0.58	50.9
Approach		104	0.0	0.138	9.2	LOS A	0.5	3.6	0.58	0.81	0.58	50.9
North: Yaamba Road												
7	L2	27	0.0	0.015	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	53.6
8	T1	1407	3.4	0.365	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		1435	3.3	0.365	0.2	NA	0.0	0.0	0.00	0.01	0.00	59.8
All Vehicles		1539	3.1	0.365	0.8	NA	0.5	3.6	0.04	0.07	0.04	59.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: Access 2 [2031 PM Base]

Yaamba Rd / Southern Site Access
2031 PM Peak Hour
Base Case
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Site Access												
4	L2	174	0.0	0.194	8.3	LOS A	0.8	5.4	0.55	0.78	0.55	51.5
Approach		174	0.0	0.194	8.3	LOS A	0.8	5.4	0.55	0.78	0.55	51.5
North: Yaamba Road												
7	L2	1	0.0	0.001	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	53.6
8	T1	1155	5.3	0.303	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		1156	5.3	0.303	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
All Vehicles		1329	4.6	0.303	1.1	NA	0.8	5.4	0.07	0.10	0.07	58.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: Access 2 [2031 PM Project]

Yaamba Rd / Southern Site Access
2031 PM Peak Hour
Project Case
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Site Access												
4	L2	220	0.0	0.240	8.3	LOS A	1.0	6.9	0.56	0.79	0.56	51.5
Approach		220	0.0	0.240	8.3	LOS A	1.0	6.9	0.56	0.79	0.56	51.5
North: Yaamba Road												
7	L2	47	0.0	0.025	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	53.6
8	T1	1119	5.3	0.294	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		1166	5.1	0.294	0.3	NA	0.0	0.0	0.00	0.02	0.00	59.6
All Vehicles		1386	4.3	0.294	1.5	NA	1.0	6.9	0.09	0.14	0.09	58.2

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: Access 2 [2031 SAT Base]

Yaamba Rd / Southern Site Access
2031 SAT Peak Hour
Base Case
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Site Access												
4	L2	437	0.0	0.463	9.6	LOS A	2.9	20.6	0.63	0.93	0.88	50.6
Approach		437	0.0	0.463	9.6	LOS A	2.9	20.6	0.63	0.93	0.88	50.6
North: Yaamba Road												
7	L2	8	0.0	0.004	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	53.6
8	T1	1092	2.1	0.281	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		1100	2.1	0.281	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.9
All Vehicles		1537	1.5	0.463	2.8	NA	2.9	20.6	0.18	0.27	0.25	56.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: Access 2 [2031 SAT Project]

Yaamba Rd / Southern Site Access
2031 SAT Peak Hour
Project Case
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: Site Access												
4	L2	485	0.0	0.506	9.8	LOS A	3.5	24.6	0.64	0.96	0.94	50.5
Approach		485	0.0	0.506	9.8	LOS A	3.5	24.6	0.64	0.96	0.94	50.5
North: Yaamba Road												
7	L2	57	0.0	0.030	5.5	LOS A	0.0	0.0	0.00	0.58	0.00	53.6
8	T1	1065	2.1	0.274	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		1122	2.0	0.274	0.3	NA	0.0	0.0	0.00	0.03	0.00	59.6
All Vehicles		1607	1.4	0.506	3.2	NA	3.5	24.6	0.19	0.31	0.28	56.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Appendix E Council's Access, Parking & Transport Code Responses

Access, parking and mobility Code

Table 9.3.1.3.1 Development outcomes for assessable development

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	RESPONSE / COMPLIANCE
Access driveways		
PO1 Access driveways are located to avoid conflicts and designed to operate efficiently and safely, taking into account: a) the size of the parking area; b) the volume, frequency and type of vehicle traffic; c) the need for some land uses (for example hospitals) to accommodate emergency vehicle access; d) the type of use and the implications on parking and circulation, for example long-term or short-term car parking; e) frontage road function and conditions; and f) the capacity and function of the adjoining street system.	**AO1.1** Access driveways are not located within: a) twenty–five (25) metres of a signalised road intersection; b) twenty (20) metres of an un-signalised road intersection in an industrial or centres zone or ten (10) metres otherwise; and c) one (1) metre of any street signage, power poles, street lights, manholes, stormwater gully pits or other Council asset.	**Complies with AO1.1** Consistent with the existing development, the proposed scheme intends to achieve access via two crossovers to Yaamba Road, with one crossover restricted to left-in movements and the other left-in/left-out. These accesses are designed to give priority to entering vehicles at all times. The accesses are not located within 25m of any intersections and achieve a minimum of one meter to any Council assets.
PO2 Access driveways do not disrupt existing road or footpath infrastructure.	**AO2.1** Access driveways: a) do not require the modification, relocation or removal of any infrastructure including street trees, fire hydrants, water meters and street signs; b) do not front a traffic island, speed control device, car parking bay, bus stop or other infrastructure within the road carriageway; c) must be sealed and to a formed road;	**Complies with AO2.1** The proposed scheme intends to achieve access via two crossovers to Yaamba Road, with one crossover restricted to left-in movements and the other left-in/left-out. It is proposed that the northern access is retained in its current form, with the southern access relocated northward. The proposed accesses comply with AO2.1. Refer to Section 5 of TTM's Traffic Engineering Report.

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	RESPONSE / COMPLIANCE
	d) are not constructed over an access point to equipment under the control of a regulatory authority, including storm water pits, water meters, hydrants and telephone pits; and e) are raised or lowered to match the surface level of the driveway, where an access chamber is to be incorporated within the driveway.	
PO3 Access driveways are designed and constructed so as to: a) enable safe and functional vehicular access from the street to the property; and b) not cause a change in the level of a footpath.	AO3.1 Access driveways are constructed in compliance with the Capricorn Municipal Development Guidelines.	Complies with AO3.1 Access driveways are constructed in compliance with the Capricorn Municipal Development Guidelines.
PO4 A driveway does not allow water to pond adjacent to any buildings or cause water to enter a building.	AO4.1 A driveway has a minimum cross fall of one (1) metre (vertical) to 100 metres (horizontal) away from all adjoining buildings.	Complies with AO4.1 Detailed design will ensure adequate cross fall of driveways.
PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	RESPONSE / COMPLIANCE
Parking		
PO5 Provision is made for on-site vehicle parking: a) to meet the demand likely to be generated by the development; and b) to avoid on-street parking where that would adversely impact on the safety or capacity of	AO5.1 On-site car parking is provided at the rates set out in Table 9.4.1.3.2 of the access, parking and mobility code. OR	Complies with AO5.1 The development proposes seventeen (17) parking spaces, including one (1) PWD space and shared area. These provisions are in accordance with Table 9.4.1.3.2 of the access, parking and mobility code. Refer to TTM's Traffic Engineering Report for information.

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	RESPONSE / COMPLIANCE
the road network or unduly impact on local amenity. Editor's note—SC6.6 — Car parking contributions planning scheme policy prescribes circumstances under which an applicant can satisfy PO5.	AO5.1.2 Where a change of use of existing premises is proposed and there is no increase in the gross floor area, the existing number of on-site car parks is retained or increased. AND AO5.2 All parking, loading and manoeuvring facilities for visitors and employees to be located on-site. AND AO5.3 Manoeuvring facilities to be of adequate dimensions to prevent any queuing in a roadway.	Not Applicable - Complies with AO5.1 Not Applicable - Complies with AO5.1 Not Applicable - Complies with AO5.1
PO6 Parking and servicing facilities are designed to meet user requirements.	AO6.1 Parking spaces, access and manoeuvring facilities, loading facilities and connections to the transport network are sealed and designed in accordance with Australian Standard AS 2890.	Complies with AO6.1 Parking spaces, access and manoeuvring facilities, loading facilities and connections to the transport network are sealed and designed in accordance with Australian Standard AS 2890. Refer to Section 4 of TTM's Traffic Engineering Report.
PO7 Sites with more than one (1) road frontage (excluding laneways) gain access only from the lower order road, except if it will introduce traffic generated by a non–residential use into a street that is in a residential zone.	No acceptable outcome is nominated.	Not Applicable The site only has frontage to Yaamba Road.

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	RESPONSE / COMPLIANCE
PO8 Parking areas are illuminated in a manner that maximises user safety but minimises the impacts on adjoining residents.	AO8.1 Parking areas for uses that operate at night are illuminated in accordance with the requirements of Australian Standard AS 1158. AND AO8.2 Lighting used in parking areas does not cause an environmental nuisance and complies with Australian Standard AS 4282.	Complies with AO8.1 Detailed design of parking areas will be in accordance with the requirements of Australian Standard AS 1158. Complies with AO8.2 Detailed design of parking areas will be in accordance with the requirements of Australian Standard AS 4282.
PO9 Car parking areas, pathways and other elements of the transport network are designed to enhance public safety by discouraging crime and antisocial behaviour, having regard to: a) provision of opportunities for casual surveillance; b) the use of fencing to define public and private spaces, whilst allowing for appropriate sightlines; c) minimising potential concealment points and assault locations; d) minimising opportunities for graffiti and other vandalism; and e) restricting unlawful access to buildings and between buildings.	No acceptable outcome is nominated. Editor's note—Refer to Crime Prevention Through Environmental Design (CPTED) guidelines for Queensland for guidance.	Refer to Town Planning Report and/or Architectural Plans/Report.

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	RESPONSE / COMPLIANCE
PO10 Parking and servicing areas are kept accessible and available for their intended use at all times during the normal business hours of the activity.	No acceptable outcome is nominated.	**Complies with PO10** No gates are proposed as part of the development. As such, the parking and servicing areas are kept accessible and available for their intended use at all times during the normal business hours of the activity.

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	RESPONSE / COMPLIANCE
Transport impact Editor's note—Applicants should note that the Department of Transport and Main Roads may have additional requirements.		
PO11 Development contributes to the creation of a transport network which is designed to: a) achieve a high level of permeability and connectivity for all modes of transport, including pedestrians and cyclists, within the development and to the surrounding area; and b) encourage people to walk, cycle or use public transport to and from the site instead of using a car.	No acceptable outcome is nominated. Editor's note—Refer to SC6.19 – Structure plan planning scheme policy for guidance.	**Complies with PO11** It is proposed that pedestrian and cyclist access to the development will be facilitated via a dedicated path that connects to the external network. Bicycle parking will be provided in accordance with Council requirements. The development is also well located in terms of Public Transport.
PO12 Development is located on roads that are appropriate for the nature of traffic generated, having regard to the safety and efficiency of the transport network.	AO12.1 Traffic generated by the development is safely accommodated within the design capacity of roads as provided in SC6.15 — Road infrastructure and hierarchy planning scheme policy. AND	**Complies with AO12.1** Section 8 of TTM's Traffic Engineering Report confirms that the traffic generated by the development is safely accommodated within the design capacity of roads.

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	RESPONSE / COMPLIANCE
	AO12.2 A road or street does not connect with another road or street that is more than two (2) levels higher or lower in the road hierarchy. AND AO12.3 The existing infrastructure fronting the proposed development is upgraded in accordance with SC6.15 — Road infrastructure and hierarchy planning scheme policy and Capricorn Municipal Development Guidelines.	**Not Applicable** No new roads are proposed as part of this development. **Complies with** AO12.3 Section 8 of TTM's Traffic Engineering Report confirms that the existing left-turn lanes into the site are sufficient to accommodate the increase in development.
PO13 Where the nature of the development creates a demand, provision is made for set down and pick-up facilities by bus, taxis or private vehicle, which: a) are safe for pedestrians and vehicles; b) are conveniently connected to the main component of the development by pedestrian pathway; and c) provide for pedestrian priority and clear sightlines.	No acceptable outcome is nominated.	**Not Applicable** The development is not considered to warrant the provision of set down and pick-up facilities.

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	RESPONSE / COMPLIANCE
Site access		
PO14 Development does not impact on the safety, operation or function of the road network or system.	AO14.1 Vehicle manoeuvring into and from the site for all vehicles is designed in accordance with the Australian Standard AS 2890, as updated from time to time. AND AO14.2 No direct property access is gained to a highway, main road, urban arterial or sub arterial road as defined in SC6.16 — Road infrastructure and hierarchy planning scheme policy other than via a service road or a joint access arrangement with other sites. AND AO14.3 Development that generates greater than 100 vehicle movements per day does not gain access to or from an urban access place or urban access streets as defined in SC6.16 — Road infrastructure and hierarchy planning scheme policy.	Complies with AO14.1 Vehicle manoeuvring into and from the site for all vehicles is designed in accordance with the Australian Standard AS 2890. Refer to Section 4 and 5 of TTM's Traffic Engineering Report. AND Complies with AO14.2 The development only has frontage to Yaamba Road; a limited access road. It is proposed that the northern access is retained in its current form, with the southern access relocated northward. Whilst the proposed southern crossover slightly differs from the existing, it is considered to be acceptable given that it is in accordance with AS2890. Further to this, an auxiliary left-turn treatment – short turn lane is proposed, which is in accordance with the *Road Planning and Design Manual*, 2nd edition, Department of Transport and Main Roads, 2016. Section 8 of TTM's Traffic Engineering Report confirms that the proposed arrangement do not result in a significant worsening to the external road network. The proposed left-on and left-out accesses are consistent with the intent of a limited access road. AND Complies with AO14.3 As detailed in Section 8 of TTM's Traffic Engineering Report, the development generates in the order of 100vph in the weekend peak hour. The development only has frontage to Yaamba Road, a state-controlled road.

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	RESPONSE / COMPLIANCE
PO15 Development facilitates the orderly provision and upgrading of the transport network or contributes to the construction of transport network improvements.	No acceptable outcome is nominated.	
PO16 On-site transport network infrastructure integrates safely and effectively with surrounding networks.	AO16.1 Intersections, connections and access arrangements are designed in accordance with the Capricorn Municipal Development Guidelines and Australian Standard AS 2890.	Complies with AO16.1 Intersections, connections and access arrangements are designed in accordance with the Capricorn Municipal Development Guidelines and Australian Standard AS 2890. Refer to Section 5 of TTM's Traffic Engineering Report.

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	RESPONSE / COMPLIANCE
Pedestrian and cyclist facilities		
PO17 Development provides safe and convenient pedestrian and cycle movement to the site and within the site having regard to desire lines, users' needs, safety and legibility.	AO17.1 Pedestrian and cyclist facilities are designed in compliance with the Capricorn Municipal Development Guidelines and Australian Standard AS 2890 — Parking facilities.	Complies with AO17.1 Pedestrian and cyclist facilities are designed in compliance with the Capricorn Municipal Development Guidelines and Australian Standard AS 2890 — Parking facilities. Refer to Section 4 and 5 of TTM's Traffic Engineering Report.
PO18 Provision is made for adequate bicycle parking and end of trip facilities, to meet the likely needs of users and encourage cycle travel.	No acceptable outcome is nominated. Editor's note—Provisions are made for parking and end of trip facilities in accordance with the SC6.4 — Bicycle network planning scheme policy.	Complies with PO18 Bicycle parking will be provided in accordance with Council requirements. Refer to Section 4 of TTM's Traffic Engineering Report.

PERFORMANCE OUTCOMES	ACCEPTABLE OUTCOMES	RESPONSE / COMPLIANCE
Servicing		
PO19 Refuse collection vehicles are able to safely access on-site refuse collection facilities.	AO19.1 Refuse collection areas are provided and designed in accordance with the waste management code and Australian Standard AS 2890.	Complies with AO19.1 Refuse collection areas are provided and designed in accordance with the waste management code and AS2890. Refer to Section 6 of TTM's Traffic Engineering Report.

Appendix F State Code 1 Responses

State code 1: Development in a state-controlled road environment

Table 1.2.1: Development in a state-controlled road environment

Performance outcomes	Acceptable outcomes	Response
Buildings and structures		
PO1 The location of buildings, structures, infrastructure, services and utilities does not create a safety hazard in a state-controlled road, or cause damage to, or obstruct road transport infrastructure	**AO1.1** Buildings, structures, infrastructure, services and utilities are not located in a state-controlled road. AND	**Complies with AO1.1** Buildings, structures, infrastructure, services and utilities are not located in a state-controlled road.
	AO1.2 Buildings, structures, infrastructure, services and utilities can be maintained without requiring access to a state-controlled road.	**Complies with AO1.2** Buildings, structures, infrastructure, services and utilities can be maintained without requiring access to a state-controlled road.
PO2 The design and construction of Buildings and structures does not create a safety hazard by distracting users of a state-controlled road.	**AO2.1** Facades of buildings and structures facing a state-controlled road are made of non-reflective materials. OR	**Complies with AO2.1** Facades of buildings and structures facing a state-controlled road will be made of non-reflective materials.
	AO2.2 Facades of buildings and structures do not reflect point light sources into the face of oncoming traffic on a state-controlled road. AND	**Complies with AO2.2** Facades of buildings and structures do not reflect point light sources into the face of oncoming traffic on a state-controlled road
	AO2.3 External lighting of buildings and structures is not directed into the face of oncoming traffic on a state-controlled road and does not involve flashing or laser lights. AND	**Complies with AO2.3** External lighting of buildings and structures is not directed into the face of oncoming traffic on a state-controlled road and does not involve flashing or laser lights.
	AO2.4 Advertising devices visible from a state-controlled road are located and designed in accordance with the Roadside advertising guide, Department of Transport and Main Roads, 2013.	**Complies with AO2.4** The development proposes to implement a pylon sign within the site's frontage to Yaamba Road. The sign is located in accordance with the Roadside Advertising Guide.
PO3 Road, pedestrian and bikeway bridges over a state-controlled road are designed and constructed to prevent projectiles from being thrown onto a state-controlled road.	**AO3.1** Road, pedestrian and bikeway bridges over a state-controlled road include throw protection screens in accordance with section 4.9.3 of the Design criteria for bridges and other structures manual, Department of Transport and Main Roads, 2014.	**N/A** No road, pedestrian and bikeway bridges are proposed over a state-controlled road as part of this development.

Filling, excavation and retaining structures		
PO4 Filling and excavation does not interfere with, or result in damage to, infrastructure or services in a state-controlled road. Note: Information on the location of services and public utility plants in a state-controlled road can be obtained from the Dial Before You Dig service. Where development will impact on an existing or future service or public utility plant in a state-controlled road such that the service or public utility plant will need to be relocated, the alternative alignment must comply with the standards and design specifications of the relevant service or public utility provider, and any costs of relocation are to be borne by the developer.	No acceptable outcome is prescribed.	**Complies with PO4.** Any filling and excavation activities required for the development will be subject to a construction traffic management plan that ensures no impacts.
PO5 Filling, excavation, building foundations and retaining structures do not undermine, or cause subsidence of, a state-controlled road. Note: To demonstrate compliance with this performance outcome, it is recommended an RPEQ certified geotechnical assessment, prepared in accordance with Volume 3 of the Road Planning And Design Manual 2nd edition, Department of Transport and Main Roads, 2016, is provided.	No acceptable outcome is prescribed.	**Complies with PO5.** All civil works will be undertaken in accordance with relevant standards to ensure no impacts.
PO6 Filling, excavation, building foundations and retaining structures do not cause ground water disturbance in a state-controlled road. Note: To demonstrate compliance with this performance outcome, it is recommended an RPEQ certified geotechnical assessment, prepared in accordance with Volume 3 of the Road planning and design manual 2nd edition, Department of Transport and Main Roads, 2016, is provided.	No acceptable outcome is prescribed.	**Complies with PO6.** All civil works will be undertaken in accordance with relevant standards to ensure no impacts.
PO7 Excavation, boring, piling, blasting or fill compaction during construction of a development does not result in ground movement or vibration impacts that would cause damage or nuisance to a state-controlled road, road transport infrastructure or road works. Note: To demonstrate compliance with this performance outcome, it is recommended an RPEQ certified geotechnical assessment, prepared in accordance with Volume 3 of the Road Planning And Design Manual 2nd edition, Department of Transport and Main Roads, 2016, is provided.	No acceptable outcome is prescribed.	**Complies with PO7.** All civil works will be undertaken in accordance with relevant standards to ensure no impacts.

PO8 Development involving the haulage of fill, extracted material or excavated spoil material exceeding 10,000 tonnes per year does not damage the pavement of a state-controlled road. Note: It is recommended a pavement impact assessment is provided in accordance with the Guide to Traffic Impact Assessment, Department of Transport and Main Roads, 2017.	**AO8.1** Fill, extracted material and spoil material is not transported to or from the development site on a state-controlled road.	**N/A** Extent of fill/excavation will not exceed 10,000 tonnes. Refer to Civil Engineering Report.
PO9 Filling and excavation associated with the construction of vehicular access to a development does not compromise the operation or capacity of existing drainage infrastructure for a state-controlled road.	No acceptable outcome is prescribed.	**Complies with PO9.** All civil works will be undertaken in accordance with relevant standards to ensure no impacts.
PO10 Fill material used on a development site does not result in contamination of a state-controlled road.	**AO10.1** Fill material is free of contaminants including acid sulfate content. Note: Soils and rocks should be tested in accordance with AS 1289.0 – Methods of testing soils for engineering purposes and AS 4133.0-2005 – Methods of testing rocks for engineering purposes. AND	**Complies with P10.** All civil works will be undertaken in accordance with relevant standards to ensure no impacts.
	AO10.2 Compaction of fill is carried out in accordance with the requirements of AS 1289.0 2000 – Methods of testing soils for engineering purposes.	**Complies with P10.** All civil works will be undertaken in accordance with relevant standards to ensure no impacts.
PO11 Filling and excavation does not cause wind-blown dust nuisance in a state-controlled road.	**AO11.1** Compaction of fill is carried out in accordance with the requirements of AS 1289.0 2000 – Methods of testing soils for engineering purposes. AND	**Complies with P11.** All civil works will be undertaken in accordance with relevant standards to ensure no impacts.
	AO11.2 Dust suppression measures are used during filling and excavation activities such as wind breaks or barriers and dampening of ground surfaces.	**Complies with P11.** All civil works will be undertaken in accordance with relevant standards to ensure no impacts.
Stormwater and drainage		
PO12 Development does not result in an actionable nuisance, or worsening of, stormwater, flooding or drainage impacts in a state-controlled road.	No acceptable outcome is prescribed.	**Complies with P12.** Refer to the Development Plans and Stormwater Management Plan
PO13 Run-off from the development site is not unlawfully discharged to a state-controlled road.	**AO13.1** Development does not create any new points of discharge to a state-controlled road. AND	**Complies with P13.** Refer to the Development Plans and Stormwater Management Plan
	AO13.2 Stormwater run-off is discharged to a lawful point of discharge. Note: Section 3.4 of the Queensland Urban Drainage Manual, Department of Energy and Water Supply, 2013, provides further information on lawful points of discharge. AND	**Complies with P13.** Refer to the Development Plans and Stormwater Management Plan
	AO13.3 Development does not worsen the condition of an existing lawful point of discharge to the state-controlled road.	**Complies with P13.** Refer to the Development Plans and Stormwater Management Plan

PO14 Run-off from the development site during construction does not cause siltation of stormwater infrastructure affecting a state-controlled road.	**AO14.1** Run-off from the development site during construction is not discharged to stormwater infrastructure for a state-controlled road.	**Complies with P14.** Refer to the Development Plans and Stormwater Management Plan
Vehicular access to a state-controlled road		
PO15 Vehicular access to a state-controlled road that is a limited access road is consistent with government policy for the management of limited access roads. Note: Refer to the SDAP Supporting Information: Vehicular access to a state-controlled road, Department of Transport and Main Roads, 2017, for further guidance on how to comply with this performance outcome.	**AO15.1** Development does not require new or changed access to a limited access road. Note: Limited access roads are declared by the transport chief executive under section 54 of the *Transport Infrastructure Act 1994* and are identified in the DA mapping system. OR	**Complies with A015.1** The development only has frontage to the Yaamba Road; a limited access state-controlled road. It is proposed that the northern access is retained in its current form, with the southern access relocated northward. Whilst the proposed southern crossover slightly differs from the existing, it is considered to be acceptable given that it is in accordance with AS2890. Further to this, an auxiliary left-turn treatment – short turn lane is proposed, which is in accordance with the *Road Planning and Design Manual*, 2nd edition, Department of Transport and Main Roads, 2016. Section 8 of TTM's Traffic Engineering Report confirms that the proposed arrangement do not result in a significant worsening to the external road network. The proposed left-on and left-out accesses are consistent with the intent of a limited access road.
	AO15.2 A new or changed access to a limited access road is consistent with the limited access policy for the state-controlled road. Note: Limited access policies for limited access roads declared under the *Transport Infrastructure Act 1994* can be obtained by contacting the relevant Department of Transport and Main Roads regional office. AND	**Complies with PO15** The development only has frontage to the Yaamba Road; a limited access state-controlled road. It is proposed that the northern access is retained in its current form, with the southern access relocated northward. Whilst the proposed southern crossover slightly differs from the existing, it is considered to be acceptable given that it is in accordance with AS2890. Further to this, an auxiliary left-turn treatment – short turn lane is proposed, which is in accordance with the *Road Planning and Design Manual*, 2nd edition, Department of Transport and Main Roads, 2016. Section 8 of TTM's Traffic Engineering Report confirms that the proposed arrangement do not result in a significant worsening to the external road network. The proposed left-on and left-out accesses are consistent with the intent of a limited access road.

	AO15.3 Where a new or changed access is for a service centre, access is consistent with the Service centre policy, Department of Transport and Main Roads, 2013 and the Access policy for roadside service centre facilities on limited access roads, Department of Transport and Main Roads, 2013, and the Service centre strategy for the state-controlled road. Note: The Service centre policy, Department of Transport and Main Roads, 2013, Access policy for roadside service centre facilities, Department of Transport and Main Roads, 2013 and the relevant Service centre strategy for a state-controlled road can be accessed by contacting the relevant Department of Transport and Main Roads regional office.	N/A The development is not a service centre.
PO16 The location and design of vehicular access to a state-controlled road (including access to a limited access road) does not create a safety hazard for users of a state-controlled road or result in a worsening of operating conditions on a state-controlled road. Note: Where a new or changed access between the premises and a state-controlled road is proposed, the Department of Transport and Main Roads will need to assess the proposal to determine if the vehicular access for the development is safe. An assessment can be made by Department of Transport and Main Roads as part of the development assessment process and a decision under section 62 of *Transport Infrastructure Act 1994* issued. Refer to the SDAP Supporting Information: Vehicular access to a state-controlled road, Department of Transport and Main Roads, 2017, for further guidance on how to comply with this performance outcome.	AO16.1 Vehicular access is provided from a local road.	N/A Vehicular access is provided from a state-controlled road. The site does not have road frontage to a local road.
	OR all of the following acceptable outcomes apply: AO16.2 Vehicular access for the development is consistent with the function and design of the state-controlled road. AND	Complies with AO16.2 The existing development (retail showroom) currently achieves access via two all-movement crossovers to the Yaamba Road. It is proposed that the northern access is retained in its current form, with the southern access relocated northward. As such, the proposed vehicular access arrangements are consistent with the function and design of the state-controlled road, Refer to Section 5 of TTM's Traffic Engineering Report.
	AO16.3 Development does not require new or changed access between the premises and the state-controlled road. Note: A decision under section 62 of the *Transport Infrastructure Act 1994* outlines the approved conditions for use of an existing vehicular access to a **state-controlled road**. Current section 62 decisions can be obtained from the relevant Department of Transport and Main Roads regional office. AND	Complies with PO16 Consistent with the existing development, the proposed scheme intends to achieve access via two crossovers to Yaamba Road, with one crossover restricted to left-in movements and the other left-in/left-out. These accesses are designed to give priority to entering vehicles at all times. An auxiliary left-turn treatment – short turn lane is provided at both crossovers, to allow vehicles entering the site to do so clear of through traffic. Section 8 of TTM's Traffic Engineering Report confirms that the proposed arrangement do not result in a significant worsening to the external road network. Based on the above, the proposed access arrangements are not considered to create a safety hazard for users of a state-controlled road or result in
	AO16.4 Use of any existing vehicular access to the development is consistent with a decision under section 62 of the *Transport Infrastructure Act 1994*. Note: The development which is the subject of the application must be of an equivalent use and intensity for which the section 62 approval was issued and the section 62 approval must have been granted no more than 5 years prior to the lodgement of the application. AND	

	AO16.5 On-site vehicle circulation is designed to give priority to entering vehicles at all times so vehicles do not queue in a road intersection or on the state-controlled road.	a worsening of operating conditions on a state-controlled road
Vehicular access to local roads within 100 metres of an intersection with a state-controlled road		
PO17 The location and design of vehicular access to a local road within 100 metres of an intersection with a state-controlled road does not create a safety hazard for users of a state-controlled road. Note: Refer to the SDAP Supporting Information: Vehicular access to a state-controlled road, Department of Transport and Main Roads, 2017, for further guidance on how to comply with this performance outcome.	**AO17.1** Vehicular access is located as far as possible from the state-controlled road intersection. AND	**Complies with PO17** The proposed egress crossover is located within 100m of the Yaamba Road/Macartney Street left-in/left-out priority-controlled Intersection. A short lane has been provided on egress from the development to ensure that development traffic does not create a safety hazard at this minor intersection.
	AO17.2 Vehicular access is in accordance with parts, 3, 4 and 4A of the Road Planning and Design Manual, 2nd Edition: Volume 3, Department of Transport and Main Roads, 2016. AND	**Complies with AO17.2** Vehicular access is in accordance with parts, 3, 4 and 4A of the Road Planning and Design Manual, 2nd Edition: Volume 3, Department of Transport and Main Roads, 2016.
	AO17.3 On-site vehicle circulation is designed to give priority to entering vehicles at all times so vehicles do not queue in the intersection or on the state-controlled road.	**Complies with AO17.3** On-site vehicle circulation is designed to give priority to entering vehicles at all times so vehicles do not queue in the intersection or on the state-controlled road.
Public passenger transport infrastructure on state-controlled roads		
PO18 Development does not damage or interfere with public passenger transport infrastructure, public passenger services or pedestrian or cycle access to public passenger transport infrastructure and public passenger services. Note: Refer to the SDAP Supporting Information: Vehicular access to a state-controlled road, Department of Transport and Main Roads, 2017, for further guidance on how to comply with this performance outcome.	**AO18.1** Vehicular access and associated road access works are not located within 5 metres of existing public passenger transport infrastructure. AND	**Complies with AO18.1** Vehicular access and associated road access works are not located within 5 metres of existing public passenger transport infrastructure.
	AO18.2 Development does not necessitate the relocation of existing public passenger transport infrastructure. AND	**Complies with AO18.2** Development does not necessitate the relocation of existing public passenger transport infrastructure.
	AO18.3 On-site vehicle circulation is designed to give priority to entering vehicles at all times so vehicles using a vehicular access do not obstruct public passenger transport infrastructure and public passenger services or obstruct pedestrian or cycle access to public passenger transport infrastructure and public passenger services. AND	**Complies with AO18.3** The development proposes two access crossovers to the Yaamba Road, with one crossover restricted to left-in movements and the other left-in/left-out. These accesses are designed to give priority to entering vehicles at all times. Refer to Section 5 of TTM's Traffic Engineering Report.

	AO18.4 The normal operation of public passenger transport infrastructure or public passenger services is not interrupted during construction of the development.	**Complies with AO18.4** The normal operation of public passenger transport infrastructure or public passenger services is not interrupted during construction of the development.
Planned upgrades		
PO19 Development does not impede delivery of planned upgrades of state-controlled roads.	**AO19.1** Development is not located on land identified by the Department of Transport and Main Roads as land required for the planned upgrade of a state-controlled road. Note: Land required for the planned upgrade of a state-controlled road is identified in the DA mapping system. OR	**Complies with AO19.1** The development is not located on land identified by the Department of Transport and Main Roads as land required for the planned upgrade of a state-controlled road
	AO19.2 Development is sited and designed so that permanent buildings, structures, infrastructure, services or utilities are not located on land identified by the Department of Transport and Main Roads as land required for the planned upgrade of a state-controlled road.	**Complies with AO19.2** The development is not located on land identified by the Department of Transport and Main Roads as land required for the planned upgrade of a state-controlled road
	OR all of the following acceptable outcomes apply: **AO19.3** Structures and infrastructure located on land identified by the Department of Transport and Main Roads as land required for the planned upgrade of a state-controlled road are able to be readily relocated or removed without materially affecting the viability or functionality of the development. AND	**N/A complies with AO19.1/19.2**
	AO19.4 Vehicular access for the development is consistent with the function and design of the planned upgrade of the state-controlled road. AND	**N/A complies with AO19.1/19.2**
	AO19.5 Development does not involve filling and excavation of, or material changes to, land required for a planned upgrade to a state-controlled road. AND	**N/A complies with AO19.1/19.2**
	AO19.6 Land is able to be reinstated to the pre-development condition at the completion of the use.	**N/A complies with AO19.1/19.2**

Network impacts		
PO20 Development does not result in a worsening of operating conditions on the state-controlled road network. Note: To demonstrate compliance with this performance outcome, it is recommended that an RPEQ certified traffic impact assessment is provided. Please refer to the Guide to Traffic Impact Assessment, Department of Transport and Main Roads, 2017, for further guidance on how to comply with this performance outcome.	No acceptable outcome is prescribed.	**Complies with PO20** As detailed in Section 8 of TTM's Traffic Engineering Report, the proposed site access intersections do not result in a worsening of operating conditions on the state-controlled road network.
PO21 Development does not impose traffic loadings on a state-controlled road which could be accommodated on the local road network.	**AO21.1** The layout and design of the development directs traffic generated by the development to the **local road** network.	**N/A** The development only has frontage to the state-controlled network.
PO22 Upgrade works on, or associated with, a state-controlled road are built in accordance with Queensland road design standards.	**AO22.1** Upgrade works required as a result of the development are designed and constructed in accordance with the *Road Planning and Design Manual*, 2nd edition, Department of Transport and Main Roads, 2016. Note: Road works in a state-controlled road require approval under section 33 of the *Transport Infrastructure Act 1994* before the works commence.	**Complies with AO22.1** In accordance with the *Road Planning and Design Manual*, 2nd edition, Department of Transport and Main Roads, 2016 and as detailed in Section 8 of TTM's Traffic Engineering Report, the proposed site access intersection warrants the provision of an auxiliary left-turn treatment – short turn lane.

Table 1.2.3: Development in a future state-controlled road environment

Performance outcomes	Acceptable outcomes	
PO32 Development does not impede delivery of a future state-controlled road.	AO32.1 Development is not located in a future state-controlled road. OR	Complies with AO32.1 Development is not located in a future state-controlled road.
	AO32.2 Development is sited and designed so that permanent buildings, structures, infrastructure, services or utilities are not located in a future state-controlled road.	N/A complies with AO32.1
	OR all of the following acceptable outcomes apply: AO32.3 Structures and infrastructure located in a future state-controlled road are able to be readily relocated or removed without materially affecting the viability or functionality of the development. AND	N/A complies with AO32.1
	AO32.4 Development does not involve filling and excavation of, or material changes to, a future state-controlled road. AND	N/A complies with AO32.1
	AO32.5 Land is able to be reinstated to the pre-development condition at the completion of the use.	N/A complies with AO32.1
PO33 Vehicular access to a future state-controlled road is located and designed to not create a safety hazard for users of a future state-controlled road or result in a worsening of operating conditions on a future state-controlled road. Note: Where a new or changed access between the premises and a future state-controlled road is proposed, the Department of Transport and Main Roads will need to assess the proposal to determine if the vehicular access for the development is safe. An assessment can be made by Department of Transport and Main Roads as part of the development assessment process and a decision under section 62 of *Transport Infrastructure Act 1994* issued.	AO33.1 Development does not require new or changed access between the premises and a future state-controlled road. AND	N/A The development proposes to achieve access via the Bruce Highway, which is not a future state-controlled road.
	AO33.2 Vehicular access for the development is consistent with the function and design of the future state-controlled road.	N/A The development proposes to achieve access via the Bruce Highway, which is not a future state-controlled road.
PO34 Filling, excavation, building foundations and retaining structures do not undermine, or cause subsidence of, a future state-controlled road. Note: To demonstrate compliance with this performance outcome, it is recommended that an RPEQ certified geotechnical assessment is provided, prepared in accordance with the Road Planning and Design Manual, 2nd edition: Volume 3, Department of Transport and Main Roads, 2016.	No acceptable outcome is prescribed.	N/A The development proposes to achieve access via the Bruce Highway, which is not a future state-controlled road.

Performance outcomes	Acceptable outcomes	
Refer to the SDAP Supporting Information: Filling, excavation and retaining structures in a state-controlled road environment, Department of Transport and Main Roads, 2017, for further guidance on how to comply with this performance outcome and prepare a geotechnical assessment.		
PO35 Fill material from a development site does not result in contamination of land for a future state-controlled road. Note: Refer to the SDAP Supporting Information: Filling, excavation and retaining structures in a state-controlled road environment, Department of Transport and Main Roads, 2017, for further guidance on how to comply with this performance outcome.	AO35.1 Fill material is free of contaminants including acid sulfate content. Note: Soil and rocks should be tested in accordance with AS1289 – Methods of testing soils for engineering purposes and AS4133 2005 – Methods of testing rocks for engineering purposes. AND	N/A The development proposes to achieve access via the Bruce Highway, which is not a future state-controlled road.
	AO35.2 Compaction of fill is carried out in accordance with the requirements of AS1289.0 2000 – Methods of testing soils for engineering purposes.	N/A The development proposes to achieve access via the Bruce Highway, which is not a future state-controlled road.
PO36 Development does not result in an actionable nuisance, or worsening of, stormwater, flooding or drainage impacts in a future state-controlled road. Note: Refer to the SDAP Supporting Information: Stormwater and drainage in a state-controlled road environment, Department of Transport and Main Roads, 2017, for further guidance on how to comply with this performance outcome.	No acceptable outcome is prescribed.	N/A The development proposes to achieve access via the Bruce Highway, which is not a future state-controlled road.
PO37 Run-off from the development site is not unlawfully discharged to a future state-controlled road. Note: Refer to the SDAP Supporting Information: Stormwater and drainage in a state-controlled road environment, Department of Transport and Main Roads, 2017, for further guidance on how to comply with this performance outcome.	AO37.1 Development does not create any new points of discharge to a future state-controlled road. AND	N/A The development proposes to achieve access via the Bruce Highway, which is not a future state-controlled road.
	AO37.2 Stormwater run-off is discharged to a lawful point of discharge. Note: Section 3.4 of the Queensland Urban Drainage Manual, Department of Energy and Water Supply, 2013, provides further information on lawful points of discharge. AND	N/A The development proposes to achieve access via the Bruce Highway, which is not a future state-controlled road.
	AO37.3 Development does not worsen the condition of an existing lawful point of discharge to the future state-controlled road.	N/A The development proposes to achieve access via the Bruce Highway, which is not a future state-controlled road.

Environmental Noise Level Impact Assessment for Proposed Fast Food Restaurant, 452-488 Yaamba Road, Norman Gardens

conducted for

Brownfield Nominees Pty Ltd

Report No: R20046/D3417/Rev.0/19.08.2020

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

These plans are approved subject to the current conditions of approval associated with

Development Permit No.: D/106-2020

Dated: 7 April 2021

Revision No.	Date	Comment
Draft	18.08.2020	Draft.
0	19.08.2020	Original report.

Report prepared for:	Brownfield Nominees Pty Ltd, GPO Box 3872 SYDNEY NSW 2001
Authorised by:	Mr Matthew Lindley Development Manager Mobile: 0437 013 167 Telephone: -
Dates of assessment:	Thursday 4 to Thursday 11 April 2019
Consultants:	David Moore & Associates Pty Ltd (PO Box 38) 7 Eleanor Drive SILVAN QLD 3795 Telephone: 07 3170 3222 Mobile: 0417 717 506

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David Moore, B App Sc, MAAS

Our reference:	R20046/D3417/Rev.0/19.08.2020

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INTRODUCTION

It is proposed to establish a fast food restaurant on the subject site at 452-488 Yaamba Road, Norman Gardens (Rockhampton), in the south-west corner of this site (previously a Bunnings Warehouse). This site is adjoined by Yaamba Road to the west and residential to the south, with the Bunnings Warehouse building to the east and associated carpark to the north.

This proposed development will include the restaurant building, drive through facility and carpark.

Noise from this development could include:

- plant and equipment;
- carpark activity;
- drive through – food ordering;
- delivery vehicles.

To assess the existing ambient noise levels a noise logger was located on the subject site immediately adjacent to the boundary with the residential to the south for a 7-day period from Thursday 4 April 2019. The results of this ambient noise assessment, the requirements of the Environmental Protection (Noise) Policy 2019 and the Environmental Protection Act 1994 have been used to determine the appropriate noise limits for this development.

This report details the results of the ambient noise level measurements, noise limits, source noise levels, noise level impact at the closest residences and any required noise control measures.

In preparing this report the site plan prepared by Tulip Designs Qld, Project Number 2003, drawing A1.02, rev B was referenced.

Refer Figure 1 for locality plan and monitoring location A and Figure 2 for proposed site plan.

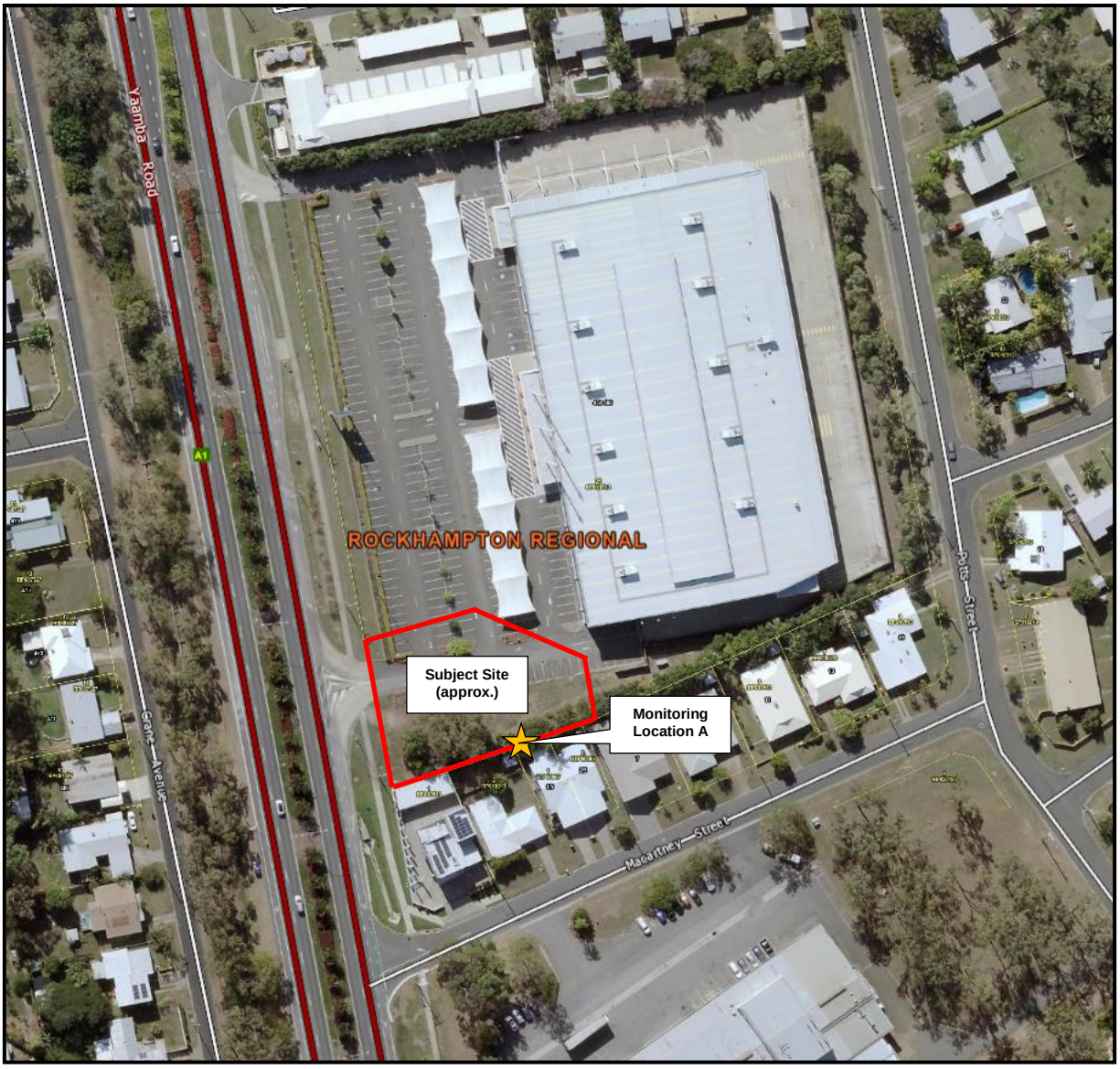


Figure 1
Locality Plan for Proposed Fast Food Restaurant, Closest Residences and Monitoring Location A (Top of the Page is North)

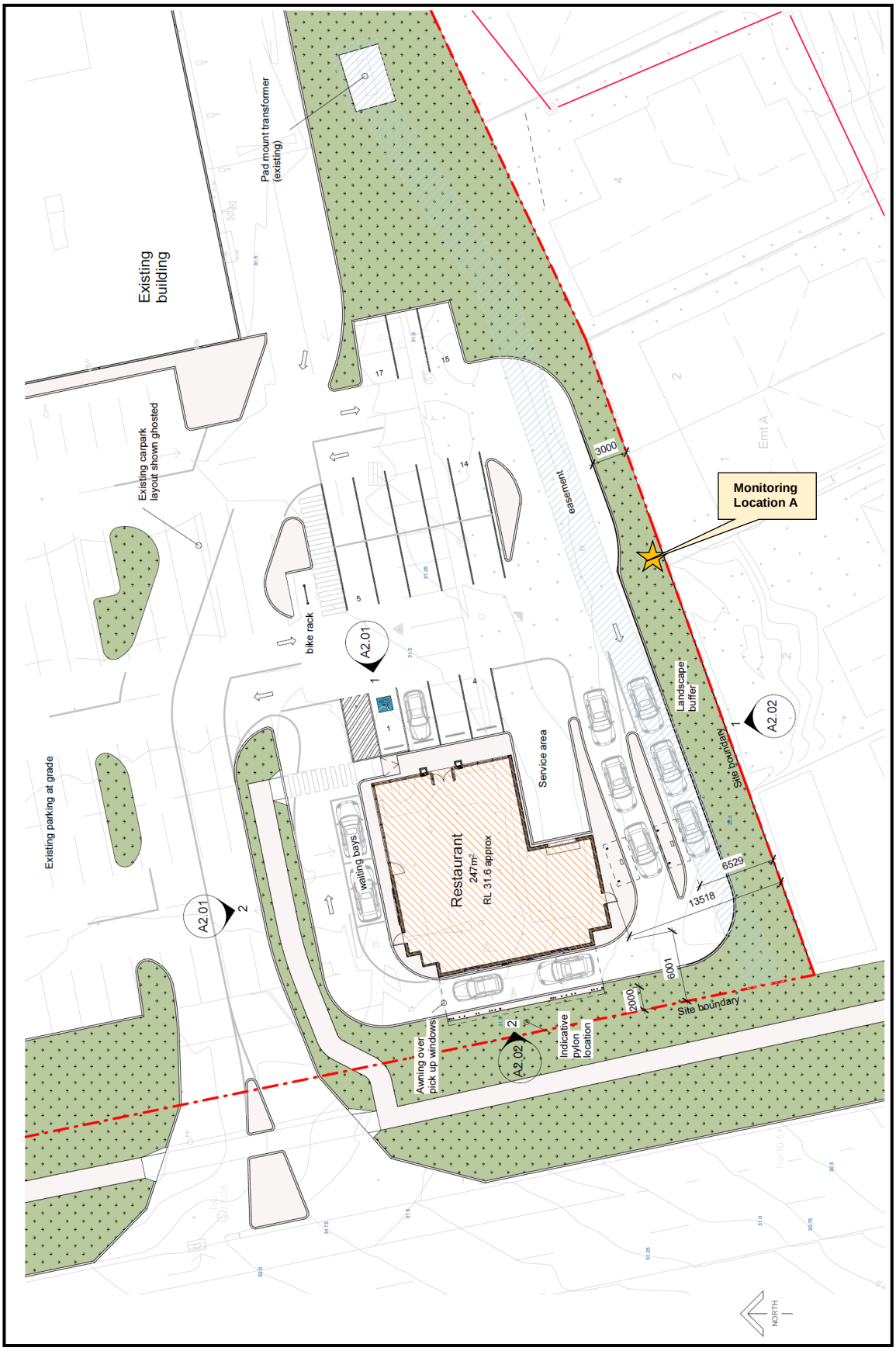


Figure 2
Proposed Site Plan and Monitoring Location A

CRITERIA

All noise level measurements were conducted in accordance with the following:

- general requirements of the Queensland environmental protection legislation;
- Environmental Protection (Noise) Policy 2019;
- *Noise Measurement Manual*, Queensland Department of Environmental and Heritage Protection Version 4, 22 August 2013;
- Australian Standard AS 1055-2018, *Acoustics – Description and Measurement of Environmental Noise*.

NOISE LIMITS

The Rockhampton Regional Planning Scheme 2015 requires protection of amenity of residential areas and makes mention of the Environmental Protection (Noise) Policy (EPP Noise). Noise limits, therefore, have been defined in accordance with the EPP Noise 2019, which only contains the Acoustic Quality Objectives. Reference is also made to the Default Noise Standards of the Environmental Protection Act 1994 for refrigeration and air-conditioning unit noise limits.

The adopted noise limits are as follows:

- air-conditioning and refrigeration:
  - daytime (0700 to 1800 hours): background + 5 dB(A);
  - evening (1800 to 2200 hours): background + 5 dB(A);
  - night-time (2200 to 0700 hours): background + 3 dB(A);

- all other noise sources – Acoustic Quality Objectives:
  - Acoustic quality objectives, daytime and evening, external to dwelling:
    - 50 dB(A) $L_{Aeq,adj,1H}$;
    - 55 dB(A) $L_{A10,adj,1H}$; and
    - 65 dB(A) $L_{A1,adj,1H}$;
  - Acoustic quality objectives, daytime and evening, inside dwelling:
    - 35 dB(A) $L_{Aeq,adj,1H}$;
    - 40 dB(A) $L_{A10,adj,1H}$; and
    - 45 dB(A) $L_{A1,adj,1H}$;
  - Acoustic quality objectives, night-time, inside dwelling:
    - 30 dB(A) $L_{Aeq,adj,1H}$;
    - 35 dB(A) $L_{A10,adj,1H}$; and
    - 40 dB(A) $L_{A1,adj,1H}$;

For the night-time period the internal noise criteria needs to be converted to be equivalent to outside the closest residences. Allowing a 7 dB(A) noise level reduction from outside to inside (based on windows partially closed and in accordance with the Queensland Environmental Protection Agency Ecoaccess Guideline *Planning for Noise Control*) the internal criteria would be equivalent to the following levels external to the dwelling:

- 37 dB(A) $L_{Aeq,adj,1H}$;
- 42 dB(A) $L_{A10,adj,1H}$; and
- 47 dB(A) $L_{A1,adj,1H}$.

NOISE LEVEL MEASUREMENTS

Table 1 details the results of the ambient noise level measurements conducted from monitoring location A, from the subject site side of the rear boundary of 5 Macartney Street, with the microphone elevated 1.6 metres. For details of noise measurement equipment, equipment settings, calibration and atmospheric conditions, refer Appendix A. For all of the results of the ambient noise assessment refer Appendix B.

With respect to Table 1 the following should be noted:

- daytime: 0700 to 1800 hours;
- evening: 1800 to 2200 hours;
- night-time: 2200 to 0700 hours;
- 'A' weighted: adjustment made by the sound level meter to the measured noise to correspond to the response of the human ear. This adjustment is standardised by international noise standards;
- $L_{Aeq,T}$: the equivalent continuous (or approximately the 'average') 'A' weighted sound pressure level for the measurement period 'T';
- $L_{A1,T}$: the 'A' weighted sound pressure level exceeded for 1% of the measurement period 'T';
- $L_{A10,T}$: the 'A' weighted sound pressure level exceeded for 10% of the measurement period 'T', which is an approximation of the 'average of the maximum noise levels';
- $L_{A90,T}$: the 'A' weighted sound pressure level exceeded for 90% of the measurement period 'T', which is an approximation of the 'average of the minimum noise levels', which is also known as the 'background' noise level;

Table 1
Results of Ambient Noise Level Measurements, Monitoring Location A

Day	Date	Time Period	Ambient Noise Level, dB(A)							
			L_{Aeq}		L_{A1}		L_{A10}		L_{A90}	
			Range	Av.	Range	Av.	Range	Av.	Range	Av.
Thursday	4/4/19	Evening	53.7-58.8	56.1	63.2-67.5	65.7	55.8-61.3	58.9	42.9-50.0	46.9
		Night	45.9-57.1	52.7	58.5-67.0	64.1	46.6-61.2	55.8	30.9-47.1	40.7
Friday	5/4/19	Daytime	55.7-59.3	57.4	63.1-68.4	65.7	58.8-61.4	60.4	46.3-51.3	49.2
		Evening	53.4-57.5	55.3	63.0-68.6	65.6	57.0-60.5	58.6	40.4-46.4	43.6
		Night	45.8-56.3	51.8	58.3-67.1	63.2	47.4-58.3	54.6	31.6-45.2	39.9
Saturday	6/4/19	Daytime	53.7-64.5	56.8	61.1-70.4	65.3	57.3-60.8	59.4	43.1-48.9	46.6
		Evening	53.3-56.6	55.2	61.4-66.9	65.1	57.4-59.9	58.6	41.4-47.2	44.6
		Night	43.8-55.9	50.6	56.2-65.6	61.5	45.2-58.8	53.9	29.3-47.5	39.2
Sunday	7/4/19	Daytime	53.1-58.6	55.7	61.0-70.5	65.4	57.3-61.6	59.0	39.1-46.7	44.0
		Evening	49.9-55.3	53.2	59.9-66.6	64.0	54.0-58.8	57.1	34.0-44.1	39.3
		Night	43.4-57.7	51.9	57.1-67.8	62.6	41.8-61.5	55.0	29.2-46.2	39.2
Monday	8/4/19	Daytime	55.4-62.1	57.3	62.3-73.8	66.9	58.8-62.8	60.3	43.8-48.9	46.7
		Evening	51.9-56.3	54.3	62.5-66.1	64.5	55.7-59.8	57.8	36.9-45.2	41.2
		Night	44.5-58.6	52.9	57.8-68.3	64.0	45.4-62.2	56.1	31.4-48.2	40.7
Tuesday	9/4/19	Daytime	54.9-64.7	57.5	63.8-76.7	67.2	58.0-61.5	60.1	43.7-48.6	46.9
		Evening	52.0-57.7	55.0	62.1-67.6	65.4	52.2-61.2	58.5	34.5-46.7	41.7
		Night	45.1-58.4	53.4	58.2-68.0	64.6	46.1-62.6	56.9	32.5-47.8	40.0

Table 1
Results of Ambient Noise Level Measurements, Monitoring Location A

Day	Date	Time Period	Ambient Noise Level, dB(A)							
			L_{Aeq}		L_{A1}		L_{A10}		L_{A90}	
			Range	Av.	Range	Av.	Range	Av.	Range	Av.
Wednesday	10/4/19	Daytime	55.4-59.5	57.5	64.2-71.2	66.6	58.7-61.8	60.6	42.7-48.8	46.1
		Evening	52.1-65.1	56.9	61.1-69.1	65.7	55.7-60.6	58.6	36.4-44.8	41.6
		Night	46.1-59.7	52.9	58.1-67.9	63.9	45.9-60.9	55.7	27.9-47.1	39.5
Thursday	11/4/19	Daytime	57.2-70.1	61.9	63.2-80.2	71.4	59.3-74.5	65.4	47.7-60.1	53.0

From Table 1, the following average ambient noise levels should be noted:

- $L_{Aeq,T}$:
  - daytime: 57.4, 56.8, 55.7, 57.3, 57.5, 57.5, 61.9* Average = 57.0 dB(A);
  - evening: 56.1, 55.3, 55.2, 53.2, 54.3, 55.0, 56.9 Average = 55.1 dB(A);
  - night-time: 52.7, 51.8, 50.6, 51.9, 52.9, 53.4, 52.9 Average = 52.3 dB(A);

- $L_{A1,T}$:
  - daytime: 65.7, 65.3, 65.4, 66.9, 67.2, 66.6, 71.4* Average = 66.2 dB(A);
  - evening: 65.7, 65.6, 65.1, 64.0, 64.5, 65.4, 65.7 Average = 65.1 dB(A);
  - night-time: 64.1, 63.2, 61.5, 62.6, 64.0, 64.6, 63.9 Average = 63.4 dB(A);

- $L_{A10,T}$:
  - daytime: 60.4, 59.4, 59.0, 60.3, 60.1, 60.6, 65.4* Average = 60.0 dB(A);
  - evening: 58.9, 58.6, 58.6, 57.1, 57.8, 58.5, 58.6 Average = 58.3 dB(A);
  - night-time: 55.8, 54.6, 53.9, 55.0, 56.1, 56.9, 55.7 Average = 55.4 dB(A);

- $L_{A90,T}$:
  - daytime: 49.2, 46.6, 44.0, 46.7, 46.9, 46.1, 53.0* Average = 46.6 dB(A);
  - evening: 46.9, 43.6, 44.6, 39.3, 41.2, 41.7, 41.6 Average = 42.7 dB(A);
  - night-time: 40.7, 39.9, 39.2, 39.2, 40.7, 40.0, 39.5 Average = 39.9 dB(A).

- Excluded from average due to rainfall.

Based on the above the noise limits for air-conditioning and refrigeration noise are:

- daytime (0700 to 1800 hours): 47 dB(A) $L_{A90,T}$ + 5 = 52 dB(A) $L_{Aeq,adj,T}$;
- evening (1800 to 2200 hours): 43 dB(A) $L_{A90,T}$ + 5 = 48 dB(A) $L_{Aeq,adj,T}$;
- night-time (2200 to 0700 hours): 40 dB(A) $L_{A90,T}$ + 5 = 45 dB(A) $L_{Aeq,adj,T}$.

SOURCE NOISE LEVELS

Steady State Noise

From previous fast food restaurant source noise level measurements conducted by the consultant the steady state source noise levels are:

- air-conditioning, coldroom and freezer: 70.0 dB(A) $L_{Aeq,adj,T}$ @ 1.3 m;
- exhaust fan: 63.2 dB(A) $L_{A90,T}$ @ 0.6 m;

The above noise sources were all roof mounted.

Time Varying Noise

From previous noise level measurements conducted by the consultant of general fast food restaurant noise sources, the time varying source noise levels, are:

- delivery truck: 56.5 dB(A) $L_{Aeq,adj,15min}$ @ 6 m;
- waste collection: 58.5 dB(A) $L_{Aeq,adj,15min}$ @ 8 m;
- food ordering: 49.7 dB(A) $L_{Aeq,adj,15min}$ @ 8 m;
- food collection: 46.0 dB(A) $L_{Aeq,adj,15min}$ @ 8 m;
- people noise: 55 dB(A) $L_{Aeq,adj,15min}$ @ 8 m;
- carpark activity: 50.6 dB(A) $L_{Aeq,adj,15min}$ @ 8 m.

NOISE LEVEL IMPACT – STEADY STATE NOISE

At the closest residences to the south (closest of these residences to each of the potential noise sources) the steady state source noise levels will be as per Table 2.

Table 2
Steady State Source Noise Levels Calculated to Closest Residences to South

Premises	Noise Source	Source Noise Level (dB(A))	Distance to Receptor (m)	Noise Level Reduction (dB(A))			Receptor Noise Level (dB(A))
				Distance	Barrier	Ground	
Fast Food Restaurant	A/C + refrig	70.0 @ 1.3m	33	-28	0	0	42.0
	Exhaust fan	63.2 @ 0.6m	33	-34	0	0	29.2
						TOTAL	42

For the closest residences to the proposed Fast Food Restaurant the predicted combined plant and equipment noise levels comply with the daytime, evening and night-time noise limits, with all of the plant and equipment detailed in Table 2 operating for the complete 24-hour day. This compliance is with no additional noise control measures in place and is in accordance with both the Acoustic Quality Objectives and the Default Noise Standards.

NOISE LEVEL IMPACT – TIME VARYING NOISE

At the closest residences to the south the time varying source noise levels will be as per Table 3.

Table 3
Time Varying Source Noise Levels Calculated to Closest Residences to South

Premises	Noise Source	Source Noise Level (dB(A))	Distance to Receptor (m)	Noise Level Reduction (dB(A))			Receptor Noise Level (dB(A))
				Distance	Barrier	Ground	
Fast Food Restaurant	Food ordering	49.7 $L_{Aeq,adj,15min}$ @ 8m	20	-8	0	0	42
	Food collection	46.0 $L_{Aeq,adj,15min}$ @ 8m	32	-12	0	0	34
	People talking loudly	55.0 $L_{Aeq,adj,15min}$ @ 8m	25	-10	0	0	45
	Carpark activity	50.6 $L_{Aeq,adj,15m}$ @ 8m	20	-8	0	0	43
	Delivery truck	56.5 $L_{Aeq,adj,15min}$ @ 8m	25	-10	0	0	47
	Waste collection	58.5 $L_{Aeq,adj,15m}$ @ 8m	25	-10	0	0	49

For the closest residences to the south of the Fast Food Restaurant all of the time varying noise sources comply with the daytime and evening noise limits, but all except food collection exceed the night-time criteria.

If delivery trucks and waste collection are limited to occur only after 0700 hours and before 2200 hours, then to control the remainder of the noise sources to the night-time noise limit an acoustic barrier providing a noise reduction of up to 8 dB(A) is required. By path difference calculation an acoustic barrier 2.4 metres high on the adjoining residential boundary would provide this 8 dB(A) reduction. This acoustic barrier must be located as per Figure 3, be continuous and gap free and have a minimum surface area density of 12.5 kg/m^2.

Examples of suitable materials of construction include:

- reinforced concrete;
- concrete block;
- brick;
- hebel panel;
- sheet metal at least 2 mm thick;
- minimum 9 mm thick fibrous cement sheet;
- lapped timber palings, for example, kiln dried softwood palings at least 23 mm thick and overlapped a minimum 15 mm;
- any combination of the above.

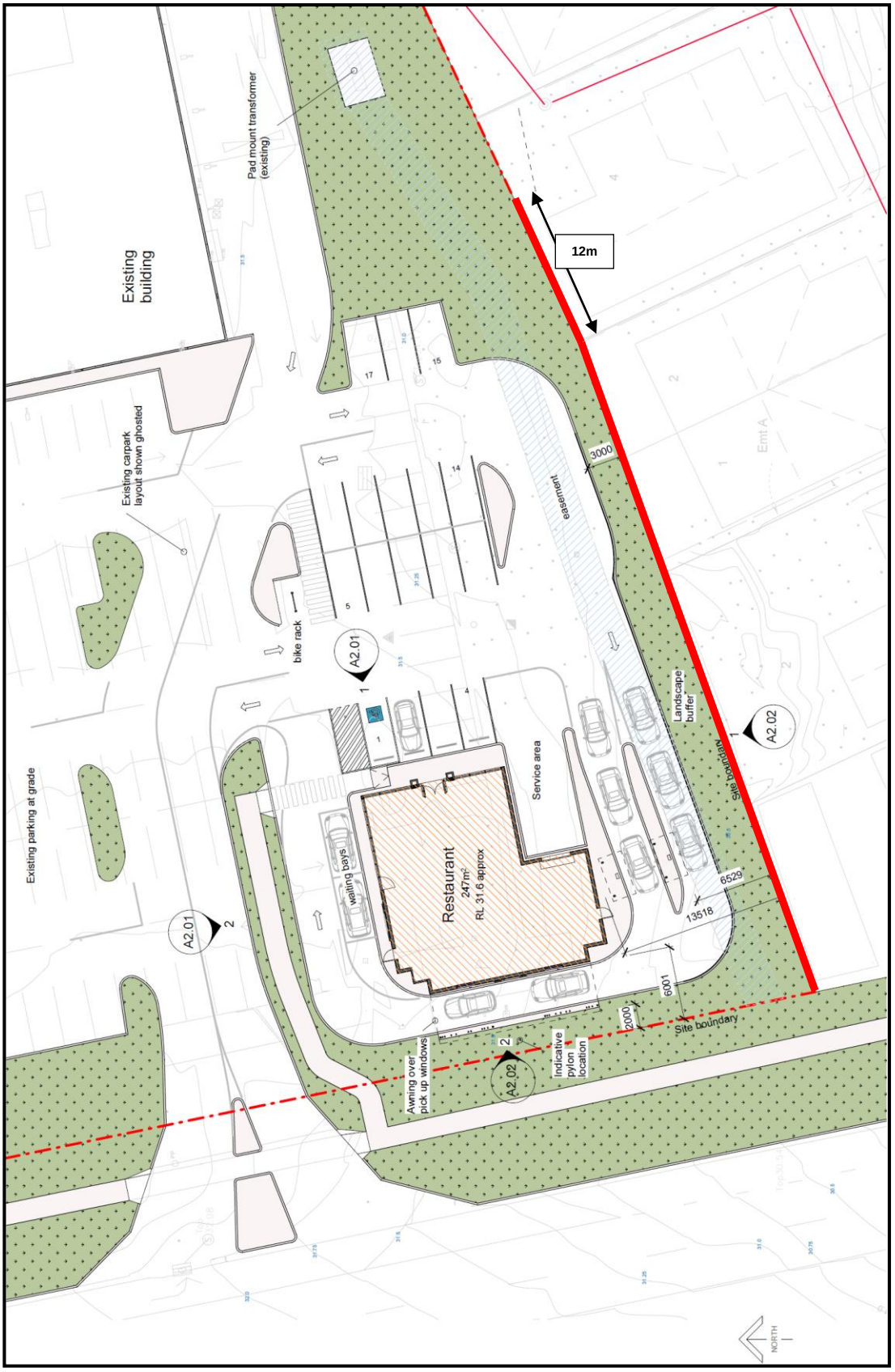


Figure 3
Location of 2.4 m High Acoustic Barrier (Bold Red Line)

NOISE CONTROL

For the closest residences to the south of the proposed Fast Food Restaurant the following noise control measures are required to permit 24-hour operation:

- waste collection limits to between 0700 and 2200 hours;
- delivery trucks limited to between 0700 and 2200 hours;
- acoustic barrier 2.4 metres high constructed on the common boundary with the adjoining residential to the south, as per Figure 3. This acoustic barrier must be continuous and gap free and have a minimum surface area density of 12.5 kg/m^2.

Once all of the plant and equipment has been selected, together with the location of all of this plant and equipment, an acoustic consultant should be engaged to re-calculate the noise level impact and determine whether or not any noise control measures are required.

CONCLUSIONS

It is proposed to establish a fast food restaurant on the subject site at 452-488 Yaamba Road, Norman Gardens (Rockhampton), in the south-west corner of this site (previously a Bunnings Warehouse). This site is adjoined by Yaamba Road to the west and residential to the south, with the Bunnings Warehouse building to the east and associated carpark to the north.

This proposed development will include the restaurant building, drive through facility and carpark.

Noise from this development could include:

- plant and equipment;
- carpark activity;
- drive through – food ordering;
- delivery vehicles.

To assess the existing ambient noise levels a noise logger was located on the subject site immediately adjacent to the boundary with the residential to the south for a 7-day period from Thursday 4 April 2019. The results of this ambient noise assessment, the requirements of the Environmental Protection (Noise) Policy 2019 and the Environmental Protection Act 1994 have been used to determine the appropriate noise limits for this development.

Steady state noise sources associated with this proposed fast food restaurant (refrigeration and air-conditioning) were assumed to be roof mounted. The combined noise level of all potential plant and equipment complied with the noise limits for the complete 24-hour day, with no additional noise control measures required.

For the time varying noise sources, these also would comply with the noise limits provided deliveries and waste collection only occurred from 0700 to 2200 hours and a 2.4 metre high acoustic barrier is constructed on along the southern boundary of the subject site, located as per Figure 3. This acoustic barrier must be continuous and gap free and have a minimum surface area density of 12.5 kg/m^2.

Once all of the plant and equipment has been selected, together with the location of all of this plant and equipment, an acoustic consultant should be engaged to re-calculate the noise level impact and determine whether or not any noise control measures are required.

RECOMMENDATION

It is recommended that, from an environmental noise perspective, the proposed fast food restaurant at 452-488 Yaamba Road, Norman Gardens, be approved for 24-hour operation, provided that the noise control measures detailed in this report are incorporated into the development.

APPENDIX A: NOISE LEVEL MEASUREMENT EQUIPMENT

Measurement Equipment

The following equipment was used to conduct the ambient noise level study at Monitoring Location A:

- Bruel and Kjaer Type 2250 L Hand Held Analyzer – Serial No. 3004242, with Type BZ 7131, BZ 7132 and BZ 7133 Software and Prepolarised free-field ½" microphone, Type 4189, Serial No. 2879996;
- Bruel and Kjaer Type 3592 outdoor microphone kit, including Type UA1404 outdoor microphone;
- Bruel and Kjaer Type AO 0442 ten metre microphone extension cable; and
- Bruel and Kjaer Type 4231 Sound Level Calibrator, Serial No. 2292747.

All of the above equipment is Type 1 in accordance with the requirements of Australian Standard AS 1259-1990, *Acoustics – Sound Level Meters*, as required by Australian Standard AS 1055-2018.

Measurement Equipment Settings

The above equipment was used with the following settings:

- Detector: RMS
- Time Weighting: FAST
- Frequency Weighting: A
- Sound Incidence: FRONTAL
- Microphone sensitivity: 35.443 mV/Pa

Calibration

The sound level meter was calibrated to the required value of 93.8 dB at 1000 Hz immediately before and after the noise level measurements were conducted. At no time was an adjustment of more than ±0.5 dB required. This complies with the requirements of the Australian Standard.

Monitoring Location

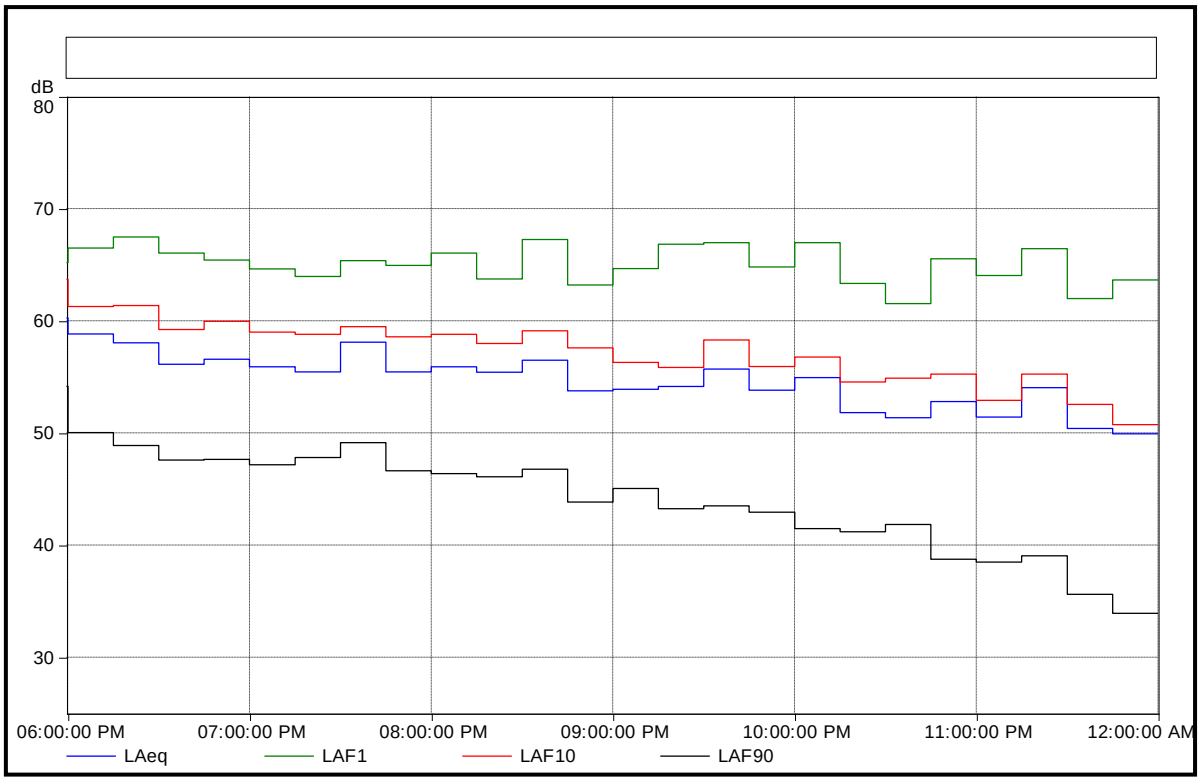
Monitoring Location A was on the subject site side of the common boundary fence between the subject site and the residential to the south, at the rear of 5 Macartney Street, with the microphone elevated 1.6 metres above ground level. Refer Figures 1 and 2 for further details of Monitoring Location A.

Atmospheric Conditions

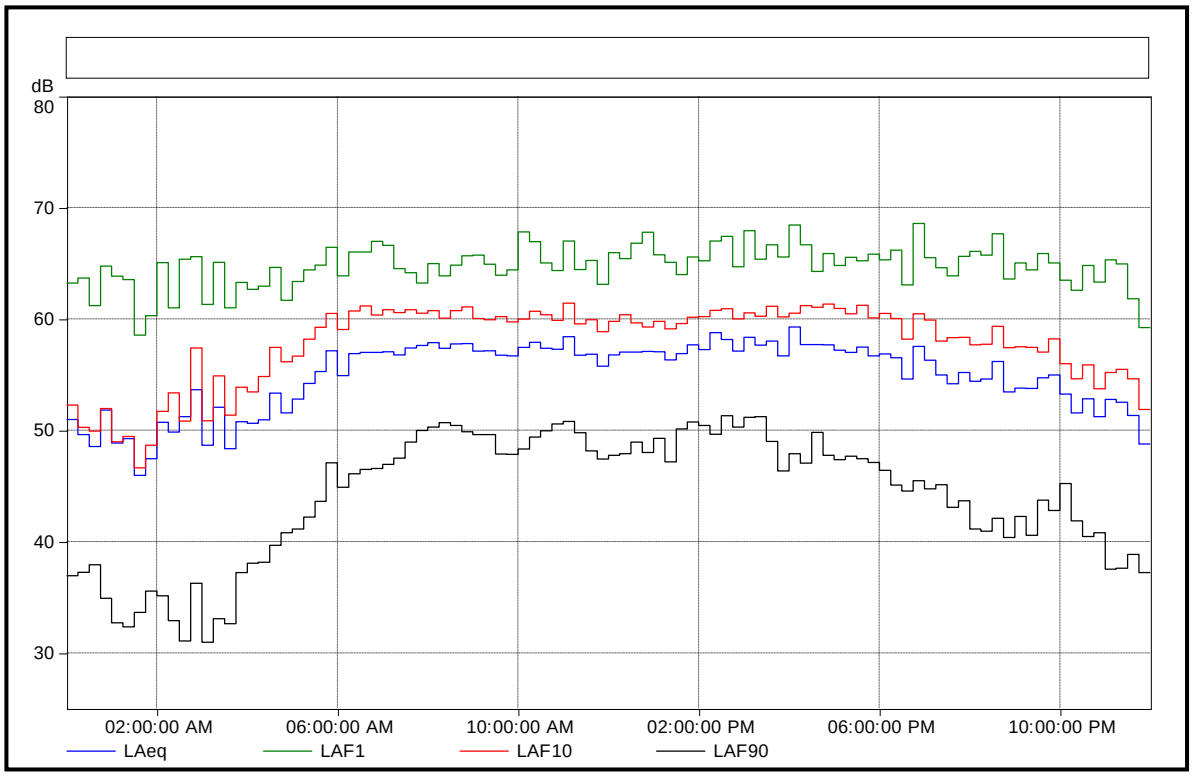
Throughout the 7-day ambient noise assessment atmospheric conditions generally complied with the requirements of the Australian Standard. However, on the final day (Thursday 11th April) there was rain and consequently this data was excluded from the averaging.

APPENDIX B: AMBIENT NOISE LEVEL MEASUREMENT RESULTS

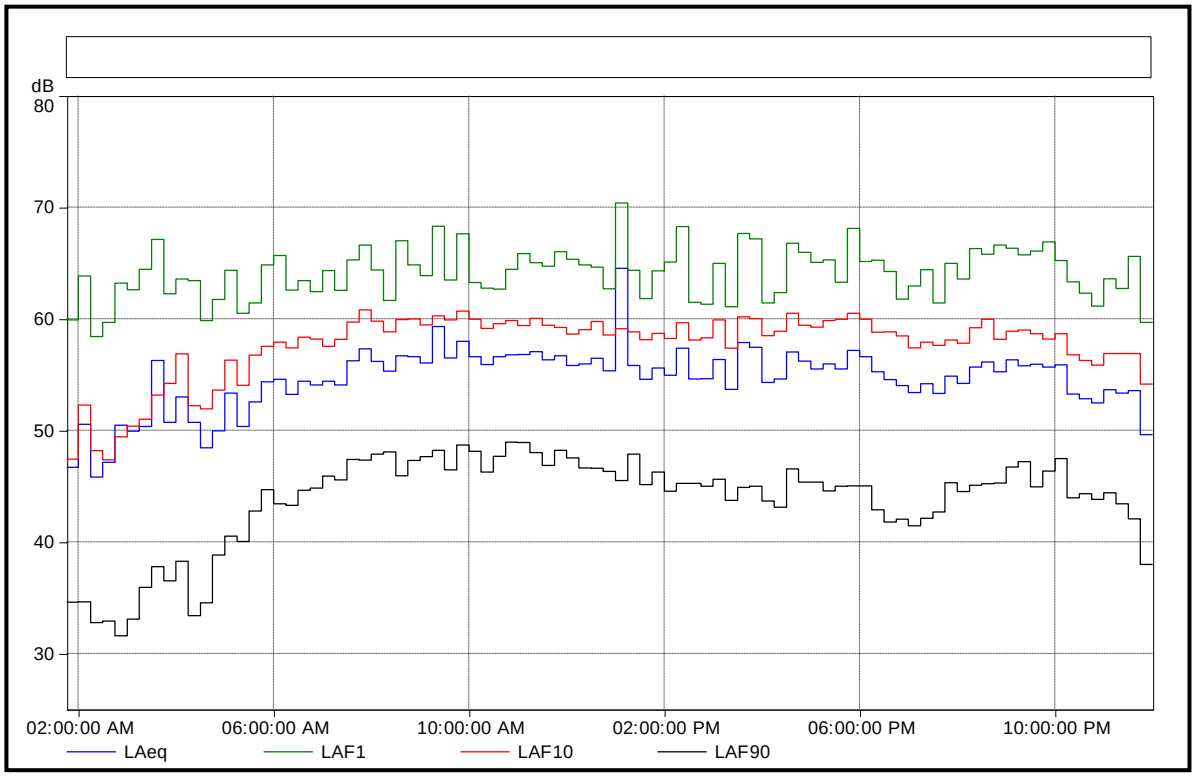
Instrument:		2250-L
Application:		BZ7133 Version 4.7.5
Start Time:		04/04/2019 17:59:30
End Time:		04/06/2019 01:03:27
Elapsed Time:		1.07:03:57
Bandwidth:		1/3-octave
Max Input Level:		143.92
	Time	Frequency
Broadband (excl. Peak):	FSI	AC
Broadband Peak:		C
Spectrum:	FS	Z
Instrument Serial Number:		3004242
Microphone Serial Number:		2879996
Input:		
Windscreen Correction:		None
Sound Field Correction:		Free-field
Calibration Time:		04/04/2019 17:53:03
Calibration Type:		External reference
Sensitivity:		35.4429632425308 mV/Pa



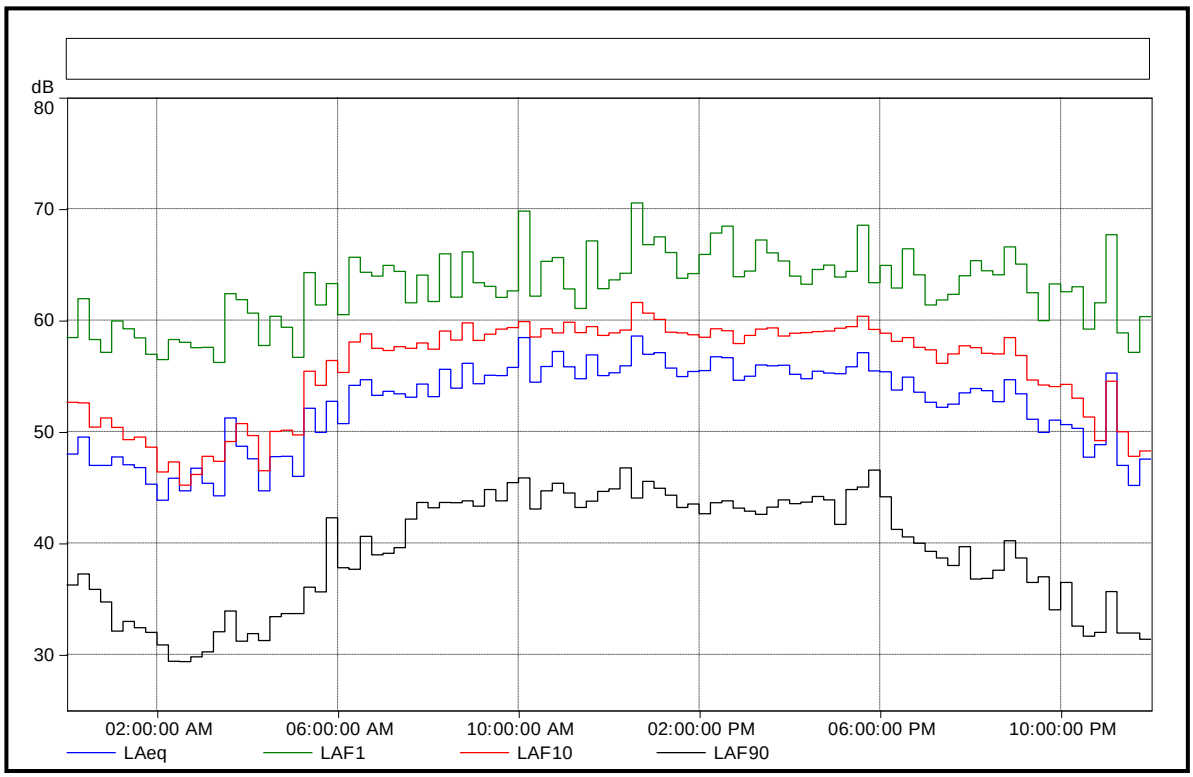
Day 1, Thursday 4 April 2019, from 1800 hours



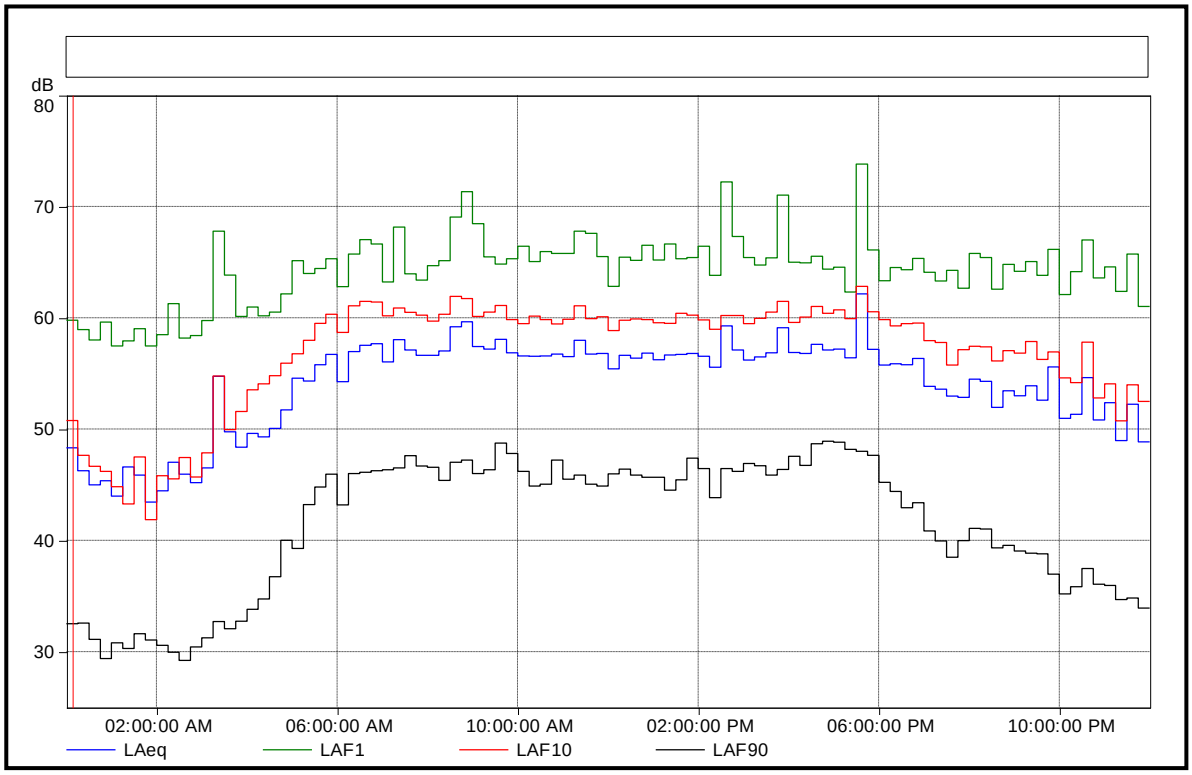
Day 2, Friday 5 April 2019



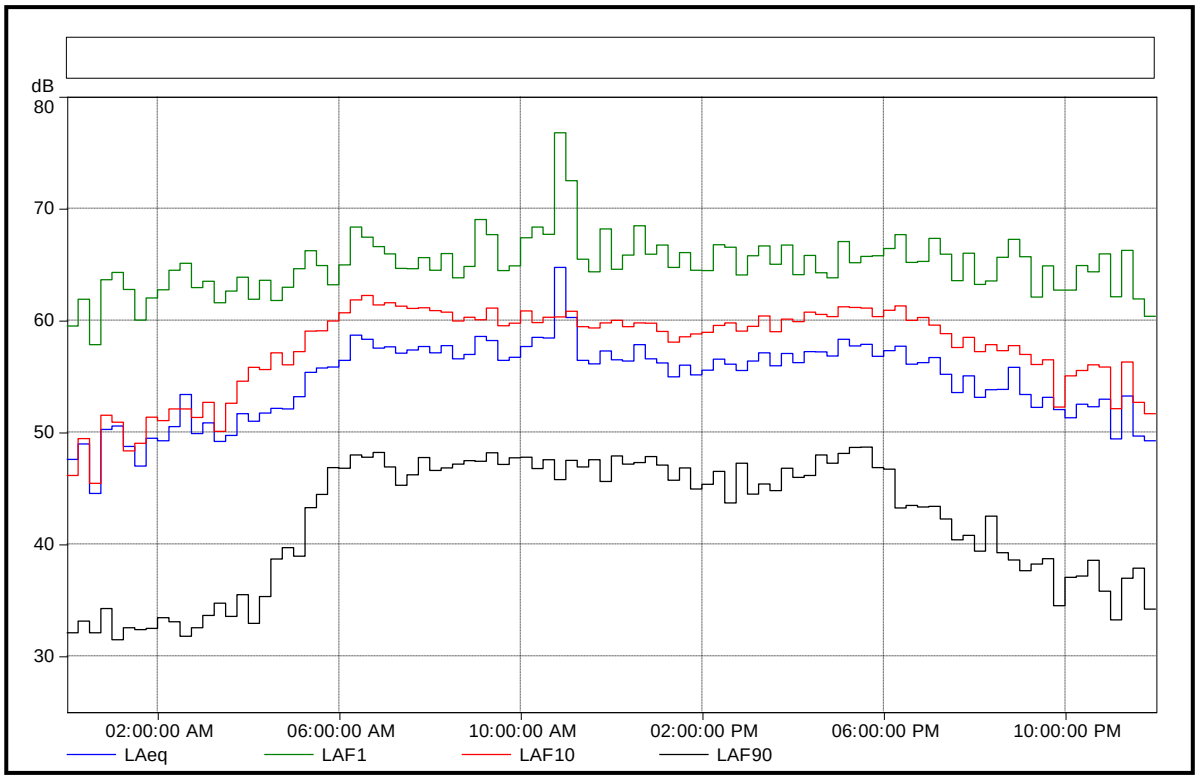
Day 3, Saturday 6 April 2019



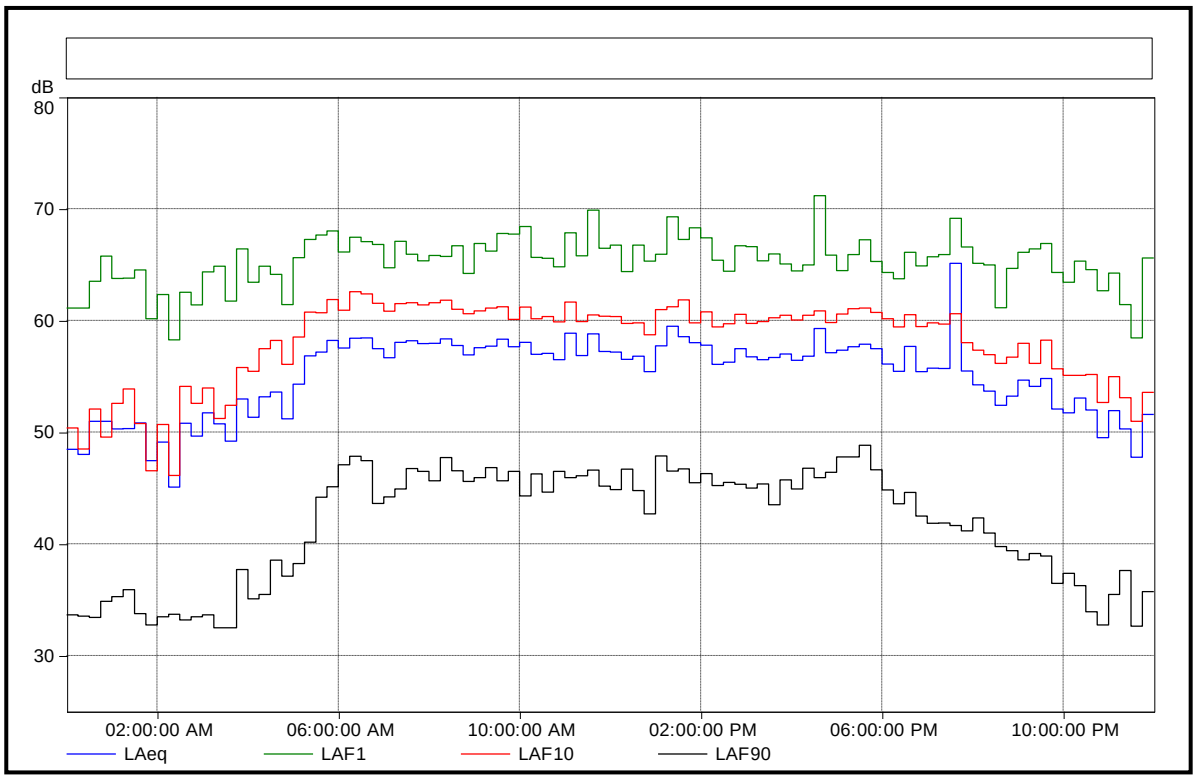
Day 4, Sunday 7 April 2019



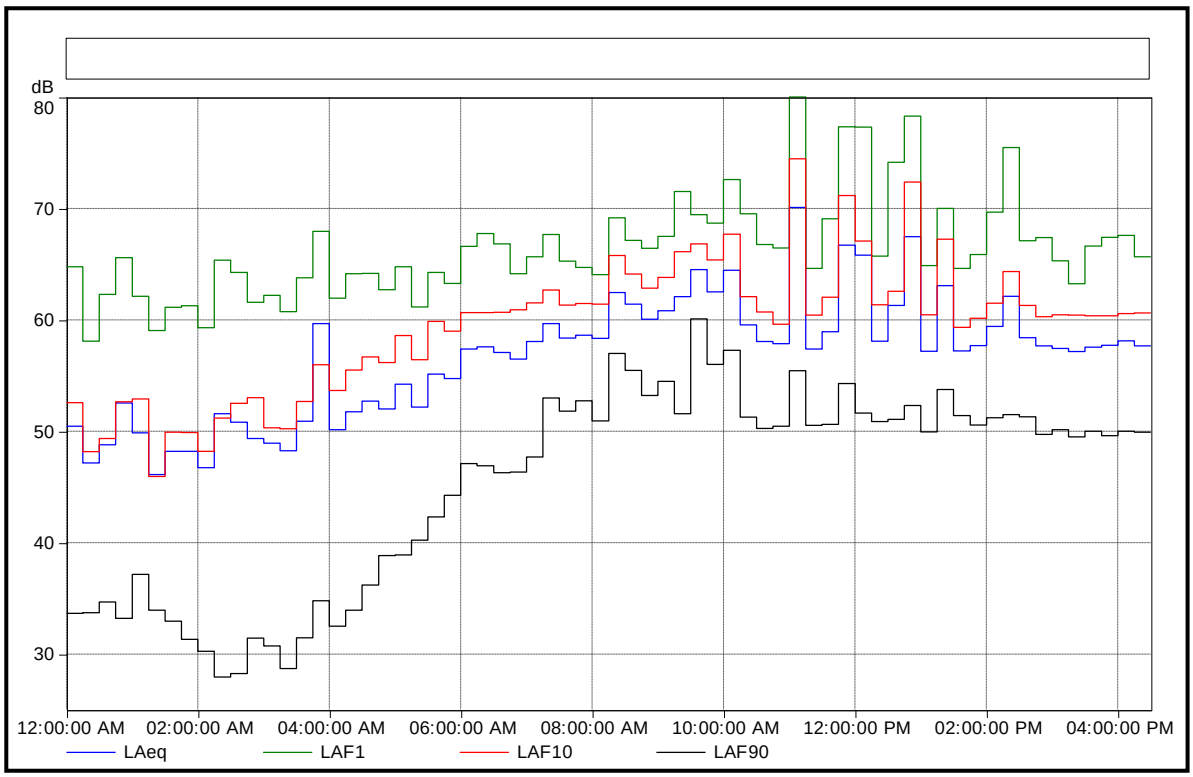
Day 5, Monday 8 April 2019



Day 6, Tuesday 9 April 2019



Day 7, Wednesday 10 April 2019



Day 8, Thursday 11 April 2019 until 1630 hours

NORMAN GARDENS - FOOD PAD

LANDSCAPE CONCEPT DESIGN REPORT

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

These plans are approved subject to the current conditions of approval associated with

Development Permit No.: D/106-2020

Dated: 7 April 2021

Client
Brownfield

Project Address
452-488 Yaamba Road
Norman Gardens, QLD 4701

Contact
02 Landscape Architecture
(07) 3831 0681

Document Number
425 SD_LR001_A
Date: 02/09/2020

Contents

Introduction

Design Intent

The character of the proposed vegetation on this site will be reflective of the existing amenity plantings in the area. Species chosen for this site will include local native species (with a minimum of 50%) and will be designed to incorporate a 3 tiered landscape treatment including trees, shrubs and groundcovers.

Three Tier Landscape Treatment

We proposed a 'Three Tier' landscape treatment as part of the general planting scheme. It will consist of:
- Trees at five (5) meter intervals
- Shrubs at two (2m) meter intervals; and
- Groundcovers at 0.5m to one (1) metre intervals.

Entrance to Estate (see Figure 1, across)

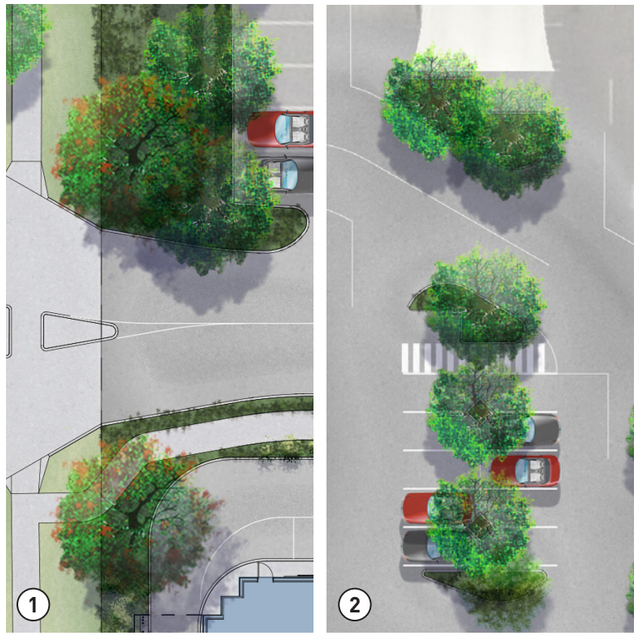
- The entrance to the existing estate is to be upgraded and enhanced. Existing shrubs are to remain with additional Feature Tree plantings to both entry corners (outside of required sitelines).
- Shrubs and groundcovers will placed to ensure sightlines are maintained for both pedestrians and vehicles.

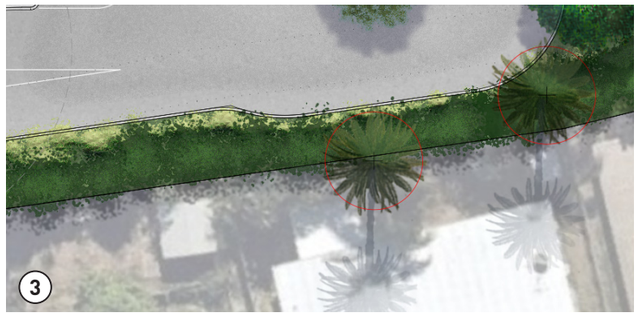
Shade Trees (see Figure 2, across)

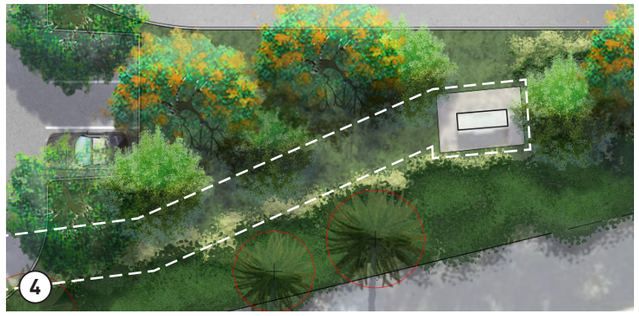
- Shade trees within the carpark will be a minimum height of two (2) metres and are provided at a rate of 1 x tree per six (6) car parks (double sided). Each tree will have a minimum clean trunk of 2m and ground covers less than 1m high in accordance with Rockhampton Regional Council's Landscape Code 9.3.4.3.1.
- Shade trees will also be provided around the perifery of the buffer planting zones to ensure that shade is cast across as much of the hardstand zones as possible.

Southern Boundary Buffer and Electricity Transmission Corridor (see Figure 3 & 4, across)

- Deep buffer planting is proposed for the entirety of the southern boundary. It has a minimum width of 3 metres and a maximum width of 17.6m.
- The buffer in general will consist of a combination of trees, shrubs and groundcovers that include locally native species and that suit the climatic conditions in a 3 tiered landscape treatment.
- There is a 3m wide electricity transmission corridor passing through a section of the buffer and an existing pad mounted transformer.
- The buffer will include trees and shrubs growing to a maximum height of 10m located adjacent to the electricity transmission corridor is located. The mature foliage of trees and shrubs will not be located within three (3) metres of an electrial substation boundary.
- The southrn boundary is currently fully vegetated. The intention is to keep the existing shrubs and trees with supplementary planting where necessary. These supplementary plans would include a low row of groundcovers to the back of the new kerb and screening shrubs up to 5m high and at 2m centres This will ensure that privacy for the adjoining residential neighbours is achieved.







Plans

Site Plan

LEGEND

1. Existing P.M.T.
2. Electrical Transmission Easement
3. Proposed Building

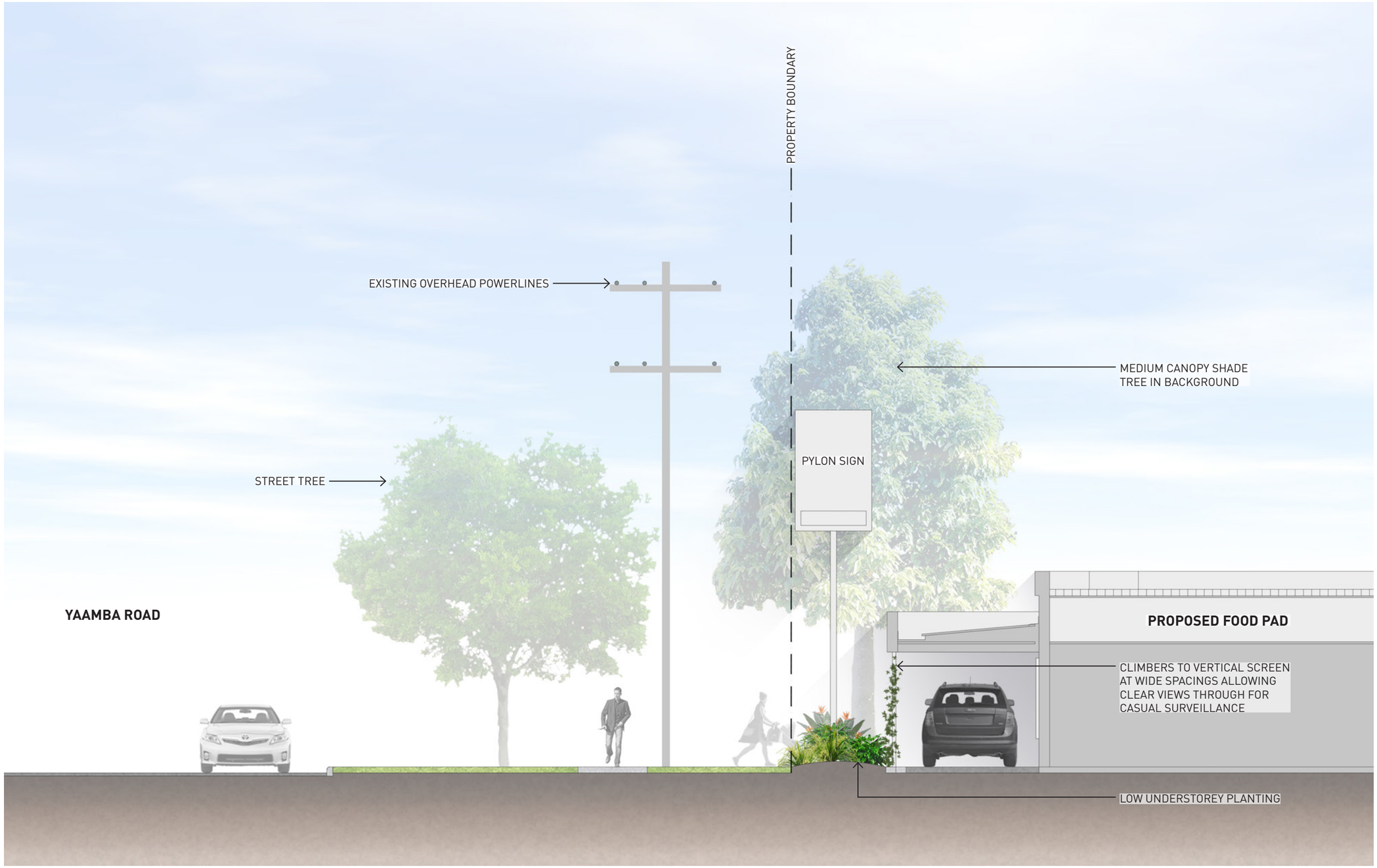
KEY

- Existing Vegetation Buffer
- Existing Tree
- Existing Street Tree
- Medium Canopy Shade Tree
- Medium Columnar Canopy Screening Tree
- Small / Medium Canopy Carpark Shade Tree
- Small Columnar Tree
- Screening Shrubs
- Understorey Planting

1:500 - A3 0 2 5 10 20 35m

Sections

Section A-A: Yaamba Rd Boundary Interface

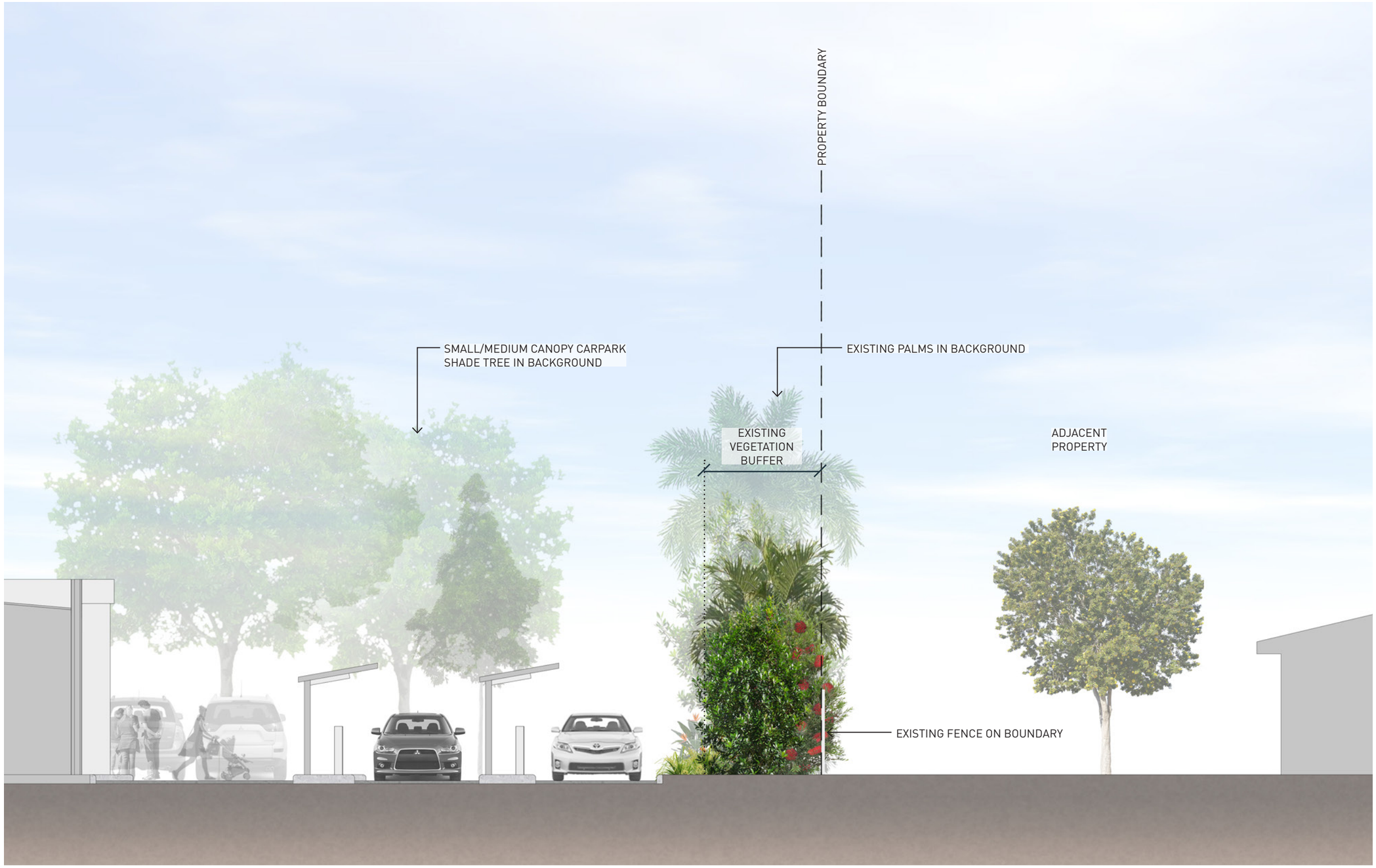


1:100 - A3

0 0.5 1 2 5 7.5m

Sections

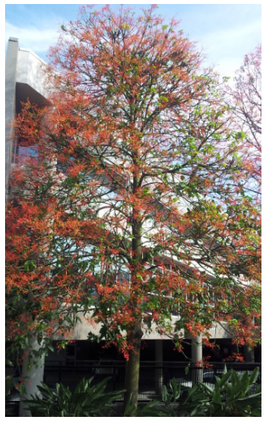
Section B-B: Southern Residential Interface



Character

Tree Species Palette

ARCHONTOPHOENIX cunninghamiana
H: 10-12m | W: 4-6m



BRACHYCHITON acerifolius
H: 8-15m | W: 5-8m

CUPANIOPSIS anacardioides
H: 8-12m | W: 4-8m

ELAEOCARPUS eumundii
H: 8-10m | W: 3-5m

FLINDERSIA australis
H: 8-10m | W: 6-8m

JAGERA pseudorhus
H: 5-8m | W: 5m

MELALEUCA bracteata
H: 3-10m | W: 3-6m

MELALEUCA viridiflora
H: 8-10m | W: 4-6m

Character

Understorey Species Palette

ACACIA species

BAECKEA virgata ‘Miniature’

BANKSIA ‘Coastal Cushion’

BANKSIA robur

CALLISTEMON ‘Little John’

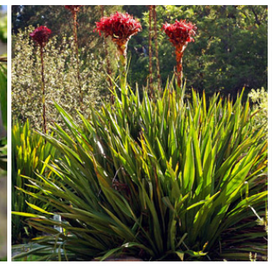
CALLISTEMON ‘Little John’

CALLISTEMON pachyphyllus

CARPOBROTUS glaucesens

CHRYSOCEPHALUM apiculatum

DODONAEA species



DORYANTHES excelsa

EUPHORBIA Galaxy Glow

PANDOREA pandorana

SYZYGIUM ‘Cascade’

SYZYGIUM ‘Tiny Trev’

TRACHELOSPERMUM jasminoides

LEPTOSPERMUM flavescens ‘Cardwell’

LEPTOSPERMUM ‘Pink Cascade’

LIRIOPE ‘Evergreen Giant’

LOMANDRA longifolia

METROSIDEROS ‘Fiji Fire’

METROSIDEROS ‘Lemon Twist’

METROSIDEROS ‘Little Dugald’

MELALEUCA ‘Little Beauty’