SITE ADDRESS
353 YAAMBA ROAD, PARK AVENUE,
ROCKHAMPTON 4701

RPD
LOT 1 ON RP 605623
LOT 1 ON LIV 401228

SITE AREA
4375 SQM

LOCAL COUNCIL:
ROCKHAMPTON REGIONAL COUNCIL

DEVELOPMENT DATA

GFA AREA
TOTAL 2,130 SQM

SITE COVER
TOTAL 48%

IMPERVIOUS AREA
TOTAL 93%

CARPARKING

PROVIDED 50 CARPARKS
INCLUDING 2 ACCESSIBLE

LANDSCAPING
PROVIDED 262 SQM

LEGEND

CONC	PAINTED CONCRETE TILT PANEL
DP	DOWNPIPE
EG	EAVES GUTTER
-E	EXISTING (SUFFIX)
FL	FLASHING
HOA	HEADS OF AGREEMENT
LP	LIGHTPOLE
MRS	METAL ROOF SHEETING
PP	POWERPOLE
SCR	SCREEN

DRAWING SCHEDULE

DA-00	COVERSHEET
DA-01	LOCATION PLAN AND NOTES
DA-02	GROUND FLOOR PLAN
DA-03	ROOF PLAN
DA-04	ELEVATIONS & SECTION

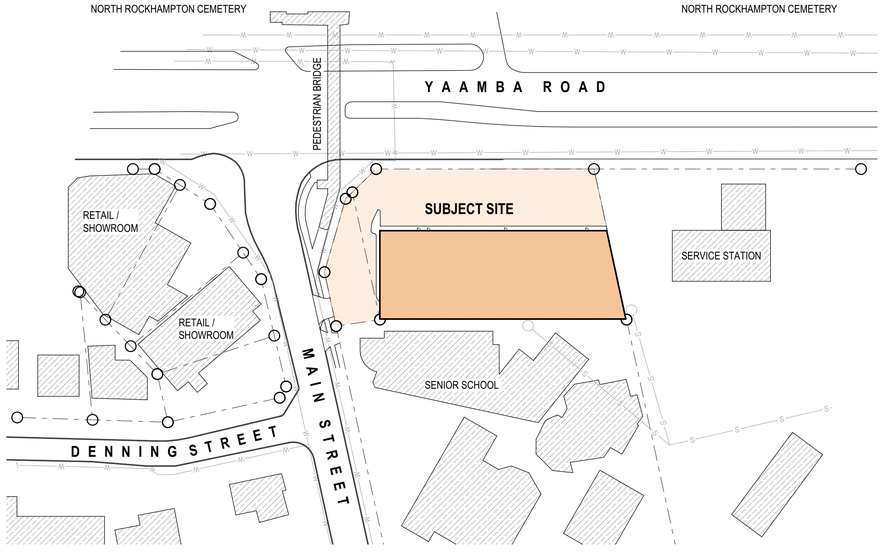
ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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

Development Permit No.: D/169-2022

Dated: 21 February 2025



LOCATION PLAN
SCALE 1:1000

Reddog
reddogarchitects.com
P 07 3252 8912 **F** 07 3252 8914
email@reddogarchitects.com

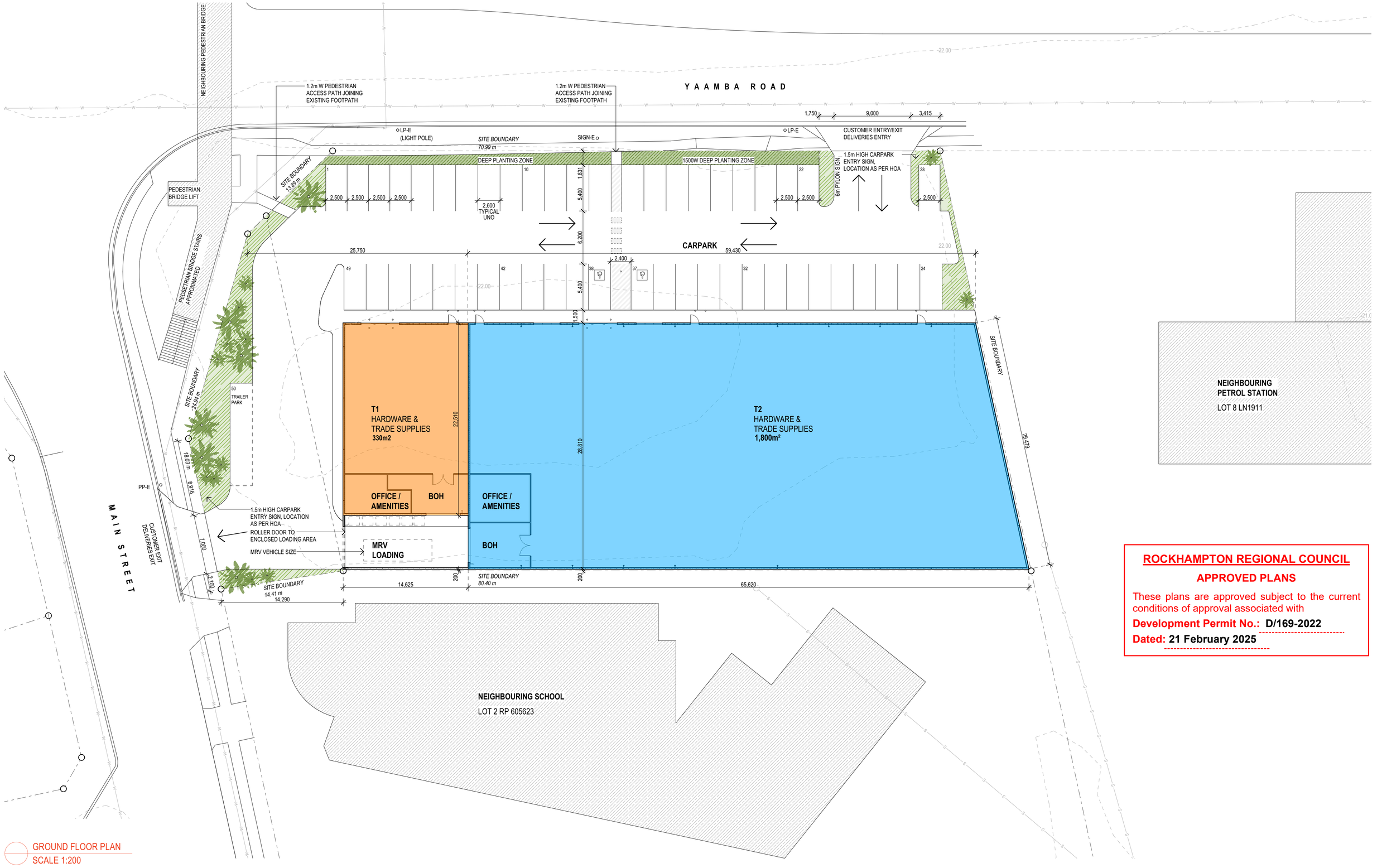
0 10 20 50m
SCALE 1:1000@A1

ISSUE	DATE	BY	DESCRIPTION	CHKD
A	26.04.2024	CJ	DA ISSUE	GT
B	03.07.2024	EK	DA IR ISSUE	JB

YAAMBA ROAD RETAIL

DRAWING
LOCATION PLAN AND NOTES

PROJECT NO.	DRAWING NO.	ISSUE
2862-459	DA-01	B



GROUND FLOOR PLAN
SCALE 1:200

ROCKHAMPTON REGIONAL COUNCIL

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Dated: 21 February 2025

Reddog
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P 07 3252 8912 F 07 3252 8914
email@reddogarchitects.com

0 4 8 20m
SCALE 1:200@A1

ISSUE	DATE	BY	DESCRIPTION	CHKD
A	26.04.2024	CJ	DA ISSUE	GT
B	03.07.2024	EK	DA IR ISSUE	JB

YAAMBA ROAD RETAIL

DRAWING
GROUND FLOOR PLAN

PROJECT NO.	DRAWING NO.	ISSUE
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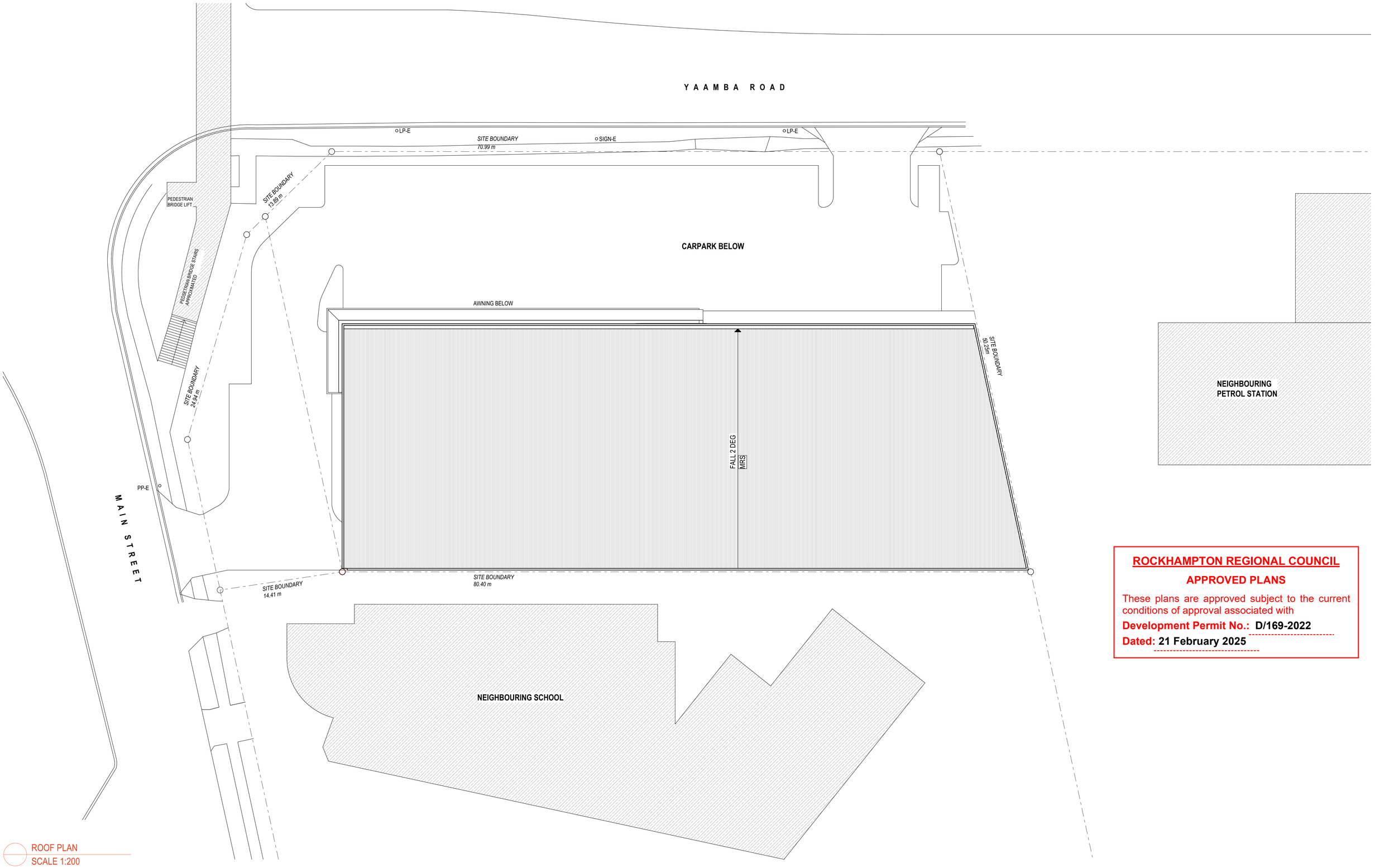

ROOF PLAN
SCALE 1:200

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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Dated: 21 February 2025

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email@reddogarchitects.com

0 4 8 20m

SCALE 1:200@A1

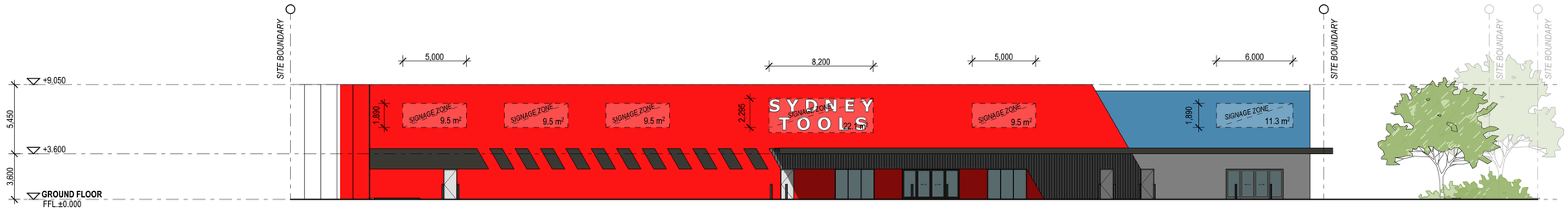
ISSUE	DATE	BY	DESCRIPTION	CHKD
A	26.04.2024	CJ	DA ISSUE	GT
B	03.07.2024	EK	DA IR ISSUE	JB

YAAMBA ROAD RETAIL

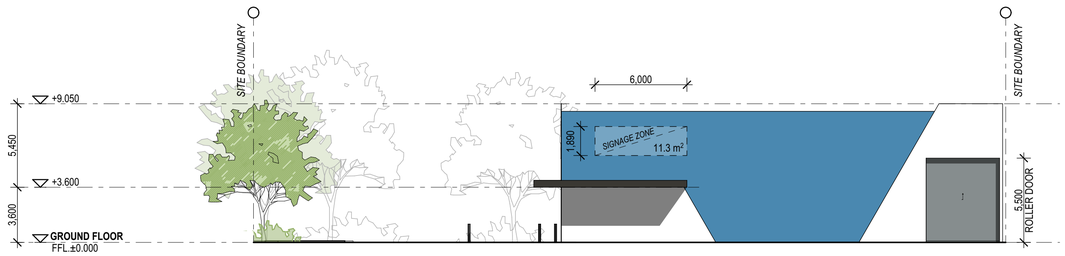
DRAWING

ROOF PLAN

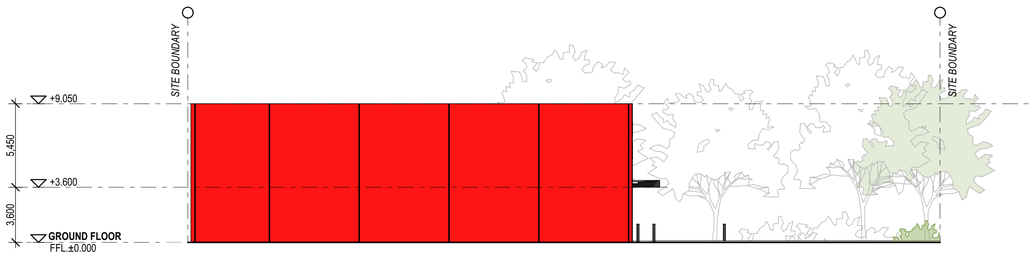
PROJECT NO.	DRAWING NO.	ISSUE
2862-459	DA-03	B



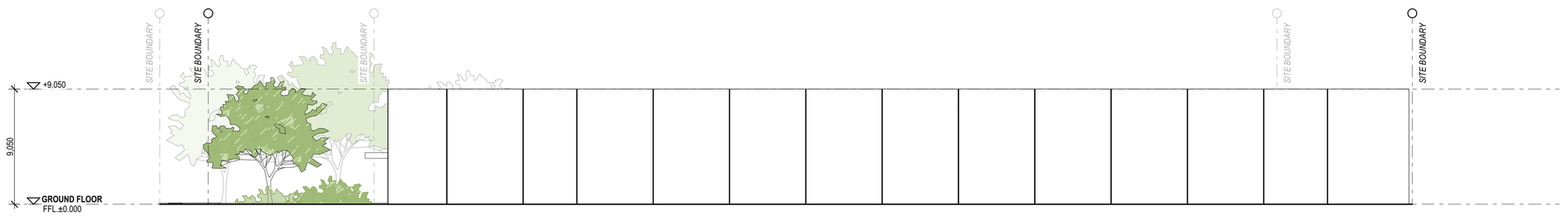
EAST ELEVATION
SCALE 1:200



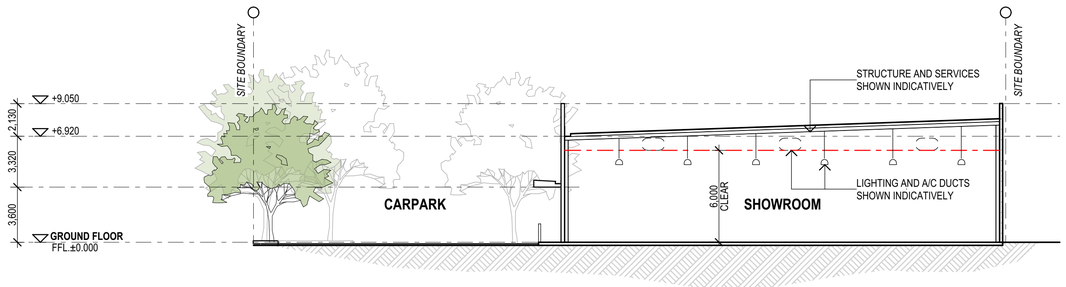
NORTH ELEVATION
SCALE 1:200



SOUTH ELEVATION
SCALE 1:200



WEST ELEVATION
SCALE 1:200



A
SECTION
SCALE 1:200

ROCKHAMPTON REGIONAL COUNCIL

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Dated: 21 February 2025

Reddog
reddogarchitects.com
P 07 3252 8912 **F** 07 3252 8914
email@reddogarchitects.com

0 4 8 20m
SCALE 1:200@A1

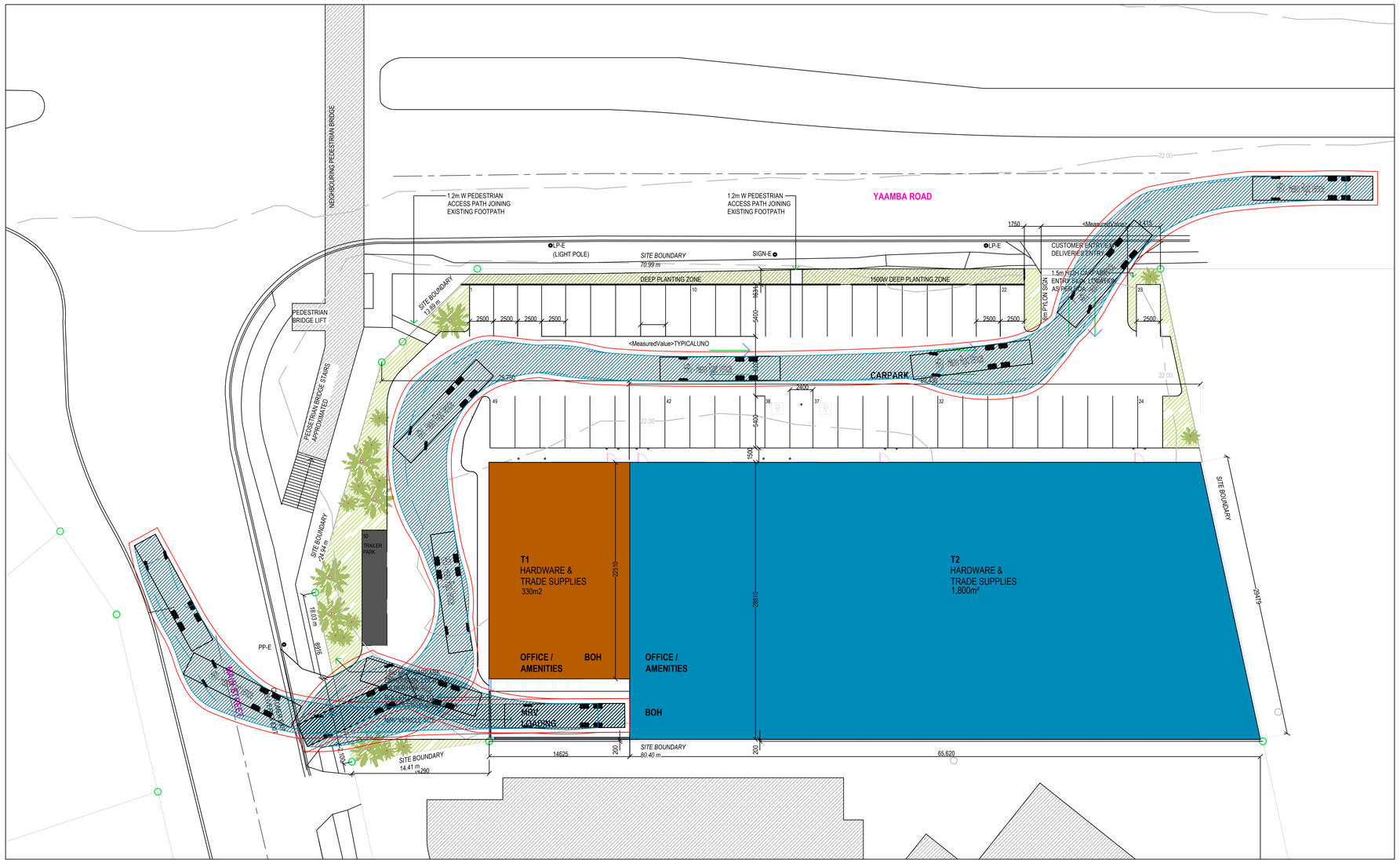
ISSUE	DATE	BY	DESCRIPTION	CHKD
A	26.04.2024	CJ	DA ISSUE	GT
B	03.07.2024	EK	DA IR ISSUE	JB

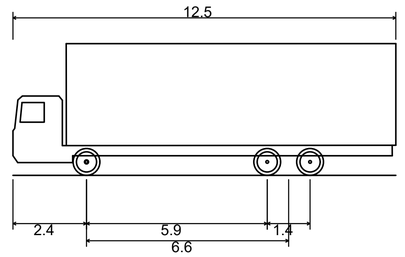
YAAMBA ROAD RETAIL

DRAWING
ELEVATIONS & SECTION

PROJECT NO.	DRAWING NO.	ISSUE
2862-459	DA-04	B

Engineering Reimagined.





HRV - Heavy Rigid Vehicle	
Overall Length	12.500m
Overall Width	2.500m
Overall Body Height	4.300m
Min Body Ground Clearance	0.417m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12.500m

HEAVY RIGID VEHICLE PATHWAY

SCALE 1:250

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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Development Permit No.: D/169-2022

Dated: 21 February 2025

PROJECT STAMP

FOR INFORMATION

DRAWING SCALE

0 5 10 15 20m

SCALE 1:250 @ A1 1:500 @ A3

ISSUE.REVISION

ISSUE	REV	DATE	DES	DESCRIPTION
INFO	A	23/10/24	N.H.	ISSUE FOR INFORMATION

PROJECT MANAGEMENT

THIS DOCUMENT IS UNCONTROLLED AND IS NOT TO BE USED

RPEQ CERTIFICATION		
N.H.	C.H.	
DESIGNER	CHECKED	APPROVED
INTERNAL PROJECT NO.	R0242223	
DATUM	SURVEY	

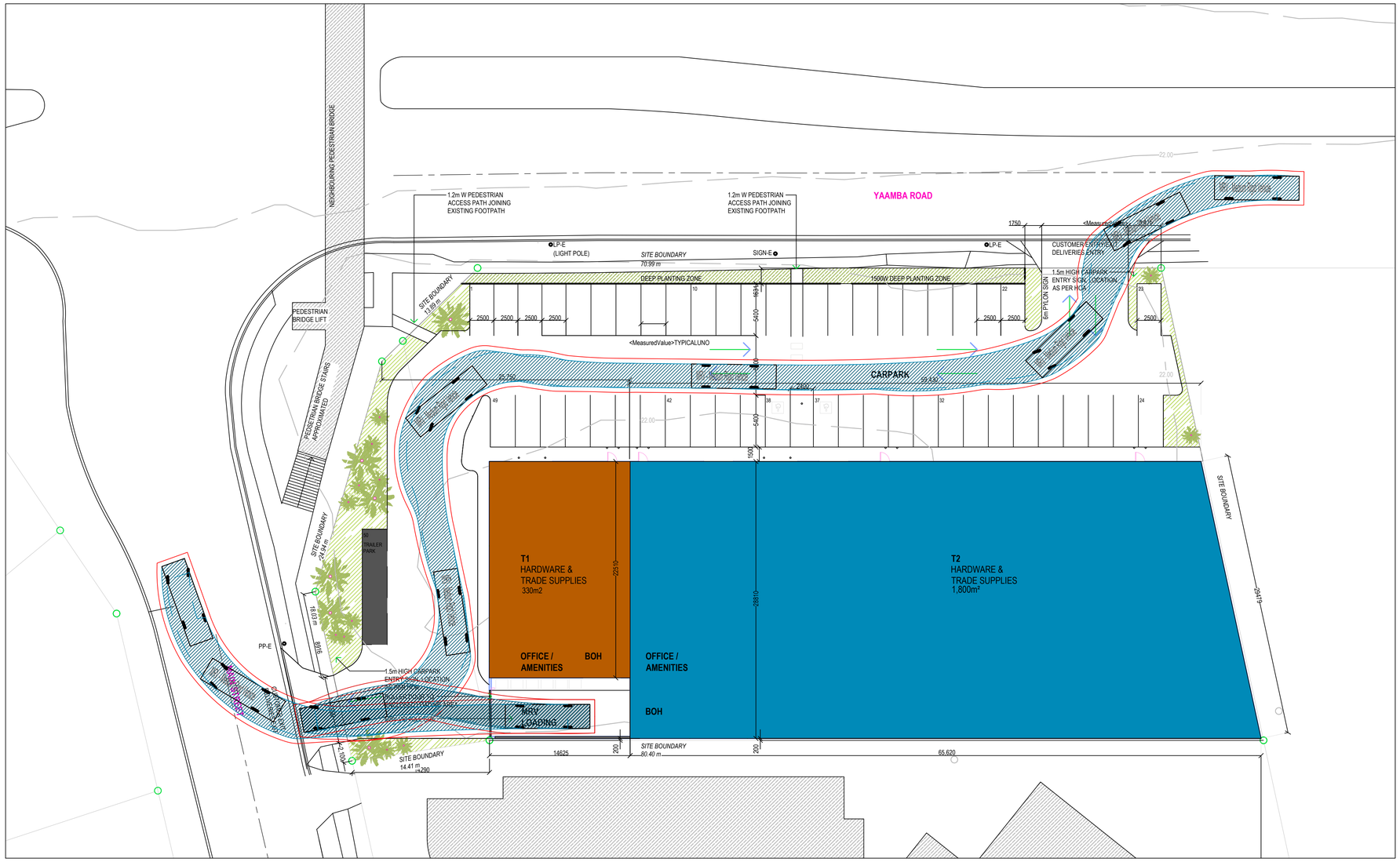
McMurtrie Consulting Engineers
ROCKHAMPTON | BUNDABERG
PH (07) 4921 1780 | mail@mcmengineers.com | MCMENGINEERS.COM

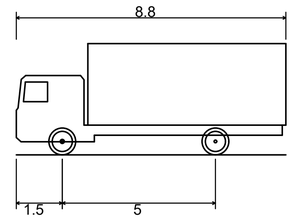
PROJECT IDENTIFIER

CLIENT REDDOG ARCHITECTS
PROJECT 353 YAAMBA ROAD - CURRENT AMBASSADOR HOTEL
TITLE
HEAVY RIGID VEHICLE

DRAWING NUMBER R0242223 - SK01

REVISION A





MRV - Medium Rigid Vehicle	
Overall Length	8.800m
Overall Width	2.500m
Overall Body Height	3.633m
Min Body Ground Clearance	0.428m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10.000m

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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Development Permit No.: D/169-2022

Dated: 21 February 2025

MEDIUM RIGID VEHICLE PATHWAY

SCALE 1:250

PROJECT STAMP

FOR INFORMATION

DRAWING SCALE

0 5 10 15 20m

SCALE 1:250 @ A1 1:500 @ A3

ISSUE.REVISION

ISSUE	REV	DATE	DES	DESCRIPTION
INFO	A	23/10/24	N.H.	ISSUE FOR INFORMATION

PROJECT MANAGEMENT

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RPEQ CERTIFICATION		
N.H.	C.H.	
DESIGNER	CHECKED	APPROVED
INTERNAL PROJECT NO.	R0242223	
DATUM	SURVEY	

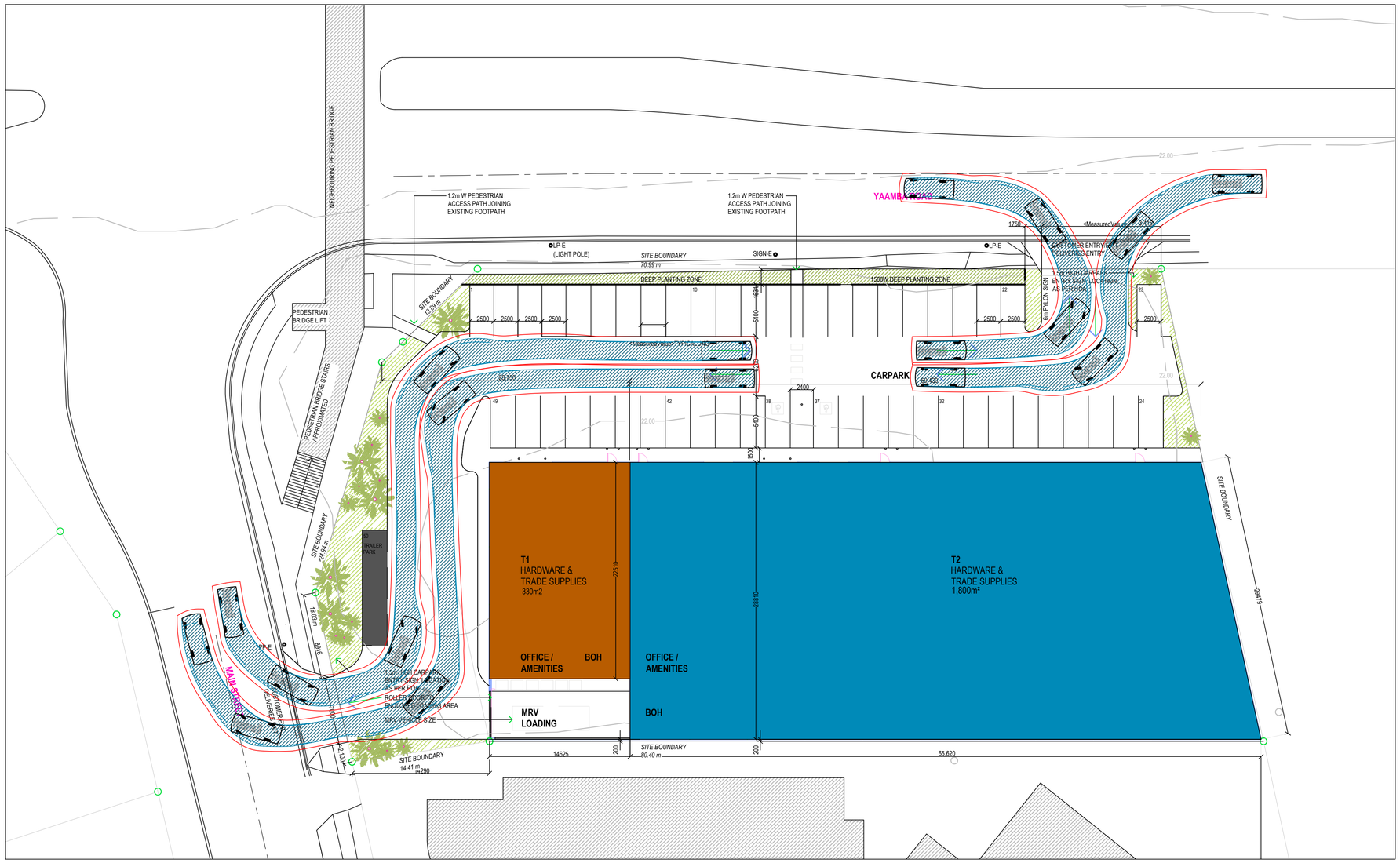
McMurtrie Consulting Engineers
ROCKHAMPTON | BUNDABERG
PH (07) 4921 1780 | mail@mcmengineers.com | MCMENGINEERS.COM

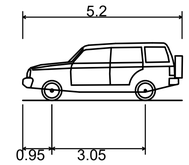
PROJECT IDENTIFIER

CLIENT REDDOG ARCHITECTS
PROJECT 353 YAAMBA ROAD - CURRENT AMBASSADOR HOTEL
TITLE
MEDIUM RIGID VEHICLE

DRAWING NUMBER R0242223 - SK02

REVISION A





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

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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Development Permit No.: D/169-2022

Dated: 21 February 2025

B99 VEHICLE PATHWAYS

SCALE 1:250

PROJECT STAMP

FOR INFORMATION

DRAWING SCALE

0 5 10 15 20m

SCALE 1:250 @ A1 1:500 @ A3

ISSUE.REVISION

ISSUE	REV	DATE	DES	DESCRIPTION
INFO	A	23/10/24	N.H.	ISSUE FOR INFORMATION

PROJECT MANAGEMENT

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RPEQ CERTIFICATION		
N.H.	C.H.	
DESIGNER	CHECKED	APPROVED
INTERNAL PROJECT NO.	R0242223	
DATUM	SURVEY	

McMurtrie Consulting Engineers
ROCKHAMPTON | BUNDABERG
PH (07) 4921 1780 | mail@mcmengineers.com | MCMENGINEERS.COM

PROJECT IDENTIFIER

CLIENT REDDOG ARCHITECTS
PROJECT 353 YAAMBA ROAD - CURRENT AMBASSADOR HOTEL
TITLE
B99 VEHICLE

DRAWING NUMBER R0242223 - SK03

REVISION A

MCE
McMurtrie Consulting Engineers

20 years of reimagining engineering
2002–2022

Engineering reimagined.

ROCKHAMPTON TKD
353 YAAMBA ROAD

Traffic Impact Assessment

ROCKHAMPTON REGIONAL COUNCIL
APPROVED PLANS
These plans are approved subject to the current conditions of approval associated with
Development Permit No.: D/169-2022
Dated: 21 February 2025

DATE
7 February 2023

REF
RA221123

CLIENT
Spinks Co Commercial

COMMERCIAL IN CONFIDENCE

Engineering reimagined.

Contact Information

McMurtrie Consulting Engineers Pty Ltd
ABN 25 634 181 294

North Rockhampton

www.mcmengineers.com
(07) 4921 1780
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Document Information

Prepared for	Spinks Co Commercial
Document Name	Traffic Impact Assessment
Job Reference	RA221123
Revision	2

Document History

Revision	Date	Description of Revision	Prepared by	Approved by		
				Name	Signature	RPEQ No
1	7/12/2022	DRAFT	Chris Hewitt	Chris Hewitt	-	-
2	7/02/2023	FINAL	Chris Hewitt	Chris Hewitt		5141

NOTE - It is acknowledged that there may be some minor discrepancies between the architectural layouts provided in this report and the associated architectural documentation. Whilst not ideal, the minor layout discrepancies should form no material impact to the proposed development from an engineering assessment perspective. Conservative engineering principals have been applied to the afforded earthworks areas, stormwater intent and servicing. As such, any concern should be suitable for conditioning as part of the detailed design process (i.e. finalised in Operational Works stage).

Contents

1 Introduction

1.1 Background

McMurtrie Consulting Engineers (MCE) have been engaged by Spinks Co Commercial to prepare a Traffic Impact Assessment for its proposed showroom located in Park Avenue.

This report forms part of a Development Application to be lodged with the Rockhampton Regional Council (RRC).

The following issues have been addressed as part of the study:

- Adequacy of the proposed car parking supply;
- The proposed car parking layout and design;
- Site access arrangements;
- Provision for service vehicle access;
- Provision for safe access by cyclists and pedestrians;
- Potential impact upon the local road network.

The subject site is adjacent to the State transport corridor, therefore the Department of Transport and Main Roads (DTMR) will act as a referral agency for the application. Responses to State Codes 1and 6 are provided in the appendixes.

1.2 References

In preparing this report, reference has been made to the following:

- Rockhampton Region Planning Scheme;
- Queensland Globe Database (Online);
- Australian / New Zealand Standard, Parking Facilities, Part 1: Off-Street Car parking AS/ NZS 2890.1:2004;
- Australian / New Zealand Standard, Parking Facilities, Part 2: Off-Street Commercial Vehicle Facilities AS/ NZS 2890.2:2018;
- Australian / New Zealand Standard, Parking Facilities, Part 6: Off-Street Parking for People with a Disability AS/ NZS 2890.6:2009;
- Austroads Guide to Road Design;
- Austroads Guide to Road Safety;
- Nearmap;
- Other documents and data as referenced in the report.

2 Site Environs

2.1 Subject Site

As shown in Figure 2.1, the subject site is located at the southern corner of the Yaamba Road / Main Street intersection, and is also adjacent to a pedestrian overpass facilitating east west movement over Yaamba Road. The site gains access from both frontages, with the Yaamba Road access restricted to left in / left out movement and unrestricted movement from Main Street.

The site is formally identified as Lot 1 on LIV401228 and Lot 1 on RP605623 and has a combined area of approximately 4,375 m^2. As shown in Figure 2.2, the site is located within the Industry Zone and abuts State transport route (Yaamba Road) along the eastern boundary.

The site is currently occupied by a motel which provides 32 units and ancillary facilities.

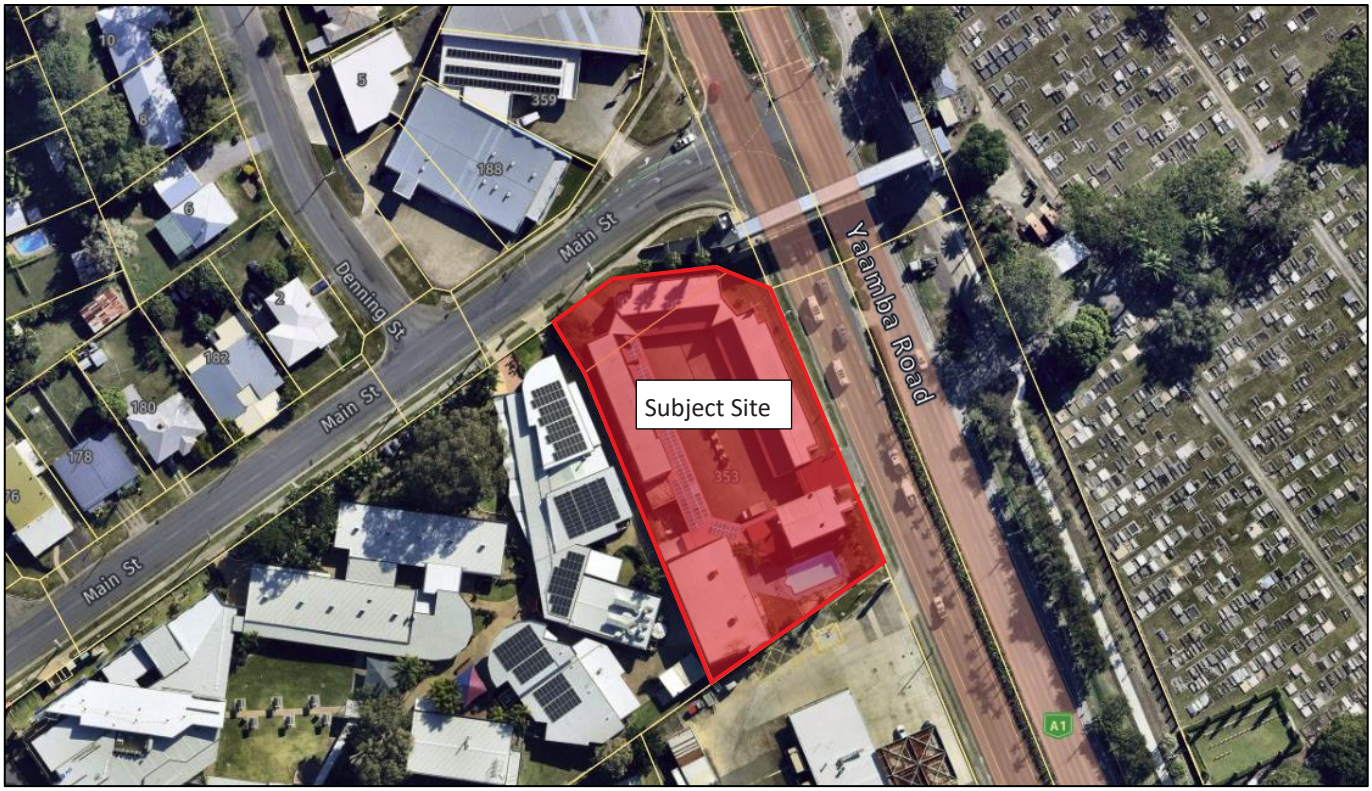
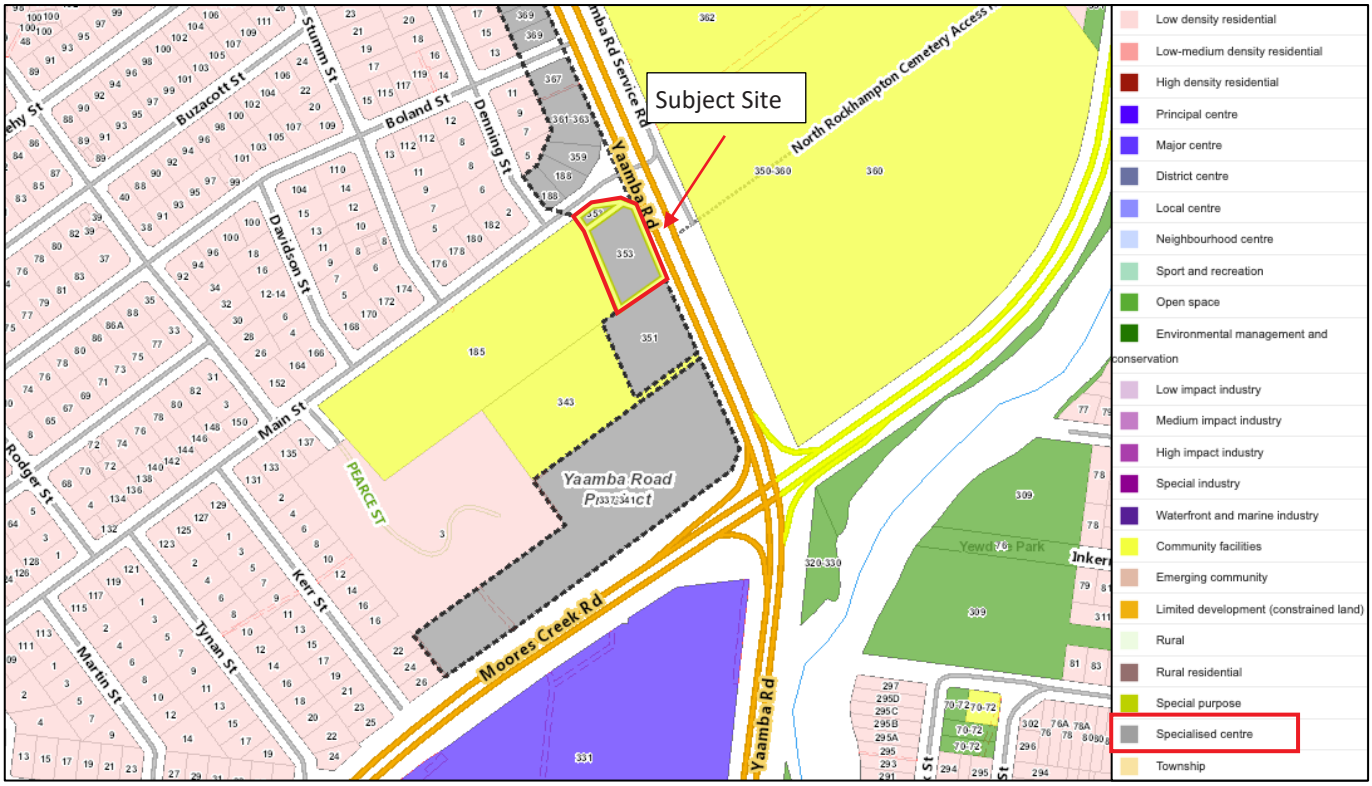


Figure 2.1: Location of subject site [Source: Nearmap]



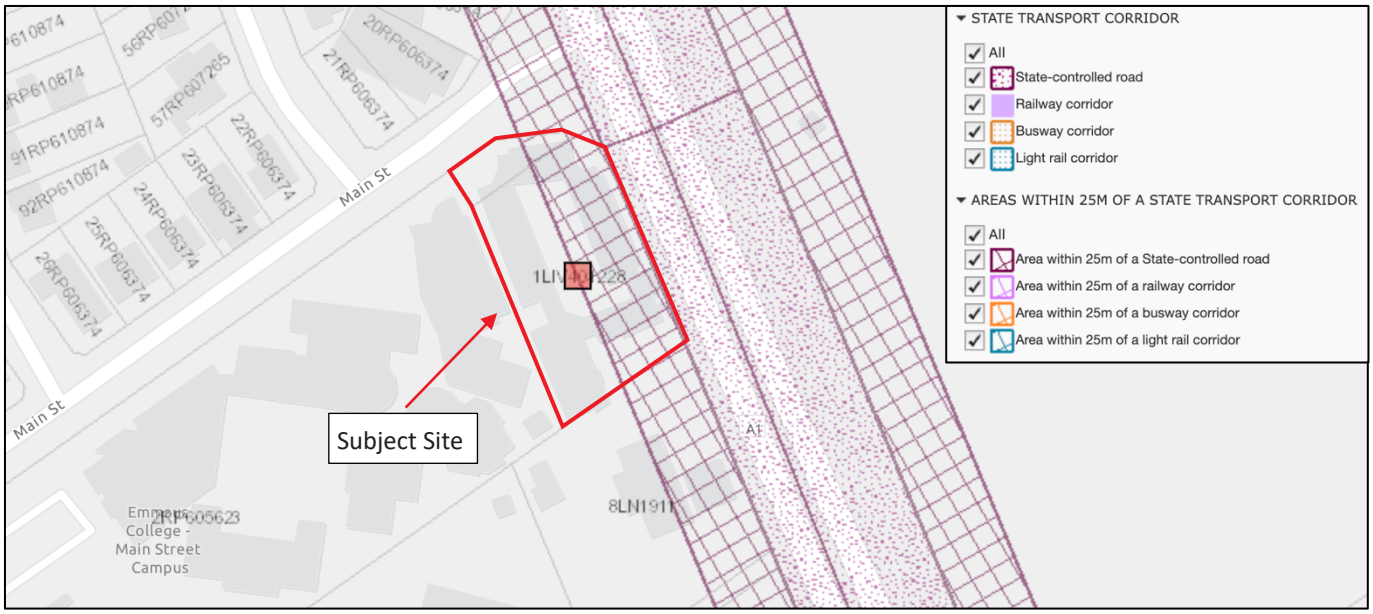


Figure 2.2: Development planning overlays [Source: Rockhampton Planning Scheme & DAMS Mapping]

2.2 Road Network

As shown in Figure 2.3, the site is bound by Yaamba Road along the eastern frontage, which forms part of the State controlled network. Main Street is in the jurisdiction of the local Council and has an urban access street function along the frontage of the site.

As mentioned above, Yaamba Road is a State-controlled road and has an arterial function adjacent to the site. Yaamba Road is a section of the Bruce Highway; between Yaamba to the north and Rockhampton to the south. Yaamba Road comprises of a divided carriageway with two lanes in each direction of travel, with turning lanes generally provided at the approach to intersections. Along the frontage of the site Yaamba Road has a posted speed limit of 70 km/h. Street view images along the frontage of the site are shown in Figure 2.4.

Main Street is a two-lane undivided access street within the local road network and provides northeast southwest connection in Park Avenue. Main Street generally allows kerbside parking along both sides and is subject to a posted speed limit of 60 km/h. Street view images along the frontage of the site are shown in Figure 2.5.

Yaamba Road Service Road is aligned along the eastern side of Yaamba Road and forms the eastern leg of the Yaamba Road / Main Street intersection. Yaamba Road Service Road is a one-way road (southbound) facilitating access to the adjacent uses, including a cemetery and a school. Given the uses adjacent to the road, Yaamba Service Road is generally a shared road and is subject to low traffic speeds (20km/hr).

Yaamba Road / Main Street intersection is a four-way signal-controlled intersection. Yaamba Road functions as the primary approach of the intersection and provides two through lanes in each direction with dedicated turning lanes on both approaches. U turn movements are permitted on both Yaamba Road approaches, with the northbound approach providing a dedicated U-turn facility to accommodate for the movement. Both Main Street and Yaamba Road Service Road provide separate turning lanes onto Yaamba Road. Bicycle lanes are provided on both Yaamba Road and Main Street approaches. Aerial image of the intersection is shown in Figure 2.6.

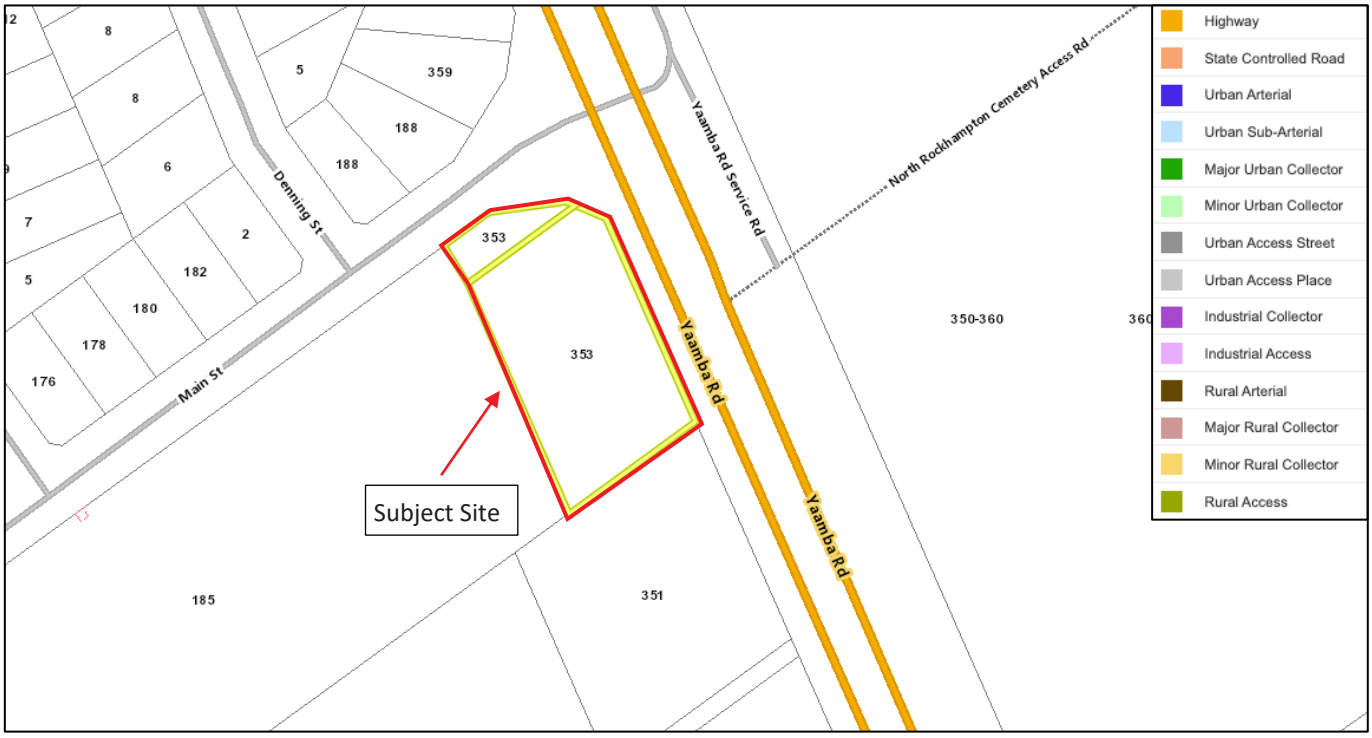


Figure 2.3: Local road network [Source: Rockhampton Planning Scheme]

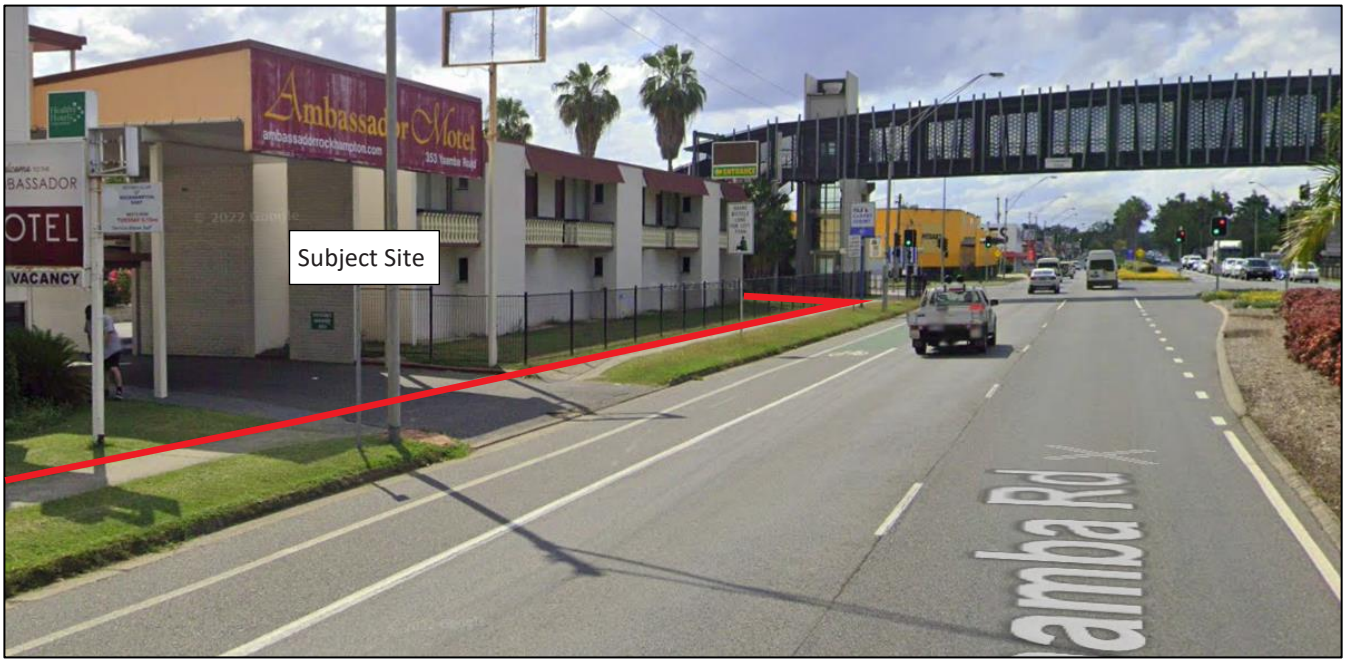


Figure 2.4: Yaamba Road along the frontage of the site [Source: Google Street View]

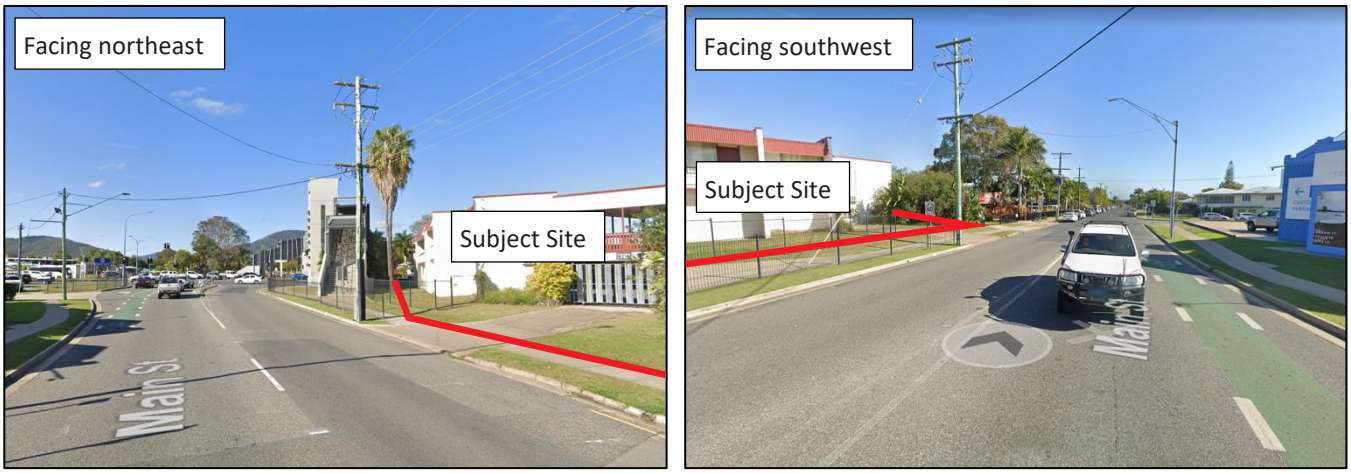


Figure 2.5: Main Street along the frontage of the site [Source: Google Street View]

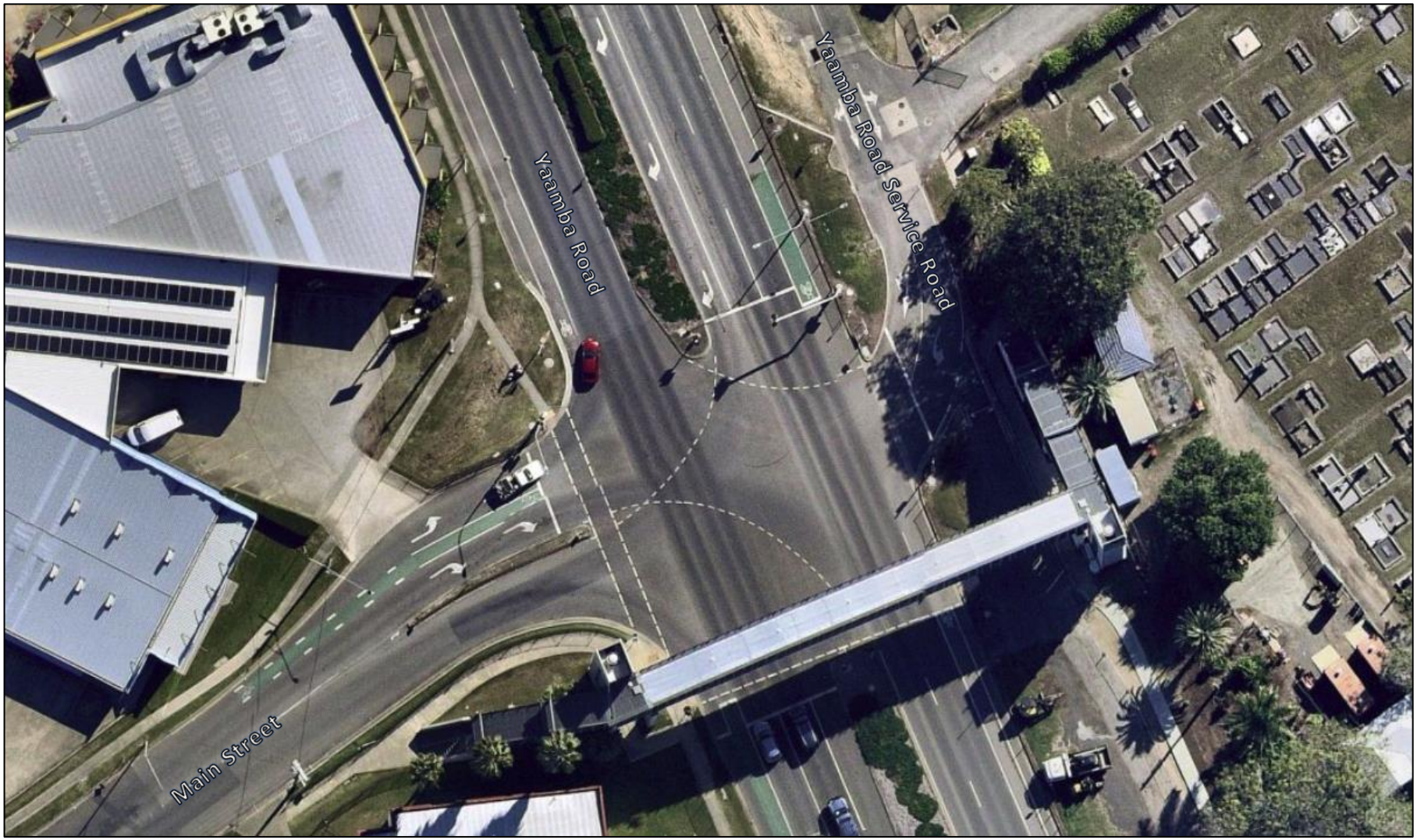


Figure 2.6: Areal image of the Yaamba Road / Main Street intersection [Source: Nearmap]

2.3 Integrated Transport Infrastructure

2.3.1 Public Transport

As shown in Figure 2.7, there are five bus stops within 350 metres of the subject site. Three stops are on Yaamba Road and two are on Main Street. The bus stops located in the proximity of the subject site are serviced on a regular basis generally every 30 minutes throughout the day.

Figure 2.7: Bus stops in the vicinity of subject site [Source: Google Maps]

2.3.2 Pedestrian and Cyclist Infrastructure

Pedestrian and cyclist infrastructure is well established in the vicinity of the subject site. As shown in Figure 2.8, there is a pedestrian path provided on both Yaamba Road and Main Street frontages. There is a pedestrian overpass (bridge) on the northeast corner of the site, allowing for safe passage of pedestrians over Yaamba Road.

There are existing bicycle facilities along both frontages of the subject site.

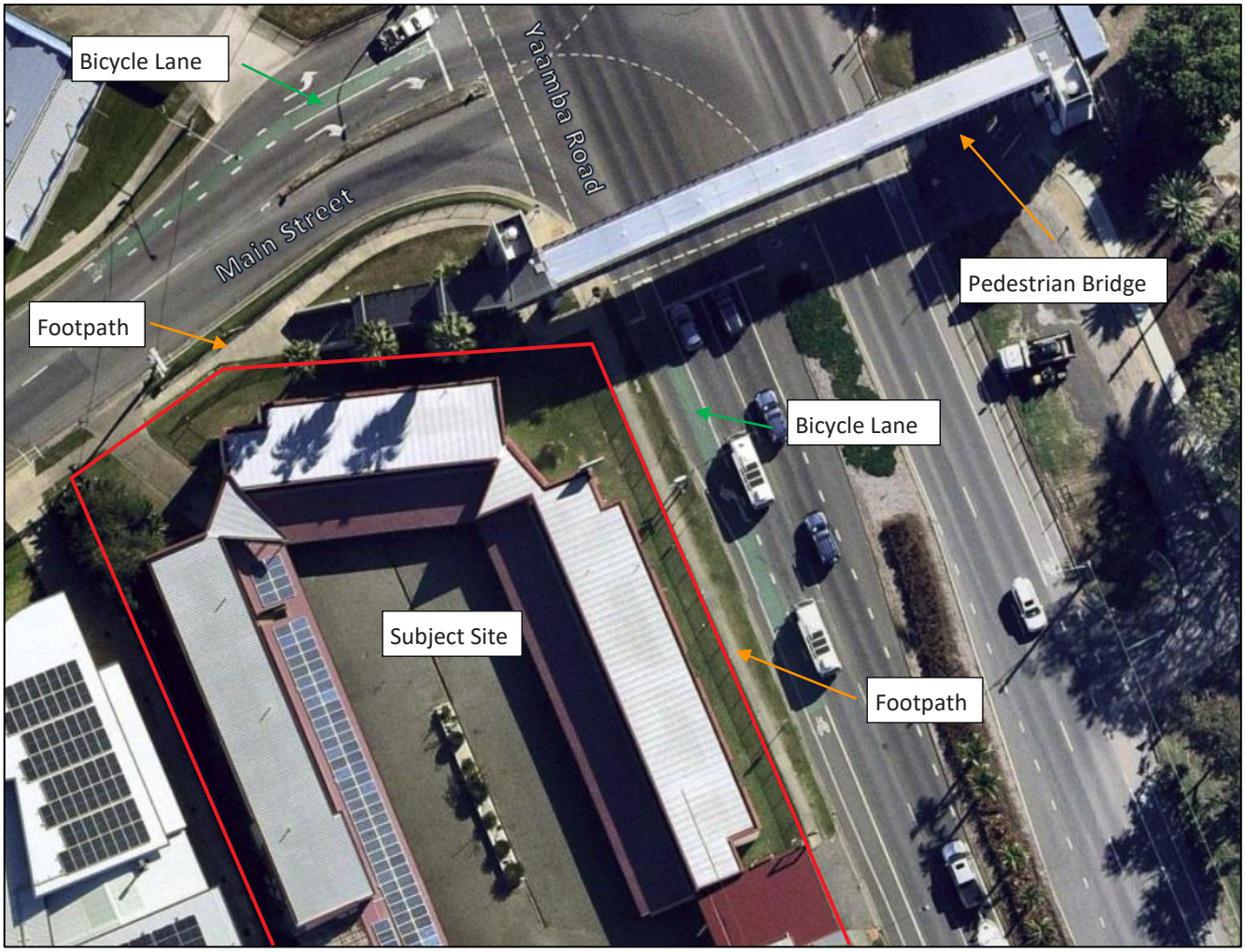


Figure 2.8: Pedestrian and cyclist infrastructure in the vicinity of subject site [Source: Nearmap]

2.4 Background Traffic Volumes

2.4.1 Surveyed Traffic

Traffic survey has been carried out at the Yaamba Road / Main Street intersection in November 2022. A summary of peak hour volumes is provided in Figure 2.9, with detailed survey results shown as Appendix A.

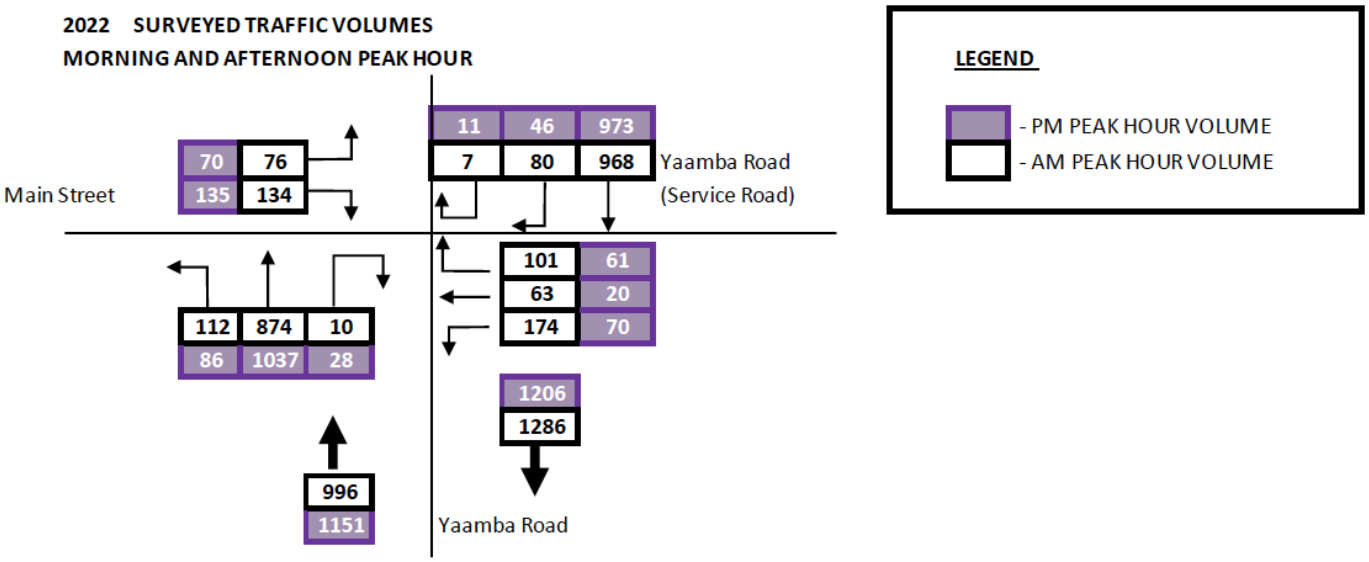
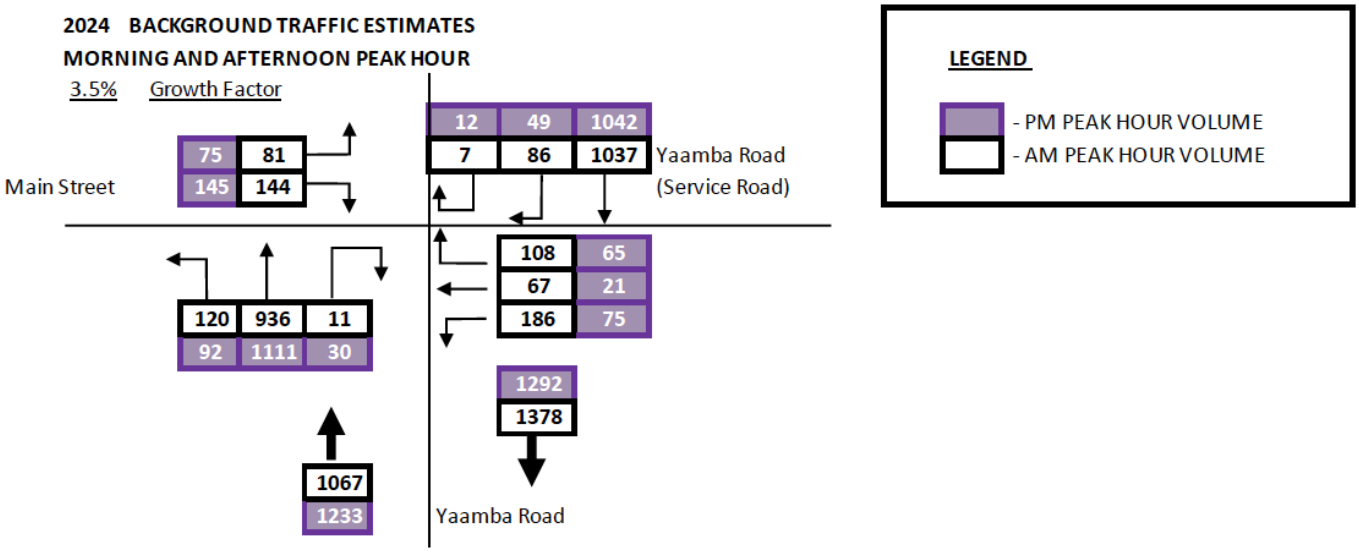


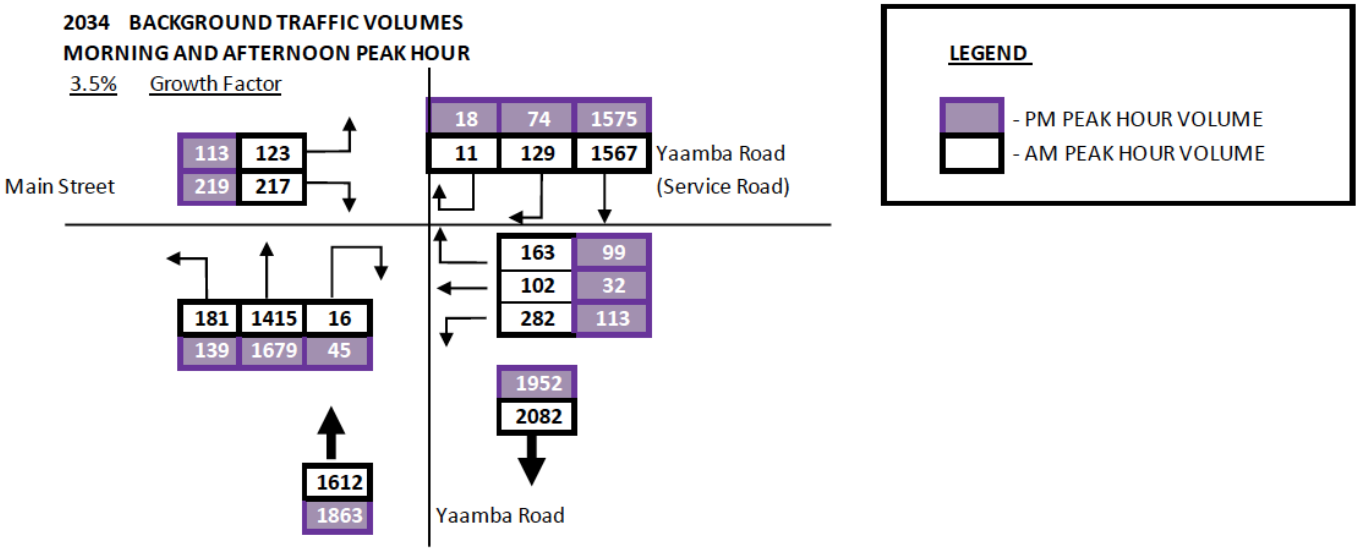
Figure 2.9 - Surveyed morning and afternoon peak hour volumes

2.4.2 Future Background Estimates

Future traffic conditions at the Yaamba Road / Main Street intersection have been estimated with application of a 3.5% compounded growth factor from the survey traffic conditions in year 2022. This has been adopted from the assessment of background traffic growth between the 2020 census data and volumes surveyed in 2022 (above).

The estimated future background traffic volumes at the anticipated completion year (2024) and 10 year horizon (2034) are provided in Figure 2.10.





Background Traffic Growth Calculation

Growth Factor		Census Data	Growth Factor Estimate	Growth Factor Estimate	Survey Data
		2020	2021	2022 (est)	**2022**
3.50%	AM PEAK (YAAMBA RD)	1948	2016	2087	**2113**
3.50%	PM PEAK (YAAMBA RD)	2062	2134	2209	**2211**

Figure 2.10: Future background morning and afternoon peak hour estimates

(year 2024 & year 2034)

3 Development Proposal

3.1 Land Uses

The proposed plan of development is for a showroom with ancillary uses. The proposal comprises of a Gross Floor Area (GFA) of 1,800 m^2, consisting of the following areas:

Showroom:	1,526 m^2
Back of House:	190 m^2
Office:	84 m^2
TOTAL:	**1,800 m2**

A plan of the proposed development is shown in Figure 3.1.

3.2 Vehicle Access

It is proposed that access from both frontages will be retained, with new crossovers provided at the farthest point from the Yaamba Road / Main Street intersection along each frontage. It is proposed that Yaamba Road access will be restricted to left in / left out via the existing median and that all movements will be retained at the Main Street access.

3.3 Car Parking

The proposed development will provide a total of 45 parking spaces, as follows:

General parking:	43 spaces
Trailer bays:	2 spaces
TOTAL:	**45 spaces**

3.4 Pedestrian and Cyclist Facilities

Pedestrian and cyclist facilities on both site frontages will be retained. Access crossovers will be designed with appropriate sight splays to ensure pedestrians are visible to cars entering and exiting the site.

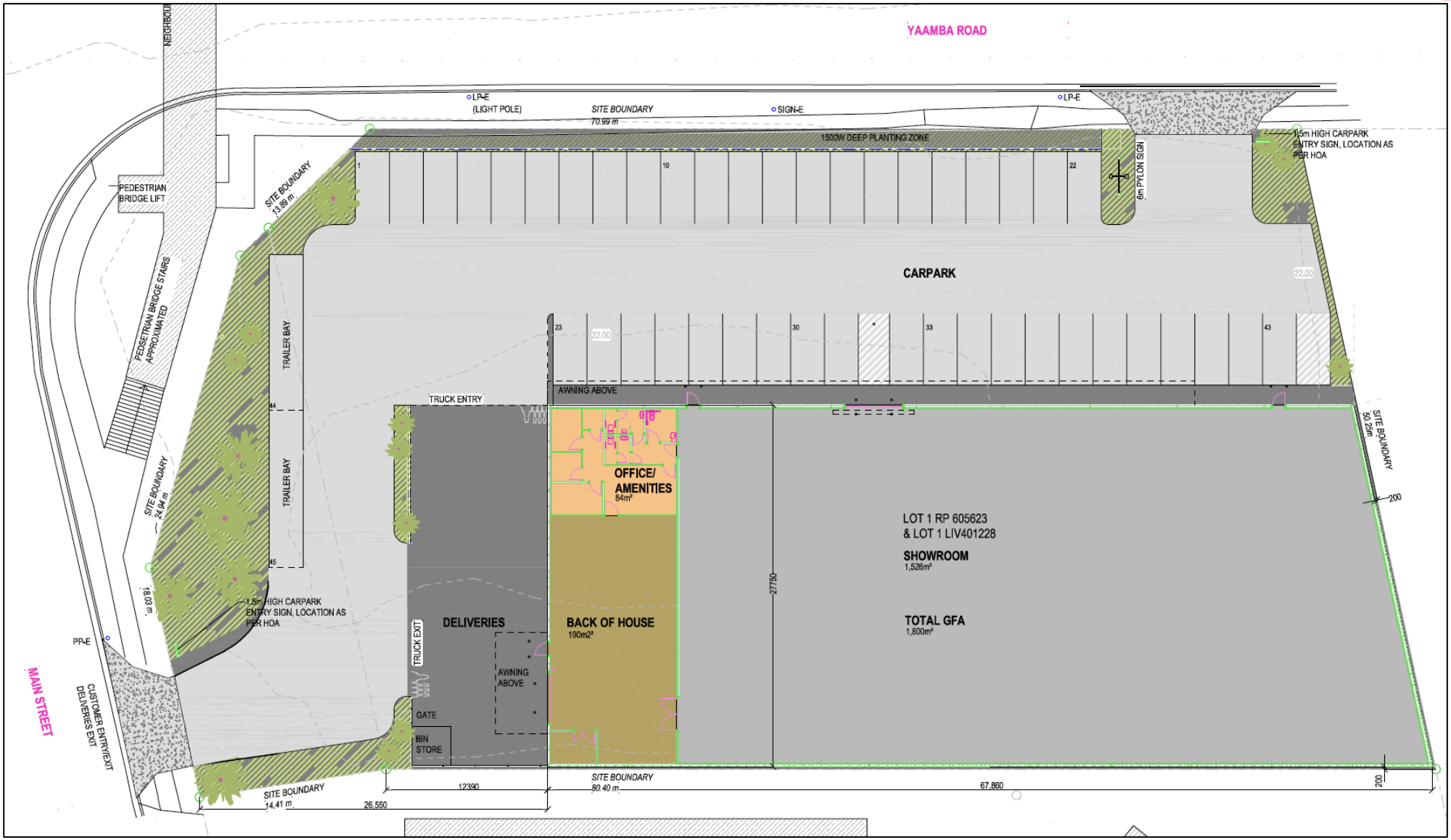


Figure 3.1: Proposed plan of development

4 Car parking

4.1 Statutory Requirement

The car parking rates for various development types are set out in Table 9.3.1.3.2 - Parking requirements of the Rockhampton Regional Council Planning Scheme. The following car parking rate is applicable for the proposed use:

Showroom: one (1) space per 40m2 or part thereof of gross floor area

Application of the above rate to the proposed plan of development (1,800m^2 GFA) results in an Acceptable Outcome of 45 car parking spaces. The proposal provides 45 car parking spaces including 2 x space for a car towing a trailer. The proposal therefore satisfies Council's Acceptable Outcome for car parking.

4.2 Car Parking Layout and Design

4.2.1 Car Parking

The geometric layout of the proposed car parking has been designed to comply with the relevant requirements specific in AS2890.1:2004, in respect to parking bay dimensions and aisle widths. The proposed car parking provides the following dimensions and characteristics:

Table 4.2: Parking Layout and Geometry

Design Element	Required	Supplied	Compliance
General parking (User Class 2)	2.5m wide x 5.4m long	2.6m wide x 5.4m long	Compliant
Disabled Parking	2.4m wide x 5.4m long, plus shared zone	2.6m wide x 5.4m long, plus Shared zone	Compliant
Aisle Width Circulation width	5.8 metres 5.5 metres	> 5.8 metres > 5.5 metres	Compliant Compliant
Aisle extension	1 metre beyond last parking / 8 metre aisle	>1m	Compliant
Internal Driveway Grades	1:20 maximum for the first 6 metres into the site	1:20 for the first 6 metres	Compliant
Internal Car Parking Grades (car parking module)	1:20 measured parallel to the angle of the parking space or 1:16 in all other directions	1:20 measured parallel to the angle of the parking space or 1:16 in all other directions	Compliant
Grade (transitions)	Max 1:8 (summit) and 1:6.7 (sag) at 2 metres	N/A	N/A
Height Clearance	Minimum 2.2m clearance to overhead structures and services	>2.2 metres	Compliant

As demonstrated in Table 4.2, the geometric layout of the proposed parking facilities is compliant with the requirements of the Australian Standards. A dimensioned layout of the proposed car parking arrangements is shown in Figure 4.1.

A swept path analysis has been prepared for the proposed parking arrangements using AutoTurn software. As shown in Figures 4.2 - 4.4, the proposed parking arrangements allow satisfactory manoeuvring for the design vehicle (85th percentile vehicle) and a car towing a trailer to negotiate the proposed car parking arrangement and exit the site in a forward gear.

Figure 4.1: Dimensioned car parking layout

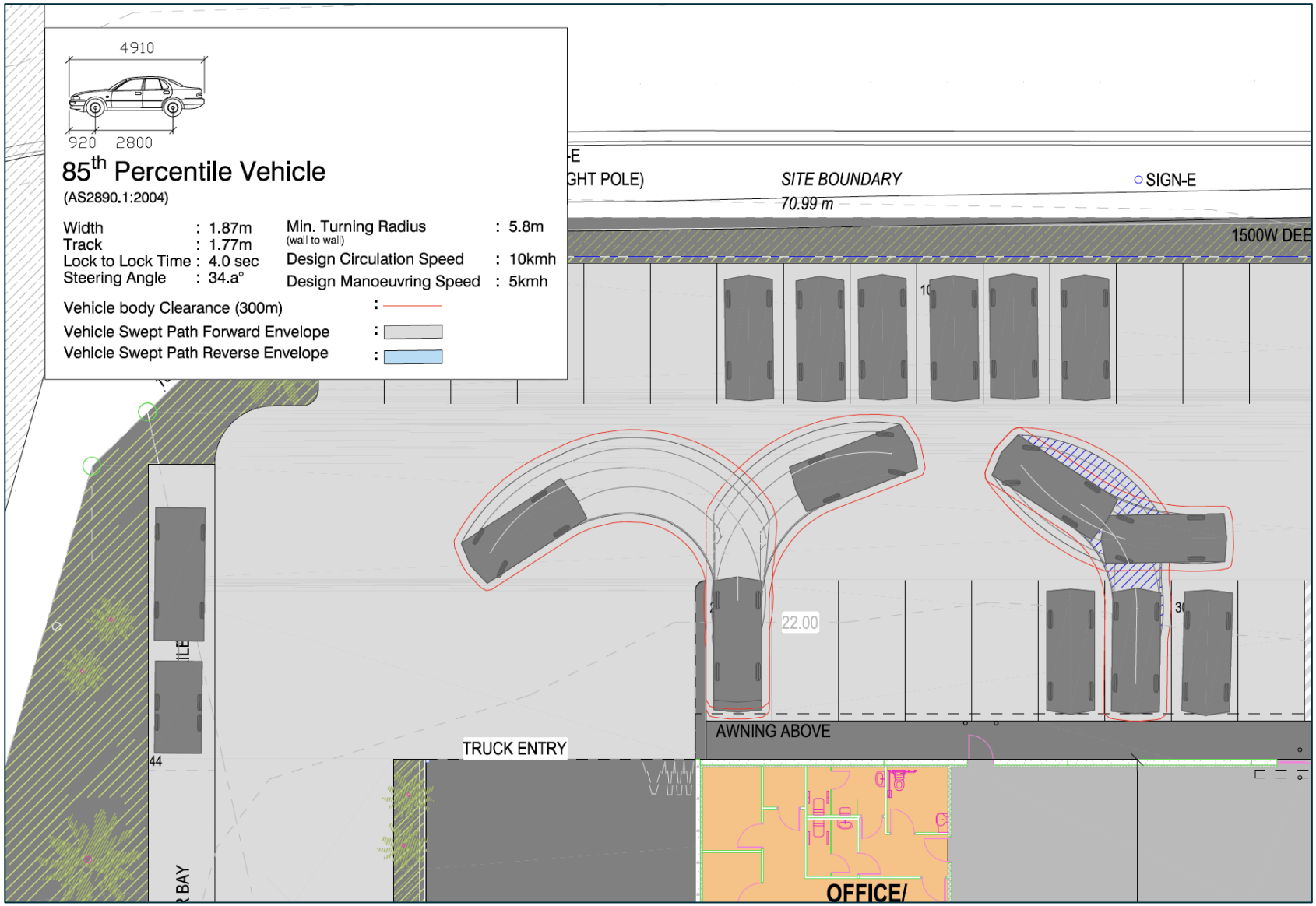


Figure 4.2: Swept path of 85th percentile vehicle

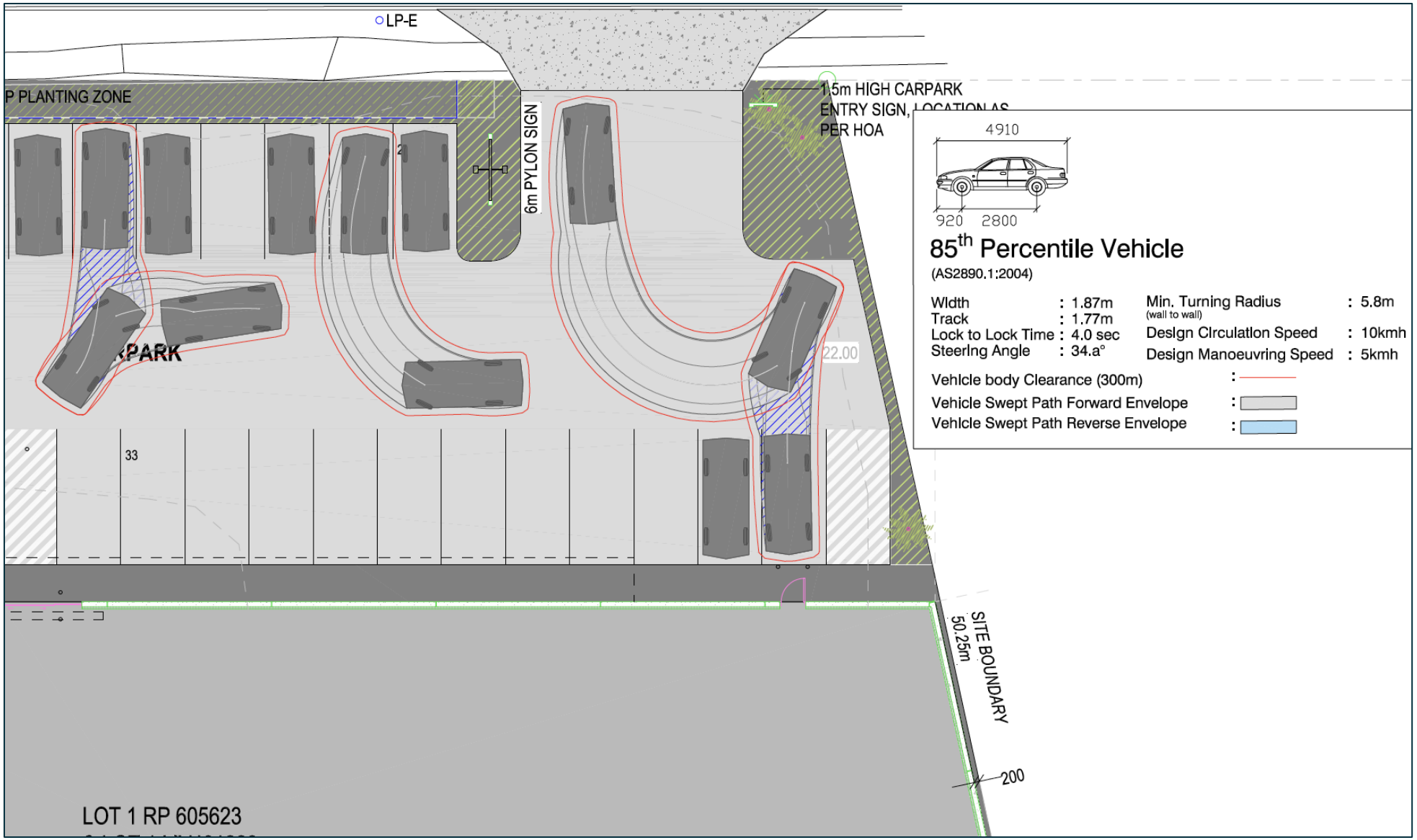


Figure 4.3: Swept path of 85th percentile vehicle

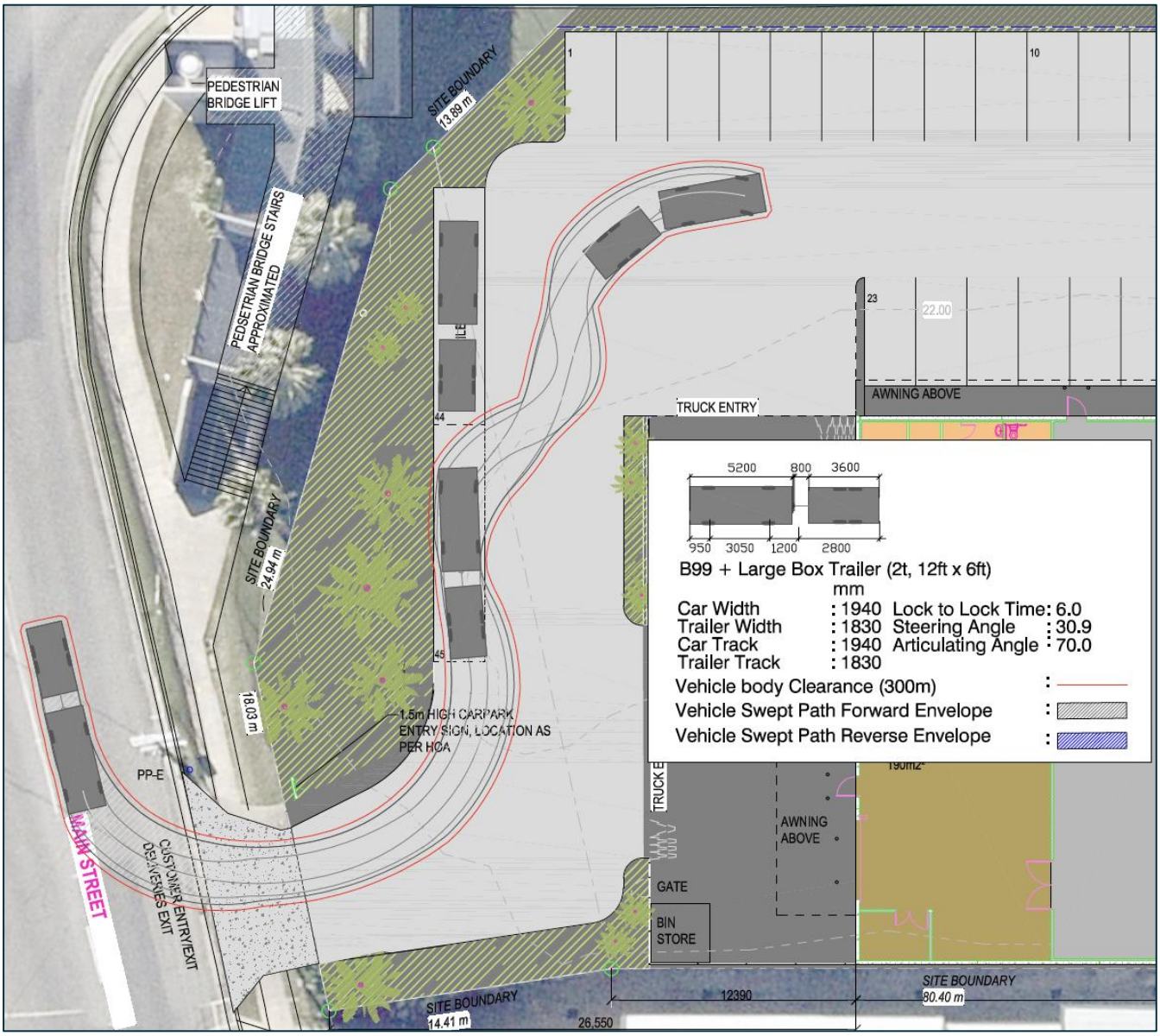


Figure 4.4: Swept path of a car (B99) towing a trailer

4.2.2 Provision for Queuing

In accordance with Table 3.3 of AS2890.1:2004, the proposal should allow queuing for up to two vehicles or 3% of the total car parking supply for up to 100 spaces (whichever is greater). Based on this, the proposal should allow for queuing for up to two vehicles between the boundary and first conflict point. As shown in Figure 4.5, the proposed design comfortably allows for a single vehicle to queue within the boundary at each access point satisfying the minimum requirements for a car park of this scale.

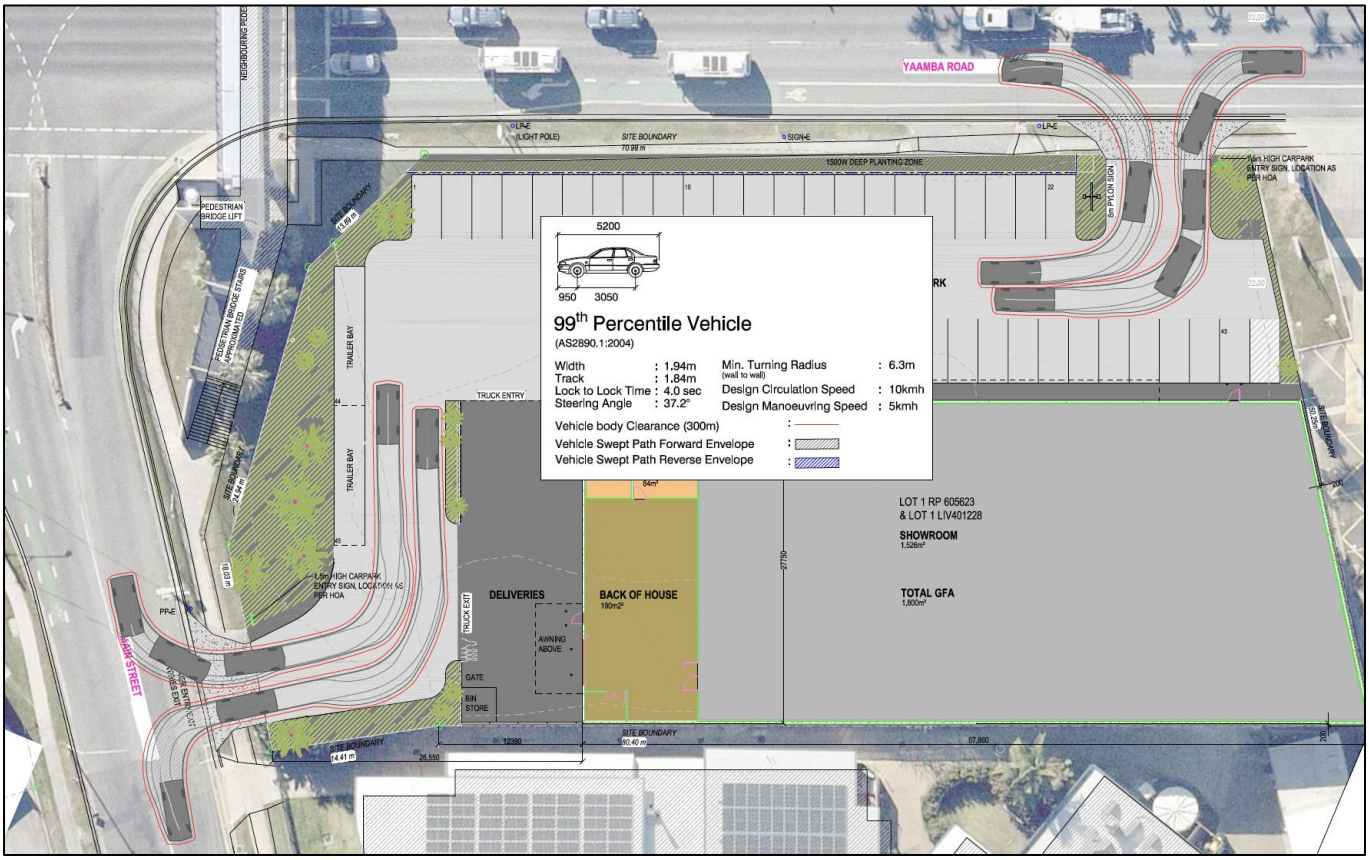


Figure 4.5: Swept path of a car (B99) entering at each access

5 Traffic Impact

5.1 Traffic Generation

Given that the site is currently occupied, it is already generating traffic and any additional demand added to the network by the proposal will only be a difference in trips between the current and proposed uses. For the purposes of the analysis traffic generation rates for the proposed and existing uses have been sourced from the Department of Transport and Main Roads Road Planning and Design Manual (RPDM).

The following trip generation rates are applicable :

Motel

Peak Hour: 0.4 trips per unit

Showroom

Peak Hour: 0.9 trips per 100m^2

Application of the above rate to the motel currently operating on the site results in 13 peak hour trips, whilst traffic generated by the proposal is in the order of 17 trips per peak hour. A comparative analysis of the existing and proposed uses has been prepared demonstrating the proposal will only result in a minor increase in 4 peak hour trips, as shown in Table 5.1.

Table 5.1 - Estimated development traffic generation

Component	Morning Peak Hour			Afternoon Peak Hour		
	In	**Out**	**Total**	**In**	**Out**	**Total**
Showroom (1,800msq)	10	7	17	7	10	17
Motel (32 units)	7	6	13	6	7	13
NET CHANGE	+3	+1	+4	+1	+3	+4

Peak Hour distribution: Showroom: AM: 60/40 PM: 40/60 Motel: AM: 50/50 PM: 50/50

Given the small change in traffic conditions and relatively low increase in background demand at the Yaamba Road / Main Street intersection, it is considered that the resultant impact will be negligible.

5.2 Traffic Distribution

Based on the location of the site and the configuration of the access arrangements in the context of the surrounding road network, it is expected that traffic to and from the site will distribute evenly throughout the network. Development traffic estimates at each access point are shown in Figure 5.1.

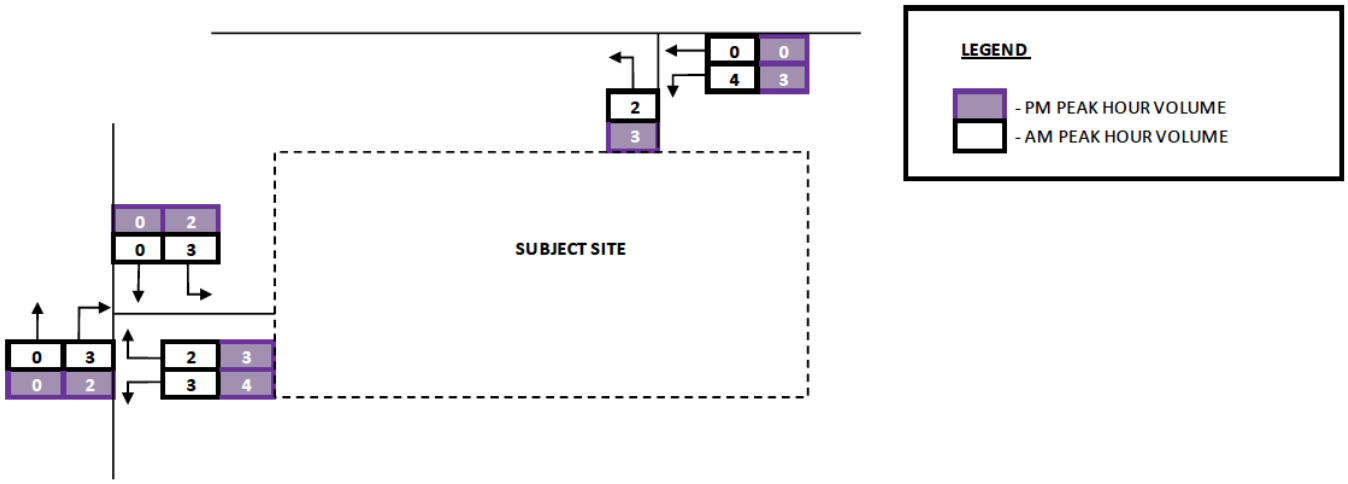


Figure 5.1: Development traffic estimates

5.3 Intersection Capacity

Whilst the resultant impact of the proposal will be negligible, given the location of the site, adjacent to a signalised intersection, a capacity analysis has been carried out at the Yaamba Road / Main Street intersection. The analysis has been carried out using SIDRA software in accordance with the Guide to Traffic Impact Assessment (GTIA 2018). As shown below, the analysis has been carried out for the surveyed traffic conditions (2022) and under anticipated completion year (2024) for both background and design traffic estimates.

Table 6.5 – Impact assessment year by impact

Impact type	Impact assessment year(s)
Road safety	Year of opening of each stage including the final stage
Access and frontage	Year of opening of each stage including the final stage and 10 years after the year of opening of the final stage for access intersections (includes both new and amended accesses)
Intersection delay	Year of opening of each stage including the final stage
Road link capacity	Year of opening of each stage including the final stage
Pavement	Year of opening of each stage including the final stage Note that mitigation of pavement impacts occurs for a period of 20 years after the opening of the final stage
Transport infrastructure	Year of opening of each stage including the final stage.

The Yaamba Road / Main Street intersection has been assessed based on the surveyed traffic conditions (2022) and estimated traffic conditions at the completion year of the development (2024). A summary of the results based on the below criteria is provided in Table 5.2 with detailed results of the assessment shown as Appendix B:

- 2022 surveyed AM peak volumes;
- 2022 surveyed PM peak volumes;
- 2024 AM peak background estimates without development;
- 2024 PM peak background estimates without development;
- 2024 AM peak design estimates with development and
- 2024 PM peak design estimates with development.

Table 5.2: SIDRA results summary (Yaamba Road / Main Street intersection)

Scenario	Degree of Saturation	Level of Service	Total Average Delay (seconds)	Queue Length (metres)
BACKGROUND VOLUMES / ESTIMATES				
2022 AM Peak [W/O dev]	0.746	C	30.0	133.6
2022 PM Peak [W/O dev]	0.732	C	26.4	135.8
2024 AM Peak [W/O dev]	0.805	C	32.4	153.9
2024 PM Peak [W/O dev]	0.737	C	27.6	156.5
DESIGN TRAFFIC ESTIMATES				
2024 AM Peak [W dev]	0.813	C	32.4	153.9
2024 PM Peak [W dev]	0.738	C	27.6	157.3

As shown above, the result of the analysis indicates that the proposal will have negligible impact on the operation of the adjacent intersection, with satisfactory queuing and delays on all approaches under the background and design traffic conditions at the anticipated completion year of the project in year 2024.

6 Access and mobility management

6.1 Access Location

The proposal provides access via both frontages, with a new crossover proposed to be provided at the farthest point from the Yaamba Road / Main Street intersection along each frontage. It is proposed that all movements will be retained at the Main Street entry, with movements at the Yaamba Road access restricted to left in / left out via the existing median.

6.2 Access Design

6.2.1 Yaamba Road Access

A turn warrants analysis has been carried out at the entry crossover from the Yaamba Road in accordance with Austroads Guide to Traffic Management Part 6. The assessment has been based on resultant future (2034) peak hour design traffic estimates of the intersection including the proposed development.

As shown in Figure 6.1, in accordance with Austroads Guide to Traffic Management Part 6, the left turn demand from Yaamba Road warrants a Basic Left Turn (BAL) treatment to the site. This is consistent with that currently provided, therefore, no additional change to that associated with the relocation of the crossover is required to facilitate access from Yaamba Road.

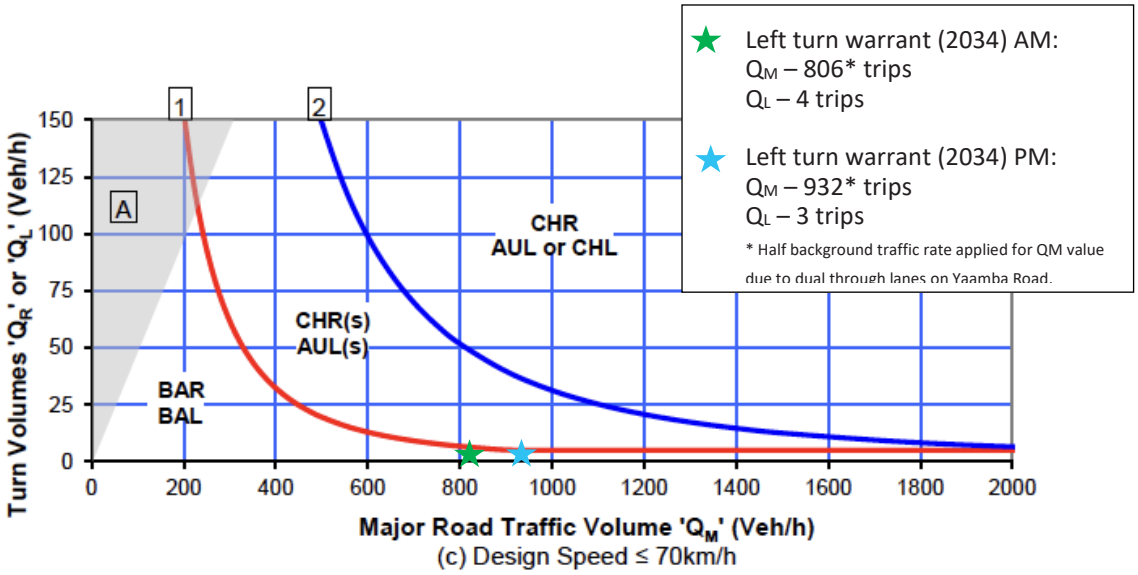


Figure 6.1: Turn warrants analysis at Yaamba Road site access (year 2034)

A concept plan of the proposed access design is shown in Figures 6.3 and 6.4. As shown, the proposal provides a vehicle driveway arrangement with a wide flared crossover splays in accordance with the IPWEA Standard Drawing RS-051.

6.2.2 Main Street Access

A turn warrants analysis has been carried out at the entry crossover from the Main Street in accordance with Austroads Guide to Traffic Management Part 6. The assessment has been based on resultant future (2034) peak hour design traffic estimates of the intersection including the proposed development.

As shown in Figure 6.2, in accordance with Austroads Guide to Traffic Management Part 6, the following treatments are warranted at the proposed access:

Left Turn - Basic Left Turn (BAL)
Right Turn - Basic Right Turn (BAR)

As demonstrated, given the low anticipated turning demand at each access, the proposal only warrants basic turn treatments from Main Street. This is generally the arrangement currently provided for the site. On this basis no additional change than that associated with the relocation of the crossover is required to facilitate access from Main Street.

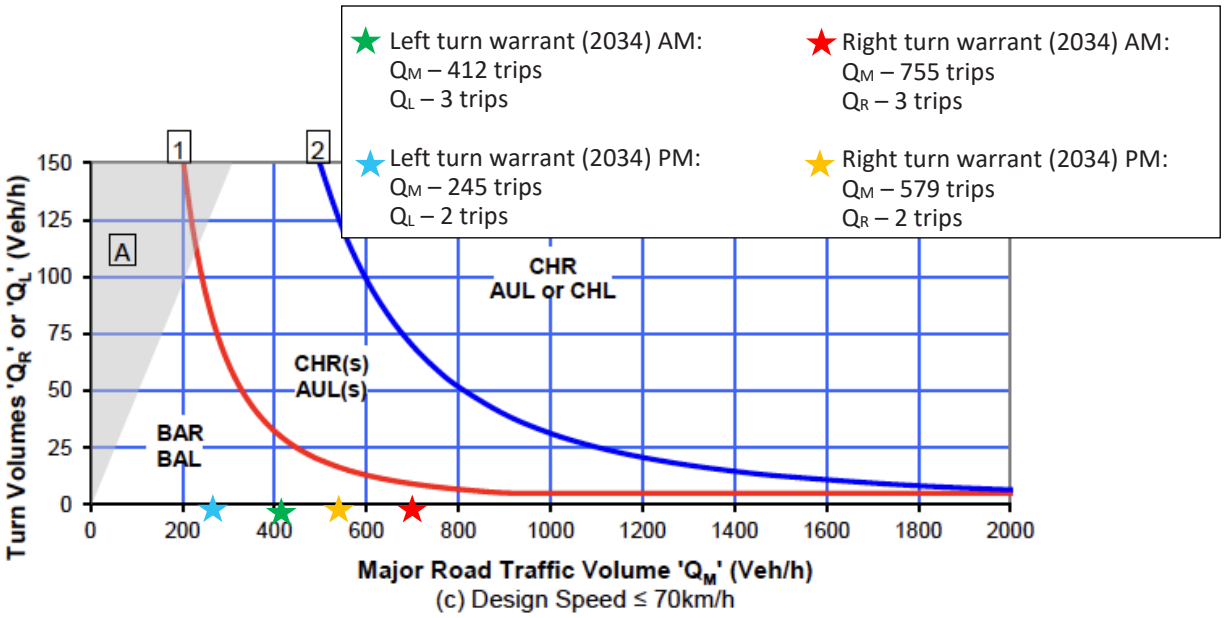


Figure 6.2: Turn warrants analysis at Main Street site access (year 2034)

A concept plan of the proposed access design is shown in Figures 6.3 and 6.5. As shown, the proposal provides a modified vehicle driveway arrangement in accordance with the IPWEA Standard Drawing RS-051. The proposal provides a wide flared crossover splays on the entry side of the driveway (eastern) and a general wide arrangement on the departure side (western). This is considered to be appropriate given that the design allows for the largest design vehicle to enter the site satisfactorily, whilst still achieving maximum separation from the Yaamba Road / Main Street intersection.

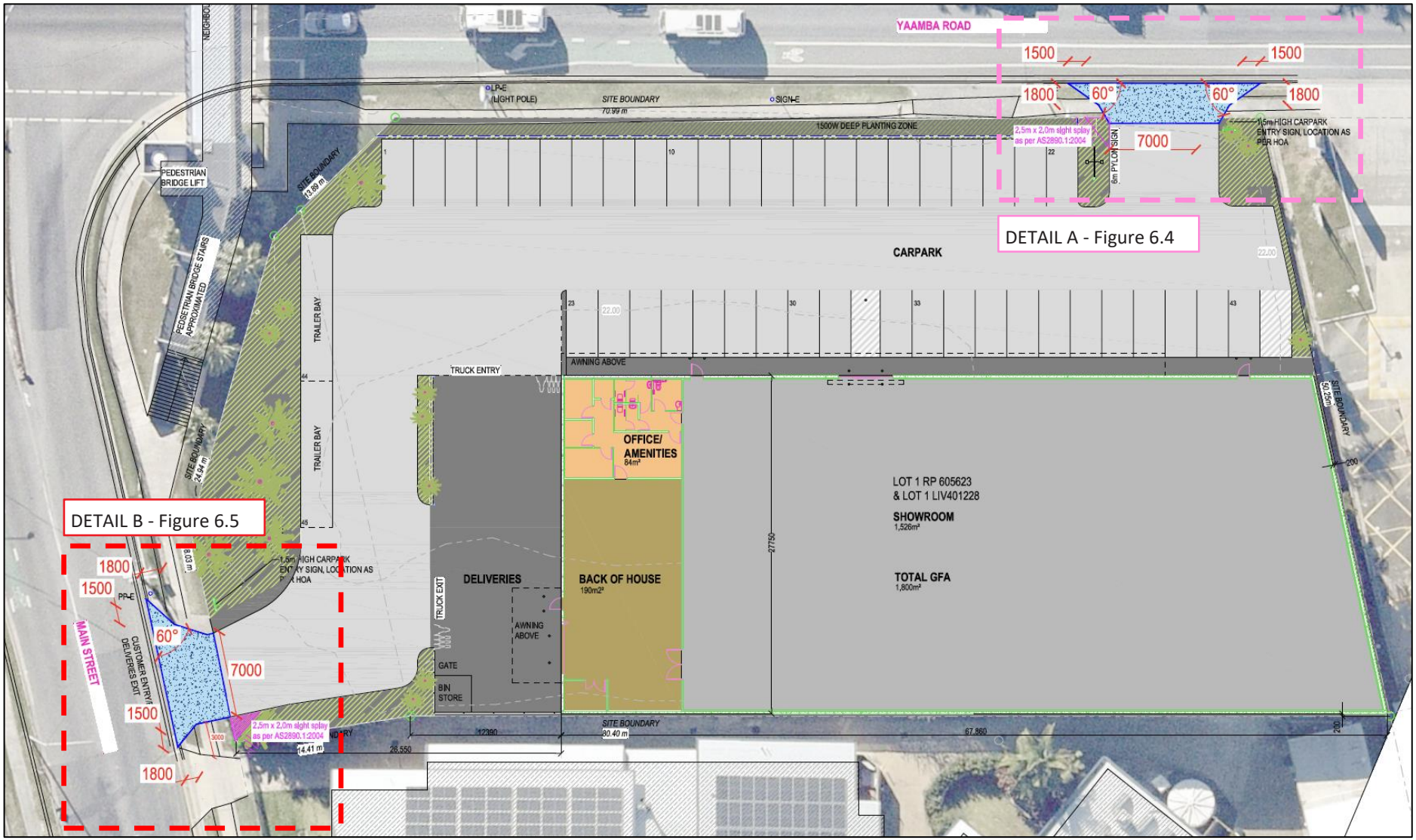


Figure 6.3: Proposed access design

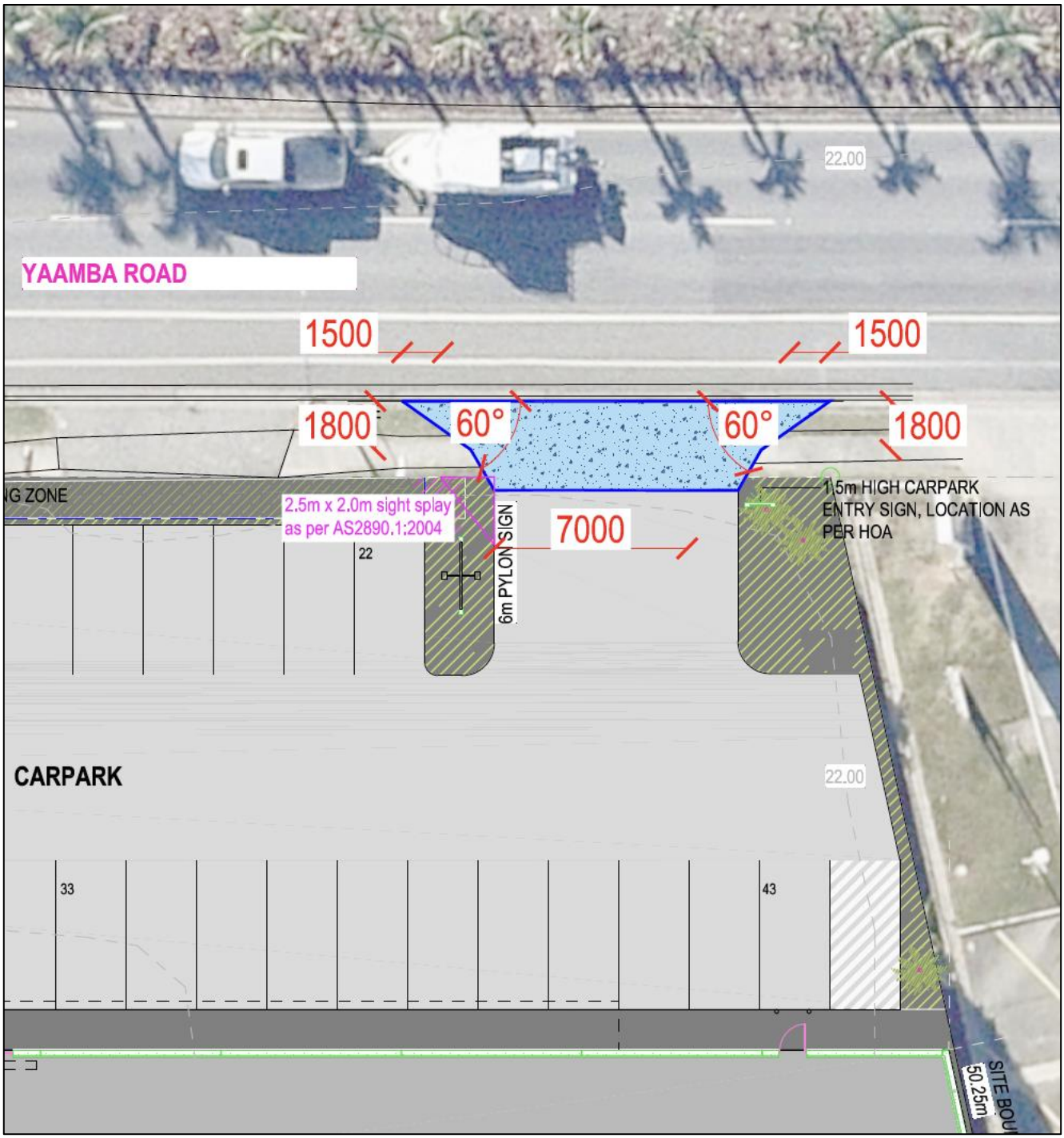


Figure 6.4: DETAIL A - Detailed Yaamba Road access design

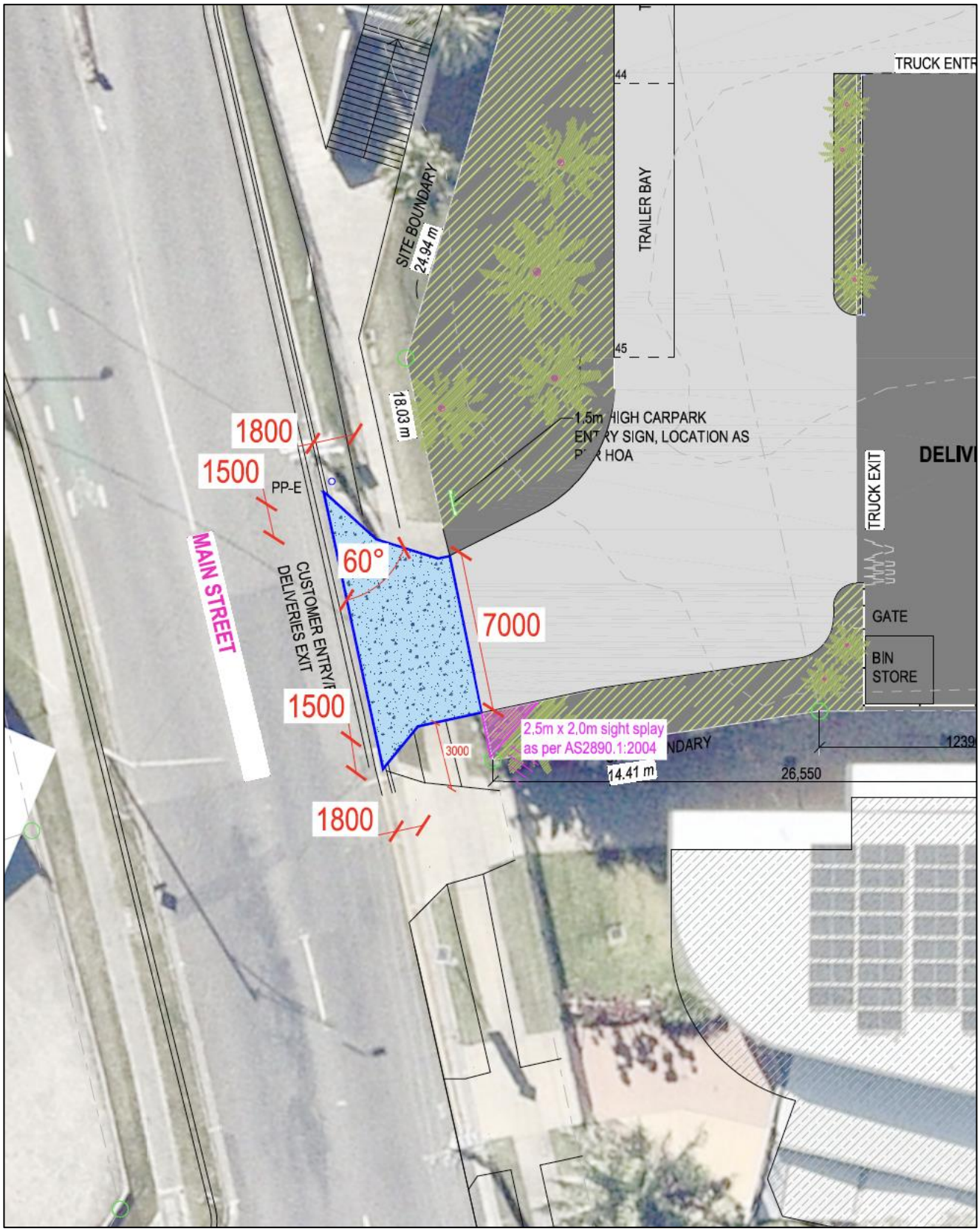


Figure 6.5: DETAIL B - Detailed Main Street access design

6.3 Provision for Pedestrians

It is intended that a dedicated pedestrian connection to the site will be provided clear of the vehicular crossovers. Detail of the proposed pedestrian connection will be provided during detailed design.

6.4 Provision for Bicycles and End of Trip Facilities

The bicycle parking rates for various development types are set out in Table SC6.4.7.1 - Bicycle parking facilities provision rates of the Rockhampton Regional Council Development Code. The following bicycle parking rates are applicable for the proposed use:

Showroom: one (1) space per 750m^2 GFA

Detailed breakdown of parking requirements for the proposed use is provided in Table 6.1 below.

Table 6.1: Acceptable outcome for bicycle parking (Rockhampton Planning Scheme)

Description	Use / scale	Statutory Parking Rate	Acceptable Outcome for Car Parking
Showroom	GFA (1,800m^2)	1 space / 750m^2	3 (2.4) spaces
TOTAL			3 spaces

The proposal provides three bicycle spaces and therefore satisfies the above Council's Acceptable Outcome.

7 Provision for Heavy Vehicles

7.1 Heavy Vehicle Access and Manoeuvring

The proposal allows servicing by heavy vehicles up to the size of a Heavy Rigid Vehicle (HRV). Swept paths of an MRV and HRV negotiating both access points and entering and exiting the delivery bay are shown in Figures 7.1 and 7.2. As shown, the proposed design allows a large car (B99) to pass a heavy vehicle standing on the driveway exiting onto Main Street.

7.2 Provision for Servicing

Waste is proposed to be collected via the loading zone with a typical collection vehicle smaller than that of an HRV. It is therefore considered that the proposed loading bay will satisfactorily accommodate servicing activities including waste collection for the proposed development.

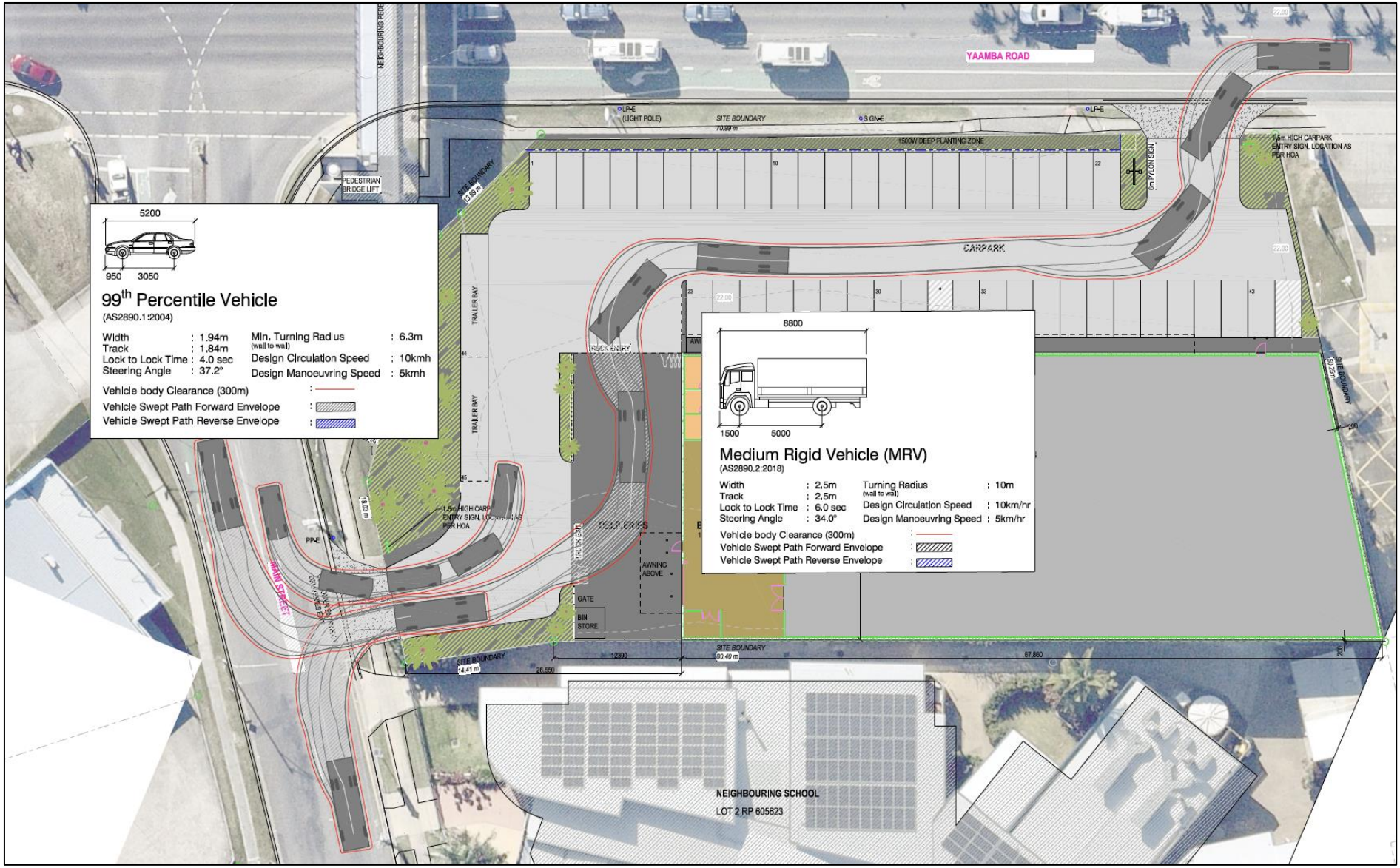


Figure 7.1: Medium Rigid Vehicle (MRV) manoeuvring

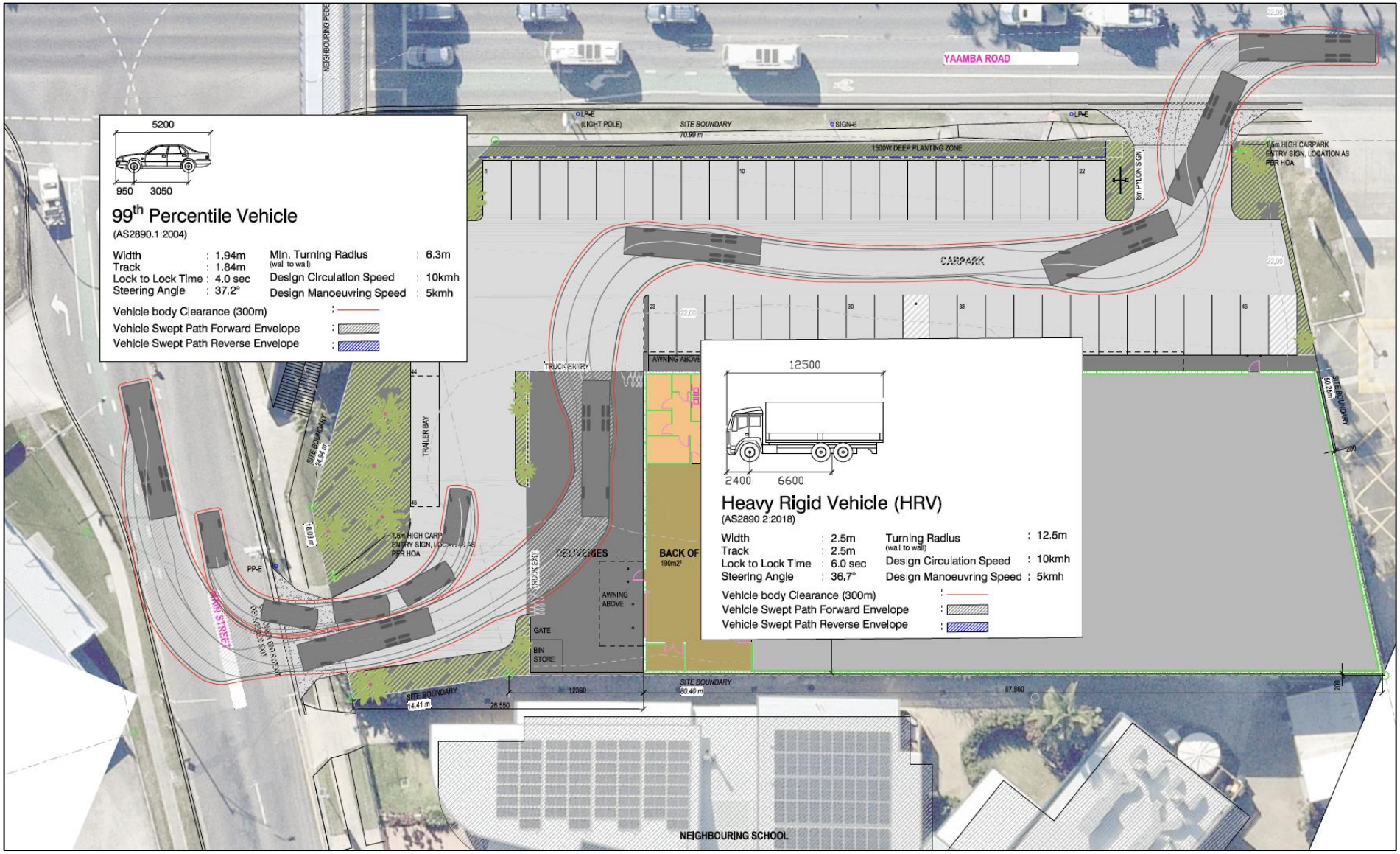


Figure 7.2: Heavy Rigid Vehicle (HRV) manoeuvring

8 Safety

8.1 Crash Data Evaluation

A review of the road crash history within 200 metres of the access points and the Yaamba Road / Main Street intersection was undertaken using the road crash data available from the Queensland Globe and DTMR databases, with the assessment completed for the last five years (2017-2022).

The incidents are summarised in Table 8.1 and shown in Figure 8.1. As shown, based on the nature and location of the recorded incidents, it is considered that the proposal and its associated access points will not compromise the safety and efficiency of the frontage roads.

Table 8.1: Crash history summary

Level of Consequence	Total Incident Count
Crash Fatal	0
Crash Hospitalisation	8
Crash Medical Treatment	2
Crash Minor Injury	1
Crash Property Damage	0

Figure 8.1: Crash locations [Source: Google Earth]

9 Conclusions and Recommendations

- The subject site is located at the southern corner of the Yaamba Road / Main Street intersection, and is also adjacent to a pedestrian overpass facilitating east - west movement over Yaamba Road. The site gains access from both frontages, with the Yaamba Road access restricted to left in / left out movement and unrestricted movement from Main Street.

- The proposed plan of development is for a showroom with ancillary uses. The proposal comprises of a Gross Floor Area (GFA) of 1,800 m^2.

- As discussed in Section 4, the Acceptable Outcome for car parking is in the order of 45 spaces. The proposal provides a total of 45 parking spaces, including two for a car towing a trailer and therefore satisfies Council's Acceptable Outcome.

- The proposal comfortably allows for a single vehicle to queue within the boundary at each access point. The proposed provision for queuing is satisfactory for the development and is expected to comfortably facilitate the peak hour queue generated by the site without resulting in an overflow demand on the State controlled network.

- A SIDRA analysis has been carried out at the Yaamba Road / Main Street intersection in accordance with the GTIA. The result of the analysis indicates that the proposal will have negligible impact on the operation of the adjacent intersection, with satisfactory queuing and delays on all approaches under the background and design traffic conditions at the anticipated completion year of the project in year 2024.

- The proposal provides access via both frontages, with a new crossover proposed to be provided at the farthest point from the Yaamba Road / Main Street intersection along each frontage. It is proposed that all movements will be retained at the Main Street entry, with movements at the Yaamba Road access restricted to left in / left out via the existing median.

- A turn warrants analysis has been carried out at both entry crossovers in accordance with Austroads Guide to Traffic Management Part 6. The assessment has been based on resultant future (2034) peak hour design traffic estimates of the intersections including the proposed development. The left turn demand from Yaamba Road warrants a Basic Left Turn (BAL) treatment to the site. This is consistent with that currently provided, therefore, no additional change to that associated with the relocation of the crossover is required to facilitate access from Yaamba Road. The proposal only warrants basic turn treatments from Main Street. This is generally the arrangement currently provided for the site. On this basis no additional change than that associated with the relocation of the crossover is required to facilitate access from Main Street.

- The proposal allows servicing by heavy vehicles up to the size of a Heavy Rigid Vehicle (HRV). Waste is proposed to be collected via the loading zone with a typical collection vehicle smaller than that of an HRV. It is therefore considered that the proposed loading bay will satisfactorily accommodate servicing activities including waste collection for the proposed development.

- A review of the road crash history within 200 metres of the access points and the Yaamba Road / Main Street intersection indicates that the proposal and its associated access points will not compromise the safety and efficiency of the frontage roads.

Appendix A: Traffic Data

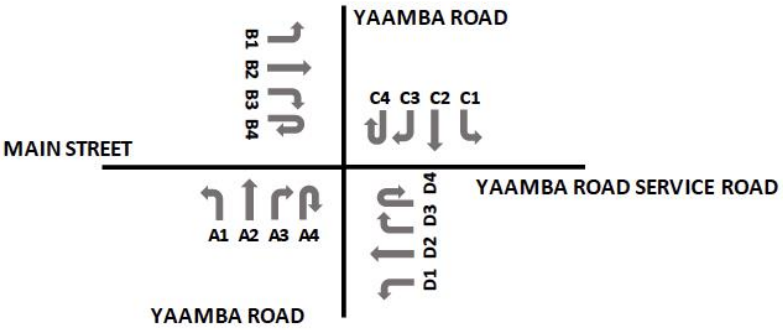
A-1: Traffic Survey Data

INTERSECTION REFERENCE

SITE DETAIL

Method: TRAFFIC CAM SURVEY
Location: YAAMBA ROAD / UNNAMED ROAD INTERSECTION
Survey Date: 23-Nov-22

ZEKACORP
DEVELOPMENT SOLUTIONS



TRAFFIC SURVEY FORM

ZEKACORP DEVELOPMENT SOLUTIONS

Method: TRAFFIC CAM SURVEY
Location: YAAMBA ROAD / UNNAMED ROAD INTERSECTION

Suvey Date: 23-Nov-22
Weather: Clear

Class: Heavy Vehicle
Light Vehicle
All Vehicle Class

Time	NORTHBOUND LEFT (A1)	NORTHBOUND THROUGH (A2)	NORTHBOUND RIGHT (A3)	NORTHBOUND U-TURN (A4)	EASTBOUND LEFT (B1)	EASTBOUND THROUGH (B2)	EASTBOUND RIGHT (B3)	EASTBOUND U-TURN (B4)	SOUTHBOUND LEFT (C1)	SOUTHBOUND THROUGH (C2)	SOUTHBOUND RIGHT (C3)	SOUTHBOUND U-TURN (C4)	WESTBOUND LEFT (D1)	WESTBOUND THROUGH (D2)	WESTBOUND RIGHT (D3)	WESTBOUND U-TURN (D4)	TOTAL
6:15	5	85	0	1	4	0	1	0	0	106	5	1	1	1	0	0	210
6:30	5	84	0	0	5	0	3	0	0	111	8	0	0	0	0	0	216
6:45	6	103	0	1	5	0	6	0	0	152	7	0	1	0	0	0	281
7:00	7	97	0	4	5	0	15	0	0	148	6	1	0	0	0	0	283
7:15	14	113	0	0	3	0	4	0	0	172	6	3	0	0	0	0	315
7:30	19	111	0	0	9	0	12	0	0	221	8	0	1	0	1	0	382
7:45	20	167	0	1	9	0	10	0	0	249	12	1	5	4	3	0	481
8:00	31	196	0	4	13	0	33	0	0	240	15	1	35	7	20	0	595
8:15	31	190	0	4	16	0	38	0	0	232	34	1	44	20	24	0	634
8:30	31	244	0	1	23	0	34	0	0	251	23	0	56	23	27	0	713
8:45	19	244	0	1	24	0	29	0	0	245	8	5	39	13	30	0	657
9:00	9	207	0	4	15	0	15	0	0	248	5	1	7	3	4	0	518
15:15	26	247	0	7	22	0	35	0	0	243	13	1	43	13	31	0	681
15:30	22	271	0	6	18	0	34	0	0	281	16	5	22	6	23	0	704
15:45	15	256	0	5	18	0	36	0	0	225	5	5	5	1	5	0	576
16:00	23	263	0	10	12	0	30	0	0	224	12	0	0	0	2	0	576
16:15	12	233	0	5	27	0	33	0	0	216	7	2	6	3	15	0	559
16:30	20	266	0	6	16	0	23	0	0	235	9	6	2	1	2	0	586
16:45	16	282	0	4	29	0	35	0	0	199	7	0	3	1	4	0	580
17:00	23	255	0	6	23	0	35	0	0	186	9	3	3	0	1	0	544
17:15	16	297	0	4	6	0	21	0	0	203	4	5	1	1	0	0	558
17:30	15	259	0	4	18	0	26	0	0	183	2	3	0	2	5	0	517
17:45	23	239	0	15	12	0	16	0	0	164	3	4	1	0	1	0	478
18:00	14	198	0	7	12	0	16	0	0	125	8	3	0	0	1	0	384
AM PEAK HR	**112**	**874**	**0**	**10**	**76**	**0**	**134**	**0**	**0**	**968**	**80**	**7**	**174**	**63**	**101**	**0**	**2599**
PM PEAK HR	**86**	**1037**	**0**	**28**	**70**	**0**	**135**	**0**	**0**	**973**	**46**	**11**	**70**	**20**	**61**	**0**	**2537**

TRAFFIC SURVEY FORM

ZEKACORP DEVELOPMENT SOLUTIONS

Method: TRAFFIC CAM SURVEY
Location: YAAMBA ROAD / UNNAMED ROAD INTERSECTION

Suvey Date: 23-Nov-22
Weather: Clear

Class: Heavy Vehicle
Light Vehicle
All Vehicle Class

Time	NORTHBOUND LEFT (A1)	NORTHBOUND THROUGH (A2)	NORTHBOUND RIGHT (A3)	NORTHBOUND U-TURN (A4)	EASTBOUND LEFT (B1)	EASTBOUND THROUGH (B2)	EASTBOUND RIGHT (B3)	EASTBOUND U-TURN (B4)	SOUTHBOUND LEFT (C1)	SOUTHBOUND THROUGH (C2)	SOUTHBOUND RIGHT (C3)	SOUTHBOUND U-TURN (C4)	WESTBOUND LEFT (D1)	WESTBOUND THROUGH (D2)	WESTBOUND RIGHT (D3)	WESTBOUND U-TURN (D4)	TOTAL
6:15	5	76	0	1	4	0	1	0	0	96	5	0	0	1	0	0	189
6:30	5	71	0	0	5	0	2	0	0	97	8	0	0	0	0	0	188
6:45	6	83	0	1	3	0	6	0	0	135	6	0	0	0	0	0	240
7:00	7	87	0	4	5	0	14	0	0	137	6	1	0	0	0	0	261
7:15	14	91	0	0	2	0	4	0	0	168	6	3	0	0	0	0	288
7:30	16	104	0	0	8	0	11	0	0	207	8	0	1	0	1	0	356
7:45	19	152	0	1	8	0	10	0	0	239	11	1	5	4	3	0	453
8:00	30	181	0	4	11	0	32	0	0	225	15	1	35	7	20	0	561
8:15	31	177	0	3	16	0	36	0	0	218	32	1	44	20	24	0	602
8:30	28	238	0	1	22	0	33	0	0	235	23	0	56	23	27	0	686
8:45	17	235	0	1	24	0	27	0	0	232	8	5	39	13	30	0	631
9:00	8	191	0	4	14	0	14	0	0	233	5	1	7	3	4	0	484
15:15	22	232	0	7	22	0	34	0	0	230	12	1	43	13	31	0	647
15:30	21	259	0	6	18	0	31	0	0	269	15	5	22	6	23	0	675
15:45	14	242	0	5	17	0	35	0	0	215	5	5	5	1	5	0	549
16:00	21	256	0	10	12	0	29	0	0	210	10	0	0	0	2	0	550
16:15	11	223	0	5	27	0	33	0	0	201	7	2	6	3	15	0	533
16:30	17	255	0	6	15	0	21	0	0	220	9	6	2	1	2	0	554
16:45	15	275	0	4	29	0	34	0	0	189	7	0	3	1	4	0	561
17:00	22	246	0	6	23	0	34	0	0	176	9	3	2	0	1	0	522
17:15	16	286	0	4	6	0	20	0	0	196	3	5	1	1	0	0	538
17:30	13	255	0	4	18	0	24	0	0	179	2	3	0	2	5	0	505
17:45	22	228	0	15	12	0	16	0	0	153	3	4	1	0	1	0	455
18:00	13	192	0	7	12	0	16	0	0	115	7	3	0	0	1	0	366
AM PEAK HR	**106**	**831**	**0**	**9**	**73**	**0**	**128**	**0**	**0**	**910**	**78**	**7**	**174**	**63**	**101**	**0**	**2480**
PM PEAK HR	**78**	**989**	**0**	**28**	**69**	**0**	**129**	**0**	**0**	**924**	**42**	**11**	**70**	**20**	**61**	**0**	**2421**

TRAFFIC SURVEY FORM

ZEKACORP DEVELOPMENT SOLUTIONS

Method: TRAFFIC CAM SURVEY
Location: YAAMBA ROAD / UNNAMED ROAD INTERSECTION

Suvey Date: 23-Nov-22
Weather: Clear

Class: **Heavy Vehicle**
Light Vehicle
All Vehicle Class

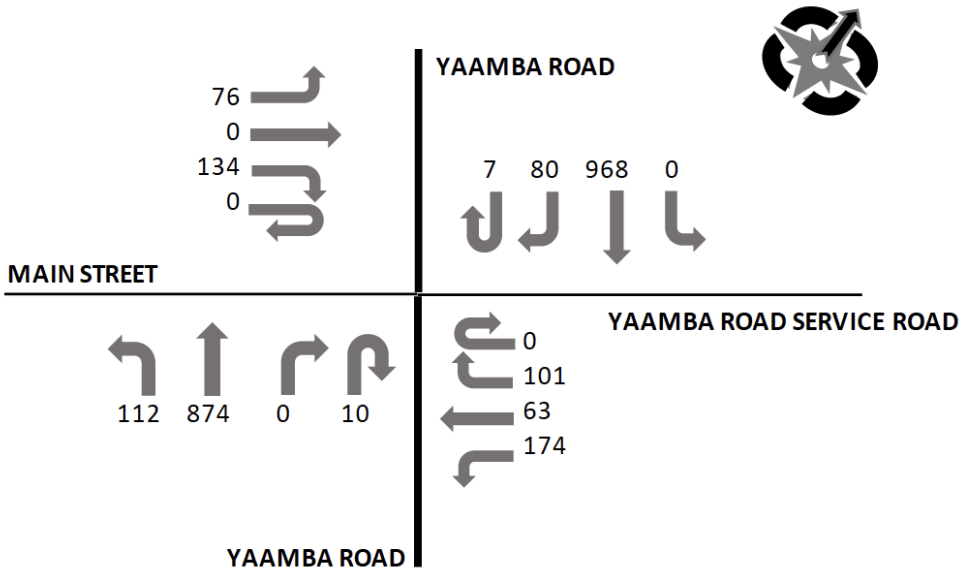
Time	NORTHBOUND LEFT (A1)	NORTHBOUND THROUGH (A2)	NORTHBOUND RIGHT (A3)	NORTHBOUND U-TURN (A4)	EASTBOUND LEFT (B1)	EASTBOUND THROUGH (B2)	EASTBOUND RIGHT (B3)	EASTBOUND U-TURN (B4)	SOUTHBOUND LEFT (C1)	SOUTHBOUND THROUGH (C2)	SOUTHBOUND RIGHT (C3)	SOUTHBOUND U-TURN (C4)	WESTBOUND LEFT (D1)	WESTBOUND THROUGH (D2)	WESTBOUND RIGHT (D3)	WESTBOUND U-TURN (D4)	TOTAL
6:15	0	9	0	0	0	0	0	0	0	10	0	1	1	0	0	0	21
6:30	0	13	0	0	0	0	1	0	0	14	0	0	0	0	0	0	28
6:45	0	20	0	0	2	0	0	0	0	17	1	0	1	0	0	0	41
7:00	0	10	0	0	0	0	1	0	0	11	0	0	0	0	0	0	22
7:15	0	22	0	0	1	0	0	0	0	4	0	0	0	0	0	0	27
7:30	3	7	0	0	1	0	1	0	0	14	0	0	0	0	0	0	26
7:45	1	15	0	0	1	0	0	0	0	10	1	0	0	0	0	0	28
8:00	1	15	0	0	2	0	1	0	0	15	0	0	0	0	0	0	34
8:15	0	13	0	1	0	0	2	0	0	14	2	0	0	0	0	0	32
8:30	3	6	0	0	1	0	1	0	0	16	0	0	0	0	0	0	27
8:45	2	9	0	0	0	0	2	0	0	13	0	0	0	0	0	0	26
9:00	1	16	0	0	1	0	1	0	0	15	0	0	0	0	0	0	34
15:15	4	15	0	0	0	0	1	0	0	13	1	0	0	0	0	0	34
15:30	1	12	0	0	0	0	3	0	0	12	1	0	0	0	0	0	29
15:45	1	14	0	0	1	0	1	0	0	10	0	0	0	0	0	0	27
16:00	2	7	0	0	0	0	1	0	0	14	2	0	0	0	0	0	26
16:15	1	10	0	0	0	0	0	0	0	15	0	0	0	0	0	0	26
16:30	3	11	0	0	1	0	2	0	0	15	0	0	0	0	0	0	32
16:45	1	7	0	0	0	0	1	0	0	10	0	0	0	0	0	0	19
17:00	1	9	0	0	0	0	1	0	0	10	0	0	1	0	0	0	22
17:15	0	11	0	0	0	0	1	0	0	7	1	0	0	0	0	0	20
17:30	2	4	0	0	0	0	2	0	0	4	0	0	0	0	0	0	12
17:45	1	11	0	0	0	0	0	0	0	11	0	0	0	0	0	0	23
18:00	1	6	0	0	0	0	0	0	0	10	1	0	0	0	0	0	18
AM PEAK HR	**5**	**50**	**0**	**1**	**4**	**0**	**4**	**0**	**0**	**53**	**3**	**0**	**0**	**0**	**0**	**0**	**120**
PM PEAK HR	**7**	**42**	**0**	**0**	**2**	**0**	**4**	**0**	**0**	**54**	**2**	**0**	**0**	**0**	**0**	**0**	**111**

PEAK HOUR VOLUME SUMMARY

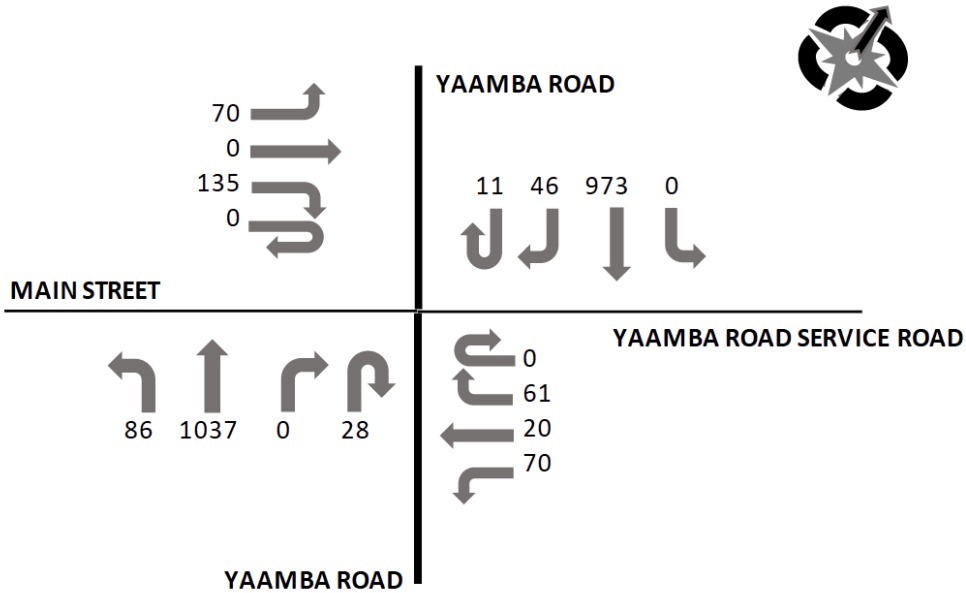
SITE DETAIL

SURVEY DATE: 23-Nov-22

AM PEAK HOUR



PM PEAK HOUR



A-2: Traffic Census Data

Queensland Government

24-Jun-2021 14:55

Traffic Analysis and Reporting System

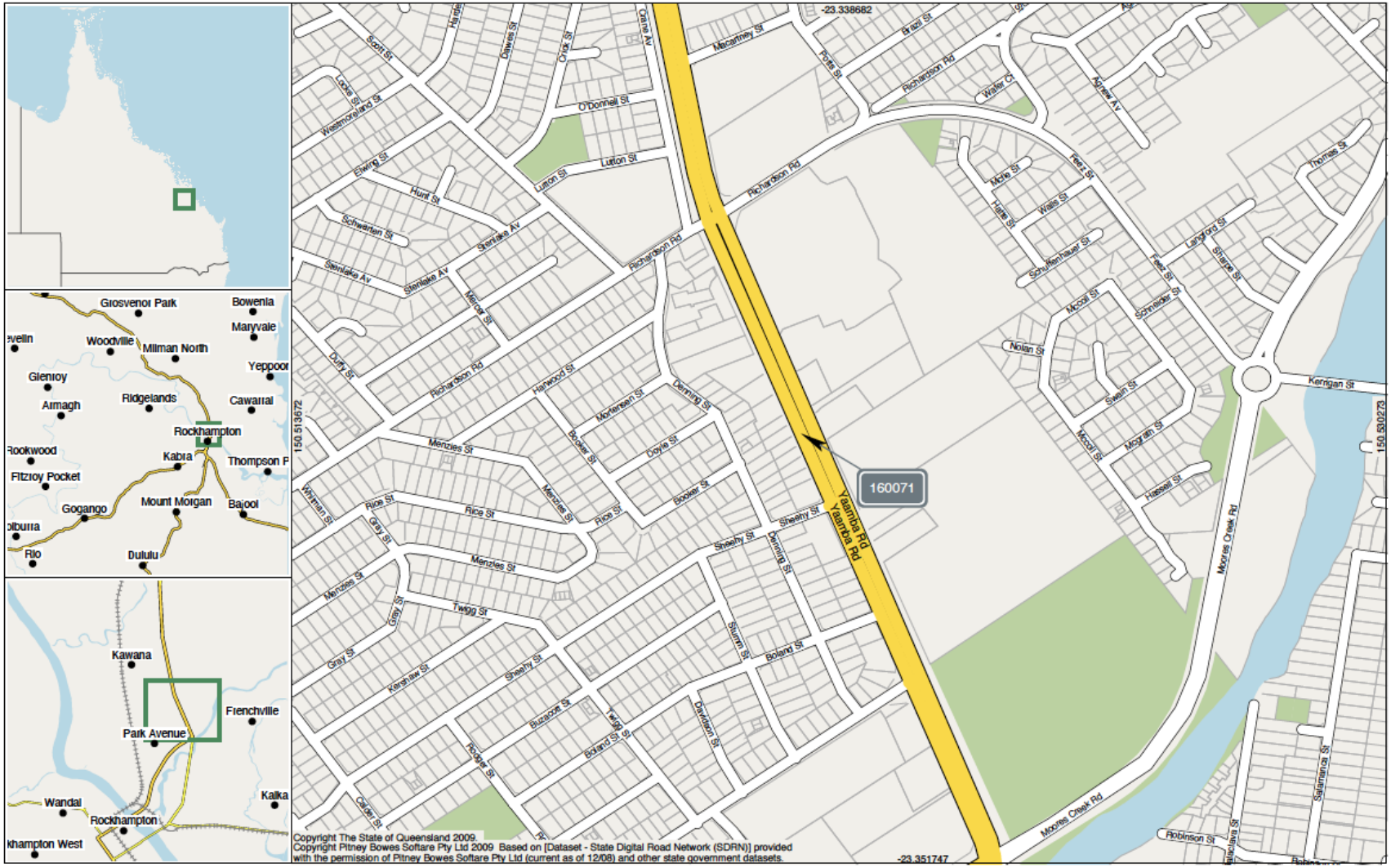
AADT Segment Report

Area 404 - Fitzroy District Road Section 10F - BRUCE HIGHWAY (ROCKHAMPTON-ST LAWRENCE)

Road Segment from 4.340km to 5.517km Segment Site 160071 Traffic Year 2020 Data Collection Year 2020

TARS

Page 1 of 2 (1 of 7)



Queensland Government

24-Jun-2021 14:55

Traffic Analysis and Reporting System

AADT Segment Report

Area 404 - Fitzroy District Road Section 10F - BRUCE HIGHWAY (ROCKHAMPTON-ST LAWRENCE)

Road Segment from 4.340km to 5.517km Segment Site 160071 Traffic Year 2020 Data Collection Year 2020

TARS

Site 160071. Point 40407240. 100m N of Sheehy St, Yaamba Rd.

5.09 km

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

4.34 km

Start Point 260000037. Moores Creek Rd to city @ Yaamba Rd.

5.52 km

End Point 260000422. Yaamba Rd to city @ Richardson Rd.

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

All Vehicles (00)		
G	12,514	100%
A	10,405	100%
B	22,919	100%

Light Vehicles (0A)		
G	11,018	88.05%
A	8,862	85.17%
B	19,880	86.74%

Heavy Vehicles (0B)		
G	1,497	11.96%
A	1,543	14.83%
B	3,040	13.26%

Short Vehicles (1A)		
G	11,018	88.05%
A	8,862	85.17%
B	19,880	86.74%

Trucks and Buses (1B)		
G	1,113	8.89%
A	1,221	11.73%
B	2,334	10.18%

Articulated Vehicles (1C)		
G	197	1.57%
A	181	1.74%
B	378	1.65%

Road Trains (1D)		
G	187	1.49%
A	141	1.36%
B	328	1.43%

Short 2-Axle Vehicles (2A)		
G	10,714	85.62%
A	8,663	83.26%
B	19,377	84.55%

Short Vehicles Towing (2B)		
G	304	2.43%
A	199	1.91%
B	503	2.19%

2-Axle Trucks and Buses (2C)		
G	1,037	8.29%
A	1,157	11.12%
B	2,194	9.57%

3-Axle Trucks and Buses (2D)		
G	58	0.46%
A	49	0.47%
B	107	0.47%

4-Axle Trucks (2E)		
G	18	0.14%
A	15	0.14%
B	33	0.14%

3-Axle Articulated (2F)		
G	28	0.22%
A	31	0.30%
B	59	0.26%

4-Axle Articulated (2G)		
G	44	0.35%
A	44	0.42%
B	88	0.38%

5-Axle Articulated (2H)		
G	25	0.20%
A	21	0.20%
B	46	0.20%

6-Axle Articulated (2I)		
G	100	0.80%
A	85	0.82%
B	185	0.81%

B Double (2J)		
G	183	1.46%
A	138	1.33%
B	321	1.40%

Double Road Trains (2K)		
G	4	0.03%
A	3	0.03%
B	7	0.03%

Triple Road Trains (2L)		
G	0	0%
A	0	0%
B	0	0%

Queensland Government

Traffic Analysis and Reporting System
Annual Volume Report

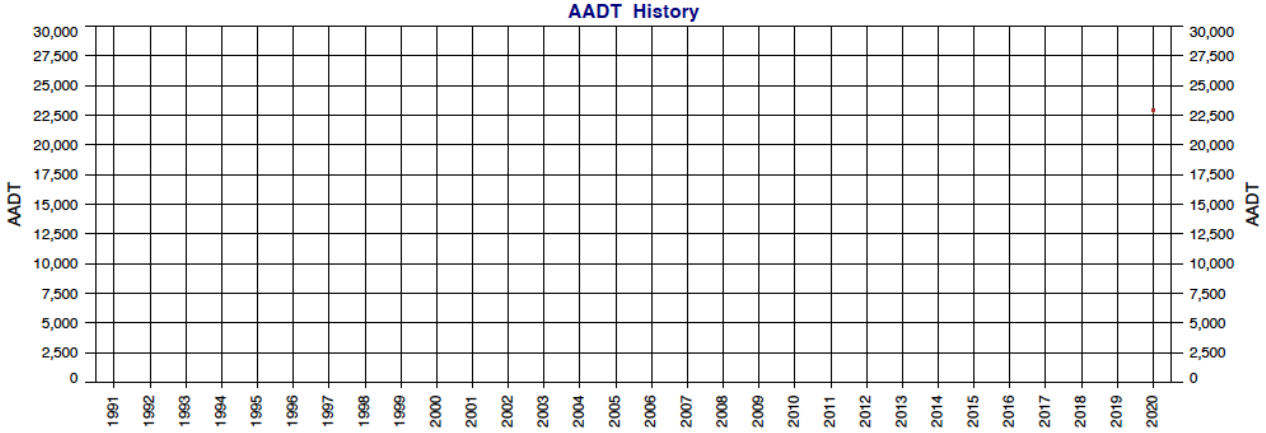
TARS

24-Jun-2021 14:55

Area	404 - Fitzroy District
Road Section	10F - BRUCE HIGHWAY (ROCKHAMPTON-ST LAWRENCE)
Site	160071 - 100m N of Sheehy St (Yaamba Rd)
Thru Dist	5.095
Type	C - Coverage
Stream	TB - Bi-directional traffic flow

Year	2020	Growth last Year	
AADT	22,919	Growth last 5 Yrs	
Avg Week Day	25,898	Growth last 10 Yrs	
Avg Weekend Day	19,481		

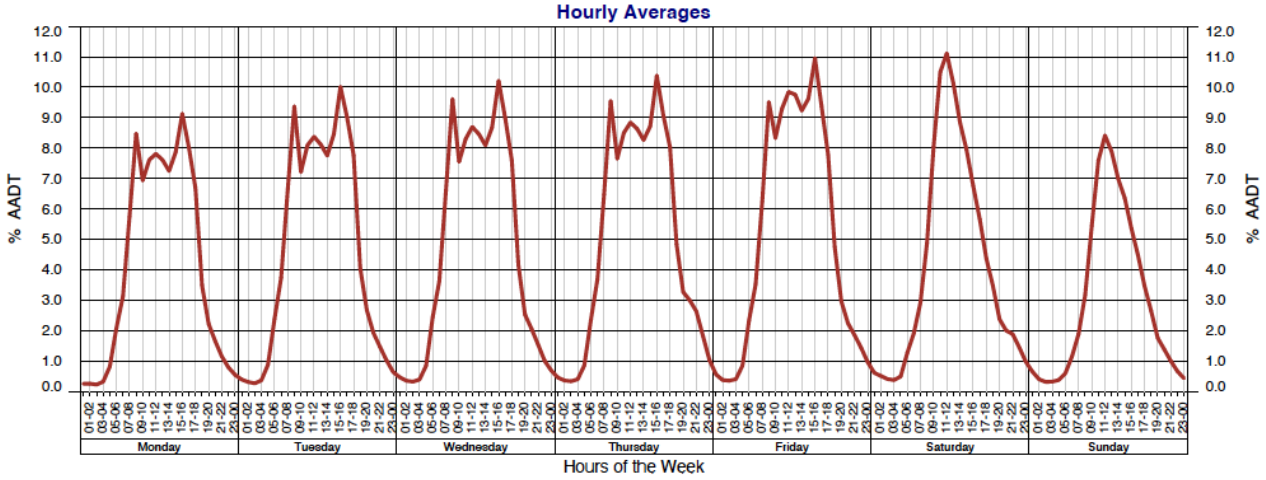
AADT History



Year	AADT	1-Year Growth	5-Year Growth	10-Year Growth
2020	22,919			
2019				
2018				
2017				
2016				
2015				
2014				
2013				
2012				
2011				
2010				
2009				
2008				
2007				
2006				

Year	AADT	1-Year Growth	5-Year Growth	10-Year Growth
2005				
2004				
2003				
2002				
2001				
2000				
1999				
1998				
1997				
1996				
1995				
1994				
1993				
1992				
1991				

Hourly Averages



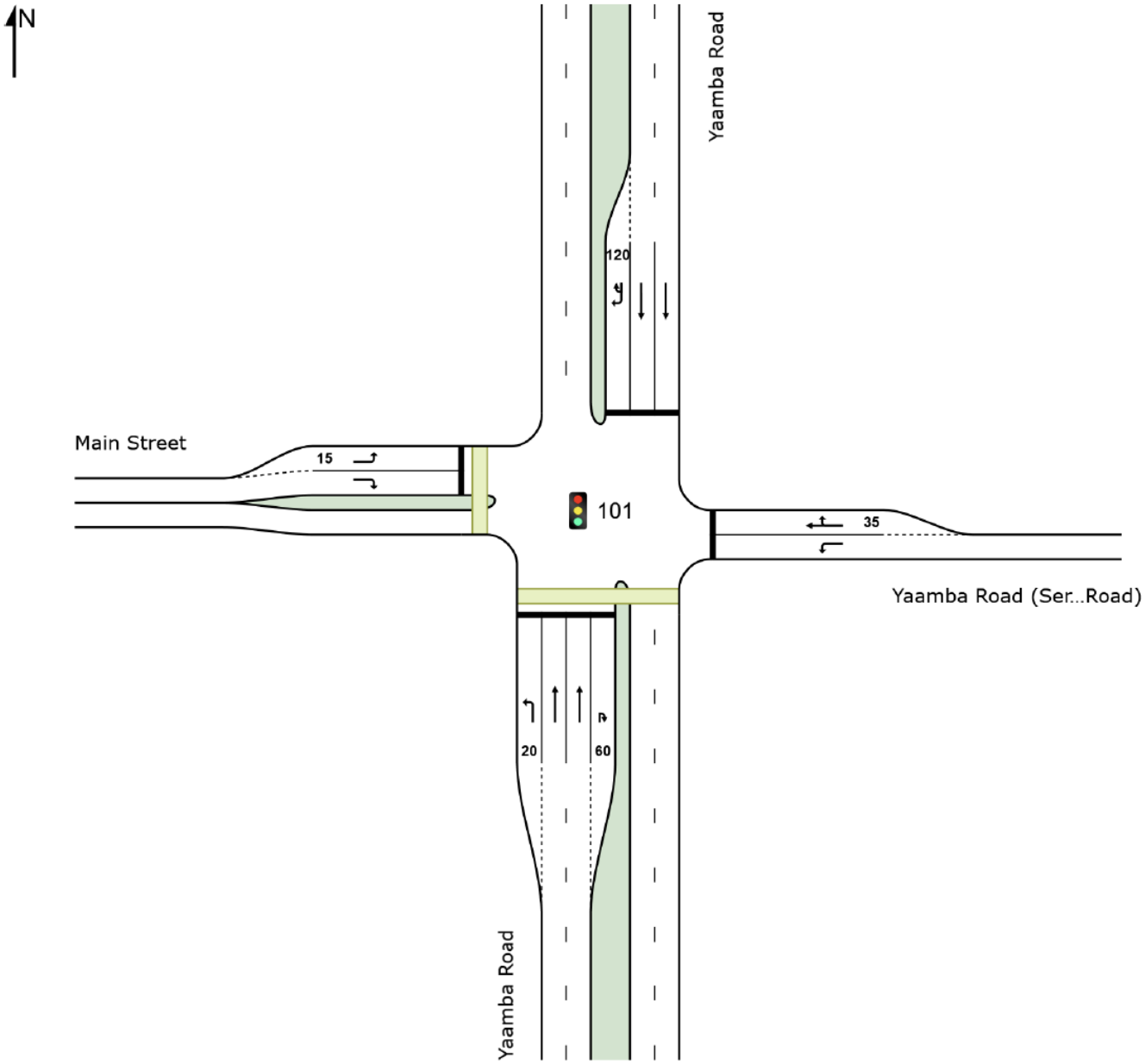
Appendix B: SIDRA

SITE LAYOUT

Site: 101 [2022 AM Peak - Survey (Site Folder: Yaamba Road / Main Street Intersection)]

ZC22125 Yaamba Road / Main Street
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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



MOVEMENT SUMMARY

Site: 101 [2022 AM Peak - Survey (Site Folder: Yaamba Road / Main Street Intersection)]

ZC22125 Yaamba Road / Main Street
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Yaamba Road														
1	L2	112	4.5	118	4.5	0.181	24.4	LOS C	3.1	22.9	0.72	0.74	0.72	41.9
2	T1	874	5.7	920	5.7	0.740	25.0	LOS C	17.6	129.3	0.91	0.83	0.96	42.5
3u	U	10	10.0	11	10.0	*0.107	47.1	LOS D	0.4	3.2	0.96	0.68	0.96	33.0
Approach		996	5.6	1048	5.6	0.740	25.2	LOS C	17.6	129.3	0.88	0.82	0.93	42.3
East: Yaamba Road (Service Road)														
4	L2	174	2.5	183	2.5	*0.730	44.9	LOS D	7.5	53.5	1.00	0.87	1.15	34.0
5	T1	63	2.5	66	2.5	0.675	38.0	LOS D	6.9	49.1	1.00	0.85	1.09	35.8
6	R2	101	2.5	106	2.5	0.675	43.6	LOS D	6.9	49.1	1.00	0.85	1.09	35.1
Approach		338	2.5	356	2.5	0.730	43.2	LOS D	7.5	53.5	1.00	0.86	1.12	34.6
North: Yaamba Road														
8	T1	968	5.5	1019	5.5	*0.746	25.7	LOS C	18.2	133.6	0.94	0.86	0.98	42.2
9	R2	80	3.8	84	3.8	0.692	49.1	LOS D	3.9	28.0	1.00	0.84	1.19	32.7
9u	U	7	2.5	7	2.5	0.692	50.2	LOS D	3.9	28.0	1.00	0.84	1.19	32.5
Approach		1055	5.3	1111	5.3	0.746	27.6	LOS C	18.2	133.6	0.94	0.86	1.00	41.2
West: Main Street														
10	L2	76	5.3	80	5.3	0.358	41.9	LOS D	3.0	22.0	0.96	0.76	0.96	34.9
12	R2	134	3.0	141	3.0	*0.731	45.4	LOS D	5.7	41.2	1.00	0.88	1.19	34.0
Approach		210	3.8	221	3.8	0.731	44.1	LOS D	5.7	41.2	0.98	0.84	1.11	34.3
All Vehicles		2599	5.0	2736	5.0	0.746	30.0	LOS C	18.2	133.6	0.93	0.84	1.00	40.0

MOVEMENT SUMMARY

Site: 101 [2022 PM Peak - Survey (Site Folder: Yaamba Road / Main Street Intersection)]

ZC22125 Yaamba Road / Main Street
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Yaamba Road														
1	L2	86	8.1	91	8.1	0.121	20.6	LOS C	2.1	16.0	0.64	0.72	0.64	43.7
2	T1	1037	4.1	1092	4.1	*0.732	20.9	LOS C	18.7	135.8	0.87	0.78	0.89	44.6
3u	U	28	2.5	29	2.5	0.172	42.4	LOS D	1.1	7.8	0.93	0.73	0.93	34.6
Approach		1151	4.3	1212	4.3	0.732	21.4	LOS C	18.7	135.8	0.85	0.78	0.87	44.3
East: Yaamba Road (Service Road)														
4	L2	70	2.5	74	2.5	0.538	47.3	LOS D	3.0	21.5	1.00	0.77	1.03	33.2
5	T1	21	2.5	22	2.5	*0.623	42.4	LOS D	3.6	25.6	1.00	0.81	1.11	34.0
6	R2	61	2.5	64	2.5	0.623	48.0	LOS D	3.6	25.6	1.00	0.81	1.11	33.4
Approach		152	2.5	160	2.5	0.623	46.9	LOS D	3.6	25.6	1.00	0.79	1.07	33.4
North: Yaamba Road														
8	T1	973	5.6	1024	5.6	0.726	24.1	LOS C	17.7	129.8	0.92	0.83	0.94	43.0
9	R2	46	4.4	48	4.4	*0.471	47.1	LOS D	2.4	17.7	1.00	0.75	1.00	33.2
9u	U	11	2.5	12	2.5	0.471	48.3	LOS D	2.4	17.7	1.00	0.75	1.00	33.0
Approach		1030	5.5	1084	5.5	0.726	25.4	LOS C	17.7	129.8	0.92	0.82	0.95	42.3
West: Main Street														
10	L2	70	2.9	74	2.9	0.324	41.6	LOS D	2.8	19.7	0.95	0.76	0.95	35.0
12	R2	135	3.0	142	3.0	*0.726	45.3	LOS D	5.8	41.5	1.00	0.88	1.18	34.0
Approach		205	2.9	216	2.9	0.726	44.1	LOS D	5.8	41.5	0.98	0.84	1.10	34.4
All Vehicles		2538	4.6	2672	4.6	0.732	26.4	LOS C	18.7	135.8	0.90	0.80	0.93	41.7

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

Site: 101 [2024 AM Peak - Background (Site Folder: Yaamba Road / Main Street Intersection)]

ZC22125 Yaamba Road / Main Street
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Yaamba Road														
1	L2	120	4.5	126	4.5	0.194	24.5	LOS C	3.4	24.7	0.72	0.74	0.72	41.9
2	T1	936	5.7	985	5.7	0.796	27.9	LOS C	20.4	149.6	0.93	0.89	1.04	41.1
3u	U	11	10.0	12	10.0	*0.118	47.2	LOS D	0.5	3.5	0.96	0.69	0.96	33.0
Approach		1067	5.6	1123	5.6	0.796	27.7	LOS C	20.4	149.6	0.91	0.88	1.01	41.1
East: Yaamba Road (Service Road)														
4	L2	186	2.5	196	2.5	*0.780	46.4	LOS D	8.2	58.8	1.00	0.91	1.23	33.5
5	T1	67	2.5	71	2.5	0.720	39.0	LOS D	7.5	53.5	1.00	0.88	1.14	35.4
6	R2	108	2.5	114	2.5	0.720	44.5	LOS D	7.5	53.5	1.00	0.88	1.14	34.8
Approach		361	2.5	380	2.5	0.780	44.5	LOS D	8.2	58.8	1.00	0.89	1.19	34.2
North: Yaamba Road														
8	T1	1037	5.5	1092	5.5	*0.800	28.5	LOS C	21.0	153.9	0.96	0.93	1.07	40.9
9	R2	86	3.8	91	3.8	0.739	49.9	LOS D	4.2	30.4	1.00	0.87	1.26	32.4
9u	U	7	2.5	7	2.5	0.739	51.0	LOS D	4.2	30.4	1.00	0.87	1.26	32.3
Approach		1130	5.3	1189	5.3	0.800	30.2	LOS C	21.0	153.9	0.97	0.92	1.08	40.0
West: Main Street														
10	L2	81	5.3	85	5.3	0.381	42.0	LOS D	3.2	23.5	0.96	0.77	0.96	34.9
12	R2	144	3.0	152	3.0	*0.805	47.9	LOS D	6.4	46.1	1.00	0.94	1.33	33.2
Approach		225	3.8	237	3.8	0.805	45.8	LOS D	6.4	46.1	0.99	0.88	1.20	33.8
All Vehicles		2783	5.0	2929	5.0	0.805	32.4	LOS C	21.0	153.9	0.95	0.90	1.08	39.0

MOVEMENT SUMMARY

Site: 101 [2024 PM Peak - Background (Site Folder: Yaamba Road / Main Street Intersection)]

ZC22125 Yaamba Road / Main Street
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Yaamba Road														
1	L2	92	8.1	97	8.1	0.121	20.7	LOS C	2.4	18.2	0.61	0.71	0.61	43.7
2	T1	1111	4.1	1169	4.1	*0.737	21.1	LOS C	21.6	156.5	0.85	0.76	0.85	44.6
3u	U	30	2.5	32	2.5	0.189	47.0	LOS D	1.3	9.4	0.93	0.73	0.93	33.1
Approach		1233	4.3	1298	4.3	0.737	21.7	LOS C	21.6	156.5	0.83	0.76	0.84	44.1
East: Yaamba Road (Service Road)														
4	L2	75	2.5	79	2.5	0.649	54.1	LOS D	3.7	26.6	1.00	0.81	1.13	31.3
5	T1	21	2.5	22	2.5	*0.735	49.8	LOS D	4.3	31.0	1.00	0.86	1.24	31.8
6	R2	65	2.5	68	2.5	0.735	55.3	LOS E	4.3	31.0	1.00	0.86	1.24	31.3
Approach		161	2.5	169	2.5	0.735	54.0	LOS D	4.3	31.0	1.00	0.84	1.19	31.4
North: Yaamba Road														
8	T1	1042	5.6	1097	5.6	0.728	25.0	LOS C	20.6	151.1	0.91	0.81	0.92	42.5
9	R2	49	4.4	52	4.4	*0.568	53.6	LOS D	3.0	21.7	1.00	0.78	1.06	31.3
9u	U	12	2.5	13	2.5	0.568	54.7	LOS D	3.0	21.7	1.00	0.78	1.06	31.2
Approach		1103	5.5	1161	5.5	0.728	26.6	LOS C	20.6	151.1	0.91	0.81	0.92	41.7
West: Main Street														
10	L2	75	2.9	79	2.9	0.300	43.9	LOS D	3.2	23.0	0.93	0.76	0.93	34.3
12	R2	145	3.0	153	3.0	*0.709	47.6	LOS D	6.7	48.3	0.98	0.86	1.12	33.3
Approach		220	2.9	232	2.9	0.709	46.4	LOS D	6.7	48.3	0.97	0.82	1.05	33.6
All Vehicles		2717	4.6	2860	4.6	0.737	27.6	LOS C	21.6	156.5	0.89	0.79	0.91	41.1

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

Site: 101 [2024 AM Peak - Design (Site Folder: Yaamba Road / Main Street Intersection)]

ZC22125 Yaamba Road / Main Street
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Yaamba Road														
1	L2	121	4.5	127	4.5	0.195	24.5	LOS C	3.4	24.9	0.72	0.74	0.72	41.9
2	T1	938	5.7	987	5.7	0.798	28.0	LOS C	20.5	150.5	0.93	0.90	1.05	41.1
3u	U	11	10.0	12	10.0	*0.118	47.2	LOS D	0.5	3.5	0.96	0.69	0.96	33.0
Approach		1070	5.6	1126	5.6	0.798	27.8	LOS C	20.5	150.5	0.91	0.88	1.01	41.1
East: Yaamba Road (Service Road)														
4	L2	186	2.5	196	2.5	*0.780	46.4	LOS D	8.2	58.8	1.00	0.91	1.23	33.5
5	T1	67	2.5	71	2.5	0.720	39.0	LOS D	7.5	53.5	1.00	0.88	1.14	35.4
6	R2	108	2.5	114	2.5	0.720	44.5	LOS D	7.5	53.5	1.00	0.88	1.14	34.8
Approach		361	2.5	380	2.5	0.780	44.5	LOS D	8.2	58.8	1.00	0.89	1.19	34.2
North: Yaamba Road														
8	T1	1037	5.5	1092	5.5	*0.800	28.5	LOS C	21.0	153.9	0.96	0.93	1.07	40.9
9	R2	86	3.8	91	3.8	0.739	49.9	LOS D	4.2	30.4	1.00	0.87	1.26	32.4
9u	U	7	2.5	7	2.5	0.739	51.0	LOS D	4.2	30.4	1.00	0.87	1.26	32.3
Approach		1130	5.3	1189	5.3	0.800	30.2	LOS C	21.0	153.9	0.97	0.92	1.08	40.0
West: Main Street														
10	L2	82	5.3	86	5.3	0.386	42.0	LOS D	3.3	23.8	0.96	0.77	0.96	34.9
12	R2	145	3.0	153	3.0	*0.813	48.3	LOS D	6.5	46.7	1.00	0.95	1.35	33.1
Approach		227	3.8	239	3.8	0.813	46.0	LOS D	6.5	46.7	0.99	0.88	1.21	33.7
All Vehicles		2788	5.0	2935	5.0	0.813	32.4	LOS C	21.0	153.9	0.95	0.90	1.08	38.9

MOVEMENT SUMMARY

Site: 101 [2024 PM Peak - Design (Site Folder: Yaamba Road / Main Street Intersection)]

ZC22125 Yaamba Road / Main Street
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Yaamba Road														
1	L2	93	8.1	98	8.1	0.122	20.7	LOS C	2.5	18.4	0.61	0.71	0.61	43.7
2	T1	1113	4.1	1172	4.1	*0.738	21.1	LOS C	21.7	157.3	0.85	0.76	0.86	44.5
3u	U	30	2.5	32	2.5	0.189	47.0	LOS D	1.3	9.4	0.93	0.73	0.93	33.1
Approach		1236	4.3	1301	4.3	0.738	21.7	LOS C	21.7	157.3	0.83	0.76	0.84	44.1
East: Yaamba Road (Service Road)														
4	L2	75	2.5	79	2.5	0.649	54.1	LOS D	3.7	26.6	1.00	0.81	1.13	31.3
5	T1	21	2.5	22	2.5	*0.735	49.8	LOS D	4.3	31.0	1.00	0.86	1.24	31.8
6	R2	65	2.5	68	2.5	0.735	55.3	LOS E	4.3	31.0	1.00	0.86	1.24	31.3
Approach		161	2.5	169	2.5	0.735	54.0	LOS D	4.3	31.0	1.00	0.84	1.19	31.4
North: Yaamba Road														
8	T1	1042	5.6	1097	5.6	0.728	25.0	LOS C	20.6	151.1	0.91	0.81	0.92	42.5
9	R2	49	4.4	52	4.4	*0.568	53.6	LOS D	3.0	21.7	1.00	0.78	1.06	31.3
9u	U	12	2.5	13	2.5	0.568	54.7	LOS D	3.0	21.7	1.00	0.78	1.06	31.2
Approach		1103	5.5	1161	5.5	0.728	26.6	LOS C	20.6	151.1	0.91	0.81	0.92	41.7
West: Main Street														
10	L2	77	2.9	81	2.9	0.308	44.0	LOS D	3.3	23.7	0.94	0.76	0.94	34.3
12	R2	146	3.0	154	3.0	*0.718	47.9	LOS D	6.8	48.9	0.98	0.86	1.13	33.3
Approach		223	2.9	235	2.9	0.718	46.5	LOS D	6.8	48.9	0.97	0.83	1.06	33.6
All Vehicles		2723	4.6	2866	4.6	0.738	27.6	LOS C	21.7	157.3	0.89	0.79	0.91	41.1

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Appendix C: Response to State Codes

C-1: Response to State Code 1

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

Table 1.1 Development in general

Performance outcomes	Acceptable outcomes	Response
Buildings, structures, infrastructure, services and utilities		
PO1 The location of the development does not create a safety hazard for users of the state-controlled road.	AO1.1 Development is not located in a state-controlled road. AND AO1.2 Development can be maintained without requiring access to a state-controlled road.	COMPLIES WITH PO
PO2 The design and construction of the development does not adversely impact the structural integrity or physical condition of the state-controlled road or road transport infrastructure.	No acceptable outcome is prescribed.	COMPLIES WITH PO
PO3 The location of the development does not obstruct road transport infrastructure or adversely impact the operating performance of the state-controlled road.	No acceptable outcome is prescribed.	COMPLIES WITH PO
PO4 The location, placement, design and operation of advertising devices, visible from the state-controlled road, do not create a safety hazard for users of the state-controlled road.	No acceptable outcome is prescribed.	NOT APPLICABLE TO TRAFFIC IMPACT ASSESSMENT

PO5 The design and construction of buildings and structures does not create a safety hazard by distracting users of the state-controlled road.	AO5.1 Facades of buildings and structures fronting the state-controlled road are made of non-reflective materials. AND AO5.2 Facades of buildings and structures do not direct or reflect point light sources into the face of oncoming traffic on the state-controlled road. AND AO5.3 External lighting of buildings and structures is not directed into the face of oncoming traffic on the state-controlled road. AND AO5.4 External lighting of buildings and structures does not involve flashing or laser lights.	NOT APPLICABLE TO TRAFFIC IMPACT ASSESSMENT
PO6 Road, pedestrian and bikeway bridges over a state-controlled road are designed and constructed to prevent projectiles from being thrown onto the state-controlled road.	AO6.1 Road, pedestrian and bikeway bridges over the state-controlled road include throw protection screens in accordance with section 4.11 of the Design Criteria for Bridges and Other Structures Manual, Department of Transport and Main Roads, 2020.	NOT APPLICABLE, THE PROPOSAL DOES NOT INCLUDE A CHANGE TO THE EXISTING OVERPASS FACILITY OR A NEW BRIDGE TO BE CONSTRUCTED AS PART OF THE PROJECT

Landscaping		
PO7 The location of landscaping does not create a safety hazard for users of the state-controlled road.	AO7.1 Landscaping is not located in a state-controlled road. AND AO7.2 Landscaping can be maintained without requiring access to a state-controlled road. AND AO7.3 Landscaping does not block or obscure the sight lines for vehicular access to a state-controlled road.	NOT APPLICABLE TO TRAFFIC IMPACT ASSESSMENT
Stormwater and overland flow		
PO8 Stormwater run-off or overland flow from the development site does not create or exacerbate a safety hazard for users of the state-controlled road.	No acceptable outcome is prescribed.	NOT APPLICABLE TO TRAFFIC IMPACT ASSESSMENT
PO9 Stormwater run-off or overland flow from the development site does not result in a material worsening of the operating performance of the state-controlled road or road transport infrastructure.	No acceptable outcome is prescribed.	NOT APPLICABLE TO TRAFFIC IMPACT ASSESSMENT
PO10 Stormwater run-off or overland flow from the development site does not adversely impact the structural integrity or physical condition of the state-controlled road or road transport infrastructure.	No acceptable outcome is prescribed.	NOT APPLICABLE TO TRAFFIC IMPACT ASSESSMENT

PO11 Development ensures that stormwater is lawfully discharged.	AO11.1 Development does not create any new points of discharge to a state-controlled road. AND AO11.2 Development does not concentrate flows to a state-controlled road. AND AO11.3 Stormwater run-off is discharged to a lawful point of discharge. AND AO11.4 Development does not worsen the condition of an existing lawful point of discharge to the state-controlled road.	NOT APPLICABLE TO TRAFFIC IMPACT ASSESSMENT
Flooding		
PO12 Development does not result in a material worsening of flooding impacts within a state-controlled road.	AO12.1 For all flood events up to 1% annual exceedance probability, development results in negligible impacts (within +/- 10mm) to existing flood levels within a state-controlled road. AND	NOT APPLICABLE TO TRAFFIC IMPACT ASSESSMENT

	AO12.2 For all flood events up to 1% annual exceedance probability, development results in negligible impacts (up to a 10% increase) to existing peak velocities within a state-controlled road. AND AO12.3 For all flood events up to 1% annual exceedance probability, development results in negligible impacts (up to a 10% increase) to existing time of submergence of a state-controlled road.	
Drainage Infrastructure		
PO13 Drainage infrastructure does not create a safety hazard for users in the state-controlled road.	AO13.1 Drainage infrastructure is wholly contained within the development site, except at the lawful point of discharge. AND AO13.2 Drainage infrastructure can be maintained without requiring access to a state-controlled road.	NOT APPLICABLE TO TRAFFIC IMPACT ASSESSMENT
PO14 Drainage infrastructure associated with, or within, a state-controlled road is constructed, and designed to ensure the structural integrity and physical condition of existing drainage infrastructure and the surrounding drainage network.	No acceptable outcome is prescribed.	NOT APPLICABLE TO TRAFFIC IMPACT ASSESSMENT

Table 1.2 Vehicular access, road layout and local roads

Performance outcomes	Acceptable outcomes	Response
Vehicular access to a state-controlled road or within 100 metres of a state-controlled road intersection		
PO15 The location, design and operation of a new or changed access to a state-controlled road does not compromise the safety of users of the state-controlled road.	No acceptable outcome is prescribed.	COMPLIES WITH PO, REFER TO TRAFFIC REPORT
PO16 The location, design and operation of a new or changed access does not adversely impact the functional requirements of the state-controlled road.	No acceptable outcome is prescribed.	COMPLIES WITH PO, REFER TO TRAFFIC REPORT
PO17 The location, design and operation of a new or changed access is consistent with the future intent of the state-controlled road.	No acceptable outcome is prescribed.	COMPLIES WITH PO, REFER TO TRAFFIC REPORT
PO18 New or changed access is consistent with the access for the relevant limited access road policy: LAR 1 where direct access is prohibited; or LAR 2 where access may be permitted, subject to assessment.	No acceptable outcome is prescribed.	COMPLIES WITH PO, REFER TO TRAFFIC REPORT
PO19 New or changed access to a local road within 100 metres of an intersection with a state-controlled road does not compromise the safety of users of the state-controlled road.	No acceptable outcome is prescribed.	COMPLIES WITH PO - THE PROPOSAL RETAINS THE EXISTING ACCESS ARRANGEMENTS AND IMPROVES ON ITS SEPARATION ACHIEVED WITH THE STATE CONTROLLED INTERSECTION.
PO20 New or changed access to a local road within 100 metres of an intersection with a state-controlled road does not adversely impact on the operating performance of the intersection.	No acceptable outcome is prescribed.	COMPLIES WITH PO

Public passenger transport and active transport		
PO21 Development does not compromise the safety of users of public passenger transport infrastructure, public passenger services and active transport infrastructure.	No acceptable outcome is prescribed.	COMPLIES WITH PO, THE PROPOSAL DOES NOT COMPROMISE THE SAFETY AND OPERATION OF THE EXISTING PUBLIC AND ACTIVE TRANSPORT FACILITIES
PO22 Development maintains the ability for people to access public passenger transport infrastructure, public passenger services and active transport infrastructure.	No acceptable outcome is prescribed.	COMPLIES WITH PO, THE PROPOSAL DOES NOT COMPROMISE THE SAFETY AND OPERATION OF THE EXISTING PUBLIC AND ACTIVE TRANSPORT FACILITIES
PO23 Development does not adversely impact the operating performance of public passenger transport infrastructure, public passenger services and active transport infrastructure.	No acceptable outcome is prescribed.	COMPLIES WITH PO, THE PROPOSAL DOES NOT COMPROMISE THE SAFETY AND OPERATION OF THE EXISTING PUBLIC AND ACTIVE TRANSPORT FACILITIES
PO24 Development does not adversely impact the structural integrity or physical condition of public passenger transport infrastructure and active transport infrastructure.	No acceptable outcome is prescribed.	COMPLIES WITH PO, THE PROPOSAL DOES NOT COMPROMISE THE SAFETY AND OPERATION OF THE EXISTING PUBLIC AND ACTIVE TRANSPORT FACILITIES

Table 1.3 Network impacts

Performance outcomes	Acceptable outcomes	Response
PO25 Development does not compromise the safety of users of the state-controlled road network.	No acceptable outcome is prescribed.	COMPLIES WITH PO - THE PROPOSAL WILL NOT HAVE ADVERSE IMPACT ON STATE CONTROLLED ROAD, REFER TO TRAFFIC REPORT
PO26 Development ensures no net worsening of the operating performance of the state-controlled road network.	No acceptable outcome is prescribed.	COMPLIES WITH PO - THE PROPOSAL WILL NOT HAVE ADVERSE IMPACT ON STATE CONTROLLED ROAD, REFER TO TRAFFIC REPORT

PO27 Traffic movements are not directed onto a state-controlled road where they can be accommodated on the local road network.	No acceptable outcome is prescribed.	COMPLIES WITH PO - THE PROPOSAL WILL NOT HAVE ADVERSE IMPACT ON STATE CONTROLLED ROAD, REFER TO TRAFFIC REPORT
PO28 Development involving haulage exceeding 10,000 tonnes per year does not adversely impact the pavement of a state-controlled road.	No acceptable outcome is prescribed.	NOT APPLICABLE TO TRAFFIC IMPACT ASSESSMENT
PO29 Development does not impede delivery of planned upgrades of state-controlled roads.	No acceptable outcome is prescribed.	COMPLIES WITH PO - THE PROPOSAL WILL NOT HAVE ADVERSE IMPACT ON STATE CONTROLLED ROAD, REFER TO TRAFFIC REPORT
PO30 Development does not impede delivery of corridor improvements located entirely within the state-controlled road corridor.	No acceptable outcome is prescribed.	COMPLIES WITH PO - THE PROPOSAL WILL NOT HAVE ADVERSE IMPACT ON STATE CONTROLLED ROAD, REFER TO TRAFFIC REPORT

Table 1.4 Filling, excavation, building foundations and retaining structures

Performance outcomes	Acceptable outcomes	Response
PO31 Development does not create a safety hazard for users of the state-controlled road or road transport infrastructure.	No acceptable outcome is prescribed.	COMPLIES WITH PO - THE PROPOSAL WILL NOT HAVE ADVERSE IMPACT ON STATE CONTROLLED ROAD, REFER TO TRAFFIC REPORT
PO32 Development does not adversely impact the operating performance of the state-controlled road.	No acceptable outcome is prescribed.	COMPLIES WITH PO - THE PROPOSAL WILL NOT HAVE ADVERSE IMPACT ON STATE CONTROLLED ROAD, REFER TO TRAFFIC REPORT
PO33 Development does not undermine, damage or cause subsidence of a state-controlled road.	No acceptable outcome is prescribed.	COMPLIES WITH PO - THE PROPOSAL WILL NOT HAVE ADVERSE IMPACT ON STATE CONTROLLED ROAD, REFER TO TRAFFIC REPORT
PO34 Development does not cause ground water disturbance in a state-controlled road.	No acceptable outcome is prescribed.	NOT APPLICABLE TO TRAFFIC IMPACT ASSESSMENT
PO35 Excavation, boring, piling, blasting and fill compaction do not adversely impact the physical	No acceptable outcome is prescribed.	NOT APPLICABLE TO TRAFFIC IMPACT ASSESSMENT

condition or structural integrity of a state-controlled road or road transport infrastructure.		
PO36 Filling and excavation associated with the construction of new or changed access do not compromise the operation or capacity of existing drainage infrastructure for a state-controlled road.	No acceptable outcome is prescribed.	NOT APPLICABLE TO TRAFFIC IMPACT ASSESSMENT

Table 1.5 Environmental emissions

Statutory note: Where a state-controlled road is co-located in the same transport corridor as a railway, the development should instead comply with Environmental emissions in State code 2: Development in a railway environment.

Performance outcomes	Acceptable outcomes	Response
Reconfiguring a lot		
Involving the creation of 5 or fewer new residential lots adjacent to a state-controlled road or type 1 multi-modal corridor		
PO37 Development minimises free field noise intrusion from a state-controlled road.	AO37.1 Development provides a noise barrier or earth mound which is designed, sited and constructed: to achieve the maximum free field acoustic levels in reference table 2 (item 2.1); in accordance with: Chapter 7 integrated noise barrier design of the Transport Noise Management Code of Practice: Volume 1 (Road Traffic Noise), Department of Transport and Main Roads, 2013; Technical Specification-MRTS15 Noise Fences, Transport and Main Roads, 2019;	NOT APPLICABLE TO TRAFFIC IMPACT ASSESSMENT

	Technical Specification-MRTS04 General Earthworks, Transport and Main Roads, 2020. OR AO37.2 Development achieves the maximum free field acoustic levels in reference table 2 (item 2.1) by alternative noise attenuation measures where it is not practical to provide a noise barrier or earth mound. OR AO37.3 Development provides a solid gap-free fence or other solid gap-free structure along the full extent of the boundary closest to the state-controlled road.	
Involving the creation of 6 or more new residential lots adjacent to a state-controlled road or type 1 multi-modal corridor		
PO38 Reconfiguring a lot minimises free field noise intrusion from a state-controlled road.	AO38.1 Development provides noise barrier or earth mound which is designed, sited and constructed: to achieve the maximum free field acoustic levels in reference table 2 (item 2.1); in accordance with: Chapter 7 integrated noise barrier design of the Transport Noise Management Code of Practice: Volume 1 (Road Traffic Noise), Department of Transport and Main Roads, 2013;	NOT APPLICABLE TO TRAFFIC IMPACT ASSESSMENT

	Technical Specification-MRTS15 Noise Fences, Transport and Main Roads, 2019; Technical Specification-MRTS04 General Earthworks, Transport and Main Roads, 2020. OR AO38.2 Development achieves the maximum free field acoustic levels in reference table 2 (item 2.1) by alternative noise attenuation measures where it is not practical to provide a noise barrier or earth mound.	
Material change of use (accommodation activity)		
Ground floor level requirements adjacent to a state-controlled road or type 1 multi-modal corridor		
PO39 Development minimises noise intrusion from a state-controlled road in private open space.	AO39.1 Development provides a noise barrier or earth mound which is designed, sited and constructed: to achieve the maximum free field acoustic levels in reference table 2 (item 2.2) for private open space at the ground floor level; in accordance with: Chapter 7 integrated noise barrier design of the Transport Noise Management Code of Practice: Volume 1 (Road Traffic Noise), Department of Transport and Main Roads, 2013; Technical Specification-MRTS15 Noise Fences, Transport and Main Roads, 2019; Technical Specification-MRTS04 General Earthworks, Transport and Main Roads, 2020.	NOT APPLICABLE TO TRAFFIC IMPACT ASSESSMENT

	OR AO39.2 Development achieves the maximum free field acoustic level in reference table 2 (item 2.2) for private open space by alternative noise attenuation measures where it is not practical to provide a noise barrier or earth mound.	
PO40 Development (excluding a relevant residential building or relocated building) minimises noise intrusion from a state-controlled road in habitable rooms at the facade.	AO40.1 Development (excluding a relevant residential building or relocated building) provides a noise barrier or earth mound which is designed, sited and constructed: to achieve the maximum building façade acoustic level in reference table 1 (item 1.1) for habitable rooms; in accordance with: Chapter 7 integrated noise barrier design of the Transport Noise Management Code of Practice: Volume 1 (Road Traffic Noise), Department of Transport and Main Roads, 2013; Technical Specification-MRTS15 Noise Fences, Transport and Main Roads, 2019; Technical Specification-MRTS04 General Earthworks, Transport and Main Roads, 2020. OR	NOT APPLICABLE TO TRAFFIC IMPACT ASSESSMENT

	AO40.2 Development (excluding a relevant residential building or relocated building) achieves the maximum building façade acoustic level in reference table 1 (item 1.1) for habitable rooms by alternative noise attenuation measures where it is not practical to provide a noise barrier or earth mound.	
PO41 Habitable rooms (excluding a relevant residential building or relocated building) are designed and constructed using materials to achieve the maximum internal acoustic level in reference table 3 (item 3.1).	No acceptable outcome is provided.	NOT APPLICABLE TO TRAFFIC IMPACT ASSESSMENT
Above ground floor level requirements (accommodation activity) adjacent to a state-controlled road or type 1 multi-modal corridor		
PO42 Balconies, podiums, and roof decks include: a continuous solid gap-free structure or balustrade (excluding gaps required for drainage purposes to comply with the Building Code of Australia); highly acoustically absorbent material treatment for the total area of the soffit above balconies, podiums, and roof decks.	No acceptable outcome is provided.	NOT APPLICABLE TO TRAFFIC IMPACT ASSESSMENT
PO43 Habitable rooms (excluding a relevant residential building or relocated building) are designed and constructed using materials to achieve the maximum internal acoustic level in reference table 3 (item 3.1).	No acceptable outcome is provided.	NOT APPLICABLE TO TRAFFIC IMPACT ASSESSMENT
Material change of use (other uses)		
Ground floor level requirements (childcare centre, educational establishment, hospital) adjacent to a state-controlled road or type 1 multi-modal corridor		

PO44 Development: provides a noise barrier or earth mound that is designed, sited and constructed: to achieve the maximum free field acoustic level in reference table 2 (item 2.3) for all outdoor education areas and outdoor play areas; in accordance with: Chapter 7 integrated noise barrier design of the Transport Noise Management Code of Practice: Volume 1 (Road Traffic Noise), Department of Transport and Main Roads, 2013; Technical Specification-MRTS15 Noise Fences, Transport and Main Roads, 2019; Technical Specification-MRTS04 General Earthworks, Transport and Main Roads, 2020; or achieves the maximum free field acoustic level in reference table 2 (item 2.3) for all outdoor education areas and outdoor play areas by alternative noise attenuation measures where it is not practical to provide a noise barrier or earth mound.	No acceptable outcome is provided.	NOT APPLICABLE TO TRAFFIC IMPACT ASSESSMENT
PO45 Development involving a childcare centre or educational establishment: provides a noise barrier or earth mound that is designed, sited and constructed: to achieve the maximum building facade acoustic level in reference table 1 (item 1.2); in accordance with: Chapter 7 integrated noise barrier design of the Transport Noise Management Code of Practice:	No acceptable outcome is provided.	NOT APPLICABLE TO TRAFFIC IMPACT ASSESSMENT

Volume 1 (Road Traffic Noise), Department of Transport and Main Roads, 2013; Technical Specification-MRTS15 Noise Fences, Transport and Main Roads, 2019; Technical Specification-MRTS04 General Earthworks, Transport and Main Roads, 2020; or achieves the maximum building facade acoustic level in reference table 1 (item 1.2) by alternative noise attenuation measures where it is not practical to provide a noise barrier or earth mound.		
PO46 Development involving: indoor education areas and indoor play areas; or sleeping rooms in a childcare centre; or patient care areas in a hospital achieves the maximum internal acoustic level in reference table 3 (items 3.2-3.4).	No acceptable outcome is provided.	NOT APPLICABLE TO TRAFFIC IMPACT ASSESSMENT
Above ground floor level requirements (childcare centre, educational establishment, hospital) adjacent to a state-controlled road or type 1 multi-modal corridor		
PO47 Development involving a childcare centre or educational establishment which have balconies, podiums or elevated outdoor play areas predicted to exceed the maximum free field acoustic level in reference table 2 (item 2.3) due to noise from a state-controlled road are provided with: a continuous solid gap-free structure or balustrade (excluding gaps required for drainage purposes to comply with the Building Code of Australia);	No acceptable outcome is provided.	NOT APPLICABLE TO TRAFFIC IMPACT ASSESSMENT

highly acoustically absorbent material treatment for the total area of the soffit above balconies or elevated outdoor play areas.		
PO48 Development including: indoor education areas and indoor play areas in a childcare centre or educational establishment; or sleeping rooms in a childcare centre; or patient care areas in a hospital located above ground level, is designed and constructed to achieve the maximum internal acoustic level in reference table 3 (items 3.2-3.4).	No acceptable outcome is provided.	NOT APPLICABLE TO TRAFFIC IMPACT ASSESSMENT
Air, light and vibration		
PO49 Private open space, outdoor education areas and outdoor play areas are protected from air quality impacts from a state-controlled road.	AO49.1 Each dwelling or unit has access to a private open space which is shielded from a state-controlled road by a building, solid gap-free fence, or other solid gap-free structure. OR AO49.2 Each outdoor education area and outdoor play area is shielded from a state-controlled road by a building, solid gap-free fence, or other solid gap-free structure.	NOT APPLICABLE TO TRAFFIC IMPACT ASSESSMENT

PO50 Patient care areas within hospitals are protected from vibration impacts from a state-controlled road or type 1 multi-modal corridor.	AO50.1 Hospitals are designed and constructed to ensure vibration in the patient treatment area does not exceed a vibration dose value of 0.1m/s1.75. AND AO50.2 Hospitals are designed and constructed to ensure vibration in the ward of a patient care area does not exceed a vibration dose value of 0.4m/s1.75.	NOT APPLICABLE TO TRAFFIC IMPACT ASSESSMENT
PO51 Development is designed and sited to ensure light from infrastructure within, and from users of, a state-controlled road or type 1 multi-modal corridor, does not: intrude into buildings during night hours (10pm to 6am); create unreasonable disturbance during evening hours (6pm to 10pm).	No acceptable outcomes are prescribed.	NOT APPLICABLE TO TRAFFIC IMPACT ASSESSMENT

Table 1.6: Development in a future state-controlled road environment

Performance outcomes	Acceptable outcomes	Response
PO52 Development does not impede delivery of a future state-controlled road.	AO52.1 Development is not located in a future state-controlled road. OR ALL OF THE FOLLOWING APPLY:	COMPLIES WITH PO - THE PROPOSAL WILL NOT HAVE ADVERSE IMPACT ON STATE CONTROLLED ROAD, REFER TO TRAFFIC REPORT

	AO52.2 Development does not involve filling and excavation of, or material changes to, a future state-controlled road. AND AO52.3 The intensification of lots does not occur within a future state-controlled road. AND AO52.4 Development does not result in the landlocking of parcels once a future state-controlled road is delivered.	
PO53 The location and design of new or changed access does not create a safety hazard for users of a future state-controlled road.	AO53.1 Development does not include new or changed access to a future state-controlled road.	COMPLIES WITH PO - THE PROPOSAL WILL NOT HAVE ADVERSE IMPACT ON STATE CONTROLLED ROAD, REFER TO TRAFFIC REPORT
PO54 Filling, excavation, building foundations and retaining structures do not undermine, damage or cause subsidence of a future state-controlled road.	No acceptable outcome is prescribed.	NOT APPLICABLE TO TRAFFIC IMPACT ASSESSMENT
PO55 Development does not result in a material worsening of stormwater, flooding, overland flow or drainage impacts in a future state-controlled road or road transport infrastructure.	No acceptable outcome is prescribed.	NOT APPLICABLE TO TRAFFIC IMPACT ASSESSMENT
PO56 Development ensures that stormwater is lawfully discharged.	AO56.1 Development does not create any new points of discharge to a future state-controlled road.	NOT APPLICABLE TO TRAFFIC IMPACT ASSESSMENT

	AND AO56.2 Development does not concentrate flows to a future state-controlled road. AND AO56.3 Stormwater run-off is discharged to a lawful point of discharge. AND AO56.4 Development does not worsen the condition of an existing lawful point of discharge to the future state-controlled road.	

C-2: Response to State Code 6

State code 6: Protection of state transport networks

Table 6.2 Development in general

Performance outcomes	Acceptable outcomes	Response
Network impacts		
PO1 Development does not compromise the safety of users of the state-controlled road network.	No acceptable outcome is prescribed.	COMPLIES WITH PO - THE PROPOSAL WILL NOT HAVE ADVERSE IMPACT ON STATE CONTROLLED ROAD, REFER TO TRAFFIC REPORT
PO2 Development does not adversely impact the structural integrity or physical condition of a state-controlled road or road transport infrastructure.	No acceptable outcome is prescribed.	COMPLIES WITH PO - THE PROPOSAL WILL NOT HAVE ADVERSE IMPACT ON STATE CONTROLLED ROAD, REFER TO TRAFFIC REPORT
PO3 Development ensures no net worsening of the operating performance the state-controlled road network.	No acceptable outcome is prescribed.	COMPLIES WITH PO - THE PROPOSAL WILL NOT HAVE ADVERSE IMPACT ON STATE CONTROLLED ROAD, REFER TO TRAFFIC REPORT
PO4 Traffic movements are not directed onto a state-controlled road where they can be accommodated on the local road network.	No acceptable outcome is prescribed.	COMPLIES WITH PO - THE PROPOSAL WILL NOT HAVE ADVERSE IMPACT ON STATE CONTROLLED ROAD, REFER TO TRAFFIC REPORT
PO5 Development involving haulage exceeding 10,000 tonnes per year does not damage the pavement of a state-controlled road.	No acceptable outcome is prescribed.	NOT APPLICABLE TO TRAFFIC IMPACT ASSESSMENT
PO6 Development does not require a new railway level crossing.	No acceptable outcome is prescribed.	NOT APPLICABLE, THE DEVELOPMENT IS NOT WITHIN ACCESSIBLE PROXIMITY OF A RAILWAY
PO7 Development does not adversely impact the operating performance of an existing railway crossing.	No acceptable outcome is prescribed.	NOT APPLICABLE, THE DEVELOPMENT IS NOT WITHIN ACCESSIBLE PROXIMITY OF A RAILWAY
PO8 Development does not adversely impact on the safety of an existing railway crossing.	No acceptable outcome is prescribed.	NOT APPLICABLE, THE DEVELOPMENT IS NOT WITHIN ACCESSIBLE PROXIMITY OF A RAILWAY

PO9 Development is designed and constructed to allow for on-site circulation to ensure vehicles do not queue in a railway crossing.	No acceptable outcome is prescribed.	NOT APPLICABLE, THE DEVELOPMENT IS NOT WITHIN ACCESSIBLE PROXIMITY OF A RAILWAY
PO10 Development does not create a safety hazard within the railway corridor.	No acceptable outcome is prescribed.	NOT APPLICABLE, THE DEVELOPMENT IS NOT WITHIN ACCESSIBLE PROXIMITY OF A RAILWAY
PO11 Development does not adversely impact the operating performance of the railway corridor.	No acceptable outcome is prescribed.	NOT APPLICABLE, THE DEVELOPMENT IS NOT WITHIN ACCESSIBLE PROXIMITY OF A RAILWAY
PO12 Development does not interfere with or obstruct the railway transport infrastructure or other rail infrastructure.	No acceptable outcome is prescribed.	NOT APPLICABLE, THE DEVELOPMENT IS NOT WITHIN ACCESSIBLE PROXIMITY OF A RAILWAY
PO13 Development does not adversely impact the structural integrity or physical condition of a railway corridor or rail transport infrastructure.	No acceptable outcome is prescribed.	NOT APPLICABLE, THE DEVELOPMENT IS NOT WITHIN ACCESSIBLE PROXIMITY OF A RAILWAY
Stormwater and overland flow		
PO14 Stormwater run-off or overland flow from the development site does not create or exacerbate a safety hazard for users of a state transport corridor or state transport infrastructure.	No acceptable outcome is prescribed.	NOT APPLICABLE TO TRAFFIC IMPACT ASSESSMENT
PO15 Stormwater run-off or overland flow from the development site does not result in a material worsening of operating performance of a state transport corridor or state transport infrastructure.	No acceptable outcome is prescribed.	NOT APPLICABLE TO TRAFFIC IMPACT ASSESSMENT
PO16 Stormwater run-off or overland flow from the development site does not interfere with the structural integrity or physical condition of the state transport corridor or state transport infrastructure.	No acceptable outcome is prescribed.	NOT APPLICABLE TO TRAFFIC IMPACT ASSESSMENT
PO17 Development associated with a state-controlled road or road transport infrastructure ensures that stormwater is lawfully discharged.	AO17.1 Development does not create any new points of discharge to a state transport corridor or state transport infrastructure. AND	NOT APPLICABLE TO TRAFFIC IMPACT ASSESSMENT

	AO17.2 Development does not concentrate flows to a state transport corridor. AND AO17.3 Stormwater run-off is discharged to a lawful point of discharge. AND AO17.4 Development does not worsen the condition of an existing lawful point of discharge to a state transport corridor or state transport infrastructure.	
Flooding		
PO18 Development does not result in a material worsening of flooding impacts within a state transport corridor or state transport infrastructure	For a state-controlled road or road transport infrastructure, all of the following apply: AO18.1 For all flood events up to 1% annual exceedance probability, development ensures there are negligible impacts (within +/- 10mm) to existing flood levels within a state transport corridor. AND AO18.2 For all flood events up to 1% annual exceedance probability, development ensures there are negligible impacts (up to a 10% increase) to existing peak velocities within a state transport corridor.	NOT APPLICABLE TO TRAFFIC IMPACT ASSESSMENT

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

	AO19.3 Drainage infrastructure associated with a railway corridor or rail transport infrastructure is wholly contained within the development site. AND AO19.4 Drainage infrastructure can be maintained without requiring access to a state transport corridor.	
PO20 Drainage infrastructure associated with, or in a state-controlled road or road transport infrastructure is constructed and designed to ensure the structural integrity and physical condition of existing drainage infrastructure and the surrounding drainage network is maintained.	No acceptable outcome is prescribed.	NOT APPLICABLE TO TRAFFIC IMPACT ASSESSMENT
Planned upgrades		
PO21 Development does not impede delivery of planned upgrades of state transport infrastructure.	No acceptable outcome is prescribed.	COMPLIES WITH PO - THE PROPOSAL WILL NOT HAVE ADVERSE IMPACT ON STATE CONTROLLED ROAD, REFER TO TRAFFIC REPORT

Table 6.3 Public passenger transport infrastructure and active transport

Performance outcomes	Acceptable outcomes	Response
PO22 Development does not damage or interfere with public passenger transport infrastructure, active transport infrastructure or public passenger services.	No acceptable outcome is prescribed.	COMPLIES WITH PO, THE PROPOSAL DOES NOT COMPROMISE THE SAFETY AND OPERATION OF THE EXISTING PUBLIC AND ACTIVE TRANSPORT FACILITIES
PO23 Development does not compromise the safety of public passenger transport infrastructure, public passenger services and active transport infrastructure.	No acceptable outcome is prescribed.	COMPLIES WITH PO, THE PROPOSAL DOES NOT COMPROMISE THE SAFETY AND OPERATION OF THE EXISTING PUBLIC AND ACTIVE TRANSPORT FACILITIES

PO24 Development does not adversely impact the operating performance of public passenger transport infrastructure, public passenger services and active transport infrastructure.	No acceptable outcome is prescribed.	COMPLIES WITH PO, THE PROPOSAL DOES NOT COMPROMISE THE SAFETY AND OPERATION OF THE EXISTING PUBLIC AND ACTIVE TRANSPORT FACILITIES
PO25 Development does not adversely impact the structural integrity or physical condition of public passenger transport infrastructure and active transport infrastructure.	No acceptable outcome is prescribed.	COMPLIES WITH PO, THE PROPOSAL DOES NOT COMPROMISE THE SAFETY AND OPERATION OF THE EXISTING PUBLIC AND ACTIVE TRANSPORT FACILITIES
PO26 Upgraded or new public passenger transport infrastructure and active transport infrastructure is provided to accommodate the demand for public passenger transport and active transport generated by the development.	No acceptable outcome is prescribed.	NOT APPLICABLE - NO UPGRADED OR NEW PUBLIC TRANSPORT INFRASCTRUCTURE IS PROPOSED TO BE CONSTRUCTED
PO27 Development is designed to ensure the location of public passenger transport infrastructure prioritises and enables efficient public passenger services.	No acceptable outcome is prescribed.	NOT APPLICABLE - NO UPGRADED OR NEW PUBLIC TRANSPORT INFRASCTRUCTURE IS PROPOSED TO BE CONSTRUCTED
PO28 Development enables the provision or extension of public passenger services, public passenger transport infrastructure and active transport infrastructure to the development and avoids creating indirect or inefficient routes for public passenger services.	No acceptable outcome is prescribed.	NOT APPLICABLE - NO UPGRADED OR NEW PUBLIC TRANSPORT INFRASCTRUCTURE IS PROPOSED TO BE CONSTRUCTED
PO29 New or modified road networks are designed to enable development to be serviced by public passenger services.	AO29.1 Roads catering for buses are arterial or sub-arterial roads, collector or their equivalent. AND AO29.2 Roads intended to accommodate buses are designed and constructed in accordance with:	NOT APPLICABLE - NO UPGRADED OR NEW PUBLIC TRANSPORT INFRASCTRUCTURE IS PROPOSED TO BE CONSTRUCTED

	Road Planning and Design Manual, 2nd Edition, Volume 3 – Guide to Road Design; Department of Transport and Main Roads; Supplement to Austroads Guide to Road Design (Parts 3, 4-4C and 6), Department of Transport and Main Roads; Austroads Guide to Road Design (Parts 3, 4-4C and 6); Austroads Design Vehicles and Turning Path Templates; Queensland Manual of Uniform Traffic Control Devices, Part 13: Local Area Traffic Management and AS 1742.13-2009 Manual of Uniform Traffic Control Devices – Local Area Traffic Management; AND AO29.3 Traffic calming devices are not installed on roads used for buses in accordance with section 2.3.2 Bus Route Infrastructure, Public Transport Infrastructure Manual, Department of Transport and Main Roads, 2015.	
PO30 Development provides safe, direct and convenient access to existing and future public passenger transport infrastructure and active transport infrastructure.	No acceptable outcome is prescribed.	COMPLIES WITH PO - EXISTING PUBLIC AND ACTIVE PASSENGER TRANSPORT ARE RETAINED
PO31 On-site vehicular circulation ensures the safety of both public passenger transport services and pedestrians.	No acceptable outcome is prescribed.	COMPLIES WITH PO, REFER TO TRAFFIC REPORT
PO32 Taxi facilities are provided to accommodate the demand generated by the development.	No acceptable outcome is prescribed.	NOT APPLICABLE, DEDICATED TAXI FACILITIES ARE NOT CONSIDERED TO BE NECESSARY

PO33 Facilities are provided to accommodate the demand generated by the development for community transport services, courtesy transport services, and booked hire services other than taxis.	No acceptable outcome is prescribed.	NOT APPLICABLE, DEDICATED OTHER TRANSPORT FACILITIES ARE NOT CONSIDERED TO BE NECCESSARY
PO34 Taxi facilities are located and designed to provide convenient, safe and equitable access for passengers.	AO34.1 A taxi facility is provided parallel to the kerb and adjacent to the main entrance. AND AO34.2 Taxi facilities are designed in accordance with: AS2890.5–1993 Parking facilities – on-street parking and AS1428.1–2009 Design for access and mobility – general requirements for access – new building work; AS1742.11–1999 Parking controls – manual of uniform traffic control devices AS/NZS 2890.6–2009 Parking facilities –off street parking for people with disabilities; Disability standards for accessible public transport 2002 made under section 31(1) of the Disability Discrimination Act 1992; AS/NZS 1158.3.1 – Lighting for roads and public spaces, Part 3.1: Pedestrian area (category P) lighting – Performance and design requirements; Chapter 7 Taxi Facilities, Public Transport Infrastructure Manual, Department of Transport and Main Roads, 2015.	NOT APPLICABLE, DEDICATED TAXI FACILITIES ARE NOT CONSIDERED TO BE NECESSARY
PO35 Educational establishments are designed to ensure the safe and efficient operation of public passenger services, pedestrian and cyclist access and active transport infrastructure.	AO35.1 Educational establishments are designed in accordance with the provisions of the Planning for Safe Transport Infrastructure at Schools, Department of Transport and Main Roads, 2011.	NOT APPLICABLE, THE PROPOSAL IS NOT FOR AN EDUCATIONAL ESTABLISHMENT

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Technical Memorandum

To:	From
Rockhampton Regional Council (RRC)	Chris Hewitt Principal Civil Engineer McMurtrie Consulting Engineers

RE: Response to Information Request (D/169-2022) 353 Yaamba Road, Park Avenue

Reference is made to the project at the above address, and Council's Information Request received on 19 January 2023. McMurtrie Consulting Engineers (MCE) have been engaged to prepare a response to Item 5 of the request in relation to traffic and access.

Responses to specific concerns raised in Item 5 of the request are presented below.

5. TRAFFIC AND ACCESS

5.1

Provide a separate access point from the footpaths adjoining Yaamba Road and Main Street for pedestrians and cyclists to safely access the site in accordance with PO29 of the Specialised Centre Zone Code.

RESPONSE:

The site plan has been modified. Please refer to the updated set of architectural drawings.

5.2

Please indicate the expected AM and PM peak hours to identify if they coincide/conflict with the peak hours of the existing schools in the area.

RESPONSE:

As demonstrated in the traffic survey provided as Appendix A in the original report, the morning and afternoon peak hours occur between 7:45am – 8:45am and 3:00pm – 4:00pm respectively. Such correspond with the peak school drop off and pick up periods.

5.3

Please demonstrate how the Main Street access will be utilised without impacting on the safety of pedestrians using the footpath.

RESPONSE:

The proposal retains the location of existing access crossovers to the site, with relatively low increase in traffic turnover at the access resultant from the proposed development as compared to what the existing access use is capable of producing. The proposed arrangement is considered to be satisfactory given:

- The ingress movement to the site will generally be limited to light vehicles, with internal arrangements configured so that heavy vehicles enter the site from Yaamba Road and exit onto Main Street.
- The proposal does not introduce an additional crossover on Main Street. Therefore, the arrangements are similar to that currently provided, with pedestrians needing to give way to traffic associated with the site.
- The proposed all movement function of the crossover is consistent with other driveways along Main Street with similar or more turning demand than that estimated for the site.

As shown in Figure 1, the proposed access has been designed in accordance with AS2890.1:20004, allowing sufficient view lines to be achieved between a pedestrian walking along the frontage and driver exiting the site. Furthermore, it is proposed that a supplementary warning sign be erected just inside the development on the egress approach to warn traffic of the potential for children crossing the driveway.

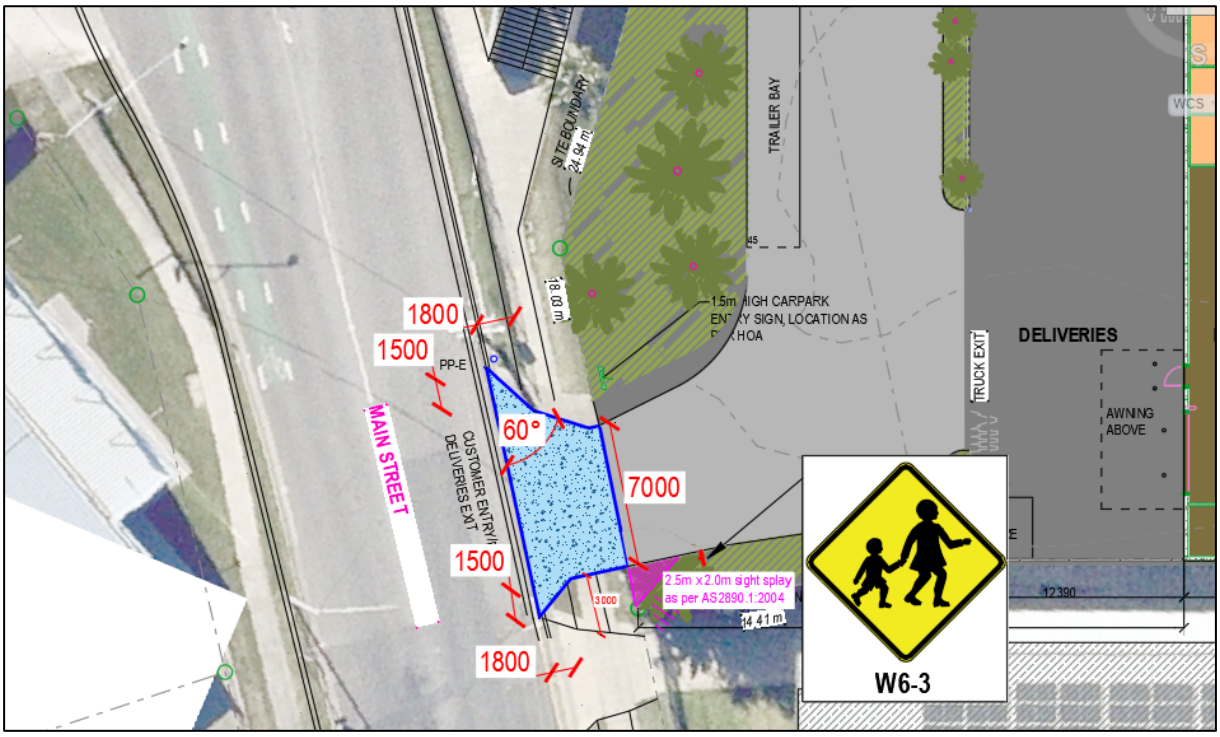

FIGURE 1 – PROPOSED ACCESS ARRANGEMENTS OFF MAIN STEET

5.4

Please provide certification of the Traffic Impact Assessment by a Registered Professional Engineer of Queensland (RPEQ).

RESPONSE:

A certified version of the original traffic report has been included as part of the information request package.

Please contact the undersigned in relation to the above information.

Yours sincerely

Chris Hewitt

Principal Civil Engineer RPEQ NO. 5141

MCE
McMurtrie Consulting Engineers

20 years of reimagining engineering
2002–2022

Engineering reimagined.

353 Yaamba Road Rockhampton

Stormwater Management Plan

ROCKHAMPTON REGIONAL COUNCIL

APPROVED PLANS

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

Development Permit No.: D/169-2022

Dated: 21 February 2025

DATE
9 December 2022

REF

R024-22-23

CLIENT
SPINKSCo Commercial

COMMERCIAL IN CONFIDENCE

Engineering reimagined.

Contact Information

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Document Information

Prepared for	SPINKSCo Commercial
Document Name	Stormwater Management Plan
Job Reference	R024-22-23
Revision	A

Document History

Revision	Date	Description of Revision	Prepared by	Approved by		
				Name	Signature	RPEQ No
A	9/12/2022	Issued for Approval	M. Mathev	C. Hewitt		5141

Contents

1 Introduction

1.1 Project Overview

McMurtrie Consulting Engineers (MCE) have been commissioned by SPINKSCo Commercial to undertake a site-based Stormwater Management Plan (SMP) for a proposed retail showroom located at 353 Yaamba Road, Rockhampton.

The aim of this SMP is to demonstrate that the proposed development will comply with Capricorn Municipal Development Guidelines (CMDG), Queensland Urban Drainage Manual (QUDM 2016), Australian Rainfall and Runoff 2019 (ARR'19) and State Planning Policy (SPP 2017).

1.2 Methodology

The assessment methodology adopted for this SMP is summarised below.

- Broadly identify the contributing catchments to the project.
- Identify Lawful Point of Discharge (LPOD) for the site stormwater runoff.
- Identify the critical storm events and duration for this project
- Estimate peak discharge runoff for pre-development and post-development scenarios.
- Identify potential mitigation and management strategies to ensure no worsening to downstream catchments and infrastructure.

1.3 Data Sources

The background data used to undertake this assessment were collected from the following sources:

- ARR'19 data hub
  - Rainfall data
  - Design storm ensemble temporal patterns
- Preliminary overall layout plan (completed by Reddog Architects dated 24.10.2022)

2 Site Characteristics

2.1 Pre-Development Condition

The proposed site is located at the intersection of Yaamba Road and Mains Street and shares a common boundary with the adjoining lots on the southern and western boundaries.

Figure 1 - Site location plan

As can be seen in Figure 1, the majority of the land is being developed consists of buildings and carparks. Approximately one third (1/3) of the site generally falls towards Yaamba Road and the rest of the site falls towards Mains Street. On average the site has a grade of approximately 1%.

2.2 Post-Development Condition

The proposed use of the site is for a commercial use - refer to Figure 2. The proposed development consists of buildings, carpark, and landscaped areas.

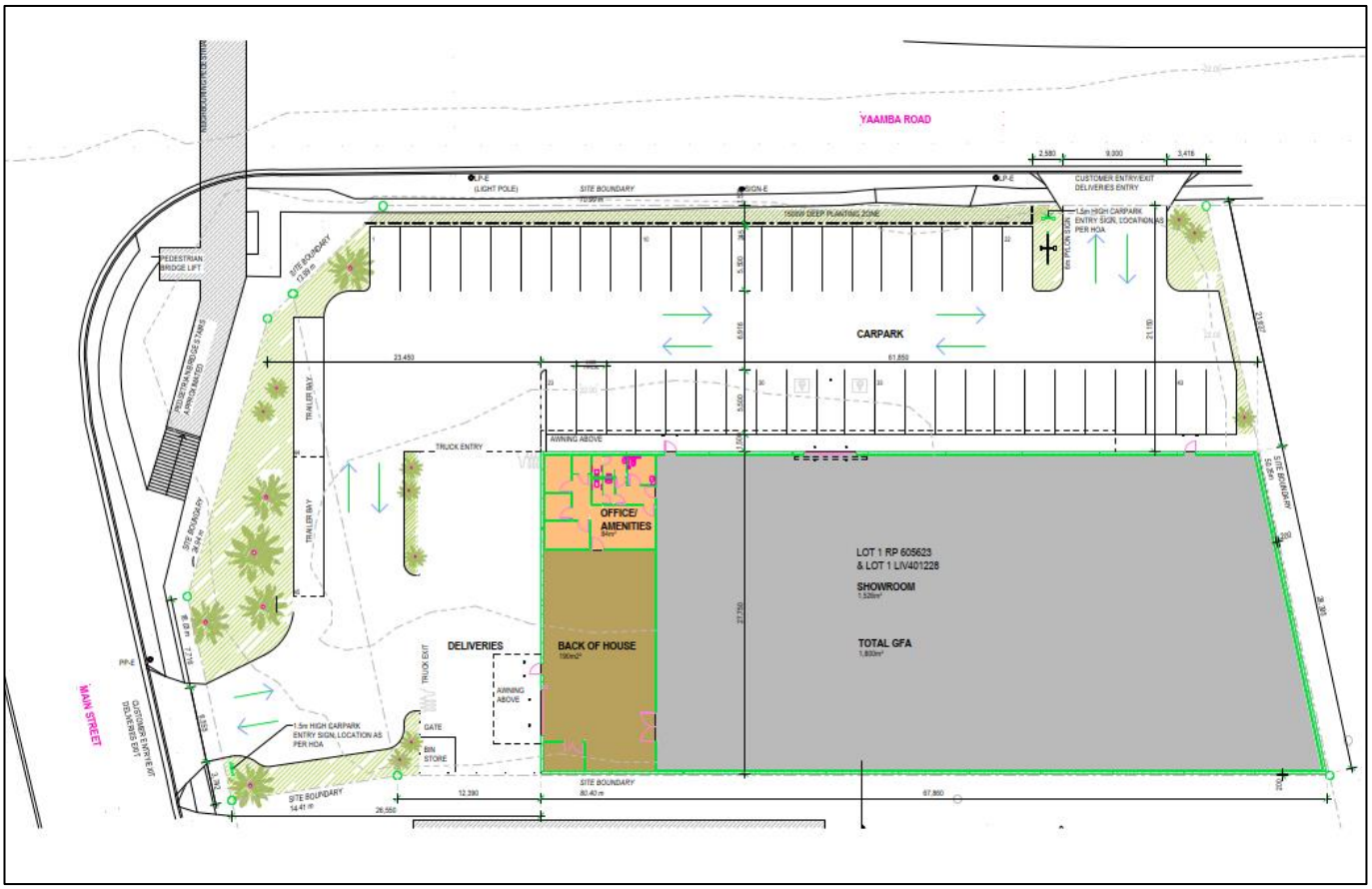

Figure 2 - Proposed site plan

2.3 External Catchments

There are no external catchments impacting this development.

3 Hydrology

The hydrologic assessment flows were derived using the Rational Method and considered the following scenarios:

- Existing: The site in its current condition, as shown in Figure 1.
- Developed: Proposed development, as shown in Figure 2.

3.1 Existing

Runoff from the existing site will be discharging on to Yaamba Road and Mains Street via access points which will be the Lawful point of Discharge (LPOD) for the site.

Table 1 – Rational Method Parameters - Existing

Parameter	
Area (ha)	0.436
Percent Impervious (%)	85
Run-off Coefficient C_{10}	0.87
Time of concentration (min)	5

3.2 Developed

Table 2 details the Rational Method Parameters used for the developed scenario.

Table 2 – Rational Method Parameters - Developed

Parameter	
Area (ha)	0.436
Percent Impervious (%)	90
Run-off Coefficient C_{10}	0.88
Time of concentration (min)	5

3.3 Results

The predicted peak discharge from the site for the existing and developed scenarios are detailed in Table 3. The table indicates that there is negligible increase in post development. Therefore, no detention is proposed for this development.

Table 3 – Peak Discharge

Storm Event (AEP %)	Existing Discharge (m^3/s)	Developed Discharge (m^3/s)	Difference (m^3/s)
10%	0.212	0.214	+0.002
1%	0.367	0.367	0.000

4 Stormwater Quality

The proposed development is for urban purpose of greater than 2,500 m^2 and therefore triggers the water quality assessment benchmarks set out in the State Planning Policy (DILGP, 2017) for MCU works. A stormwater treatment strategy is not proposed for this development for the following reasons;

- The development site currently grades towards Main Street and Yaamba Road. There are no stormwater infrastructures on Yaamba Road and Main Street fronting the development site to join the outlet from the proposed treatment device.
- The proposed use (commercial) and the impervious area for the proposed development is similar to the current development. Therefore, the proposed development would not generate additional nutrients compared to pre-development.

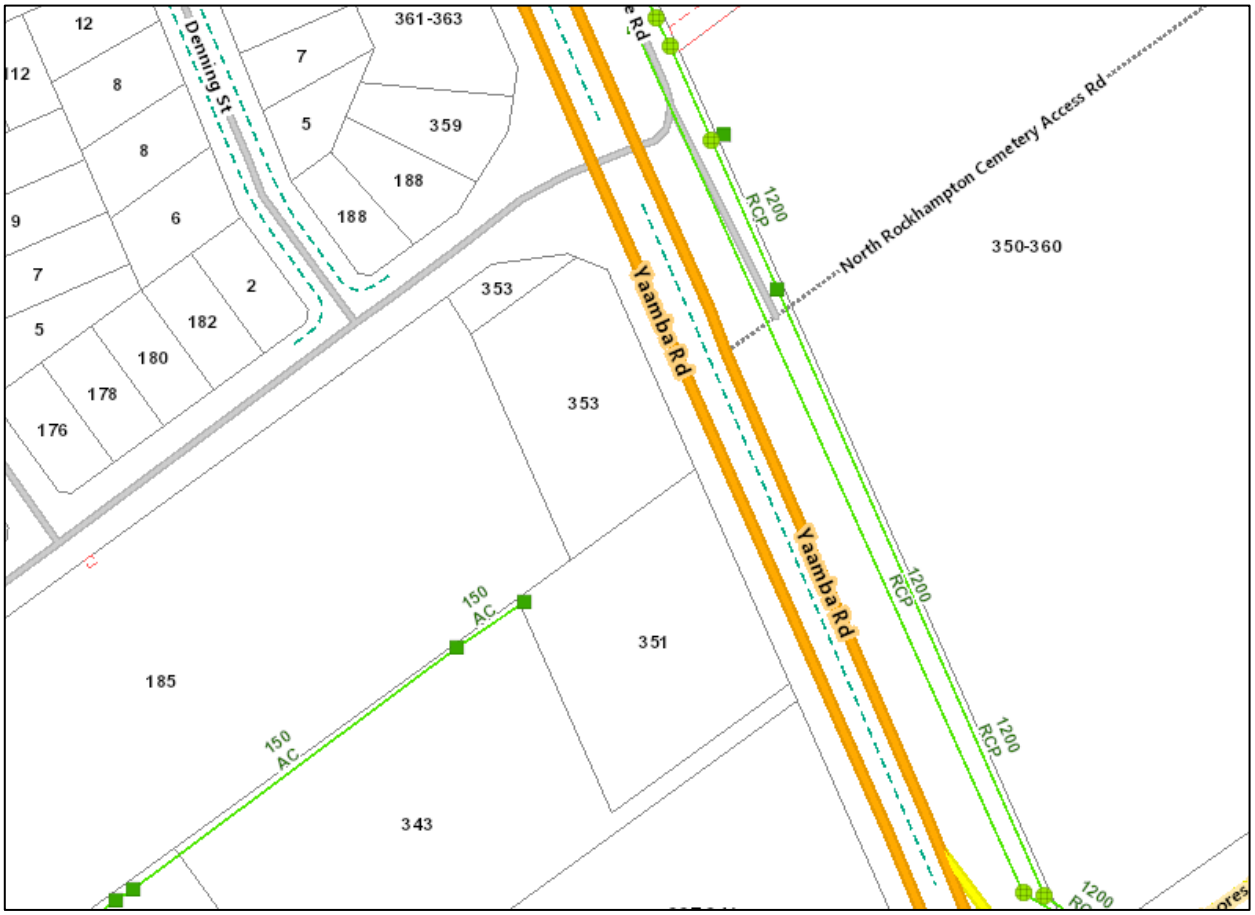

Figure 3 – Existing Stormwater Infrastructure

Deep planting zone have been proposed along the front boundary fronting Yaamba Road and landscaped areas to side boundaries. These zones will provide some form of quality treatment to the surface runoff.

During the construction phase of the development, disturbances to the existing ground have the potential to increase sediment loads entering downstream drainage systems and watercourses. The operational phase of the development will potentially increase the amount of sediments and nutrients washing from the site.

The following sections describe the construction phase controls in compliance with current guidelines.

4.1 Construction Phase

4.1.1 Key Pollutants

During the construction phase a number of key pollutants have been identified for this development. Below table illustrates the key pollutants that have been identified.

Table 4 - Key pollutants - construction phase

Pollutant	Sources
Litter	Paper, construction packaging, food packaging, cement bags, material off cuts.
Sediment	Exposed soils and stockpiles during earthworks and building works.
Hydrocarbons	Fuel and oil spills, leaks from construction equipment and temporary car park areas.

4.1.2 Erosion and Sediment Controls

Erosion and Sediment Control (ESC) devices employed on the site shall be designed and constructed in accordance with Council's guidelines.

PRE-CONSTRUCTION

- Stabilised site access/exit locations.
- Sediment fences to be located along the contour lines downstream of disturbed areas.
- Diversion drains to divert clean runoff around the construction site.
- Educate site personnel to the requirements of the Sediment and Erosion Control Plan.

CONSTRUCTION

- Maintain construction access/exit, sediment fencing, catch drains and all other existing controls as required.
- Progressively surface and revegetate finished areas as appropriate.
- During construction, all areas of exposed soils allowing dust generation are to be suitably treated. Treatments will include mulching the soil and watering.
- Road access is to be regularly cleaned to prevent the transmission of soil on vehicle wheels and eliminate any build-up of typical road dirt and tyre dusts from delivery vehicles.
- Adequate waste disposal facilities are to be provided and maintained on the site to cater for all waste materials such as litter hydrocarbons, toxic materials, acids or alkaline substances.

5 Conclusions and Qualifications

This SMP has been prepared by MCE to support a Development Application for an MCU for a commercial development located at 353 Yaamba Road, Rockhampton, Queensland. There is negligible increase in peak flows at the post development stage and will not result in any actionable nuisance external to the site. Stormwater treatment device is not proposed for this development.

The analysis and overall approach were specifically catered for the particular project requirements and may not be applicable beyond this scope. For this reason, any other third parties are not authorised to utilise this report without further input and advice from MCE.

Whilst this report accurately assesses the catchment hydrology performance using industry standard theoretical techniques and engineering practices, actual future observed catchment flows may vary from those predicted herein. It is acknowledged that there may be some minor discrepancies between the architectural layouts provided in this report. Whilst not ideal, the minor layout discrepancies should form no material impact to the proposed development from an engineering assessment perspective. Conservative engineering principals have been applied to the afforded stormwater intent and servicing. As such, any concern should be suitable for conditioning as part of the detailed design process (i.e., finalised in Operational Works stage).

Appendix A – Catchment Hydrology (Rational Method)

Stormwater Design
Rational Method

Project No: **R024-22-23**
Project Descrption: **353 Yaamba Road, Rockhampton**
Design Details: **10% AEP, Pre-Development**

Coefficient of Discharge Section

Description	*Symbol*	*Unit*	*Value*	*Reference*	*Comments*
Fractions Impervious	f_i		0.850		***Building Roof + Carpark***
1 hour ARI 10 rainfall intensity	${}^{1hr}I_{10}$	mm/hr	65.7	2016 IFD	
Frequency Factor	F_y		1.00	QUDM 2016, Table 4.5.2	***10% AEP***
10yr Coefficient of Discharge	C_{10}		0.87	QUDM 2016, Table 4.5.3	
"y' yr Coefficient of Discharge	C_y		0.87	QUDM 2016, Equ 4.3 $= F_y \times C_{10}$	

Adopted Coefficient of Discharge is: C_y **0.87**

Where a coefficient of discharge calculated from Equation 4.3 for an urban catchment exceeds 1.00, it should be arbitrarily set to 1.0 in accordance with 'the recommendations of Australian Rainfall and Runoff (2016).

Time of Concentration Sheet Flow

Description	*Symbol*	*Unit*	*Value*	*Reference*	*Comments*
Flow path Length	*L*	m	50		

Breakdown of Horton's Surface Areas

	n	*m2*	*%*	
Grass	0.035	650	15%	0.005
Roof and Carpark	0.015	3710	85%	0.013
Total		**4360**		**0.018**

Pre Development

Horton's surface roughness factor	*n*		0.018		***Refer above for breakdown of areas***
Slope of surface	*S*	%	1.0		
Overland sheet flow travel time	*t*	min	7.08	QUDM 2016, Equ 4.5 $= (107\ n\ L^{0.333}) / S^{0.2}$	*Friend's Equation (QUDM 2016, 4.5)*
Adopted Time of Concentration		**min**	**5.00**		*Standard inlet time*

Peak Flow Rate Calculation

Description	*Symbol*	*Unit*	*Value*	*Reference*	*Comments*
"y' yr Coefficient of Discharge	C_y		0.87	As above	
Catchment Area	*A*	ha	0.436		
Average rainfall intensity for a design duration of '*t*' hours (calculated abvoe) and an ARI of 'y' years	${}^{t}I_y$	mm/hr	201	2016 IFD	

Peak Flow Rate for an ARI of 'y' years Q_y m^3/sec **0.212**

Stormwater Design
Rational Method

Project No: **R024-22-23**
Project Descrption: **353 Yaamba Road, Rockhampton**
Design Details: **10% AEP, Post-Development**

Coefficient of Discharge Section

Description	*Symbol*	*Unit*	*Value*	*Reference*	*Comments*
Fractions Impervious	f_i		0.890		***Building Roof + Carpark***
1 hour ARI 10 rainfall intensity	${}^{1hr}I_{10}$	mm/hr	65.7	2016 IFD	
Frequency Factor	F_y		1.00	QUDM 2016, Table 4.5.2	***10% AEP***
10yr Coefficient of Discharge	C_{10}		0.88	QUDM 2016, Table 4.5.3	
"y' yr Coefficient of Discharge	C_y		0.88	QUDM 2016, Equ 4.3 $= F_y \times C_{10}$	

Adopted Coefficient of Discharge is: C_y **0.88**

Where a coefficient of discharge calculated from Equation 4.3 for an urban catchment exceeds 1.00, it should be arbitrarily set to 1.0 in accordance with 'the recommendations of Australian Rainfall and Runoff (2016).

Time of Concentration Sheet Flow

Description	*Symbol*	*Unit*	*Value*	*Reference*	*Comments*
Flow path Length	*L*	m	50		

Breakdown of Horton's Surface Areas

	n	*m2*	*%*	
Grass	0.035	450	10%	0.004
Roof and Carpark	0.015	3910	90%	0.013
Total		**4360**		**0.017**

Post Development

Horton's surface roughness factor	*n*		0.017		***Refer above for breakdown of areas***
Slope of surface	*S*	%	1.0		
Overland sheet flow travel time	*t*	min	6.72	QUDM 2016, Equ 4.5 $= (107\ n\ L^{0.333}) / S^{0.2}$	*Friend's Equation (QUDM 2016, 4.5)*
Adopted Time of Concentration		**min**	**5.00**		*Standard inlet time*

Peak Flow Rate Calculation

Description	*Symbol*	*Unit*	*Value*	*Reference*	*Comments*
"y' yr Coefficient of Discharge	C_y		0.88	As above	
Catchment Area	*A*	ha	0.436		
Average rainfall intensity for a design duration of '*t*' hours (calculated abvoe) and an ARI of 'y' years	${}^{t}I_y$	mm/hr	201	2016 IFD	

Peak Flow Rate for an ARI of 'y' years Q_y m^3/sec **0.214**

Stormwater Design
Rational Method

Project No:	**R024-22-23**
Project Descrption:	**353 Yaamba Road, Rockhampton**
Design Details:	**1% AEP, Pre-Development**

Coefficient of Discharge Section

Description	*Symbol*	*Unit*	*Value*	*Reference*	*Comments*
Fractions Impervious	f_i		0.850		***Building Roof + Carpark***
1 hour ARI 10 rainfall intensity	$^{1hr}I_{10}$	mm/hr	65.7	2016 IFD	
Frequency Factor	F_y		1.20	QUDM 2016, Table 4.5.2	***1% AEP***
10yr Coefficient of Discharge	C_{10}		0.87	QUDM 2016, Table 4.5.3	
'y' yr Coefficient of Discharge	C_y		1.04	QUDM 2016, Equ 4.3 $= F_y \times C_{10}$	
Adopted Coefficient of Discharge is:	C_y		**1.00**	***Where a coefficient of discharge calculated from Equation 4.3 for an urban catchment exceeds 1.00, it should be arbitrarily set to 1.0 in accordance with 'the recommendations of Australian Rainfall and Runoff (2016).***	

Time of Concentration Sheet Flow

Description	*Symbol*	*Unit*	*Value*	*Reference*	*Comments*
Flow path Length	*L*	m	50		

Breakdown of Horton's Surface Areas

	n	*m2*	*%*	
Grass	0.035	650	15%	0.005
Roof and Carpark	0.015	3710	85%	0.013
Total		**4360**		**0.018**

Pre Development

Horton's surface roughness factor	*n*		0.018		***Refer above for breakdown of areas***
Slope of surface	*S*	%	1.0		
Overland sheet flow travel time	*t*	min	7.08	QUDM 2016, Equ 4.5 $= (107\ n\ L^{0.333}) / S^{0.2}$	*Friend's Equation (QUDM 2016, 4.5)*
Adopted Time of Concentration		**min**	**5.00**		*Standard inlet time*

Peak Flow Rate Calculation

Description	*Symbol*	*Unit*	*Value*	*Reference*	*Comments*
'y' yr Coefficient of Discharge	C_y		1.00	As above	
Catchment Area	*A*	ha	0.436		
Average rainfall intensity for a design duration of '*t*' hours (calculated abvoe) and an ARI of 'y' years	$^{t}I_y$	mm/hr	303	2016 IFD	
Peak Flow Rate for an ARI of 'y' years	Q_y	m^3/sec	**0.367**		

Stormwater Design
Rational Method

Project No:	**R024-22-23**
Project Descrption:	**353 Yaamba Road, Rockhampton**
Design Details:	**1% AEP, Post-Development**

Coefficient of Discharge Section

Description	*Symbol*	*Unit*	*Value*	*Reference*	*Comments*
Fractions Impervious	f_i		0.900		***Building Roof + Carpark***
1 hour ARI 10 rainfall intensity	$^{1hr}I_{10}$	mm/hr	65.7	2016 IFD	
Frequency Factor	F_y		1.20	QUDM 2016, Table 4.5.2	***1% AEP***
10yr Coefficient of Discharge	C_{10}		0.88	QUDM 2016, Table 4.5.3	
'y' yr Coefficient of Discharge	C_y		1.06	QUDM 2016, Equ 4.3 $= F_y \times C_{10}$	
Adopted Coefficient of Discharge is:	C_y		**1.00**	***Where a coefficient of discharge calculated from Equation 4.3 for an urban catchment exceeds 1.00, it should be arbitrarily set to 1.0 in accordance with 'the recommendations of Australian Rainfall and Runoff (2016).***	

Time of Concentration Sheet Flow

Description	*Symbol*	*Unit*	*Value*	*Reference*	*Comments*
Flow path Length	*L*	m	50		

Breakdown of Horton's Surface Areas

	n	*m2*	*%*	
Grass	0.035	450	10%	0.004
Roof and Carpark	0.015	3910	90%	0.013
Total		**4360**		**0.017**

Post Development

Horton's surface roughness factor	*n*		0.017		***Refer above for breakdown of areas***
Slope of surface	*S*	%	1.0		
Overland sheet flow travel time	*t*	min	6.72	QUDM 2016, Equ 4.5 $= (107\ n\ L^{0.333}) / S^{0.2}$	*Friend's Equation (QUDM 2016, 4.5)*
Adopted Time of Concentration		**min**	**5.00**		*Standard inlet time*

Peak Flow Rate Calculation

Description	*Symbol*	*Unit*	*Value*	*Reference*	*Comments*
'y' yr Coefficient of Discharge	C_y		1.00	As above	
Catchment Area	*A*	ha	0.436		
Average rainfall intensity for a design duration of '*t*' hours (calculated abvoe) and an ARI of 'y' years	$^{t}I_y$	mm/hr	303	2016 IFD	
Peak Flow Rate for an ARI of 'y' years	Q_y	m^3/sec	**0.367**		

MCE
McMurtrie Consulting Engineers

Engineering reimagined.

ROCKHAMPTON REGIONAL COUNCIL
APPROVED PLANS
These plans are approved subject to the current conditions of approval associated with
Development Permit No.: D/169-2022
Dated: 21 February 2025

Technical Memorandum

To:	From
Rockhampton Regional Council (RRC)	Chris Hewitt Principal Civil Engineer McMurtrie Consulting Engineers chris@mcmengineers.com

RE: Response to Information Request (D/169-2022) 353 Yaamba Road, Park Avenue

Reference is made to the project at the above address, and Council's Information Request received on 19 January 2023. McMurtrie Consulting Engineers (MCE) have been engaged to prepare a response to Item 4 of the request in relation to stormwater.

4. STORMWATER

4.1
Please provide a plan showing the proposed stormwater arrangement for the development utilizing the landscaped areas for quality treatment.

RESPONSE:

The runoff calculations demonstrates that the proposed development will have negligible increase in post development flow rates. Information on parking and the access areas levels and roofwater discharge methods and location will be provided in the Operational Works stage.

Integration of landscaped areas for stormwater quality treatment will depend on the grading of the parking areas. Worst case scenario, if landscaped areas cannot be incorporated for stormwater quality, it is acknowledged that this development will not create any additional nutrients compared to what is currently onsite.

Therefore, we kindly seek Council's approval for the issued SMP which identifies the Lawful Point of Discharge, identifying the mitigation and management strategies for detention and quality. Any additional requirements such as information on parking and the access areas levels and roofwater discharge methods and locations to be conditioned as part of the development application.

Please contact the undersigned in relation to the above information.

Yours sincerely

Chris Hewitt
Principal Civil Engineer RPEQ NO. 5141