PROPOSED COMMERCIAL DEVELOPMENT
136 SOUTH STREET, CENTENARY HEIGHTS

TRAFFIC ENGINEERING ASSESSMENT

12 JUNE 2026

PREPARED FOR
STRUXI

PTT
TRAFFIC & TRANSPORT ENGINEERING

DOCUMENT CONTROL RECORD

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Report Title:	136 South Street, Centenary Heights – Traffic Engineering Assessment					
Client:	Struxi					
Project Number:	26-590					
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A	FINAL	JUN-26	RL	JG	RL (RPEQ 32326)	

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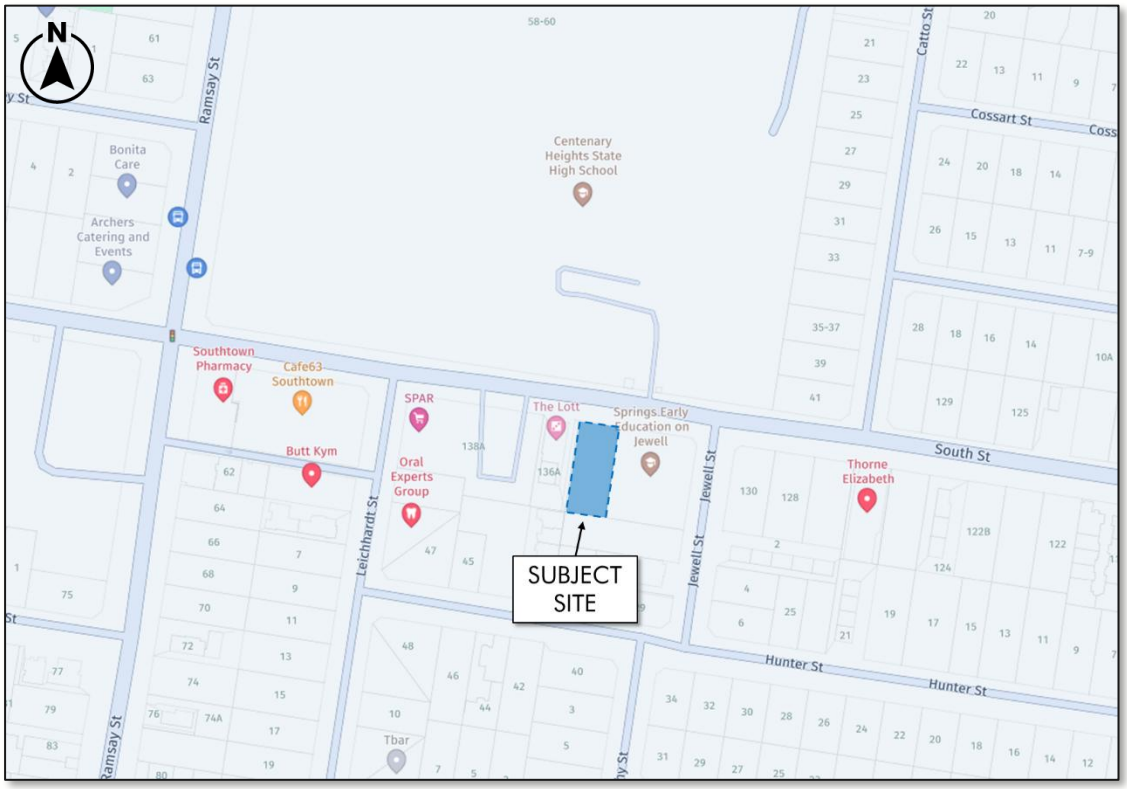
1.0 INTRODUCTION

1.1 BACKGROUND

In May 2025, PTT was commissioned by Struxi to undertake a traffic engineering assessment for a proposed commercial development at 136 South Street, Centenary Heights. The location of the subject site is shown in Figure 1.1.

Figure 1.1: SITE LOCALITY



1.2 AIM

The aim of this assessment is to review the proposed development in terms of its site access arrangements, parking provision and design, servicing arrangements, pedestrian and bicycle facilities and impact on the surrounding road network.

1.3 SCOPE OF REPORT

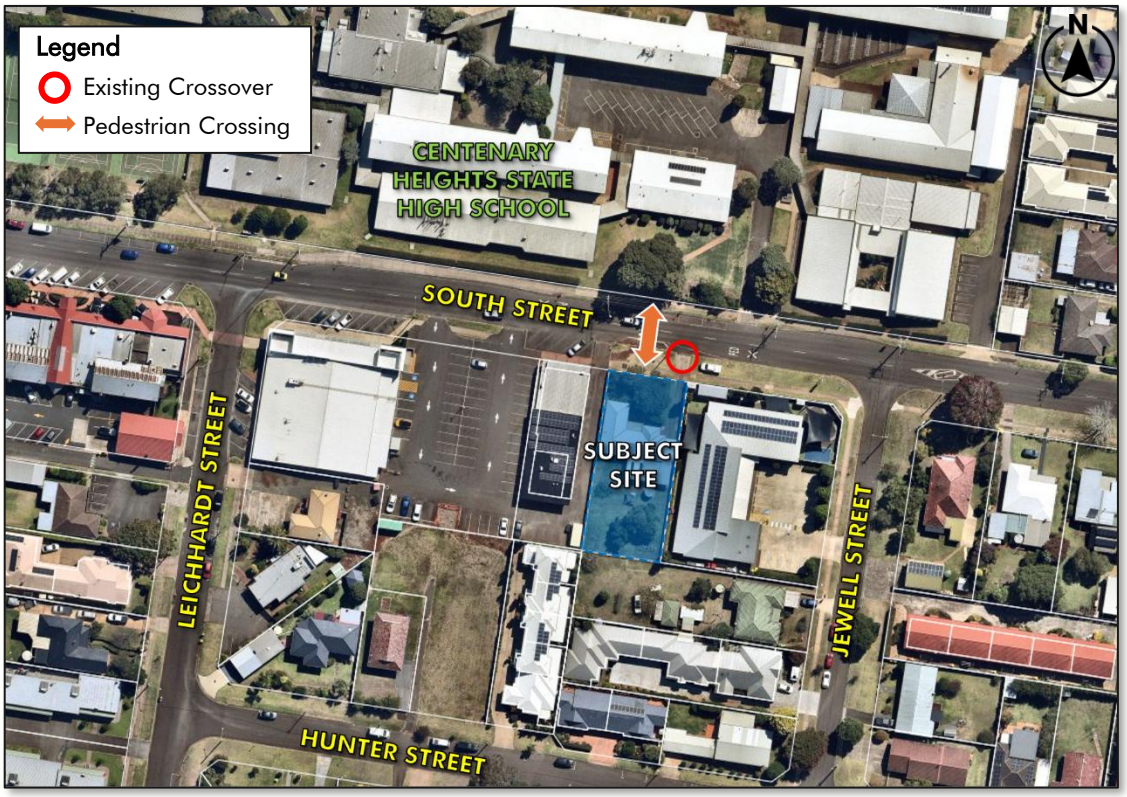
This report begins by summarising the characteristics of the existing road network (Chapter 2), followed by a description of the scope and scale of the proposed development, including access, parking and servicing arrangements (Chapter 3). The predicted peak hour traffic generation of the proposed development is estimated along with a consideration of its likely traffic impact on the surrounding road network (Chapter 4). The report concludes with a summary of key findings and recommendations (Chapter 5).

2.0 EXISTING CONDITIONS

2.1 SUBJECT SITE

The subject site is located at 136 South Street, Centenary Heights and is formally described as Lot 1 on RP44881. The site is zoned as 'Low Medium Density Residential' according to the Toowoomba Regional Council (Council) Planning Scheme. The site has an approximate area of 1,005m^2 and currently accommodates a residential dwelling, as shown in Figure 2.1.

Figure 2.1: SUBJECT SITE



2.2 ACCESS

The site is accessed via an all-movements crossover on South Street, as indicated in Figure 2.1.

2.3 SURROUNDING AREA

As shown in Figure 2.1 the site is bounded by:

- South Street to the north
- a childcare centre to the east
- a residential property to the south
- retail uses to the west

The surrounding area comprises commercial, education and residential uses.

2.4 SURROUNDING ROAD NETWORK

The key attributes of the surrounding road network are summarised in Table 2.1.

Table 2.1: ROAD NETWORK ATTRIBUTES

ATTRIBUTE	SOUTH STREET	LEICHHARDT ST	JEWELL STREET
Road Hierarchy	Distributor	Local	Local
Cross Section	Undivided with one lane per direction	Undivided with one lane per direction	Undivided with one lane per direction
Speed Limit (km/h)	60 (40 school zone)	50	50
Jurisdiction	Council	Council	Council
Predominant Land Uses	Commercial, Education and Residential	Commercial and Residential	Residential
On-Street Parking	Yes (formal)	Yes (informal)	Yes (informal)
Footpaths	Yes (both sides)	Yes (west side)	Yes (west side)
Bicycle Lanes	No	No	No
Bus Route	No	No	No

2.5 ACTIVE AND PUBLIC TRANSPORT

2.5.1 Pedestrians and Cyclists

Pedestrian footpaths are provided on both sides of South Street and along the western sides of Leichhardt Street and Jewell Street. A pedestrian crossing is located on South Street along the site frontage, as shown in Figure 2.1.

No on-street bicycle lanes are provided in the vicinity of the site.

2.5.2 Public Transport

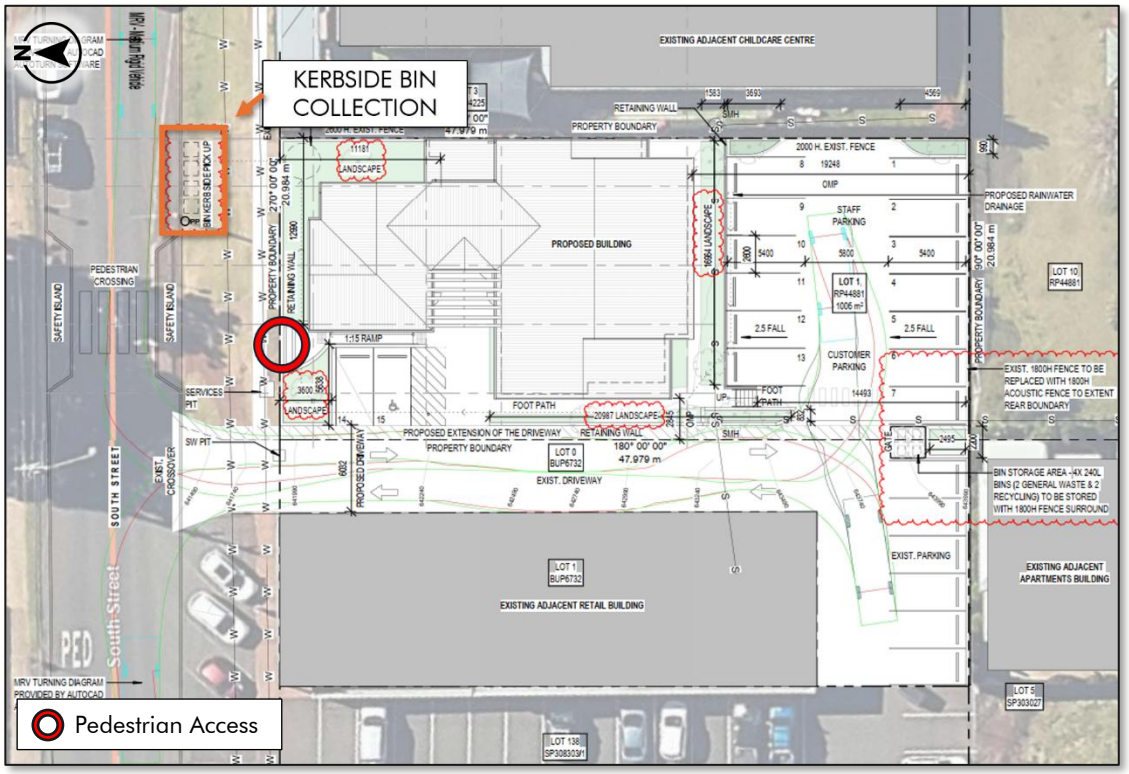
A public bus stop pair is located on Ramsay Street approximately 200m west of the subject site. This stop is serviced by TransLink bus route 904, which services areas between Toowoomba to the north and Drayton to the south. This route operates approximately once an hour between 7:15am and 6:00pm. Accordingly, the site is served by public transport.

3.0 PROPOSED DEVELOPMENT

3.1 PROPOSAL

The development application seeks approval for a commercial building, comprising approximately 330m^2 GFA. The proposed layout is shown in Figure 3.1, with plans of development included in Appendix A.

Figure 3.1: PROPOSED SITE LAYOUT



3.2 ACCESS

3.2.1 Location

The proposed development would be accessed via an existing crossover to 136A South Street (ie adjacent retail development to the west of the subject site). The existing access to the subject site would be closed.

Australian Standard AS2890.1 Parking Facilities Part 1: Off-Street Car Parking (AS2890.1) requires that access driveways be located a minimum of 6m from the kerb tangent point of adjacent intersections. The access is located well in excess of 6m from the adjacent intersections. As such, the access location is consistent with Australian Standards requirements.

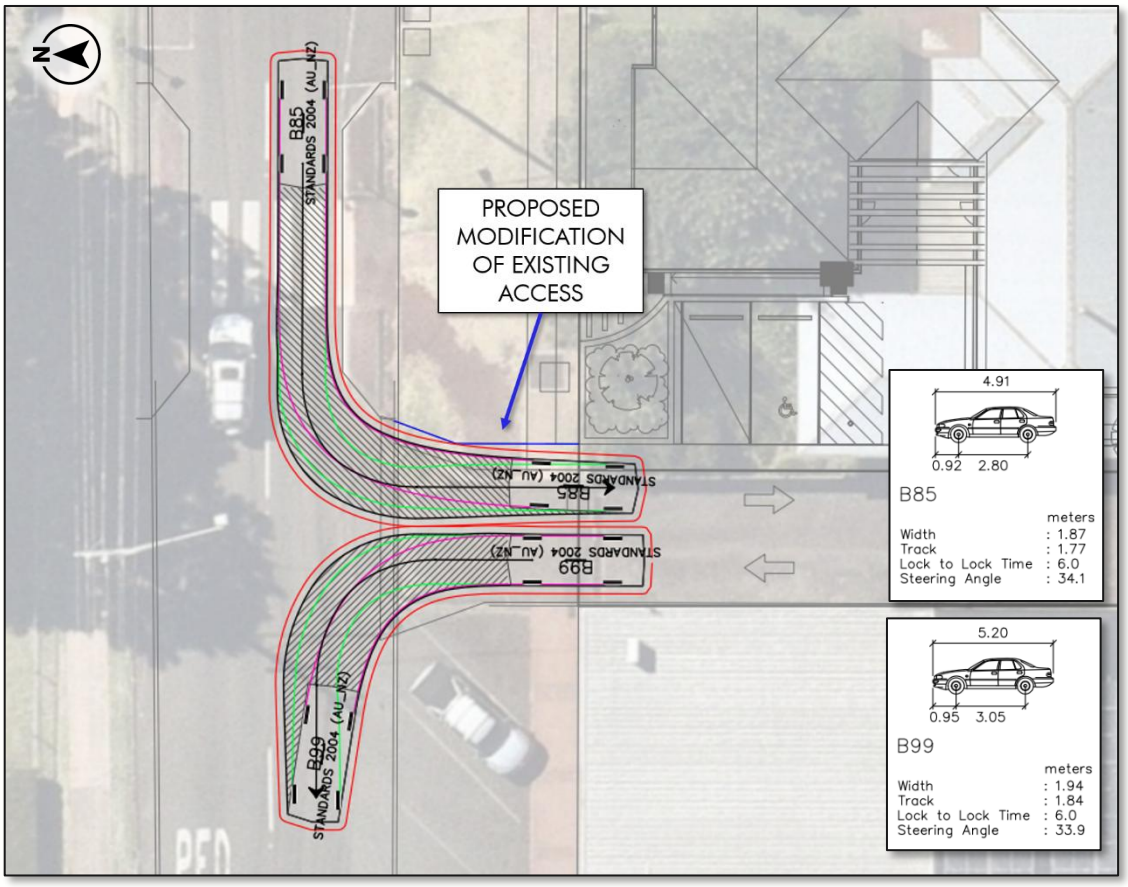
The access is located near to a pedestrian crossing. There is no minimum separation requirement between access driveways and pedestrian crossings.

3.2.2 Design

The proposed development would upgrade the existing 5m wide access driveway to a 6m wide driveway, by extending it 1.0m into the subject site. Right turns out from the access would be restricted to minimise the impacts on the adjacent pedestrian crossing. It is recommended that a 'no right turn' regulatory sign be installed at the exit to enforce the restriction.

The access flares have been modified due to the proximity of the existing access to angled on-street parking to the west and the kerb build out for the pedestrian crossing on the east. Figure 3.2 and Appendix B demonstrate that the proposed access arrangements can accommodate simultaneous operations of cars entering and exiting the site.

Figure 3.2: VEHICLE ACCESS



3.2.3 Sight Distance

No changes are proposed to the access that would affect the existing sight distance provision.

3.2.4 Queuing

AS2890.1 recommends that sufficient on-site queuing be provided to allow a free influx of traffic which will not adversely affect traffic or pedestrian flows on the frontage road (ie South Street). The 95th percentile queue at the development access is considered to be an adequate measure of the minimum queuing space required at the site access.

The 95th percentile queue at the site access has been calculated using queuing theory, as outlined in the PTT Practice Note, attached in Appendix C. The results of the analysis indicate a 95th percentile queue at the access of 0.07 vehicles during the busiest peak hour. Based on an average vehicle length of 6.0m, this equates to a 95th percentile queue length of 0.4m.

The proposed access point incorporates 3.9m of queuing space, measured between the site boundary and the first conflict point (ie the first parking space). Therefore, the proposed on-site queuing provision is expected to be sufficient to cater for the proposed development.

3.3 CAR PARKING

3.3.1 Requirement

The car parking requirement for the site has been determined based on the parking provision rates outlined in Council's Transport, Access and Parking (TAP) Code. As shown in Table 3.1, a parking provision of 16 spaces would be required to support the proposed development.

Table 3.1: PARKING REQUIREMENTS

LAND USE	SCALE	PARKING RATE	REQUIREMENT
Commercial (Shop)	330m^2 GFA	1 space per 20m^2 GFA	17

3.3.2 Provision

The proposal includes 15 parking spaces to support the development. This represents a shortfall of two spaces compared Council's TAP Code. However, the site is located next to two commercial developments, and some customers may visit multiple stores in a single visit. As such, it is expected that there would be some shared use of adjacent development parking areas.

3.3.3 Persons with Disability (PWD) Parking

The National Construction Code (NCC) specifies that parking spaces for persons with a disability be provided at a rate of one space per 50, or part thereof, for a Class 6 building (ie commercial building). The proposed development comprises one PWD parking space which satisfies the NCC requirements.

3.3.4 Design

The layout of on-site parking has been designed generally in accordance with the requirements of AS2890.1. This is typified by:

- standard parking bays dimensioned 2.6m wide by 5.4m long
- PWD parking spaces dimensioned 2.4m wide by 5.4m long with an adjacent shared bay dimensioned 2.4m wide by 5.4m long
- parking aisles dimensioned a minimum 5.8m wide
- end of aisle treatments dimensioned a minimum of 1.0m wide

3.4 SERVICING

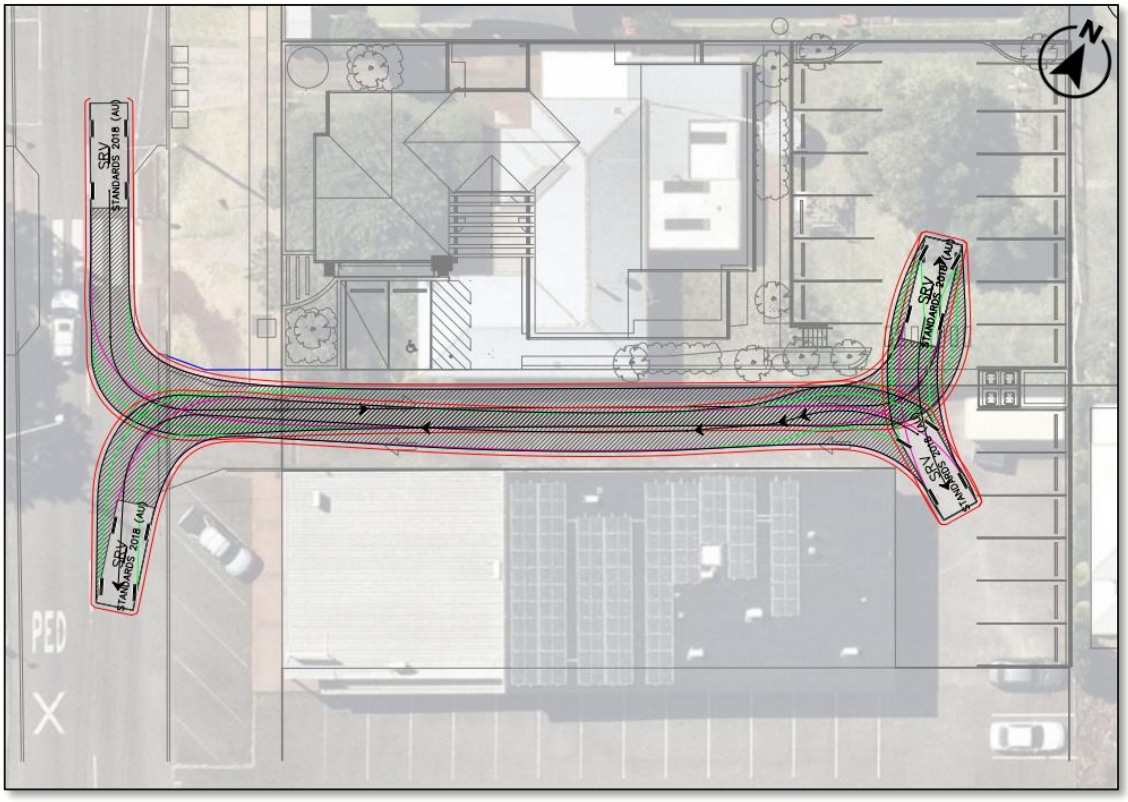
3.4.1 Refuse Collection

Refuse collection is proposed kerbside (ie on-street) using wheelie bins. As shown in Figure 3.1, there is sufficient frontage to accommodate four wheelie bins.

3.4.2 Deliveries

Council's TAP Code requires on-site servicing by a Heavy Rigid Vehicle (HRV) for shop uses less than 500m^2 GFA. However, given the scale of the proposed tenancy, it is unlikely that it would generate the servicing demand for an HRV. As such, it is expected that a Small Rigid Vehicle (SRV) would regularly service the proposed development. Figure 3.3 and Appendix B demonstrate that the proposed layout can accommodate SRV access and manoeuvring.

Figure 3.3: SRV MANOEUVRING



3.5 ACTIVE TRANSPORT

A dedicated pedestrian access, separate from the vehicular driveway, is proposed on the South Street frontage, as indicated in Figure 3.1. Internal pedestrian footpaths are proposed to provide connection between the access, parking and the commercial tenancy.

4.0 TRAFFIC OPERATIONS

4.1 TRAFFIC GENERATION

The following trip generation rates have been adopted for small retail uses (ie less than 500m^2 GFA per tenancy) based on the RTA's Guide to Traffic Generating Developments (2002) for Speciality Shops:

- 2.8 trips per 100m^2 GFA for the weekday morning peak hour
- 5.6 trips per 100m^2 GFA for the weekday evening peak hour
- 10.7 trips per 100m^2 GFA for the Saturday peak hour

The traffic generation associated with the proposed development is summarised in Table 4.1. As shown, the proposed development would generate a maximum of 35vph and the highest traffic generating day is expected to be a Saturday.

Table 4.1: PEAK TRAFFIC GENERATION

PEAK HOUR	SCALE	TRIP RATE	TRIPS (VEH/HR)	IN:OUT SPLIT	IN:OUT SPLIT (VEH)
Weekday Morning	330m^2 GFA	2.8 trips per 100m^2 GFA	9	50 : 50	4.5 : 4.5
Weekday Evening		5.6 trips per 100m^2 GFA	18	50 : 50	9 : 9
Saturday		10.7 trips per 100m^2 GFA	35	50 : 50	18 : 18

4.2 TRAFFIC IMPACT

Based on the low predicted traffic generation (ie approximately 35 two-way vehicle movements in the Saturday peak hour), the proposed development is not expected to have a significant adverse impact on the safety or efficiency of the surrounding road network.

Furthermore, the site is expected to generate even lower traffic volumes on weekdays during peak school traffic hours on South Street.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

The proposed commercial development at 136 South Street, Centenary Heights has been evaluated in terms of its site access arrangements, internal layout and impact on the surrounding road network. The main points to note are:

- the development application seeks approval for a commercial development, comprising a total of 330m^2 GFA
- vehicular access is proposed via the existing crossover to 136A South Street
- the proposal includes a 1.0m widening the east side of the access
- right-out manoeuvres at the access would be restricted
- the proposal includes an on-site parking provision of 15 parking spaces
- on-site parking layout has been designed in accordance with AS2890.1 requirements
- the proposed queuing provision is consistent with AS2890.1 requirements
- a SRV would regularly service the proposed development
- the proposed pedestrian facilities are expected to facilitate safe and convenient access within the site
- the proposed development is expected to generate 9vph, 18vph and 35vph during the weekday morning, weekday evening and Saturday peak hours, respectively
- the addition of development generated traffic is not expected to have a significant adverse impact on intersection operations

5.2 RECOMMENDATIONS

Based on the above, it is recommended that a 'no right turn' regulatory sign be installed at the exit.

APPENDIX A
PLANS OF DEVELOPMENT

SITE DETAILS:

STREET ADDRESS	136 SOUTH STREET, CENTENARY HEIGHTS QLD 4350
SITE DESCRIPTION	LOT 1 ON RP44881
SITE AREA	1006m²
LOCAL AUTHORITY	TOOWOOMBA REGIONAL COUNCIL

PLANNING SCHEME DETAILS:

ZONING	LOW MEDIUM DENSITY RESIDENTIAL
PRECINCT	URBAN RESIDENTIAL PRECINCT
DEFINED USE	COMMERCIAL
APPLICABLE CODES	AIRPORT ENVIRONS OVERLAY
GFA	280m²
COMMON USE AREA	50m²
SITE COVER	32.4%
LANDSCAPING	132.5m²
IMPERVIOUS AREA	873.5m²
IMPERVIOUS COVER	86.8%
CARPARKS REQUIRED	14
CARPARKS PROVIDED	15

BUILDING CODE DETAILS:

BUILDING CLASS	5 & 6
CONSTRUCTION TYPE	C
TOTAL FLOOR AREA	326
FIRE COMPARTMENTS	N/A
STOREYS	1
POPULATION	8
WIND CATEGORY	BY ENGINEER
CLIMATE ZONE	5

BUILDING USE:

NUMBER OF EMPLOYEES	12
DAYS OF OPERATION	6/WEEK
NUMBER OF VISITORS	12
NUMBER OF SEATS	25
CAPACITY STORAGE	7.9m²

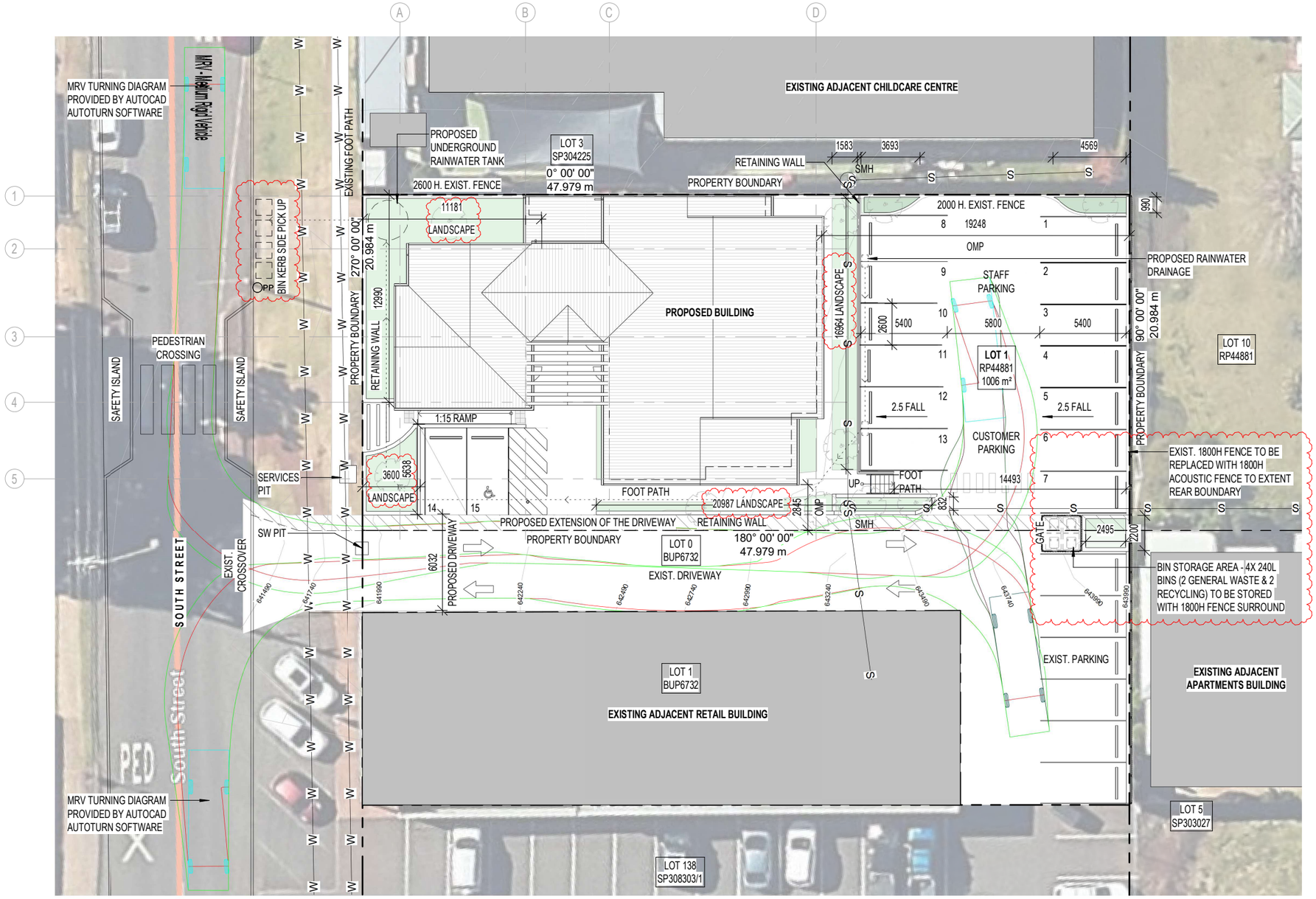
GFA AREA SCHEDULE	
NAME	AREA
GFA	280 m²
COMMON AREA	50 m²
GRAND TOTAL	330 m²

COMMERCIAL SITE PLAN NOTES:

- BUILDER IS TO CONFIRM THE LOCATION OF ALL SERVICES PRIOR TO THE COMMENCEMENT OF WORK
- EARTHWORKS & SEDIMENT CONTROL ARE TO COMPLY WITH THE CIVIL ENGINEER'S DESIGN DOCUMENTS
- FINISHED LEVELS & SURFACES ARE TO COMPLY WITH THE ENGINEER'S STORMWATER MANAGEMENT REPORT & DESIGN DOCUMENTS & WITH NCC FP1.1, FP1.2 & FP1.3
- REFER TO ENGINEER'S DRAWINGS FOR LOCATION & DESIGN OF RETAINING WALLS
- ALL STORMWATER DISCHARGE FROM ROOF IS TO COMPLY WITH THE HYDRAULIC ENGINEER'S DESIGN DOCUMENTS & AS 3500.3
- ONLY THE VEGETATION WITHIN THE AREA REQUIRED TO CONSTRUCT THE PAD PLATFORM IS TO BE REMOVED
- BUILDER IS TO REMOVE FOREIGN & LEFT-OVER MATERIAL ON OR ABOVE THE SITE SURFACE, INCLUDING RUBBISH, SCRAP, GRASS, VEGETABLE MATTER AND ORGANIC DEBRIS, SCRUB, TIMBER, STUMPS, BOULDERS AND RUBBLE.
- REMOVE THE TOPSOIL LAYER OF THE NATURAL GROUND WHICH CONTAINS SUBSTANTIAL ORGANIC MATTER OVER THE AREAS TO BE OCCUPIED BY CONSTRUCTION AND PAVING.
- STOCKPILE SITE TOPSOIL REQUIRED FOR RE-USE. PROTECT STOCKPILES FROM CONTAMINATION BY OTHER EXCAVATED MATERIAL, WEEDS AND BUILDING DEBRIS
- BUILDER IS TO PROVIDE APPROPRIATE TEMPORARY & PERMANENT FENCING TO THE SITE IN ACCORDANCE WITH ALL RELEVANT AUSTRALIAN STANDARDS & LOCAL AUTHORITY REQUIREMENTS
- BUILDER TO ENSURE SITE ACCESS, TRAFFIC MANAGEMENT, & WATER STORAGE AREA COMPLY WITH THE NCC, ALL RELEVANT AUSTRALIAN STANDARDS & LOCAL AUTHORITY REQUIREMENTS
- CROSSOVER TO COMPLY WITH COUNCIL REGULATIONS
- RAMPS, WALKWAYS & FOOTPATHS ARE TO COMPLY WITH DESIGN DOCUMENTS (INCLUSIVE OF ALL PROJECT CONSULTANTS) & AS 1428.1.10. DISCREPANCIES BETWEEN CONSULTANTS' DESIGNS, & BETWEEN DESIGN DOCUMENTS & THE STANDARD ARE TO BE REFERRED TO THE DESIGNER
- CAR PARKING LAYOUTS ARE TO COMPLY WITH DESIGN DOCUMENTS (INCLUSIVE OF ALL PROJECT CONSULTANTS) & AS 2890. DISCREPANCIES BETWEEN CONSULTANTS' DESIGNS, & BETWEEN DESIGN DOCUMENTS & THE STANDARD ARE TO BE REFERRED TO THE DESIGNER

KEY — SITE PROPOSED

SYMBOL	DESCRIPTION
	SURFACE GRADIENT LINE (APPROX)
—S—	EXISTING SEWER LINE
—W—	EXISTING WATER MAIN
PP	EXISTING POWERPOLE
SMH	EXISTING SEWER MAIN HOLE



PROPOSED SITE PLAN

1 : 200

0 1m 2m 4m 6m 8m 10m

1:200

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PROUD MEMBER OF BUILDING DESIGN QUEENSLAND SINCE 2005 MEMBER NUMBER: 720

ISSUE	DESCRIPTION	DATE
B	FOR COORDINATION	21.04.2026
A	DA APPLICATION	07.04.2026

PROJECT NAME: BEAUTY SALON (MCU)
STREET ADDRESS: 136 SOUTH STREET, CENTENARY HEIGHTS 4350 QLD
REAL PROPERTY DESCRIPTION: LOT 1 OF 44881
CLIENT: 136A SOUTH STREET PROPERTY TRUST

SHEET TITLE: PROPOSED SITE PLAN

AUTHOR	CEH
DESIGNER	RJP
ORIGINAL SIZE	420 x 594 - A2
PRINT DATE	4/21/2026 3:24:07 PM
SCALE	As indicated

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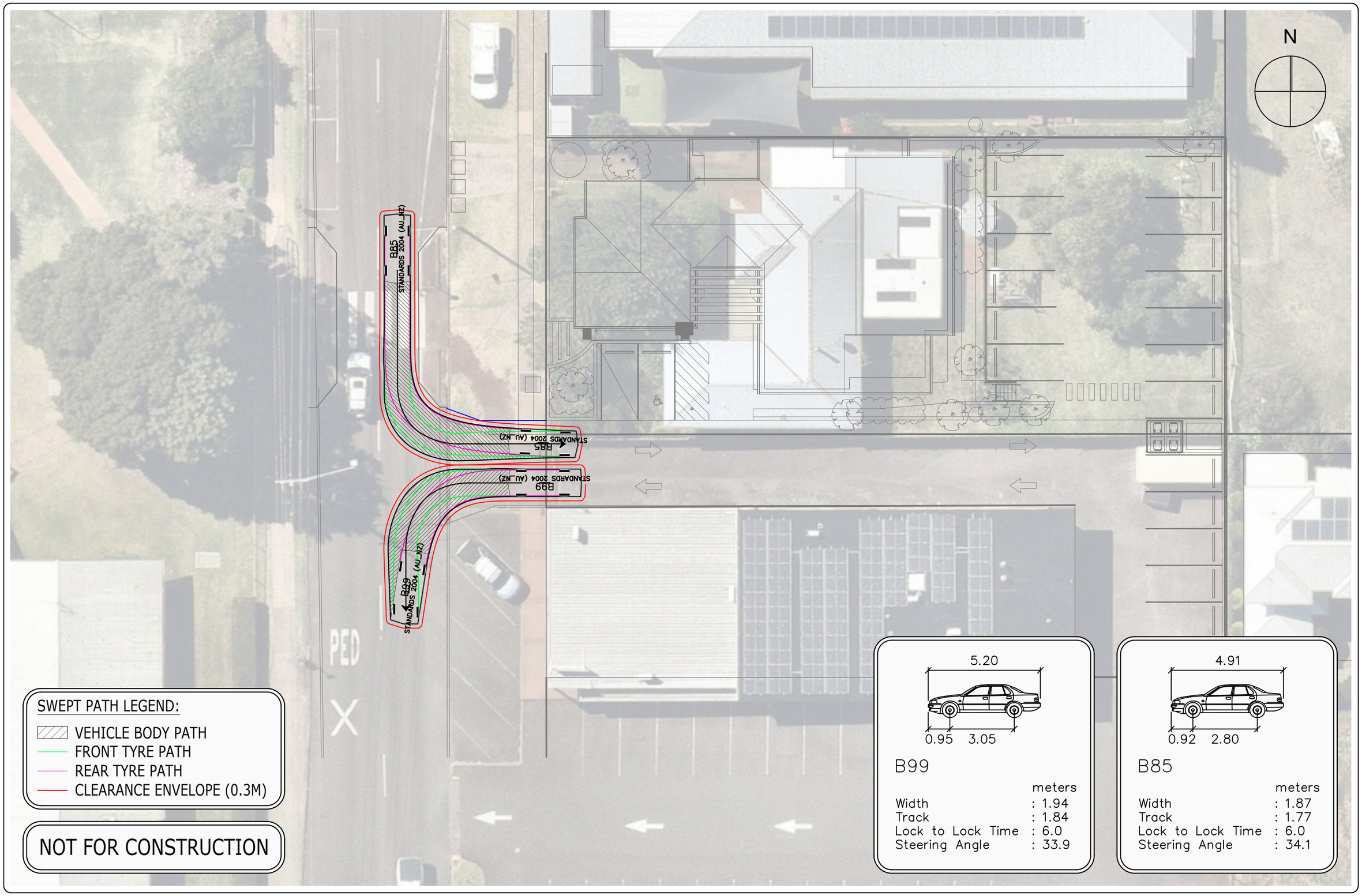
APPENDIX B
PTT DRAWINGS



SWEPT PATH LEGEND:

- VEHICLE BODY PATH
- FRONT TYRE PATH
- REAR TYRE PATH
- CLEARANCE ENVELOPE (0.3M)

NOT FOR CONSTRUCTION

B99

	meters
Width	: 1.94
Track	: 1.84
Lock to Lock Time	: 6.0
Steering Angle	: 33.9

B85

	meters
Width	: 1.87
Track	: 1.77
Lock to Lock Time	: 6.0
Steering Angle	: 34.1

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REV	DESCRIPTION	DRN	DATE
A	INITIAL ISSUE	RL	05/06/2026

DRAWING TITLE: SITE ACCESS MANOEUVRING	DRAWING NO: 26-590-001	REV: A	SCALE: 1:250 @ A3	APPROVED BY: JPG (RPEQ 22233)
PROJECT TITLE: 136 SOUTH STREET, CENTENARY HEIGHTS	CLIENT: STRUXI			

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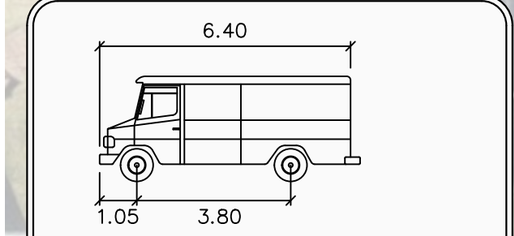

SRV

	meters
Width	: 2.30
Track	: 2.30
Lock to Lock Time	: 6.0
Steering Angle	: 38.1

SWEPT PATH LEGEND:

- VEHICLE BODY PATH
- FRONT TYRE PATH
- REAR TYRE PATH
- CLEARANCE ENVELOPE (0.3M)

NOT FOR CONSTRUCTION

N

SRV STANDARDS 2018 (AU)

SRV STANDARDS 2018 (AU)

SRV STANDARDS 2018 (AU)

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REV	DESCRIPTION	DRN	DATE
A	INITIAL ISSUE	RL	12/06/2026

DRAWING TITLE:	DRAWING NO:	REV:	SCALE:	APPROVED BY:
SRV ACCESS AND MANOEUVRING	26-590-002	A	1:250 @ A3	JPG (RPEQ 22233)
PROJECT TITLE: 136 SOUTH STREET, CENTENARY HEIGHTS	CLIENT: STRUXI			

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APPENDIX C
PTT PRACTICE NOTE

PRACTICE NOTE

QUEUING CHARACTERISTICS AT SITE ACCESSES

BACKGROUND

On-site queuing areas are required at site access locations to ensure that vehicles do not queue across pedestrian paths or back onto the frontage road.

However, with queuing requirements in planning scheme policies becoming increasingly onerous, the usage of these figures can result in excessive queuing areas which can unnecessarily have an adverse effect construction costs and development yields.

This practice note demonstrates how conventional queuing theory can be used in traffic engineering to determine the anticipated queue length at access locations as a function of local conditions.

QUEUING THEORY

To calculate the amount of queuing space required, we must estimate the probability of a number of vehicles in a queue (n) exceeding a specified number of vehicles (N) at any instant. This is calculated using the following formula:

$$Pr\ (n>N) = \rho^{N+1} \leq \alpha$$

Where:

- ρ is the queue utilisation factor
- α is the probability of a queue of N vehicles being exceeded

Rearranging this formula enables the calculation of the design queue length in terms of the number of vehicles as follows:

$$N = \frac{\log(\alpha)}{\log(\rho)} - 1$$

The **minimum** design queue would be calculated as N vehicles, which may include a fraction of a vehicle (eg 1.2 vehicles). This design queue could be applied subject to engineering judgment.

The **desirable** design queue would be the smallest integer which contains the value, N (ie rounded up to the nearest integer).

Application of a standard vehicle length of 6m per vehicle results in a design queue length in metres.

QUEUE UTILISATION FACTOR

The utilisation factor, ρ, is the ratio of the mean arrival rate (r) and the mean service rate (s), ie:

$$\rho = \frac{r}{s}$$

The mean arrival rate (veh/hr) varies for each situation. It is calculated using the peak hour trip generation for the facility. This is expressed in vehicles per hour.

The mean service rate (veh/hr) is determined by observing the operations of similar facilities.

PTT has calculated the mean service rate for a non-controlled (ie no boom gate) parking facility by surveying the average time taken for cars to enter and leave from visitor parks in a residential development.

This survey was undertaken at a recently approved and constructed mixed use commercial/residential development at Nundah on a Wednesday in July 2014 between 4:30-6:00pm. A minimum of 30 observations were made for both "parking" and "unparking" manoeuvres The results of this analysis are shown in Table 1.

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PRACTICE NOTE

QUEUING CHARACTERISTICS AT SITE ACCESSES

Table 1: MEAN VEHICLE MANOEUVRING TIME (seconds/vehicle)

MANOEUVRE	MEAN TIME	STD DEV	MIN	MAX
Parking	12.2	13.8	1.1	69.5
Unparking	14.7	7.1	2.1	37.2

The application of the mean "unparking" value from Table 1 assumes that each vehicle which enters the access will be waiting for a car to "unpark" from the space nearest to the access. This is an extremely conservative assumption, which will result in an over-estimate of queue lengths.

The mean service time for car parks with entrance controls such as boom gates, ticket dispensing machines, car stackers and mechanical parking installations can usually be provided by the supplier of the product.

PROBABILITY OF EXCEEDANCE

The queuing formula is used to calculate the queue length given a specified probability (α).

Generally, the 95th percentile queue is considered an adequate measure of an acceptable queue at access driveways. This infers that there is a 5% probability that the queue length will be exceeded (ie α=0.05).

Australian Standards, AS2890.1, outlines the requirement to provide a 98th percentile queue for situations where mechanical parking installations such as car stackers are used (ie α=0.02).

EXAMPLE

A development with a mean peak hour trip generation of 100 veh/hr and a 80:20 in:out split results in a vehicle arrival rate of 80 veh/hr.

The service rates from Table 1 can be applied to calculate the queue utilisation factor. However common units are required to find a ratio.

Therefore, the service rate, s, is:

$$\frac{vehicle}{hour} = 3{,}600\left(\frac{seconds}{vehicle}\right)^{-1}$$

$$s = \frac{3{,}600}{14.7} = 244.9 \text{ vehicles per hour}$$

The queue utilisation factor is:

$$\rho = \frac{r}{s} = \frac{80}{244.9} = 0.327$$

The 95th percentile design queue:

$$N = \frac{\log(\alpha)}{\log(\rho)} - 1$$

$$N = \frac{\log(0.05)}{\log(0.327)} - 1$$

$$N = 1.68 \text{ vehicles}$$

Therefore, desirably, the development should be designed to allow for an entrance queue of two vehicles (ie 12m). However, an available queuing distance of 1.68 vehicles (ie 10.1m) would be considered acceptable to cater for the 95th percentile queue, subject to engineering judgment.

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PRACTICE NOTE

QUEUING CHARACTERISTICS AT SITE ACCESSES

CONCLUSION

Conventional traffic engineering queuing theory can be used to determine the anticipated queue length at access locations. This ensures that queuing does not adversely impact on nearby traffic or pedestrian flows whilst ensuring that the queuing area is not excessive.

REFERENCES

Bennett, DW and Rose, G (1988), *Unsignalised Intersection Analysis,* University of Melbourne

Institute of Transport Studies Monash University (2003), *Traffic Engineering and Management,* Volume 2, Caufield East

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DISCLAIMER

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