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APPENDIX G

Traffic Impact Assessment

Amber

Traffic & Transportation Direction

Childcare Centre

2 Premiers Street, Nemingha

Traffic Impact Assessment

14 March 2025

Reference: 1200 rep 250314 final

Childcare Centre

2 Premiers Street, Nemingha

Traffic Impact Assessment

Prepared for: Barnson

Status: Final report

Date: 14 March 2025

Reference: 1200 rep 250314 final

Revision	Date	Description	Author	Reviewed	Approved
A	12/03/25	Draft 01	W Cavey	O Mihaila	O Mihaila
B	14/03/25	Final 01	W Cavey	O Mihaila	O Mihaila

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Table of Contents

1. Introduction

Amber Organisation Pty Ltd has been engaged by Barnson to advise on the traffic and parking matters associated with the proposed childcare centre development located at 2 Premiers Street in Nemingha.

The childcare centre is proposed to operate with a capacity of 168 children, with a total of 42 car parking spaces proposed on-site including two accessible spaces. Vehicular access is proposed via separate entry and exit crossovers to Premiers Street.

This report has been prepared to address the traffic and parking impacts of the proposed development. It is based on surveys and observations at the site and our experience of similar developments elsewhere.

2. Transport Environment

2.1 Site Location

The site is located on the northeastern corner of the intersection of Nundle Road and Premiers Street in Nemingha. Figure 1 shows the location of the site in relation to the surrounding transport network.

Figure 1: Site Location

Source: OpenStreetMap

The site and surrounding areas on the northern side of Nundle Road are zoned R5 – Large Lot Residential, while land on the south side of Nundle Road is zoned RU1 – Primary Production. Nemingha Public School is situated opposite the site on the western side of Premiers Street, with vehicular access via Nundle Road. The city of Tamworth is located approximately 8 kilometres northwest of the site and provides a range of commercial, residential and recreational land uses.

Figure 2 shows an aerial photograph view of the site and the surrounding area. The site is currently undeveloped and consists of grassed land, with vehicular access via a crossover connecting with the eastern side of Premiers Street. The image shows the Nemingha Public School west of the site as well as surrounding large-lot residential properties in the broader area.

Figure 2: Aerial Photograph

Source: Nearmap

2.2 Road Network

Premiers Street is a municipal local road which runs north and then east from its connection with the northern side of Nundle Road. It provides a carriageway width of approximately 9.5 metres which accommodates two-way vehicle movement. The road is subject to the default urban speed limit of 50 km/h, and no footpaths are provided.

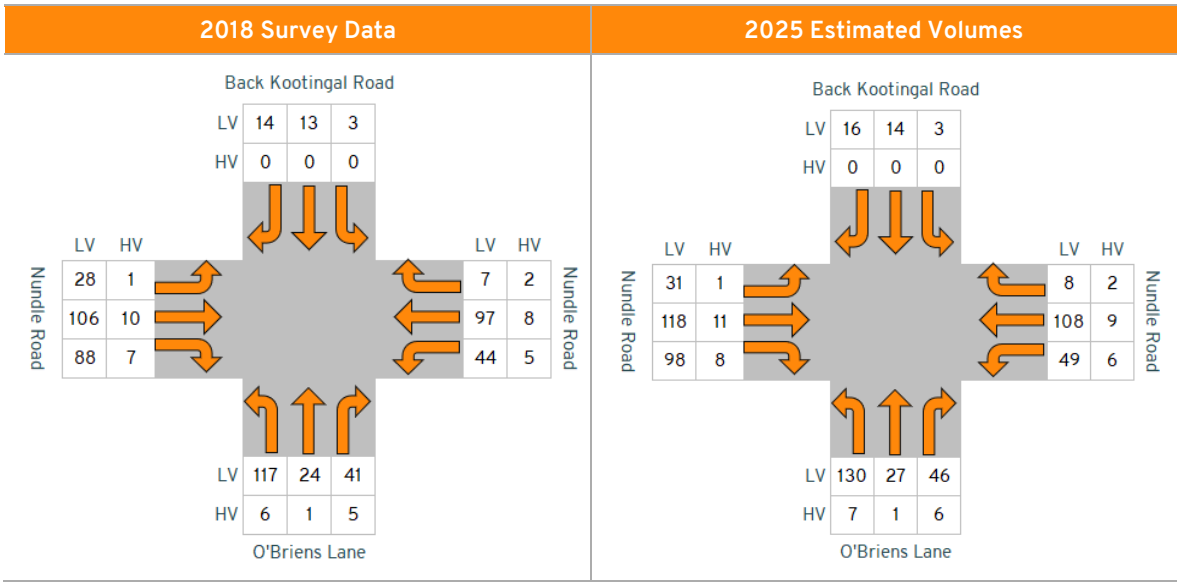
Nundle Road is a regional road which runs in a general northwest-southeast alignment between New England Highway in Nemingha and Oakenville Street in Nundle. Along the site frontage, it provides a carriageway width of 9.0 metres which accommodates one traffic lane in each direction. A speed limit of 60km/h applies within the vicinity of the site and to the west, with a 40km/h school zone active during school times. A speed limit of 100km/h applies east of the site, and no footpaths are provided along the road.

The intersection of Premiers Street and Nundle Road is a priority-controlled T-intersection with 'Give Way' signage provided for vehicles exiting Premiers Street.

2.3 Traffic Volumes

Intersection peak hour traffic volumes have been sourced from the Traffic Impact Assessment prepared by SECA Solution (dated 18 March 2019) for the subdivision associated with the site. The traffic volume data was collected in June 2018 for the daily peak hour (3:15-4:15pm), at the roundabout intersection of Nundle Road / O'Briens Lane / Back Kootingal Road approximately one kilometre west of the site. The traffic survey results are presented in Figure 3 and a compounding annual growth rate of 1.5% has been applied to estimate the current 2025 traffic volumes.

Figure 3: Turning Movement Count Peak Hour Survey Results



The data indicates that the intersection currently accommodates a moderate level of traffic. The majority of vehicle movements occur along Nundle Road and O'Briens Lane, with lower volumes along Back Kootingal Road. The highest traffic volumes were recorded for the through movement along Nundle Road (both directions) and the left/right turns between O'Briens Lane and the western leg of Nundle Road.

Overall, the survey results indicate the intersection currently accommodates a moderate level of traffic for a regional road intersection and is likely able to accommodate an increase in vehicle movement.

2.4 Sustainable Transport

Given the regional nature of the surrounding area, the site does not currently have convenient access to walking and cycling infrastructure or public transport services. Various school bus services operate along Nundle Road with a bus stop provided along the Nemingha Public School frontage.

2.5 Crash History

Amber has conducted a review of the TfNSW Centre for Road Safety Crash and Casualty Statistics database for all crashes within the following search area:

- The entire length of Premiers Street.
- Nundle Road between New England Highway and the site.
- All respective intersections.

The crash database provides the location and severity of all casualty crashes for the latest available five-year period which is currently between 2019 and 2023. The search revealed two moderate injury crashes occurred at the Nundle Road / O'Briens Lane / Back Kootingal Road intersection in 2023, which would meet the criteria for classification as a 'Black Spot'.

It is noted that the intersection provides a roundabout configuration which aligns with Safe System principles to reduce vehicle operating speeds and potential impact angles in the event of a crash. Furthermore, the proposed development is unlikely to have a material impact on the operation of the intersection as the traffic generated by the site would represent a small proportion of the existing traffic using the intersection. Accordingly, it is recommended that the identified road safety issue is investigated separately by Council if required as the relevant road authority.

Given the search area, associated road network classifications and lack of discernible crash trends across the broader area, it is concluded that the surrounding road network is otherwise operating in a relatively safe manner.

3. Development Proposal

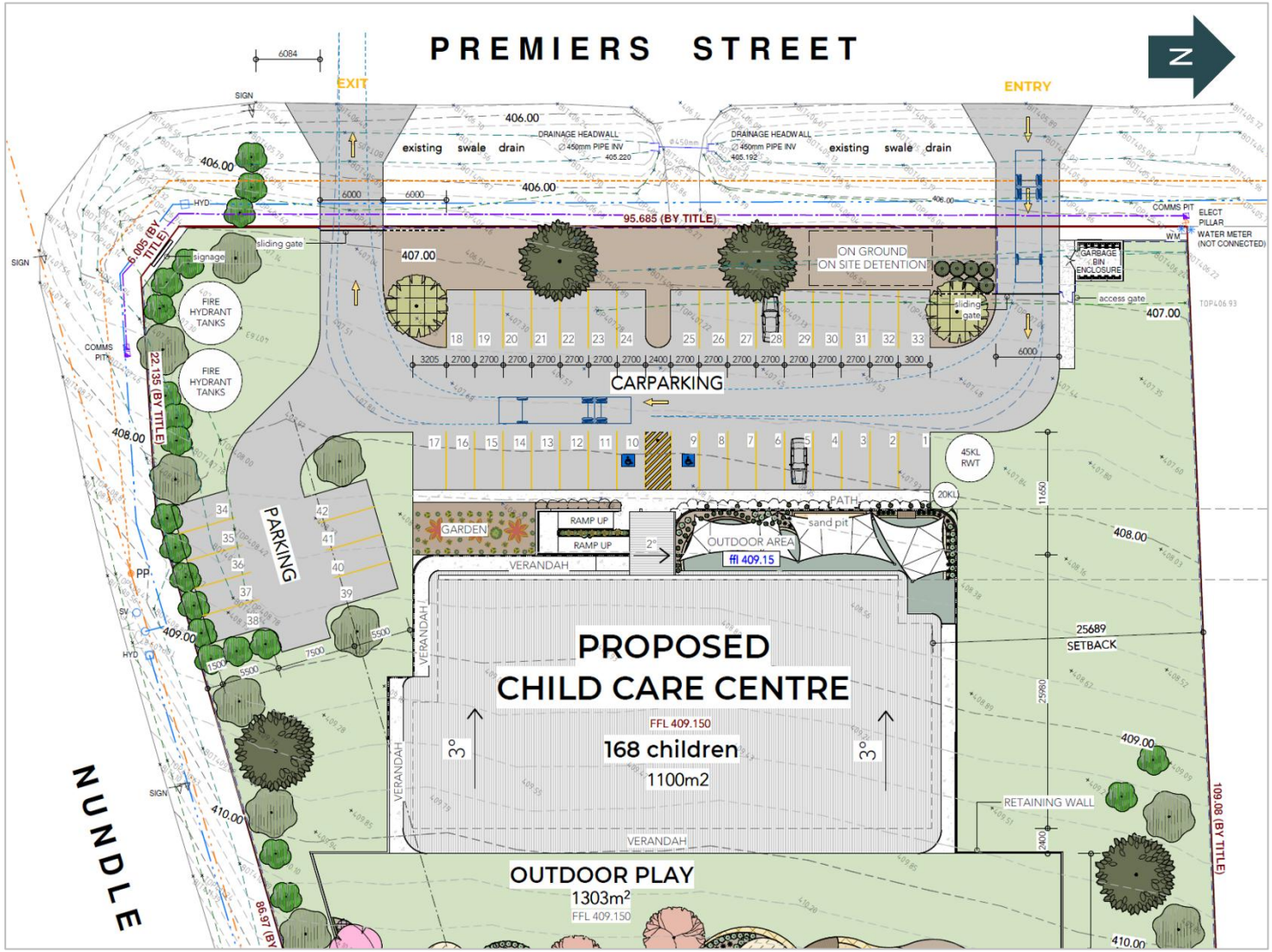
It is proposed to develop a childcare centre at 2 Premiers Street in Nemingha.

The childcare centre is proposed to operate with a capacity of 168 children. A total of 42 car parking spaces are proposed on-site, including two accessible spaces, with all car parking provided at ground level in a 90-degree configuration. Vehicular access is proposed via separate entry and exit crossovers to Premiers Street.

Refuse and recycling bins are provided within an enclosure adjacent to the site entry driveway. Waste is expected to be collected within the car park via private waste collection services outside of peak times.

The proposed car park layout is shown in Figure 4.

Figure 4: Car Park Layout



Source: Barnson

4. Traffic Assessment

4.1 Traffic Generation and Distribution

The *Roads & Maritime Services Validation Trip Generation Surveys - Child Care Centres* (Analysis Report), dated September 2015, provides surveyed trip generation data for a childcare centre within a regional area which is the Nords Wharf Community Preschool located approximately 30km southwest of Newcastle. The surveyed trip generation rates were found to be 1.25 and 1.10 vehicle trip per child during the morning and evening peak hours, respectively.

Application of these rates to the proposed capacity of 168 children generates a total of 210 and 185 vehicle trips during the morning and evening peak hours, respectively. It is noted that a vehicle trip is defined as a movement in one direction (i.e. a vehicle accessing the site would generate one trip toward the site when it arrives and another trip away from the site when it departs).

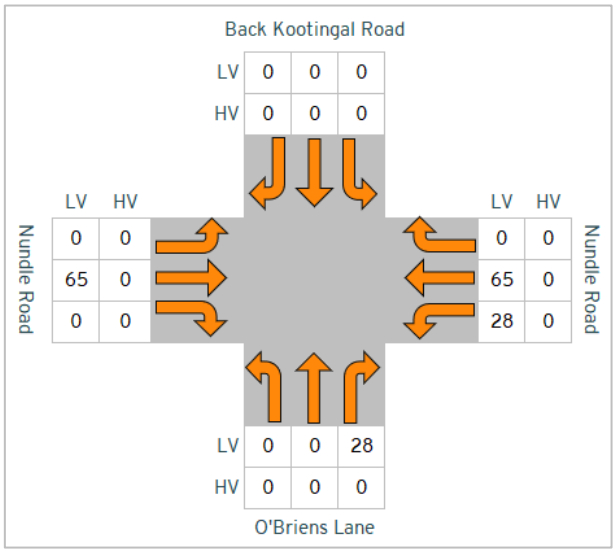
The majority of traffic associated with the site is expected to occur during morning drop-off and afternoon pick-up times. For the purposes of the assessment, it has conservatively been assumed that vehicle trips would be split evenly between inbound and outbound trips, and the afternoon peak traffic generating hour for the site would coincide with the afternoon peak hour on the road network.

Vehicle trips will be distributed to/from the site via Premiers Street and Nundle Road. It is expected that the majority of trips will be associated with the drop-off and pick-up of children which would generally occur during the morning and evening, with minimal traffic entering or exiting the site throughout the remainder of the day.

For the purposes of the assessment, it is conservatively assumed that all vehicle trips would occur to/from the west of the site along Nundle Road. It is estimated that 70% would continue to/from Oxley Highway or New England Highway while the remaining 30% would travel to/from Calala or South Tamworth via O'Briens Lane.

The resulting traffic volumes generated by the site at the intersection of Nundle Road / O'Briens Lane / Back Kootingal Road during the afternoon peak hour are outlined in Figure 5.

Figure 5: Estimated Traffic Volumes Generated by Proposed Development



4.2 Traffic Modelling

In order to review the traffic implications of the proposal, a traffic modelling exercise has been undertaken using the SIDRA intersection modelling software. The SIDRA software is an advanced lane-based micro-analytical tool for design and evaluation of individual intersections and networks of intersections including modelling of separate movement classes.

A key indicator of intersection performance is Level of Service which is a qualitative measure used to describe the operating conditions of a section of road or an intersection. Levels of Service are designated from A to F from best (free flow conditions) to worst (forced flow with stop start operation, long queues and delays) and represent the perception of the road conditions by motorists including speed and travel time, freedom to manoeuvre, traffic interruptions, comfort and convenience, and safety.

The best indicator of the level of service at an intersection is the average delay experienced by vehicles at that intersection. For priority-controlled intersections including roundabouts, the critical movement for level of service assessment is the movement with the highest average delay. Table 1 sets out the average delays associated with different levels of service.

Table 1: Level of Service Criteria for Intersections

Level of Service	Average Delay per Vehicle (sec/veh)	Description
A	Less than 14	Good operation
B	15 – 28	Acceptable delays and spare capacity
C	29 – 42	Satisfactory, but accident study required
D	43 – 56	Near capacity and accident study required
E	57 - 70	At capacity, require other control mode

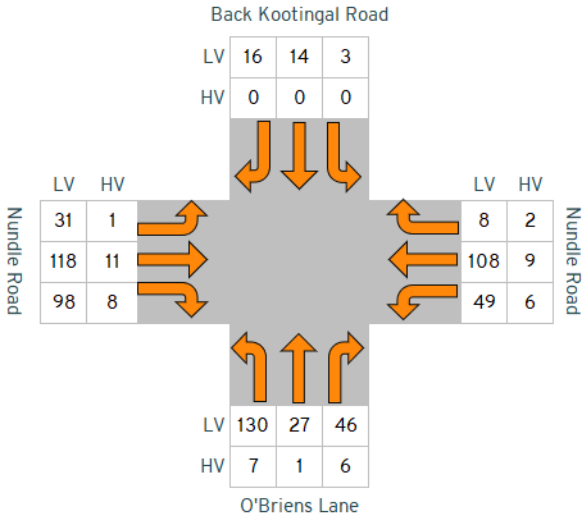
The SIDRA modelling was carried out for the afternoon peak hour at the intersection of Nundle Road / O'Briens Lane / Back Kootingal Road based on the following scenarios:

- 2025 Base Case: Existing traffic without the development traffic.
- 2025 Project Case: Existing traffic plus development traffic.
- 2035 Future Case: Existing traffic adjusted by a 1.5% compounding annual growth rate to estimate future volumes in 2035, plus development traffic.

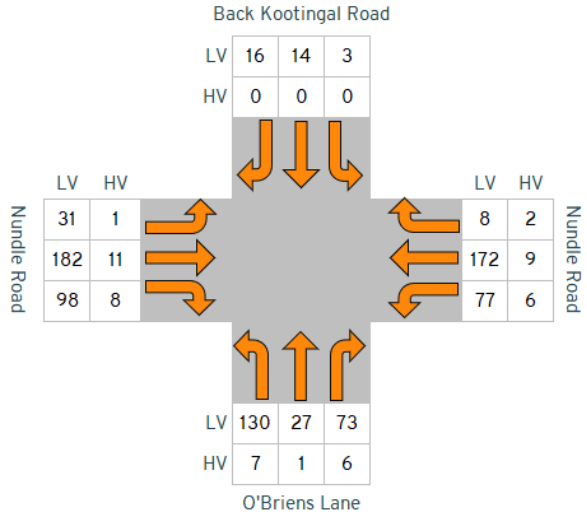
The traffic volumes utilised for the modelling of each scenario are outlined in Figure 5.

Figure 6 - Traffic Volumes for Modelling Scenarios

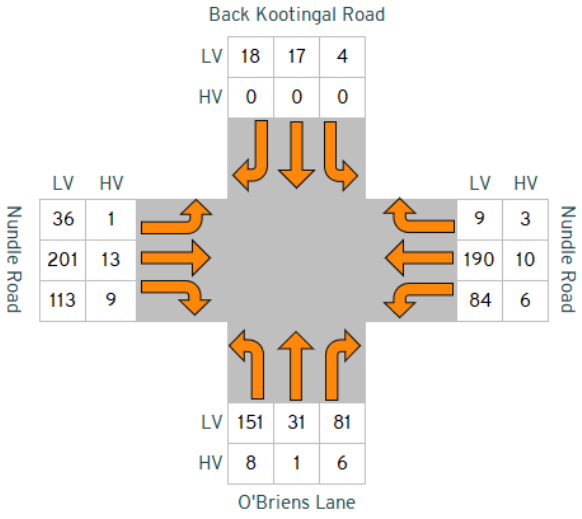
2025 Base Case



2025 Project Case



2035 Future Case



The results of the SIDRA analysis are summarised in Table 2 with the full results presented within Appendix A. It is noted that the default SIDRA settings have been adopted for the modelling analysis.

Table 2: SIDRA Analysis Results Summary

Approach / Movement		PM Peak Hour		
		Average Delay (sec)	95% Queue (m)	Level of Service
2025 Base Case				
O'Briens Lane (South)	Left	5.3	8.5	A
	Through	5.5	8.5	A
	Right	9.3	8.5	A
Nundle Road (East)	Left	5.4	7.0	A
	Through	5.6	7.0	A
	Right	9.4	7.0	A
Back Kootingal Road (North)	Left	5.9	1.2	A
	Through	6.1	1.2	A
	Right	9.7	1.2	A
Nundle Road (West)	Left	4.9	10.1	A
	Through	5.3	10.1	A
	Right	8.8	10.1	A
2025 Project Case				
O'Briens Lane (South)	Left	5.8	10.6	A
	Through	6.0	10.6	A
	Right	9.7	10.6	A
Nundle Road (East)	Left	5.3	10.9	A
	Through	5.5	10.9	A
	Right	9.5	10.9	A
Back Kootingal Road (North)	Left	6.4	1.3	A
	Through	6.7	1.3	A
	Right	10.2	1.3	A
Nundle Road (West)	Left	5.2	13.7	A
	Through	5.5	13.7	A
	Right	9.1	13.7	A

Approach / Movement		Evening Peak Hour		
		Average Delay (sec)	95% Queue (m)	Level of Service
2035 Future Case				
O'Briens Lane (South)	Left	6.1	12.8	A
	Through	6.2	12.8	A
	Right	9.9	12.8	A
Nundle Road (East)	Left	5.5	12.8	A
	Through	5.7	12.8	A
	Right	9.8	12.8	A
Back Kootingal Road (North)	Left	6.7	1.7	A
	Through	7.0	1.7	A
	Right	10.5	1.7	A
Nundle Road (West)	Left	5.3	16.5	A
	Through	5.6	16.5	A
	Right	9.2	16.5	A

The SIDRA analysis indicates the following:

- The intersection is expected to operate with minimal queue lengths and delays on all approaches.
- The overall average delay at the intersection is 6.3 seconds under the 2025 Base Case scenario, with a negligible increase to 6.7 seconds under the 2035 Future Case scenario.
- The intersection is expected to continue to operate with good level of service (LOS A).

While the assessment has been carried out for the afternoon peak hour as the surveyed peak hour on the road network, it is considered that the level of traffic during the morning peak hour would be similar. Accordingly, the intersection is expected to continue to operate efficiently with minimal queuing and delays.

The intersection of Nundle Road / Premiers Street provides Basic Left and Right turn treatments to allow for through traffic to safely pass vehicles turning toward the site, noting an urban speed limit of 60km/h applies along Nundle Road with a 40km/h school zone.

4.3 Summary

Overall, the increase in traffic generated by the proposed development is expected to have minimal impact on the surrounding road network which is anticipated to continue to operate with a good level of service. Therefore, the surrounding road network is able to accommodate the increase in vehicle traffic which is not expected to create any notable adverse impacts on the road environment.

5. Car Parking Assessment

5.1 Car Parking Requirement

The Tamworth Regional Development Control Plan 2010 (DCP) specifies the parking requirement for various land uses. The minimum parking requirement applicable to a childcare centre is *1 space per 4 children*. Application of this rate to the proposed capacity of 168 children results in a parking requirement of 42 spaces.

A total of 42 spaces are proposed on-site which meets the parking requirement of the DCP.

5.2 Car Park Design

A total of 42 car parking spaces are proposed on site within an open-air ground-level car park at the site frontage, including two accessible parking spaces. Access to the car park is proposed from Premiers Street via separate entry and exit crossovers.

The Tamworth Regional DCP states that the design and layout of parking is to be in accordance with Australian Standards AS2890.1 and AS2890.6. Table 3 provides a review of the car park layout and access arrangements against the relevant design requirements of *AS/NZS 2890.1:2004 – Off-street car parking* and *AS/NZS 2890.6:2022 - Off-street parking for people with disabilities.* The design assessment is based on the requirements for a User Class 3A parking facility which is suitable for use by both staff and visitors.

Table 3: Car Park Design Assessment

Design Parameters	AS 2890.1 / AS 2890.6 Requirement	Proposed Design	Compliance
Parking Module Dimensions (User Class 3A – 90 Degrees)			
Parking aisle width	6.2-6.6m minimum	6.9m minimum	Compliant
Parking space length	5.4m minimum with no overhang	5.5m	Compliant
Parking space width	2.6m minimum	2.7m minimum	Compliant
Clearance from obstructions	300mm	300mm minimum	Compliant
Column locations	As per Figure 5.2 of AS 2890.1	As per Figure 5.2	Compliant
Extension of blind aisle	1.0m minimum	2.7m	Compliant
Length of blind aisle	6 parking spaces plus 1.0m	5 parking spaces plus 2.7m	Compliant
Accessible parking space length	5.4m minimum	5.5m	Compliant
Accessible parking space width	2.4 minimum	2.7m	Compliant
A shared area on one side of accessible parking spaces	2.4m x 5.4m minimum	3.0m x 5.5m	Compliant

Design Parameters	AS 2890.1 / AS 2890.6 Requirement	Proposed Design	Compliance
Circulation Roadways			
Straight roadway width	3.0m minimum (one-way) 5.5m minimum (two-way)	6.0m minimum	Compliant
Curved roadway width	As per Table 2.2 of AS 2890.1	Based on swept path assessment (Appendix B)	Acceptable
Access Driveways (User Class 3A, Parking Facility Category 2)			
Entry/exit width	3.0m minimum (separate)	6.0m	Compliant
Access driveway location	6.0m minimum clearance from intersection	6.1m minimum clearance from intersection	Compliant
Sight distance	45m minimum (50km/h)	Over 45m in all directions	Compliant
Pedestrian sight triangles	2.0m x 2.5m	2.0m x 2.5m (subject to fence design)	Compliant
Queuing length from property boundary to sliding gate	2 cars	1 car within property boundary + 2 cars on crossover	Acceptable
Height Clearance			
General headroom	2.2m minimum	Open air	Compliant
Accessible parking space headroom	2.5m	Open air	Compliant

Overall, the car park and vehicle access arrangements have been suitably designed in general accordance with the requirements of AS/NZS 2890.1:2004 and AS/NZS 2890.6:2022.

6. Bicycle Parking

The Tamworth Regional Development Control Plan 2010 (DCP) specifies the bicycle parking requirement for various land uses. The minimum parking requirement applicable to a new commercial development is *1 space per 15 car parking spaces*. Application of this rate to the proposed 42 car parking spaces results in a bicycle parking requirement of 3 spaces.

No bicycle parking spaces are proposed as part of the development. The site is not expected to generate any notable demand for bicycle parking as it is located in a regional area with no dedicated cycling infrastructure currently provided in the local area. Furthermore, it is expected that parents and caregivers would generally use private vehicles to drop off and pick up children, which is typical for childcare centre developments particularly in regional areas.

Accordingly, the lack of on-site bicycle parking provision is considered acceptable.

7. Waste Collection and Loading

Refuse and recycling bins are provided within an enclosure adjacent to the site entry driveway. Waste is expected to be collected on-site outside peak times via private waste collection services, utilising a rigid truck up to 10.0m long.

A swept path assessment is provided in Appendix B for the waste collection vehicle. The assessment indicates the vehicle is able to suitably access and egress the site in a forward direction with no reverse manoeuvres required. It is noted that waste collection would be undertaken during off-peak times to limit any impacts on the operation of the car park.

Loading for the proposal will primarily be related to deliveries for the ongoing need to restock the proposed childcare centre. It is anticipated that all deliveries to the centre will be made outside of peak drop-off/pick-up times in which a small van would be able to utilise the plentiful supply of car parking spaces (which would be vacant outside of peak times) to facilitate loading/unloading. Deliveries are anticipated to be infrequent and will be performed under the management of the childcare centre.

Accordingly, the proposed waste collection and loading procedures are considered acceptable and the vehicles are expected to be able to suitably enter and exit the site in a forward direction.

8. Conclusion

It is proposed to develop a childcare centre at 2 Premiers Street in Nemingha.

The childcare centre is proposed to operate with a capacity of 168 children. A total of 42 car parking spaces are proposed on-site, including two accessible spaces, with all car parking provided at ground level in a 90-degree configuration. Vehicular access is proposed via separate entry and exit crossovers to Premiers Street.

Based on the assessment above, the following conclusions are provided:

- The proposal generates a parking requirement of 42 car parking spaces under the DCP and as such, the parking provision meets the requirements of the DCP.
- The proposal is expected to generate a total of 210 and 185 vehicle trips during the morning and evening peak hours, respectively. The increase in traffic generated by the proposal is expected to have a minimal impact to the operation of the surrounding road network including the intersection of Nundle Road / O'Briens Lane / Back Kootingal Road which is expected to continue operating with a good level of service.
- The car park layout and access arrangements have been suitably designed in general accordance with AS/NZS 2890.1:2004 and AS/NZS 2890.6:2022.
- No bicycle parking spaces are proposed which is considered acceptable as the development is not expected to generate any notable demand for cycling trips.
- Waste is proposed to be collected by private waste collection services outside of peak times to limit the impact to the operation of the car park. The waste collection vehicle is able to suitably access and egress the site in a forward direction with no reverse manoeuvres required.

Therefore, it is concluded that the traffic and parking aspects of the proposed development are satisfactory, and the development will have a minimal impact on the surrounding road environment.

Appendix A

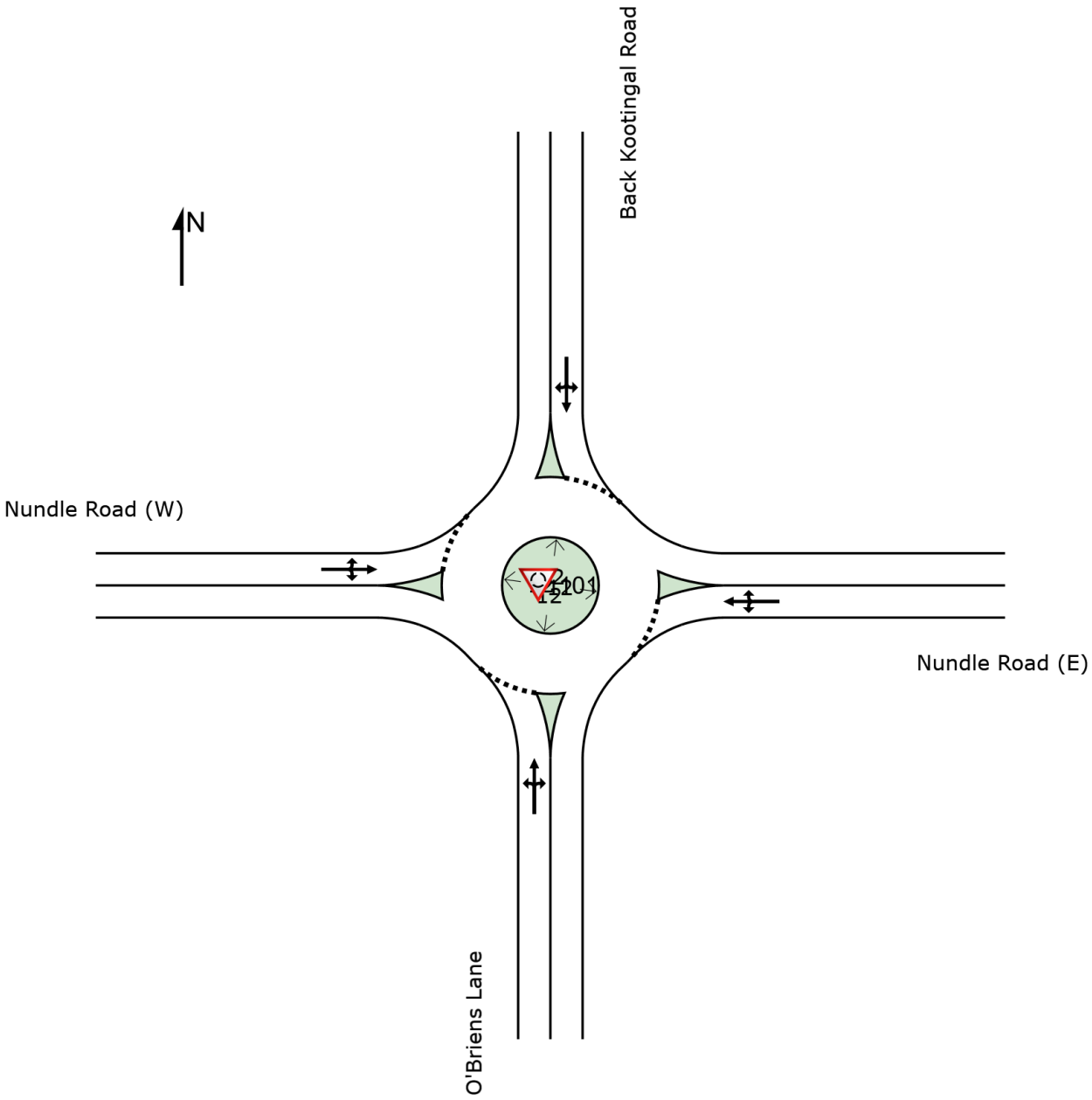
SIDRA Results

SITE LAYOUT

Site: 101 [2025 Base Case (Site Folder: Nundle Rd / O'Briens Ln / Back Kootingal Rd - PM)]

New Site
Site Category: (None)
Roundabout

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



MOVEMENT SUMMARY

Site: 101 [2025 Base Case (Site Folder: Nundle Rd / O'Briens Ln / Back Kootingal Rd - PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: O'Briens Lane															
1	L2	All MCs	144	5.1	144	5.1	0.204	5.3	LOS A	1.2	8.5	0.37	0.55	0.37	52.2
2	T1	All MCs	29	3.6	29	3.6	0.204	5.5	LOS A	1.2	8.5	0.37	0.55	0.37	52.7
3	R2	All MCs	55	11.5	55	11.5	0.204	9.3	LOS A	1.2	8.5	0.37	0.55	0.37	51.5
Approach			228	6.5	228	6.5	0.204	6.3	LOS A	1.2	8.5	0.37	0.55	0.37	52.1
East: Nundle Road (E)															
4	L2	All MCs	58	10.9	58	10.9	0.173	5.4	LOS A	0.9	7.0	0.35	0.51	0.35	52.2
5	T1	All MCs	123	7.7	123	7.7	0.173	5.6	LOS A	0.9	7.0	0.35	0.51	0.35	52.8
6	R2	All MCs	11	20.0	11	20.0	0.173	9.4	LOS A	0.9	7.0	0.35	0.51	0.35	51.4
Approach			192	9.3	192	9.3	0.173	5.7	LOS A	0.9	7.0	0.35	0.51	0.35	52.6
North: Back Kootingal Road															
7	L2	All MCs	3	0.0	3	0.0	0.034	5.9	LOS A	0.2	1.2	0.45	0.60	0.45	51.3
8	T1	All MCs	15	0.0	15	0.0	0.034	6.1	LOS A	0.2	1.2	0.45	0.60	0.45	51.7
9	R2	All MCs	17	0.0	17	0.0	0.034	9.7	LOS A	0.2	1.2	0.45	0.60	0.45	51.0
Approach			35	0.0	35	0.0	0.034	7.8	LOS A	0.2	1.2	0.45	0.60	0.45	51.3
West: Nundle Road (W)															
10	L2	All MCs	34	3.1	34	3.1	0.230	4.9	LOS A	1.4	10.1	0.30	0.54	0.30	51.9
11	T1	All MCs	136	8.5	136	8.5	0.230	5.3	LOS A	1.4	10.1	0.30	0.54	0.30	52.1
12	R2	All MCs	112	7.5	112	7.5	0.230	8.8	LOS A	1.4	10.1	0.30	0.54	0.30	51.3
Approach			281	7.5	281	7.5	0.230	6.6	LOS A	1.4	10.1	0.30	0.54	0.30	51.8
All Vehicles			736	7.3	736	7.3	0.230	6.4	LOS A	1.4	10.1	0.34	0.54	0.34	52.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [2025 Project Case (Site Folder: Nundle Rd / O'Briens Ln / Back Kootingal Rd - PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: O'Briens Lane															
1	L2	All MCs	144	5.1	144	5.1	0.247	5.8	LOS A	1.4	10.6	0.46	0.59	0.46	51.7
2	T1	All MCs	29	3.6	29	3.6	0.247	6.0	LOS A	1.4	10.6	0.46	0.59	0.46	52.2
3	R2	All MCs	83	7.6	83	7.6	0.247	9.7	LOS A	1.4	10.6	0.46	0.59	0.46	51.2
Approach			257	5.7	257	5.7	0.247	7.1	LOS A	1.4	10.6	0.46	0.59	0.46	51.6
East: Nundle Road (E)															
4	L2	All MCs	87	7.2	87	7.2	0.251	5.3	LOS A	1.5	10.9	0.37	0.50	0.37	52.3
5	T1	All MCs	191	5.0	191	5.0	0.251	5.5	LOS A	1.5	10.9	0.37	0.50	0.37	52.8
6	R2	All MCs	11	20.0	11	20.0	0.251	9.5	LOS A	1.5	10.9	0.37	0.50	0.37	51.4
Approach			288	6.2	288	6.2	0.251	5.6	LOS A	1.5	10.9	0.37	0.50	0.37	52.6
North: Back Kootingal Road															
7	L2	All MCs	3	0.0	3	0.0	0.037	6.4	LOS A	0.2	1.3	0.51	0.63	0.51	51.0
8	T1	All MCs	15	0.0	15	0.0	0.037	6.7	LOS A	0.2	1.3	0.51	0.63	0.51	51.4
9	R2	All MCs	17	0.0	17	0.0	0.037	10.2	LOS A	0.2	1.3	0.51	0.63	0.51	50.6
Approach			35	0.0	35	0.0	0.037	8.4	LOS A	0.2	1.3	0.51	0.63	0.51	51.0
West: Nundle Road (W)															
10	L2	All MCs	34	3.1	34	3.1	0.293	5.2	LOS A	1.9	13.7	0.37	0.53	0.37	51.8
11	T1	All MCs	203	5.7	203	5.7	0.293	5.5	LOS A	1.9	13.7	0.37	0.53	0.37	52.2
12	R2	All MCs	112	7.5	112	7.5	0.293	9.1	LOS A	1.9	13.7	0.37	0.53	0.37	51.3
Approach			348	6.0	348	6.0	0.293	6.6	LOS A	1.9	13.7	0.37	0.53	0.37	51.8
All Vehicles			928	5.8	928	5.8	0.293	6.5	LOS A	1.9	13.7	0.40	0.54	0.40	52.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [2035 Future Case (Site Folder: Nundle Rd / O'Briens Ln / Back Kootingal Rd - PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival 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	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: O'Briens Lane															
1	L2	All MCs	167	5.0	167	5.0	0.288	6.1	LOS A	1.7	12.8	0.50	0.60	0.50	51.6
2	T1	All MCs	34	3.1	34	3.1	0.288	6.2	LOS A	1.7	12.8	0.50	0.60	0.50	52.1
3	R2	All MCs	92	6.9	92	6.9	0.288	9.9	LOS A	1.7	12.8	0.50	0.60	0.50	51.2
Approach			293	5.4	293	5.4	0.288	7.3	LOS A	1.7	12.8	0.50	0.60	0.50	51.5
East: Nundle Road (E)															
4	L2	All MCs	95	6.7	95	6.7	0.284	5.5	LOS A	1.7	12.8	0.41	0.52	0.41	52.2
5	T1	All MCs	211	5.0	211	5.0	0.284	5.7	LOS A	1.7	12.8	0.41	0.52	0.41	52.7
6	R2	All MCs	13	25.0	13	25.0	0.284	9.8	LOS A	1.7	12.8	0.41	0.52	0.41	51.0
Approach			318	6.3	318	6.3	0.284	5.8	LOS A	1.7	12.8	0.41	0.52	0.41	52.5
North: Back Kootingal Road															
7	L2	All MCs	4	0.0	4	0.0	0.046	6.7	LOS A	0.2	1.7	0.55	0.65	0.55	50.9
8	T1	All MCs	18	0.0	18	0.0	0.046	7.0	LOS A	0.2	1.7	0.55	0.65	0.55	51.2
9	R2	All MCs	19	0.0	19	0.0	0.046	10.5	LOS A	0.2	1.7	0.55	0.65	0.55	50.5
Approach			41	0.0	41	0.0	0.046	8.6	LOS A	0.2	1.7	0.55	0.65	0.55	50.9
West: Nundle Road (W)															
10	L2	All MCs	39	2.7	39	2.7	0.336	5.3	LOS A	2.2	16.5	0.41	0.54	0.41	51.7
11	T1	All MCs	225	6.1	225	6.1	0.336	5.6	LOS A	2.2	16.5	0.41	0.54	0.41	52.0
12	R2	All MCs	128	7.4	128	7.4	0.336	9.2	LOS A	2.2	16.5	0.41	0.54	0.41	51.1
Approach			393	6.2	393	6.2	0.336	6.8	LOS A	2.2	16.5	0.41	0.54	0.41	51.7
All Vehicles			1044	5.7	1044	5.7	0.336	6.7	LOS A	2.2	16.5	0.44	0.55	0.44	51.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
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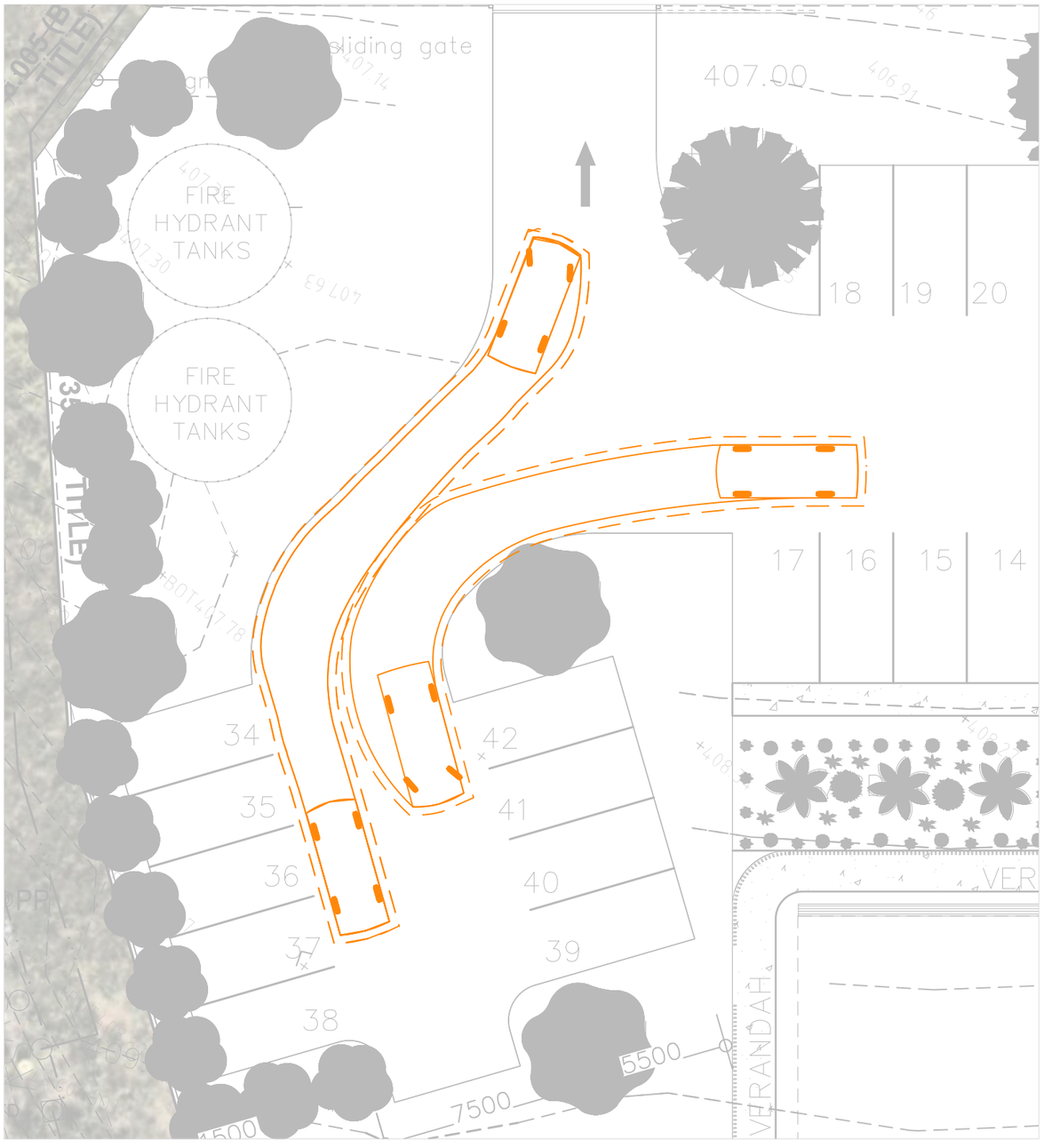
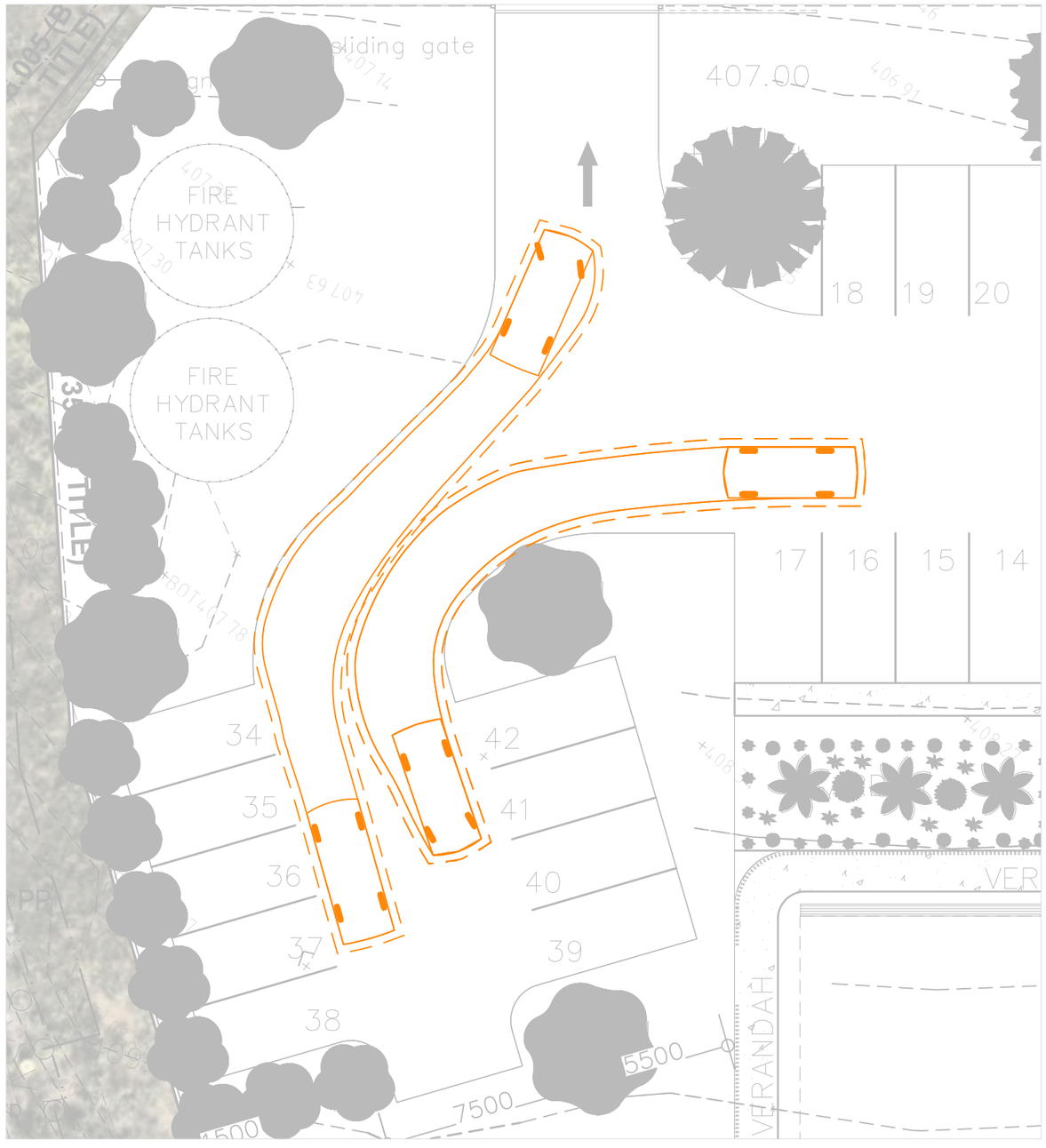
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Appendix B

Swept Path Assessment



Passing Manoeuvre - B99 Entry / B85 Exit



Passing Manoeuvre - B85 Entry / B99 Exit

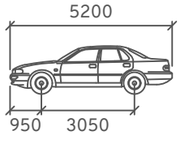
Vehicle Envelope

300mm Clearance

Reverse Manoeuvre

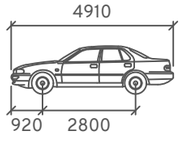
Min. Design Speed 5km/h

B99



	mm
Width	: 1940
Track	: 1840
Height	: 2200
Lock to Lock	: 6.0s
Steering Angle	: 33.9

B85



	mm
Width	: 1870
Track	: 1770
Lock to Lock	: 6.0s
Steering Angle	: 34.1
Height	: 2100

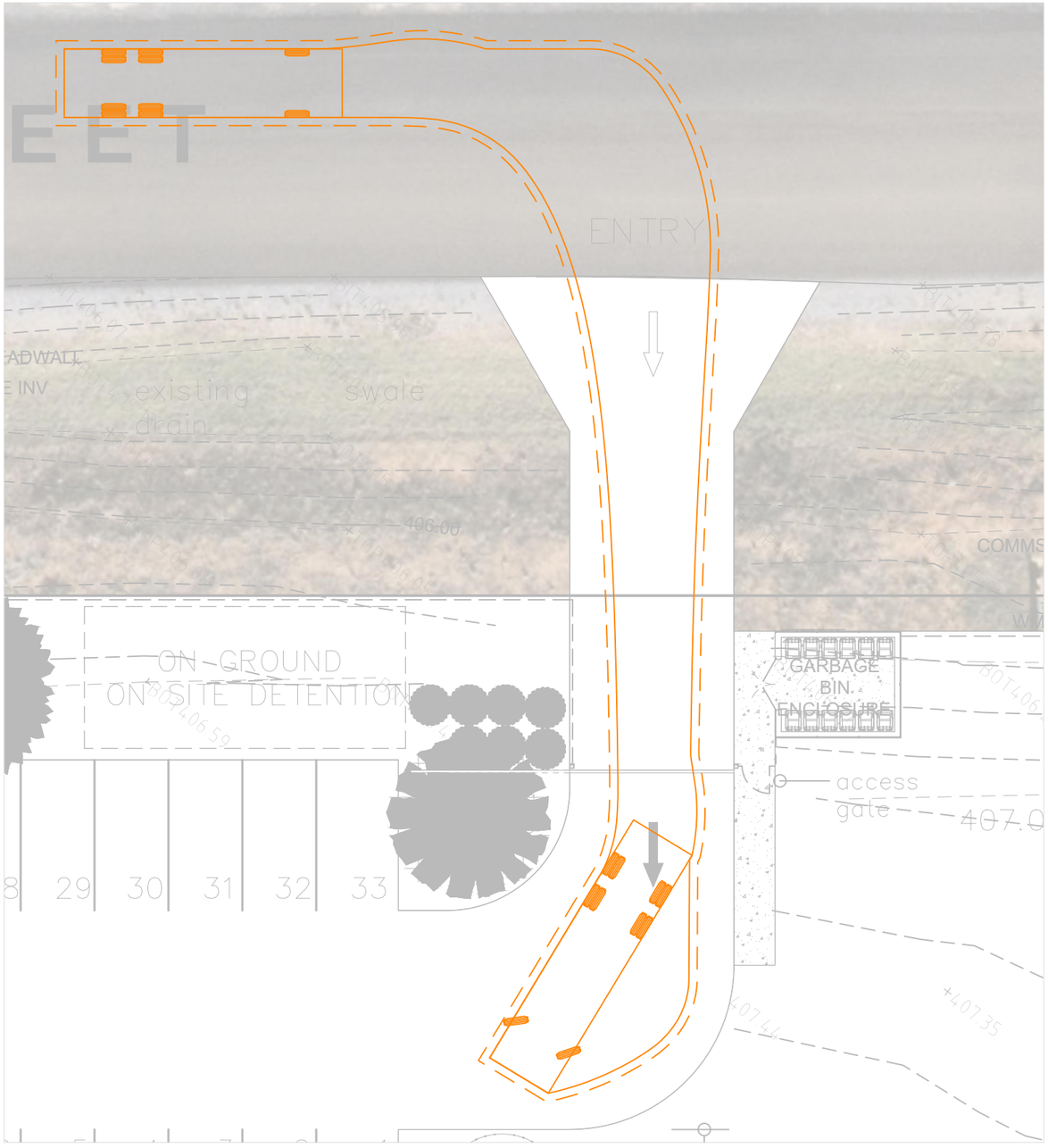
Childcare Centre

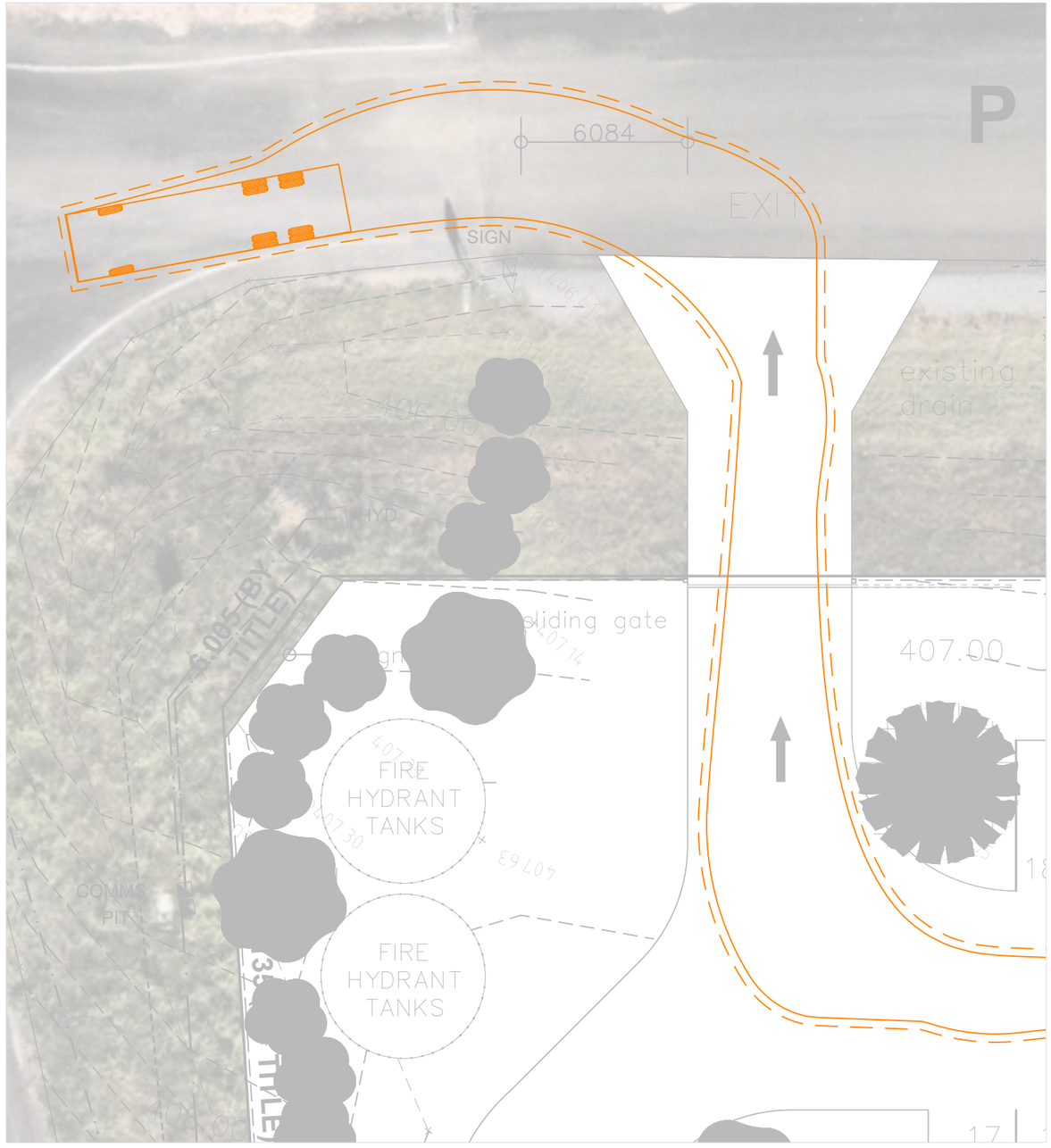
2 Premiers Street, Nemingha

Swept Path Assessment

DRAWN: OM
DATE: 14/03/2025
DWG NO: 1200 S01B
SCALE at A3: 1:200

Amber 01





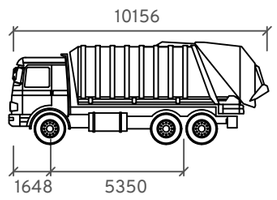
Waste Collection

Vehicle Envelope

300mm Clearance

Reverse Manoevure

Min. Design Speed 5km/h



	mm
Length	: 10156
Width	: 2500
Height	: 3743
Kerb-Kerb Radius	: 9450
Track	: 2500
Lock to Lock	: 4.0s

Typical Waste Vehicle

Childcare Centre

2 Premiers Street, Nemingha

Swept Path Assessment

DRAWN: OM
DATE: 14/03/2025
DWG NO: 1200 S01B
SCALE at A3: 1:200

Amber 02