ATTACHMENT 2

Traffic Impact Assessment
prepared by Rytenskild Traffic Engineering



UPS
URBAN PLANNING SERVICES



rytenskild
Traffic Engineering

TRANSPORT IMPACT ASSESSMENT

PROPOSED MULTIPLE DWELLING DEVELOPMENT

19 – 21 ANNE AVENUE, BROADBEACH

Prepared for

MARY ANNE DEVELOPMENTS

2 MAY 2025

DOCUMENT REGISTER

RTE Reference 24169

Document History

Version	Version date	Details	Reviewed and Authorised	
			Name / Position	Signature
1	10 FEBRUARY 2025	DA	Luke Rytenskild Director RPEQ 6293	
2	2 MAY 2025	IR	Luke Rytenskild Director RPEQ 6293	

COPYRIGHT NOTICE

© Copyright CRG Traffic Pty Ltd All Rights Reserved. Copyright in the whole and every part of this document belongs to CRG Traffic Pty Ltd and may not be used, sold, transferred, copied or reproduced in whole or in part in any manner or form or in or on any media to any person without the prior written consent of CRG Traffic Pty Ltd.

COMPANY INFORMATION

CRG Traffic Pty Ltd as trustee for the Rytenskild CRG Trust trading as Rytenskild Traffic Engineering
ABN 24 401 134 418
ACN 151 846 847
Director: Luke Rytenskild RPEQ 6293

GOLD COAST
Suite 2
24 Surfers Avenue
Mermaid Beach QLD 4218

BRISBANE
Suite 52
149 Wickham Tce
Spring Hill QLD 4000

SYDNEY
Level 26
44 Market Street
Sydney NSW 2000

Phone: 1300 220 020
Facsimile: 1300 087 177
Email: info@rytenskildtraffic.com
Web: www.rytenskildtraffic.com

TABLE OF CONTENTS

1.0 INTRODUCTION 4

2.0 SUBJECT SITE AND ROAD NETWORK 8

2.1 Subject Location 8

2.2 Local Road Network 8

2.3 Survey Traffic Volumes 13

3.0 DEVELOPMENT PROPOSAL 14

4.0 CAR PARKING 21

4.1 Car Parking Supply 21

4.2 Car Parking Design 22

5.0 RAMP MANAGEMENT 33

5.1 Operations 33

5.2 Vehicle Queuing 33

6.0 PROPOSED ACCESS ARRANGEMENTS 40

7.0 PROVISION FOR SERVICE VEHICLES 42

7.1 Acceptable Outcome 42

7.2 Proposed Outcome 42

8.0 PROVISION FOR PEDESTRIANS AND BICYCLES 44

9.0 DEVELOPMENT TRAFFIC ESTIMATES 46

9.1 Traffic Generation 46

9.2 Traffic Distribution 46

9.3 Road Network Impact Assessment 48

10.0 SUMMARY OF CONCLUSIONS & RECOMMENDATIONS 49

APPENDICES 49

APPENDIX A– SURVEYED TRAFFIC VOLUMES 50

APPENDIX B– SIDRA MODELLING RESULTS 52

1.0 INTRODUCTION

Rytenskild Traffic Engineering (RTE) has been engaged by Mary Anne Developments to review the transport elements of its proposed multiple dwelling development at Broadbeach.

This is an amended version of the report submitted as part of the Development Application and responds to matters raised by Council in their Information Request letter dated 1st April 2025.

Responses to the Transport Code and Driveways and Vehicular Crossings Code have been removed from this version of the report. A brief response to the matters raised by Council are provided below and throughout the report.

Item:

Transport Assessment

1. Servicing

The proposed location of the 'standing area' for a Medium Rigid Vehicle (MRV) represents several conflicts with Transport code outcomes, as follows.

a. The proposed MRV 'standing area' conflicts with vehicle access to/from the site (does not allow two-way access for passenger vehicles to be maintained). An alternative location for MRV servicing (on-site) is requested to be demonstrated, supported by swept paths showing the ability for two-way passenger vehicle access to be maintained on-site (i.e. passing provision, at ground level) when an MRV is positioned in the 'standing area').
b. Swept paths showing access to/from the proposed MRV standing area show use of the 'turn from stop' function. Revised swept paths are requested to be submitted demonstrating access by an MRV to and from the standing area without using the 'turn from stop' function (and ensuring the vehicle position is maintained within the kerbside travel lane i.e. does not cross over the centre of Anne Avenue to enter or exit the site). Modification to the alignment of the vehicle crossover may be required, to align with the driveway (while ensuring that a compliant pedestrian sight triangle is maintained on the departure side of the western driveway).
c. It's unclear how far back the (minimum) 4.5m vertical clearance extends, from the front property boundary. Submit a drawing clearly depicting the length of driveway that accommodates compliant vertical clearance for an MRV.
d. The proposed MRV standing area is only 8.7m long; the standing area is requested to be 8.8m long (minimum).
e. The MRV standing area may be reduced to 2.5m wide (rather than 3.5m), as it is a standing area (rather than a dedicated service bay).

Response:

a. The proposed plan of development has been updated to relocate the Medium Rigid Vehicle (MRV) standing area. The removal of the former porte-cochère and widening of the driveway enables the MRV standing area to be positioned further toward the front boundary. As shown in Figure 5.2, a B99 passenger vehicle can safely circulate past a stationary MRV, with sufficient clearance.
b. Updated swept paths have been prepared for the revised MRV standing location (Figure 7.1). Anne Avenue functions as a local access street with no centreline marking. It is acceptable for occasional heavy vehicle movements to cross the centre of the road, as is common for other developments in the area.
   The vehicle crossover has been realigned with the driveway to support compliant entry and exit movements while maintaining a clear pedestrian sight triangle.
c. Refer to the architectural package for further details.
d. The MRV standing area has been extended to 8.8 metres in length.
e. The width of the MRV standing area has been reduced to 2.5 metres.

To support ongoing operational management, a Traffic Management Plan will be implemented and incorporated into the Body Corporate By-Laws. The plan will require residents to schedule MRV use to avoid peak traffic periods and potential overlap with other large vehicle movements. A designated traffic supervisor—such as an on-site manager, resident, or third-party contractor—will be responsible for managing vehicle movements around the standing area during servicing, independent of loading/unloading activities.

It is also proposed to implement an on-street loading zone between the two driveways on Anne Avenue. This would facilitate access for regular small deliveries and waste collection services, consistent with servicing practices for similar developments within the Broadbeach central area.

Item:

2. Active transport networks

Demonstrate the provision of the following pedestrian infrastructure on the development drawings:

a. A new 2m wide footpath along the site's frontage to Anne Avenue.
b. A minimum 1.5m wide 'connecting' pathway, located within the verge of Anne Avenue, connecting the development's proposed pedestrian access point to the new frontage road footpath.

a. The proposed plan of development has been updated to include a 2.0m wide footpath along the Anne Avenue frontage.
b. The proposed plan of development has been updated to include a 1.5m wide footpath providing a continuous connection across the frontage.

Item:

3. Ingress and egress

Performance outcome PO14 of the Transport code requires all vehicles to enter and exit the site in a forward gear. Additional information is required to demonstrate compliance with PO14, including:

a. Submit a swept path demonstrating the ability for a B85 vehicle to turn around using the proposed turning bay located in the visitor car parking aisle (noting that the proposed turning area is impacted by columns and is only 2.3m wide, and is accessed from an aisle width of only 5.8m, instead of 6.1m).
   Note: a compliant number of visitor car parking spaces must be maintained with any changes proposed to accommodate a compliant turn-around area.
b. Provide further information regarding the intended function of the porte cochere and drop-off area.

Response:

a. Swept paths provided in Figure 4.10 confirm that a B85 vehicle can turn around using the turning bay located in the visitor parking aisle.
b. The drop-off area has been removed from the proposed plan of development.

Item:

4. Integrated transport and land use

The development's trip generation has been calculated incorrectly in Table 9.1 of the Transport Impact Assessment (the table applies a trip rate based on the number of bedrooms to the total number of dwellings). Trip generation for the development would be significantly higher than that illustrated in Table 9.1 of the report (more in line with that indicated in Section 5.2 of the report). All SIDRA assessments shall be revised and resubmitted on this basis. Any mitigation measures or upgrade works required to Council's road network as a result of development traffic should be identified and supported by functional layout drawings, where relevant.

Response:

The Traffic Impact Assessment has been amended to adopt trip generation rates consistent with the RMS Guide to Traffic Generating Developments. Given the accessible location of the site, the higher end of the 'Sydney Range' rate has been applied to the development proposal.

Accordingly, Table 9.1 and all associated SIDRA modelling have been updated to reflect the revised trip generation estimates for the development. As shown in Tables 9.2 – 9.3, the SIDRA modelling indicates the surrounding road network will function satisfactorily with the proposed development completed. Accordingly, no mitigation measures or upgrade works are required as a result of development traffic.

Item:

5. General

The proposed vehicle access and circulation arrangements demonstrate a number of non-compliances with AS2890.1 and Transport code requirements. Amendments to the proposal are requested to resolve the following issues:

Note: the traffic report appears to confuse 'basement' and 'podium' levels, particularly with respect to swept paths; the items contained herein refer to basement and podium levels as indicated on the development drawings (i.e. basement access from the western driveway, podium access from the eastern driveway):

a. Swept paths show that two-way, two-lane vehicle access is not achieved for access between the ground floor and basement level (western access); however, ramp management measures have not been identified. Development drawings are required to identify the location of a hold line at ground level (for vehicles entering the site), supported by swept paths demonstrating (a) the ability for a B99 vehicle (exiting the basement) to pass a vehicle waiting at the hold line, and (b) the ability for a B99 vehicle to move from the hold line to the basement ramp.

b. Further to item b, submit a queuing assessment identifying the 95th percentile vehicle queue expected in relation to ramp management measures for access to basement levels (western access). The hold line at ground level is to be positioned to provide sufficient queuing provision, consistent with the queuing assessment. The hold line position must also maintain two-way passenger vehicle access when an MRV is on-site, as per item c, below).
   Note: a probability-based queuing assessment is required, quantifying the 95th percentile queue expected; the statement in the Transport Impact Assessment that 'it is considered the probability of a queue extending more than one vehicle during peak hour operation of the development is low' is insufficient.

c. Two-way passenger vehicle access to/from the site (western access) is not maintained when an MRV is on-site. Swept paths are required demonstrate the ability for passenger vehicles to pass each other at ground level when an MRV is on-site.

d. Within podium levels, the hold line location and vehicle position (for exiting vehicles) do not match. Revised swept paths are requested to demonstrate the ability for an exiting vehicle to move into the proposed hold line position (without corrective movements), and for an entering vehicle to pass a vehicle waiting at this location. Alternatively, the hold line location may be modified to match the swept path - however, a passing vehicle must still be able to maintain compliant clearances to the hold line, when passing.

e. Within podium levels, swept paths for the 'inside' movement (entering vehicles) are based on a B85 vehicle; as this represents the most constrained circulation movement, swept paths must be undertaken using a B99 vehicle, in accordance with AS2890.1 requirements; in addition, compliant circulation clearances must be demonstrated for this movement (600mm clearances on the outside of the swept path, not 300mm as shown; and 300mm clearances on the inside of the swept path).
   Note - if compliant passing provision cannot be demonstrated within podium levels, and all passing is required to occur at ground level, sufficient queuing provision must be demonstrated (95th percentile vehicle queue).

f. Swept paths (eastern vehicle access) demonstrate that a vehicle waiting at the proposed hold line (entering the site) would overhang the front property boundary; all vehicle queuing must be contained within the boundaries of the site. Any change to the location of the hold line is requested to be supported by swept paths demonstrating the ability for (a) an entering vehicle (B99) to move from the hold line to the podium ramp, without corrective movements; and (b) for an exiting vehicle (B99), leaving podium levels, to pass a vehicle waiting at the hold line.

g. Further to item f, submit a queuing assessment, identifying the 95th percentile vehicle queue expected in relation to ramp management measures for access to podium levels (eastern access). The hold line at ground level should be positioned to provide sufficient queuing provision, consistent with the queuing assessment. Any change to the location of the hold line is requested to be supported by swept paths demonstrating vehicle access to the podium ramp (from the hold line), and passing of the hold line location by an opposing vehicle (i.e. two-way access).
   Note – a probability-based queuing assessment is required, quantifying the 95th percentile queue expected; the statement in the Transport Impact Assessment that 'it is considered the probability of a queue extending more than one vehicle during peak hour operation of the development is low' is insufficient; further, the statement in the Transport Impact Assessment that 'there is sufficient space available for a second vehicle to queue clear of the frontage roadway without blocking exit travel route from the site' is incorrect.

h. Swept paths are requested to be submitted demonstrating vehicle circulation within basement levels, with any need for management of opposing vehicle movements clearly demonstrated, and measures reflected on development drawings (note - swept paths have only been provided for circulation in podium levels).
Note - if compliant passing provision cannot be demonstrated within basement levels, and all passing is required to occur at ground level, sufficient queuing provision must be demonstrated (95th percentile vehicle queue).
i. The 'centreline' of all hold lines are to be appropriately positioned to guide vehicles into the correct position, and to allow opposing vehicles to pass the hold line with compliant clearances maintained (to be clear, centrelines of hold lines, in all cases, are located too far over the 'centre' of the respective aisle and do not reflect vehicle movements, as shown in swept paths).
j. Swept paths show vehicles are unable to successfully exit visitor car parking space V1 - swept paths show a vehicle driving through the gate at the top of the basement ramp. This is likely due to the non-compliant aisle extension (<1m) at the end of the visitor parking aisle and also the non-compliant aisle width (5.75m measured to the gate at the top of the basement ramp).
k. Demonstrate a compliant width for the visitor car parking aisle (width of 6.1m required, between edge of parking spaces and vertical obstructions located opposite). Widths as low as 5.75m are currently shown.
l. Identify the space located between visitor car parking spaces V5 and V6 as 'No parking'.
m. The vehicle crossover and driveway (western access) do not align; demonstrate how the driveway area leading to the crossover (on exit from the western driveway) will be treated to guide vehicles appropriately (and preserving the pedestrian sight triangle area).

Response:

a. Based on the assessed arrival and exit rates, the likelihood of a vehicle entering and exiting the site simultaneously and crossing paths at the ground floor ramp interface is low, with such overlap estimated to occur less than once every 12 minutes during the peak hour. Given that the internal access aisles and ramps are generally configured to accommodate two-way vehicle movement, a dedicated holding bay is not considered necessary.
b. A probability-based queuing assessment has been undertaken (refer to Section 5.2) for the basement and podium ramps, based on an arrival rate of 0.3 vehicles per minute and a service rate of 0.667 vehicles per minute during the peak period. The assessment identified a 95th percentile queue length of three vehicles. As previously noted, a dedicated holding bay is not considered necessary on the basis that the proposal generally provides for two vehicles to pass on basement ramps, with only a need for one driver to give way to another at corners (which is typical of two-lane ramp systems). Notwithstanding this, the western driveway provides provision for more than three cars to queue before the ramp entry, and therefore meets the 95th percentile demand.
c. Given the frequency and duration of service vehicle activity, which is typically scheduled outside of peak traffic periods, it is not considered necessary to provide provision for two passenger vehicles to pass a loading MRV. As shown in Figure 5.2, the proposal provides provision for a passenger vehicle to pass a loading MRV. This is considered satisfactory as passenger vehicles are expected to overlap less than once every 12 minutes.
d. Within the podium level, the hold line location has been adjusted to match vehicle swept paths. Figure 5.4 confirms that exiting vehicles can reach the hold line position without corrective movements, and incoming vehicles can pass safely.
e. B99 vehicles have been used for all constrained turning paths in the podium level, in accordance with AS2890.1. Swept paths in Figure 5.4 confirm compliance with required 300mm (inside) and 600mm (outside) clearances.
f. The updated hold line at the eastern access is now fully contained within the property boundary. As shown in Figure 5.3, B99 vehicles can comfortably travel from the hold line to the podium ramp without corrective movements, and a second vehicle can pass in the opposing direction with sufficient clearance.
g. As stated above, the queuing assessment (refer to Section 5.2) identified a 95th percentile queue length of three vehicles. The eastern access has been designed to accommodate one vehicle at the hold line, with capacity for a second vehicle to queue within the driveway clear of the frontage. While this is marginally below the 95th percentile value, the shortfall is

considered acceptable as the likelihood of a three-vehicle queue is low, occurring in less than 5% of peak conditions. Vehicle arrivals are expected to be evenly distributed across the peak hour, and the system operates with low traffic intensity, indicating it is unoccupied more than half the time. Additionally, Anne Avenue is a local road carrying low traffic volumes, and its two-lane configuration provides sufficient width for through vehicles to pass around a vehicle momentarily waiting to enter the site. On this basis, the queuing provision is considered satisfactory under expected operating conditions. As shown in Figure 5.3, vehicles can move from the hold line to the podium ramp and pass each other satisfactorily.

h. Swept paths showing vehicle circulation within the basement are now provided in Figure 5.5. As stated in response to Item 5(b), the western driveway provides provision for more than three cars to queue before the ramp entry, and therefore meets the 95th percentile demand.
i. Hold line centreline positions have been adjusted across the plans to reflect realistic vehicle tracking and allow compliant passing movements.
j. Vehicle access to Visitor Space V1 has been addressed. As shown in Figure 4.5, swept paths now confirm that a B99 vehicle can enter and exit this space without conflict with the entry gate or aisle width constraints.
k. As shown in Figure 4.10, the proposed parking aisle width of 5.8 metres allows adequate manoeuvring space for B99 vehicles in accordance with AS2890.1 requirements, particularly given the minimal usage and short-term nature of these bays.
l. This space is no longer proposed.
m. The alignment between the western driveway and crossover has been adjusted accordingly. Refer to Figure 6.1.
n. Pedestrian sight triangles are now shown consistently across all drawings, with appropriate annotation. Refer to Figure 6.1.

2.0 SUBJECT SITE AND ROAD NETWORK

2.1 Subject Location

As shown in Figure 2.1, the subject site is located on the northern side of Anne Avenue. The site is identified as Lot 1 – 4 on BUP1114 and has a site area of approximately 1,032m^2.

The site is located within the mapped area of the Transport Hub, and is within 450 metres walking distance of the Broadbeach South light rail station.

2.2 Local Road Network

To the west, Anne Avenue connects to Surf Parade via a priority-controlled T junction, with Surf Parade as the priority. Surf Parade and Anne Avenue are identified as local roads, and comprise of two lanes (one in each direction). Surf Parade functions as a distributor road in the local road network, whereas Anne Avenue provides for local access.

To the east, Anne Avenue connects to Old Burleigh Road via a priority controlled T junction, with Old Burleigh Road as the priority. Old Burleigh Road is identified as a local road, and comprises of two lanes (one in each direction). Similar to Surf Parade, Old Burleigh Road has a distributor function in the surrounding road network.

Images of the surrounding road network are shown in Figures 2.2 – 2.4.



FIGURE 2.1 – LOCATION OF SUBJECT SITE



FIGURE 2.2 – IMAGES OF THE SURROUNDING ROAD NETWORK



FIGURE 2.3 – IMAGE OF THE SURF PARADE / ANNE AVENUE INTERSECTION



FIGURE 2.4 – IMAGE OF THE OLD BURLEIGH ROAD / ANNE AVENUE INTERSECTION

2.3 Survey Traffic Volumes

RTE carried out peak period traffic counts at the Surf Parade / Anne Avenue and Old Burleigh Road / Anne Avenue intersections on a typical weekday (Friday) in November 2024.

The full traffic survey is provided in Appendix A, with peak period traffic volumes summarised in Figure 2.5.

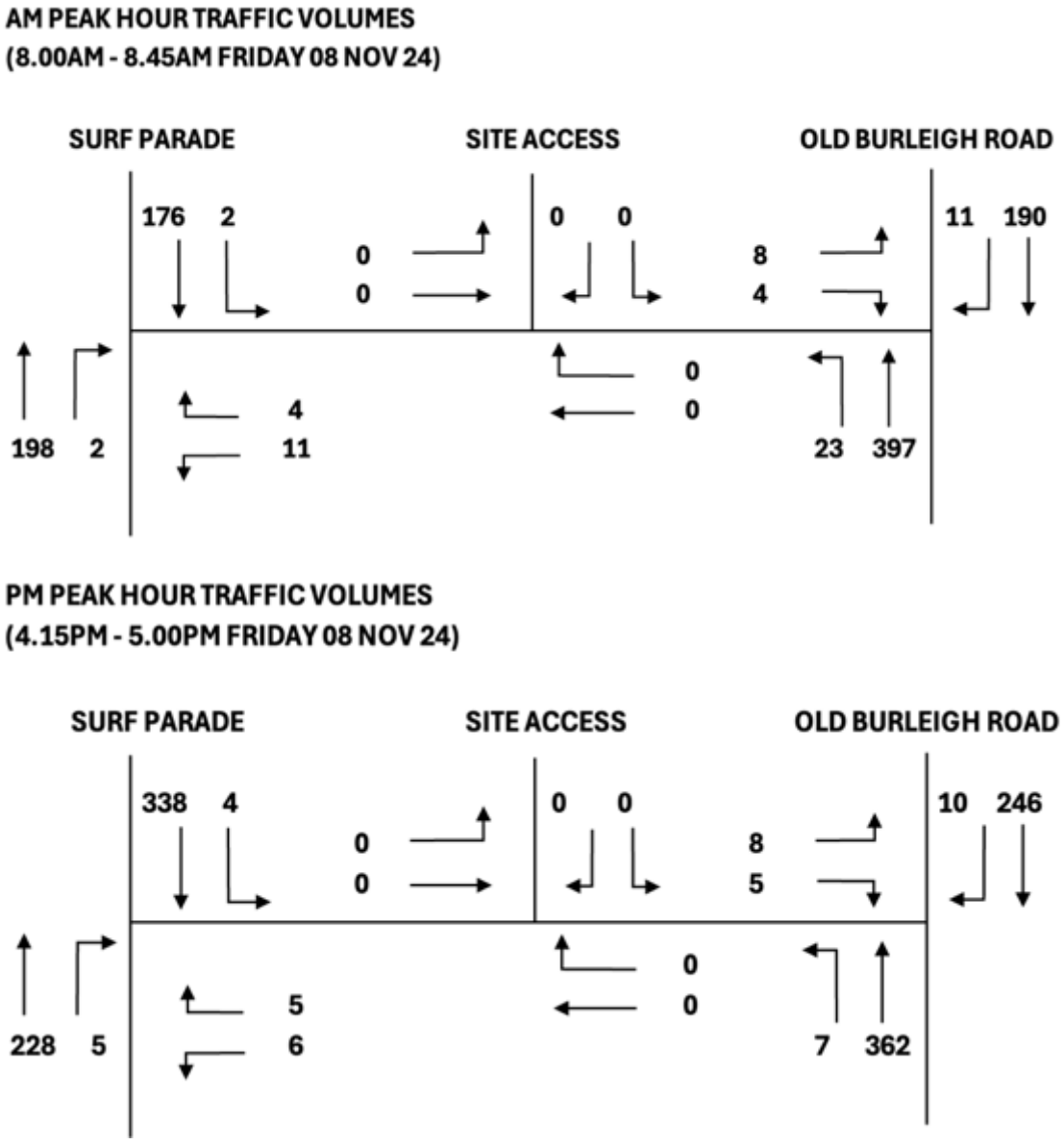


FIGURE 2.5 – SURVEYED PEAK HOUR TRAFFIC VOLUMES AT THE SURVEYED INTERSECTIONS

3.0 DEVELOPMENT PROPOSAL

The proposed plan of development is for a multiple dwelling development comprising of 56x three-bedroom units (168 bedrooms).

The proposal provides a total of 107 car parking spaces are proposed to be provided over two podium levels, ground floor and two basement levels. A breakdown of the proposed car parking supply is as follows:

Resident Car Parking:	100 spaces
Residential Visitors:	7 spaces
Total:	**107 spaces**

Access is proposed to be gained via two crossovers located at either end of the road frontage. The western crossover will provide for access to visitor parking and basement level resident parking, whereas the eastern crossover will provide for access to resident parking on the podium levels.

The proposed podium levels, ground and basement parking levels are shown in Figures 3.1 – 3.6.

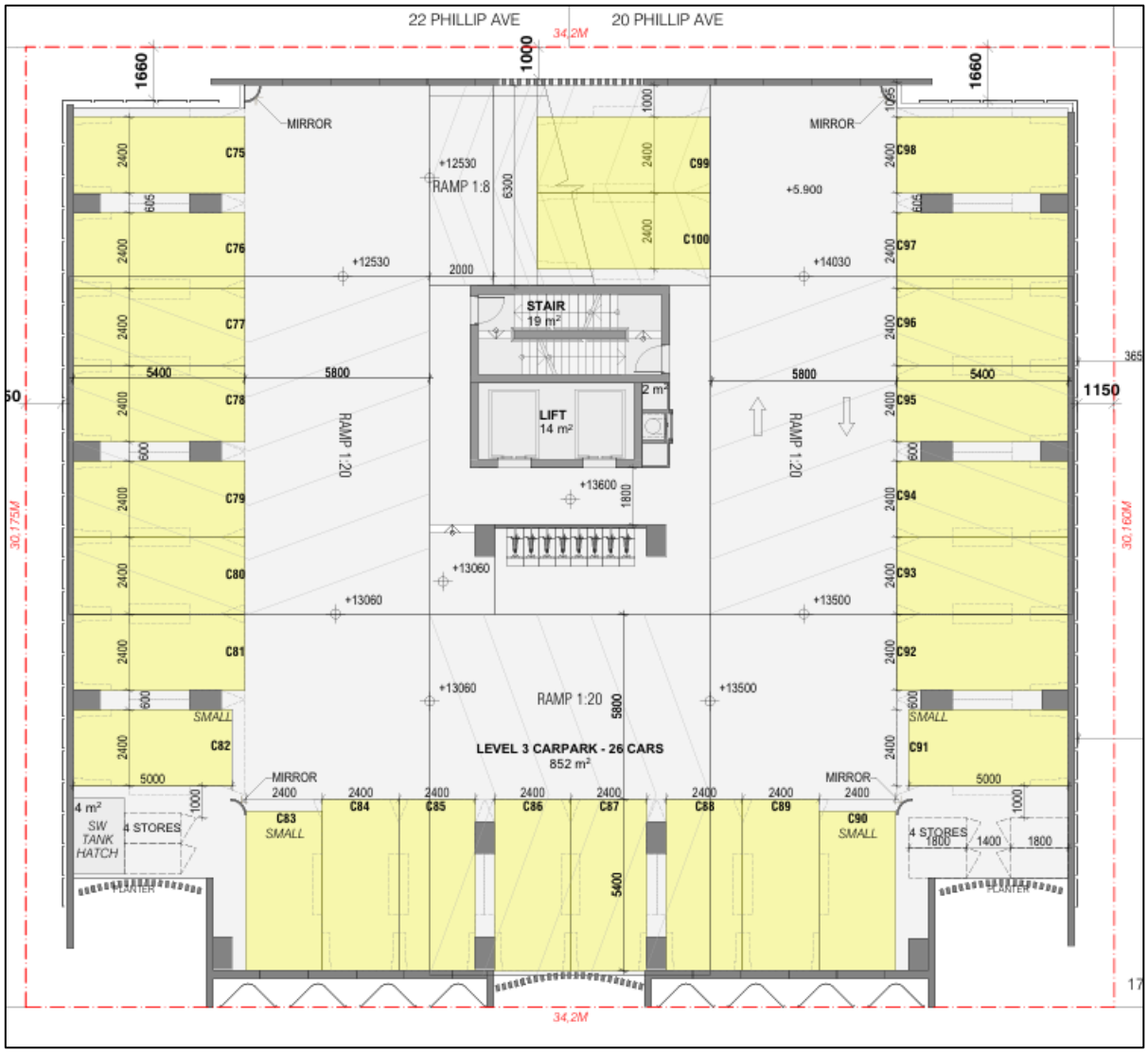


FIGURE 3.1 – PROPOSED LEVEL THREE FLOOR PLAN

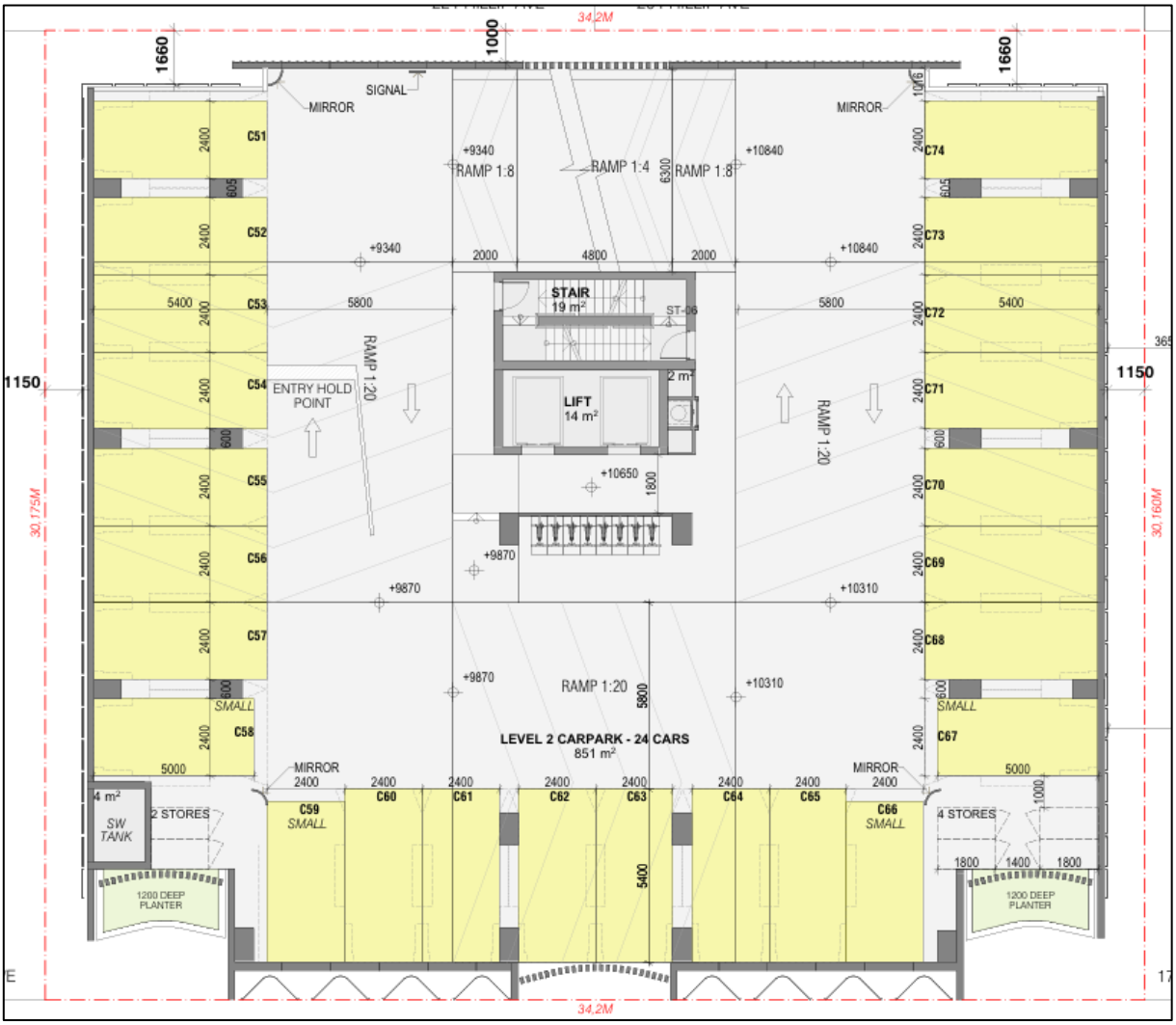


FIGURE 3.2 – PROPOSED LEVEL TWO FLOOR PLAN

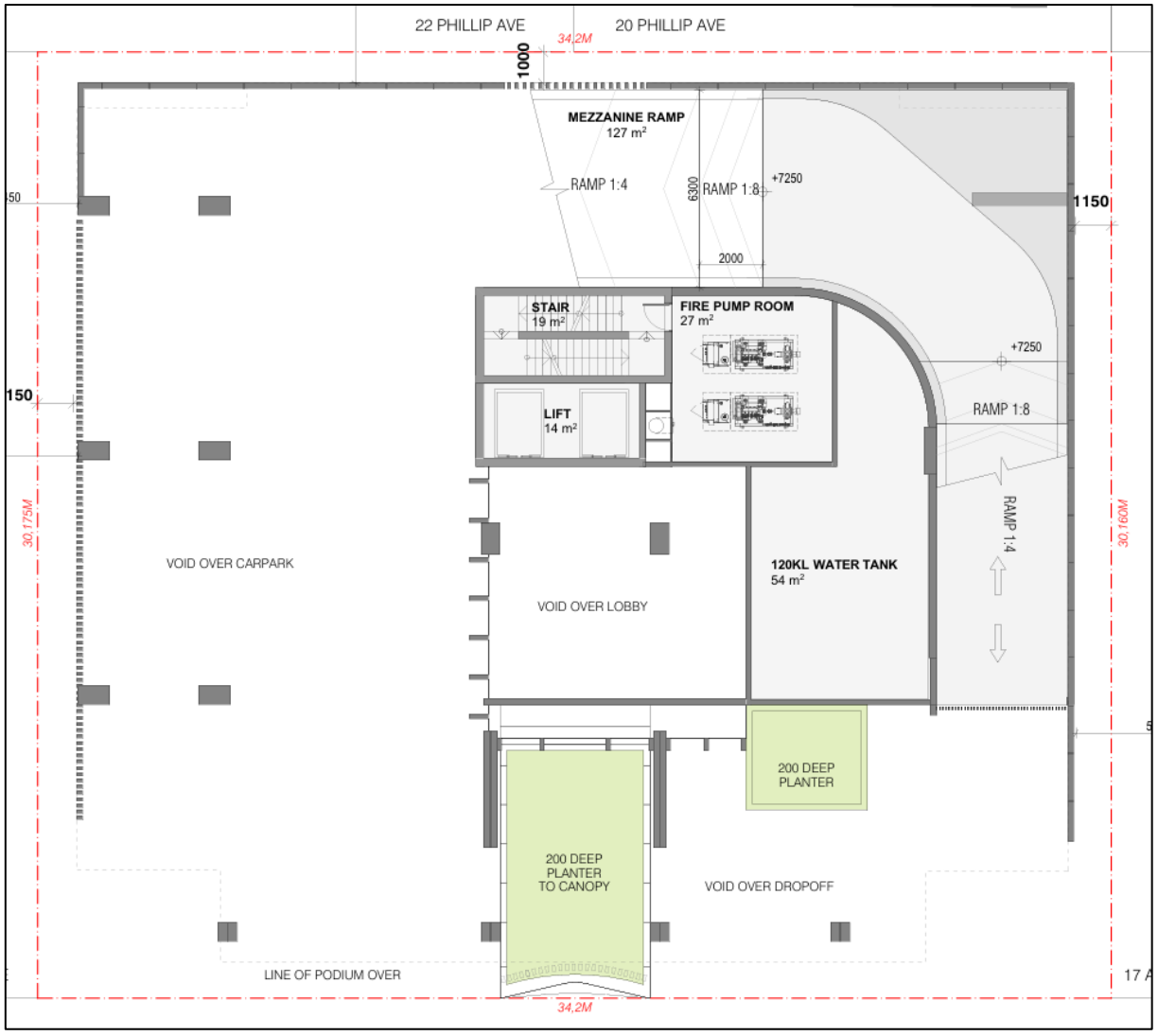


FIGURE 3.3 – PROPOSED MEZZANINE FLOOR PLAN

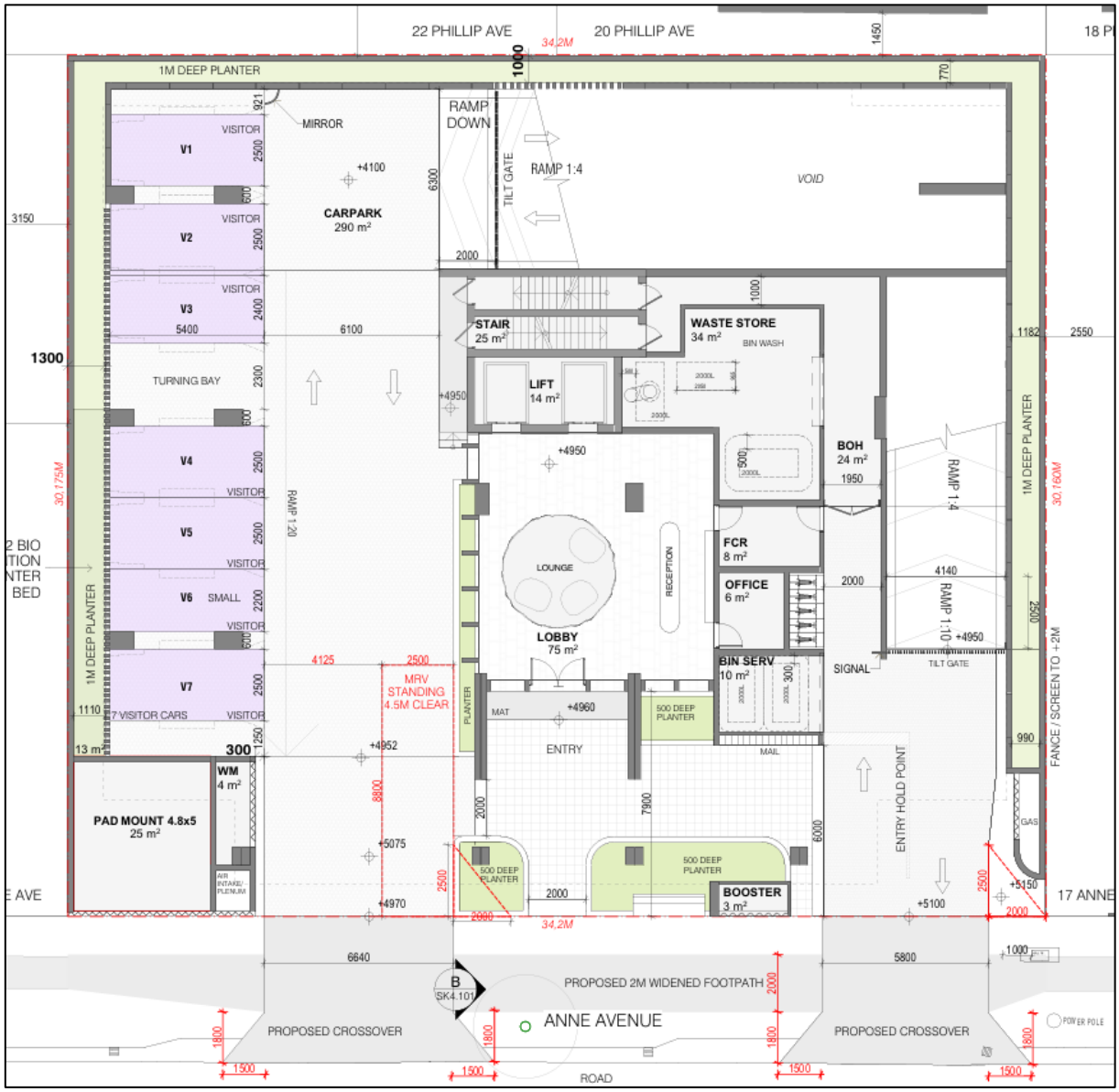


FIGURE 3.4 – PROPOSED GROUND FLOOR PLAN

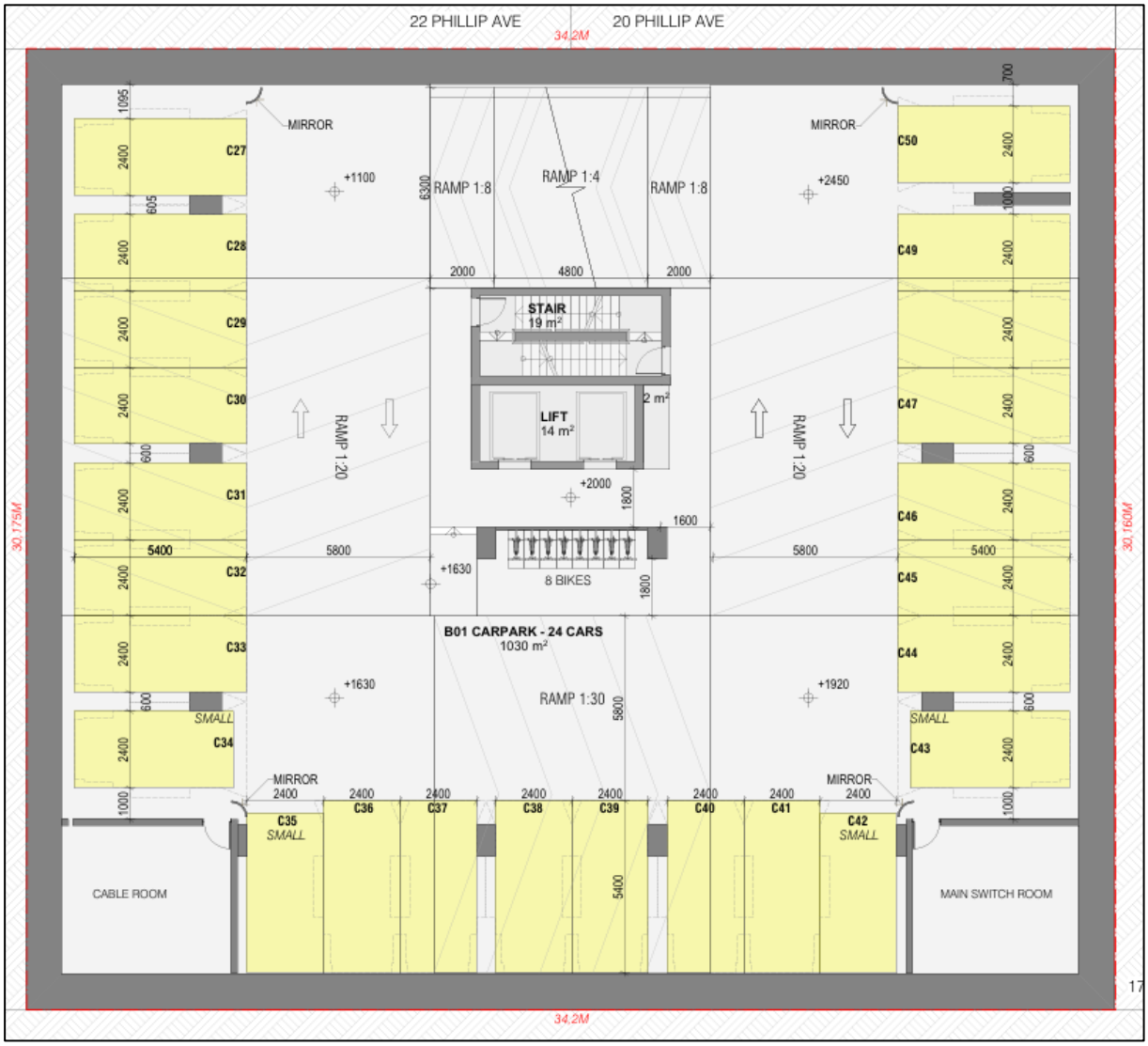


FIGURE 3.5 – PROPOSED BASEMENT LEVEL ONE PLAN

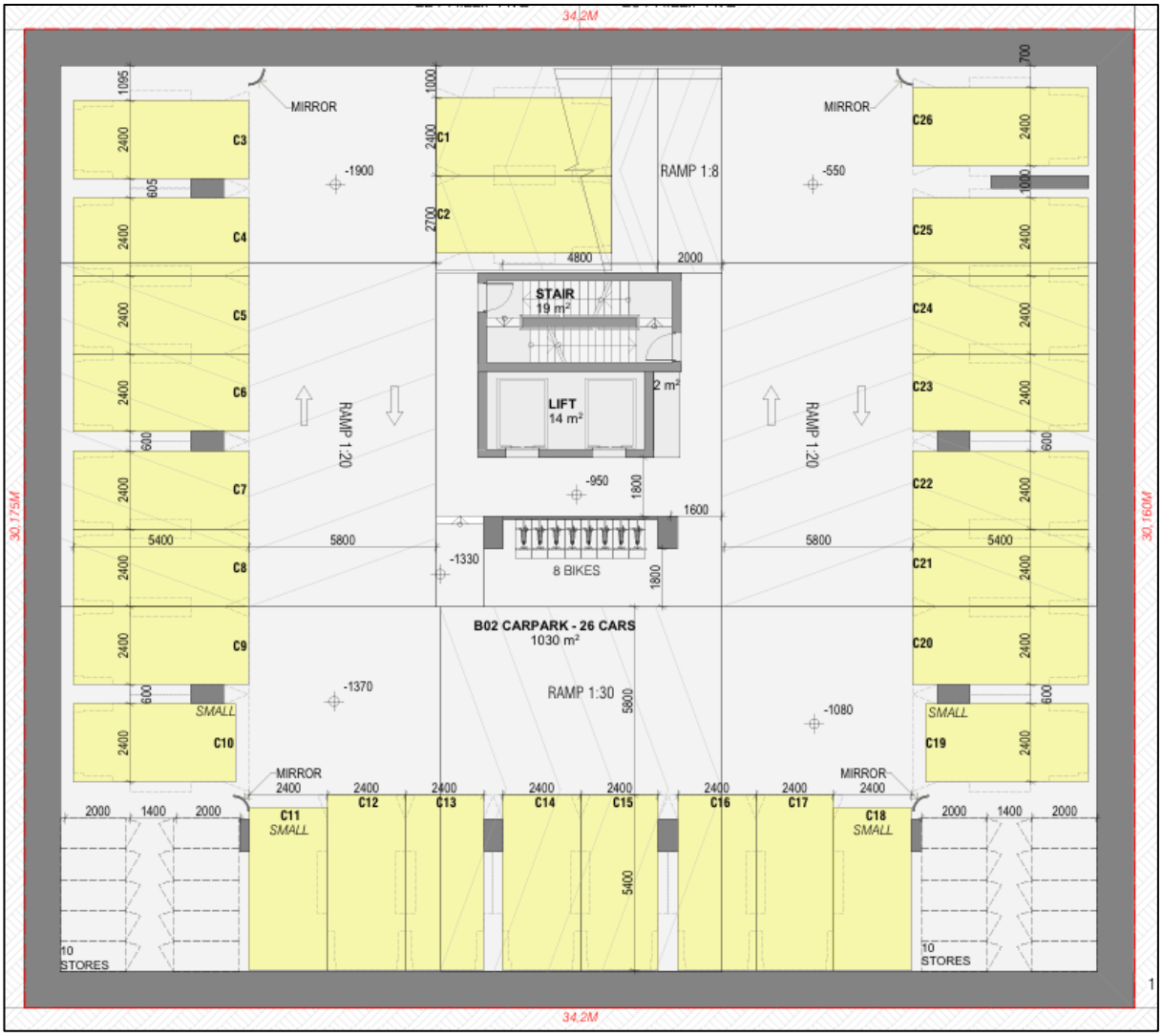


FIGURE 3.6 – PROPOSED BASEMENT LEVEL TWO PLAN

4.0 CAR PARKING

4.1 Car Parking Supply

In accordance with the Gold Coast City Plan, *9.4.13 Transport code, Table 9.4. 13-4: Car parking rates for Centre Zone (within 800 metres of a light rail station),* the following rate applies to the proposed development:

Residential – permanent/long-term accommodation:
0.9 per unit or dwelling and 1 per 10 units or dwelling for visitors.
*A minimum of 17.5% residential parking, excluding visitor, is to be unbundled.

Application of the above rates results in the following Acceptable Outcome:

Table 4.1: Acceptable Outcome for Parking

Component	Acceptable Outcome
Multiple Dwelling: 56 units	50.4 (51) spaces
Visitor Parking: 56 units	5.6 (6) spaces
TOTAL	**57 spaces**

The proposal provides a total of 107 car parking spaces, including 7 spaces for visitors, and therefore meets the Acceptable Outcome.

4.2 Car Parking Design

The geometric layout of the proposed parking facilities generally complies with the relevant requirements specified by the Transport Code.

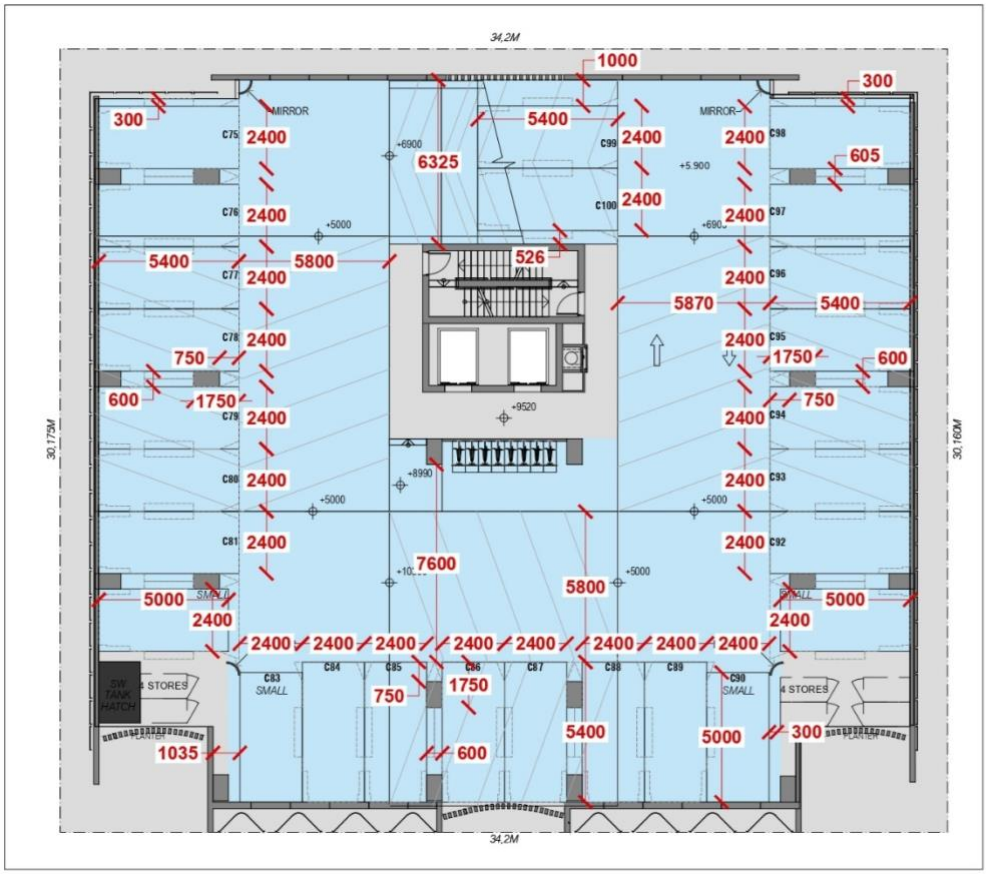
The proposed car park has been designed with the following characteristics:

Table 4.2 – Car Parking Design Characteristics

Design Aspect	Minimum AS2890.1 Standard	Proposed Provision	Compliance
Parking space length: - Resident (regular) - Visitor	 5.4 metres 5.4 metres	 5.4 metres 5.4 metres	 Compliant Compliant
Parking space width: - Resident - Visitor	 2.4 metres 2.5 metres	 2.4 metres 2.5 metres	 Compliant Compliant
Aisle Width: - Parking aisle - Circulation aisle (one-way)_	 5.8 metres 3.6 metres	 5.8 metres N/A	 Compliant N/A
Maximum Gradient - Parking Bay - Parking Aisle - Ramp	 1:20 (5.0%) 1:16 (6.25%) 1:40 (2.5%)	 <1:20 (5.0%) <1:20 (5.0%) <1:4 (25%)	 Compliant
Maximum Change in Grade Ramp Grade	1:8 (12.5%) summit 1:6.67 (15.0%) sag 1:4 (25%)	<1:8 (12.5%) summit <1:8 (12.5%) sag 1:4 (25%)	Compliant Compliant
Height Clearance - General Min. - Absolute Min.	 2.2 metres N/A	 >2.2 metres	 Compliant
Parking Aisle Extension	1 metre beyond last bay or 8m adj. aisle	Combination	Alternative Solution

The proposed car parking dimensions are shown in Figures 4.1 - 4.3.

A swept path analysis has been carried out using AutoTURN in accordance with AS2890.1:2004. Vehicle manoeuvring paths (B50, B85 and B99) are shown in Figures 4.4 – 4.10.



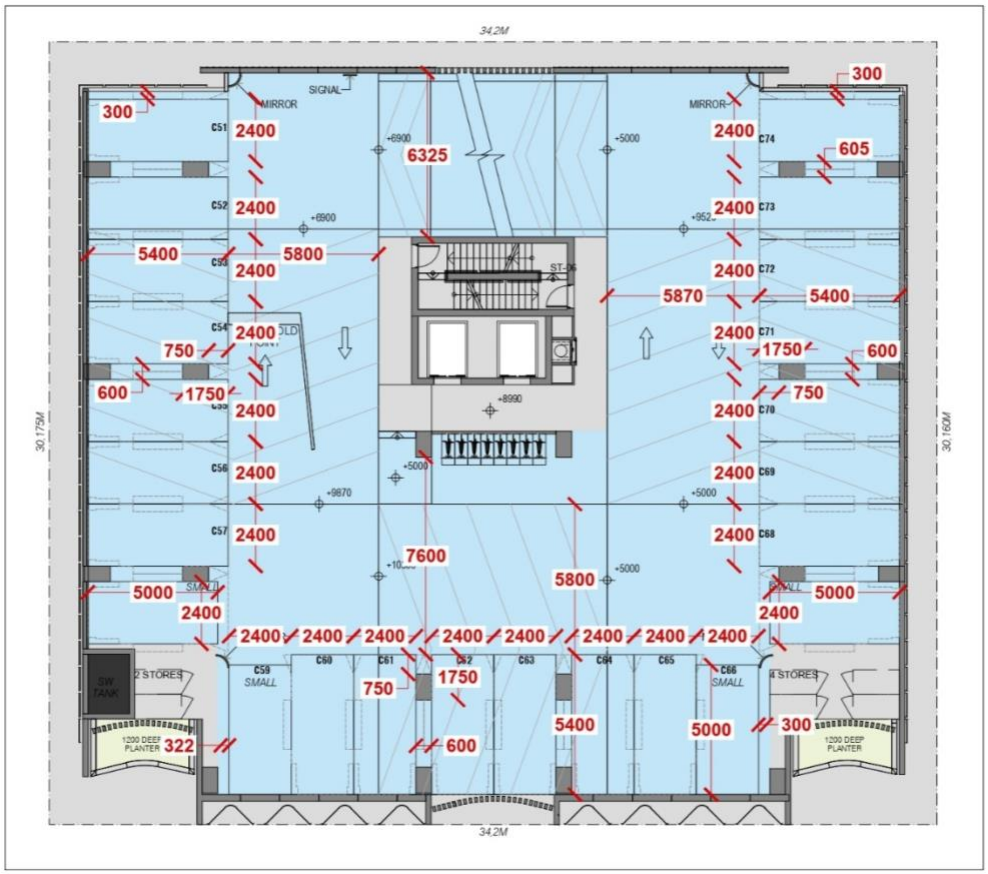


FIGURE 4.1 – PROPOSED CAR PARKING LAYOUT AND DIMENSIONS (PODIUM LEVELS THREE & TWO)

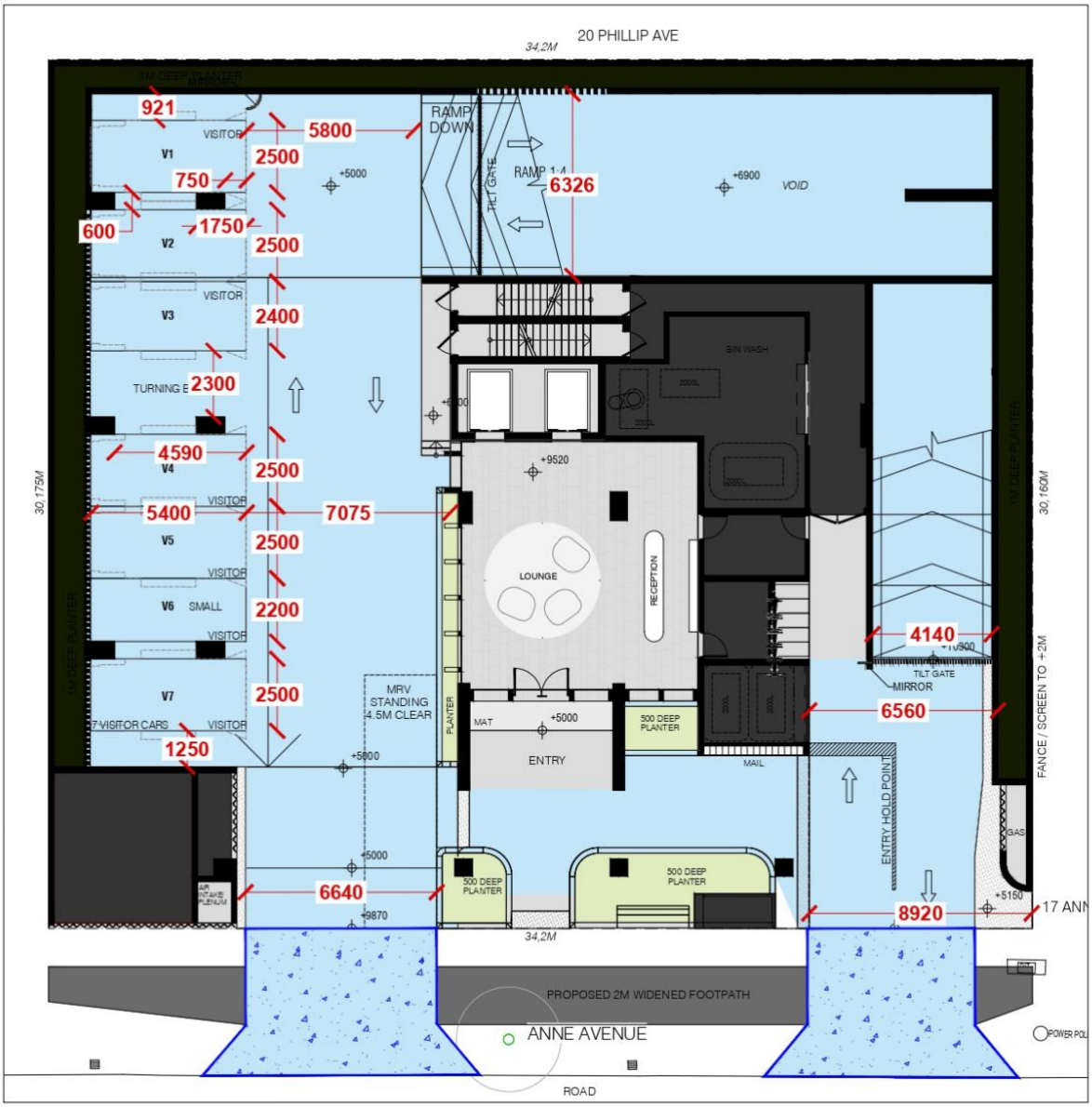


FIGURE 4.2 – PROPOSED CAR PARKING LAYOUT AND DIMENSIONS (GROUND FLOOR)

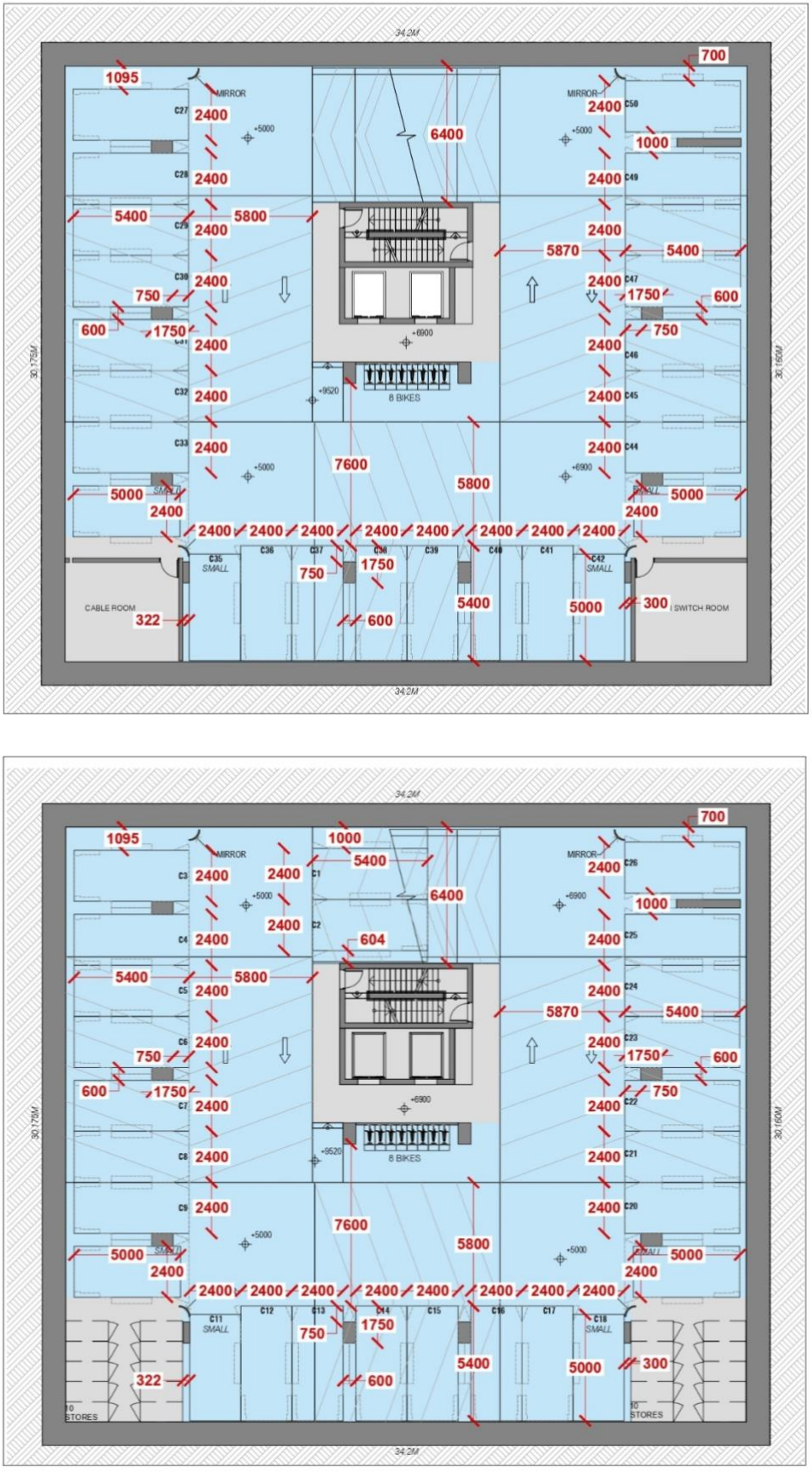


FIGURE 4.3 – PROPOSED CAR PARKING LAYOUT AND DIMENSIONS (BASEMENT LEVELS ONE & TWO)

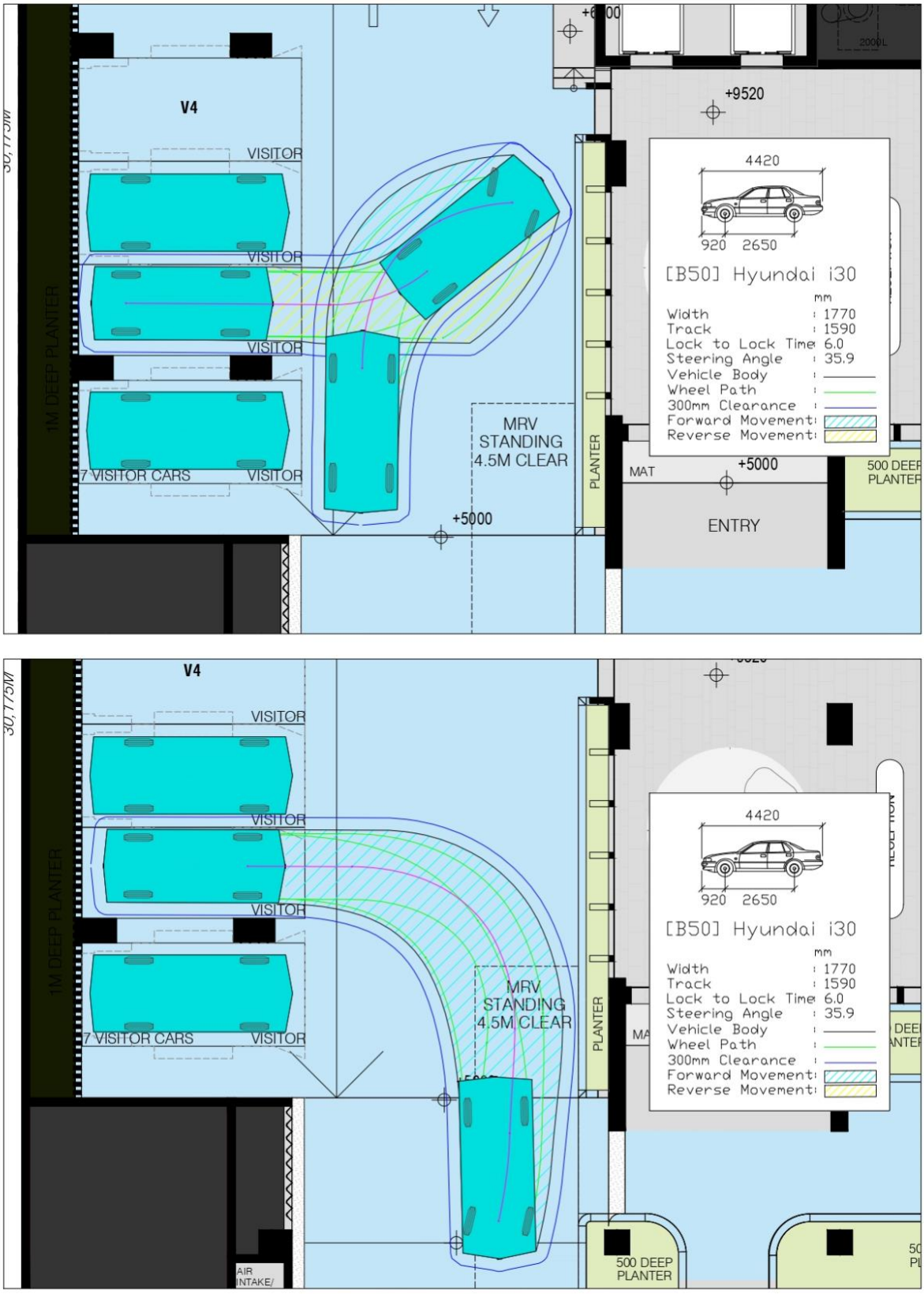


FIGURE 4.4 – B50 VEHICLE PATHS (CRITICAL CAR PARKING AND MANOEUVRES)

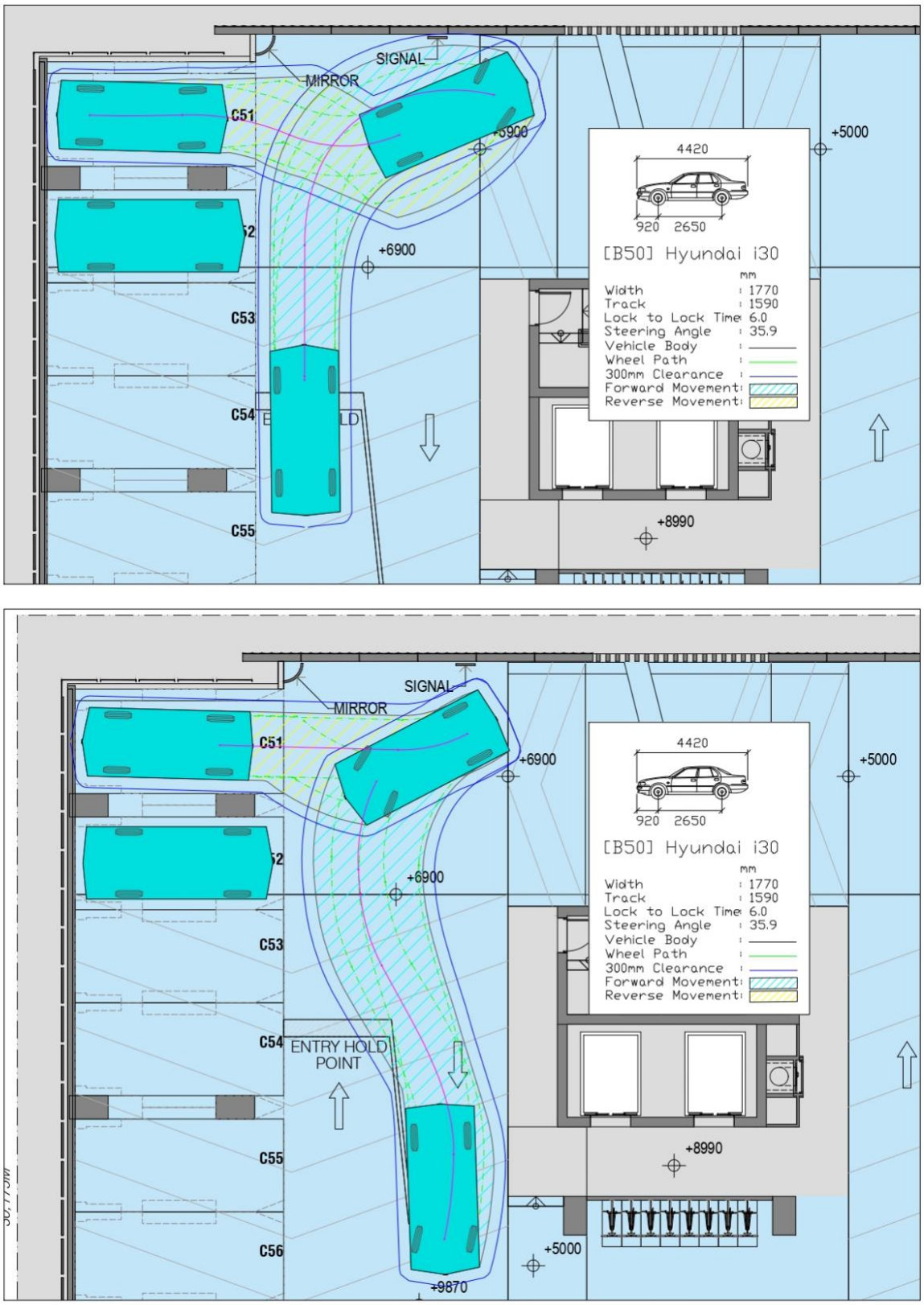


FIGURE 4.5 – B50 VEHICLE PATHS (CRITICAL CAR PARKING AND MANOEUVRES)

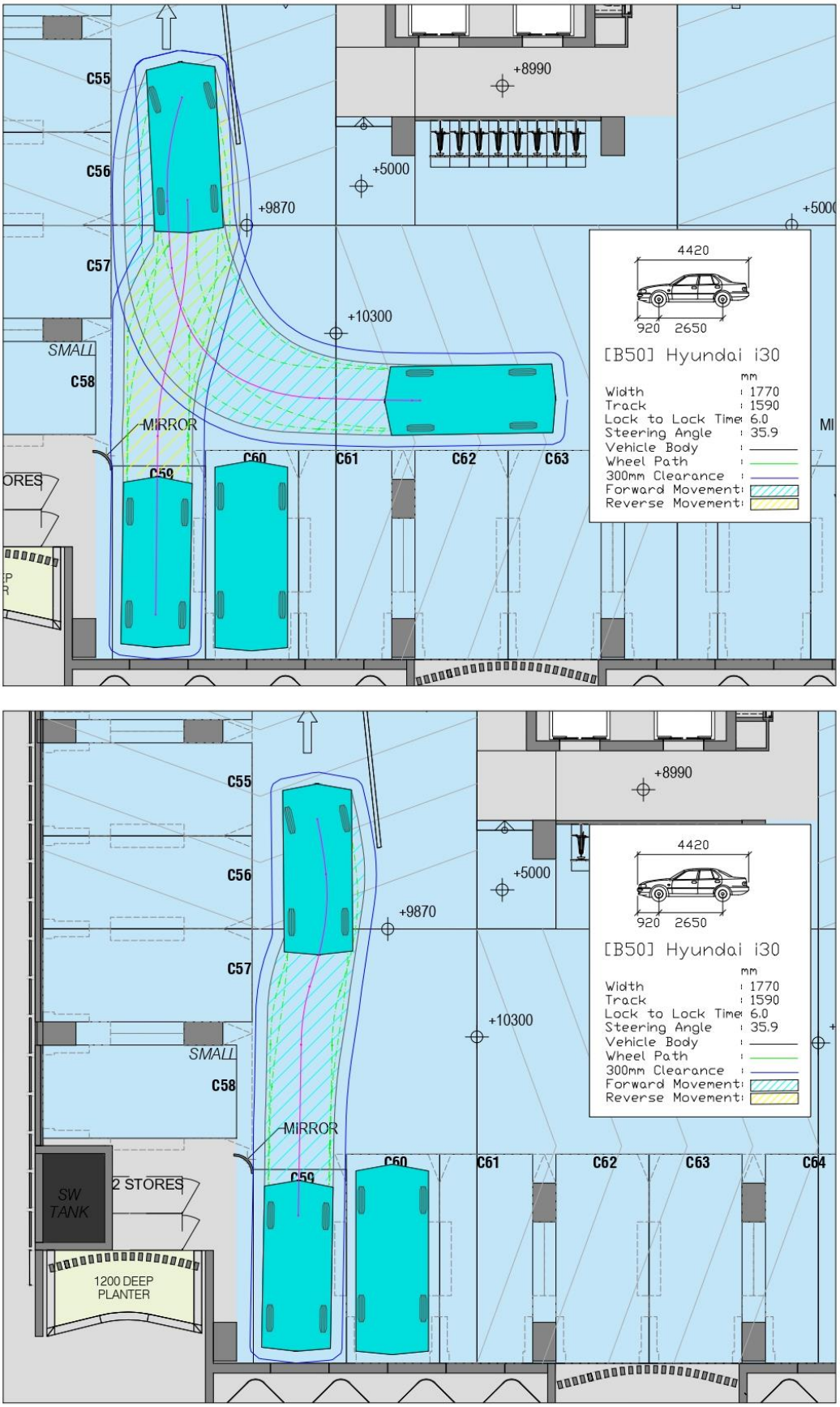


FIGURE 4.6 – B50 VEHICLE PATHS (CRITICAL CAR PARKING AND MANOEUVRES)

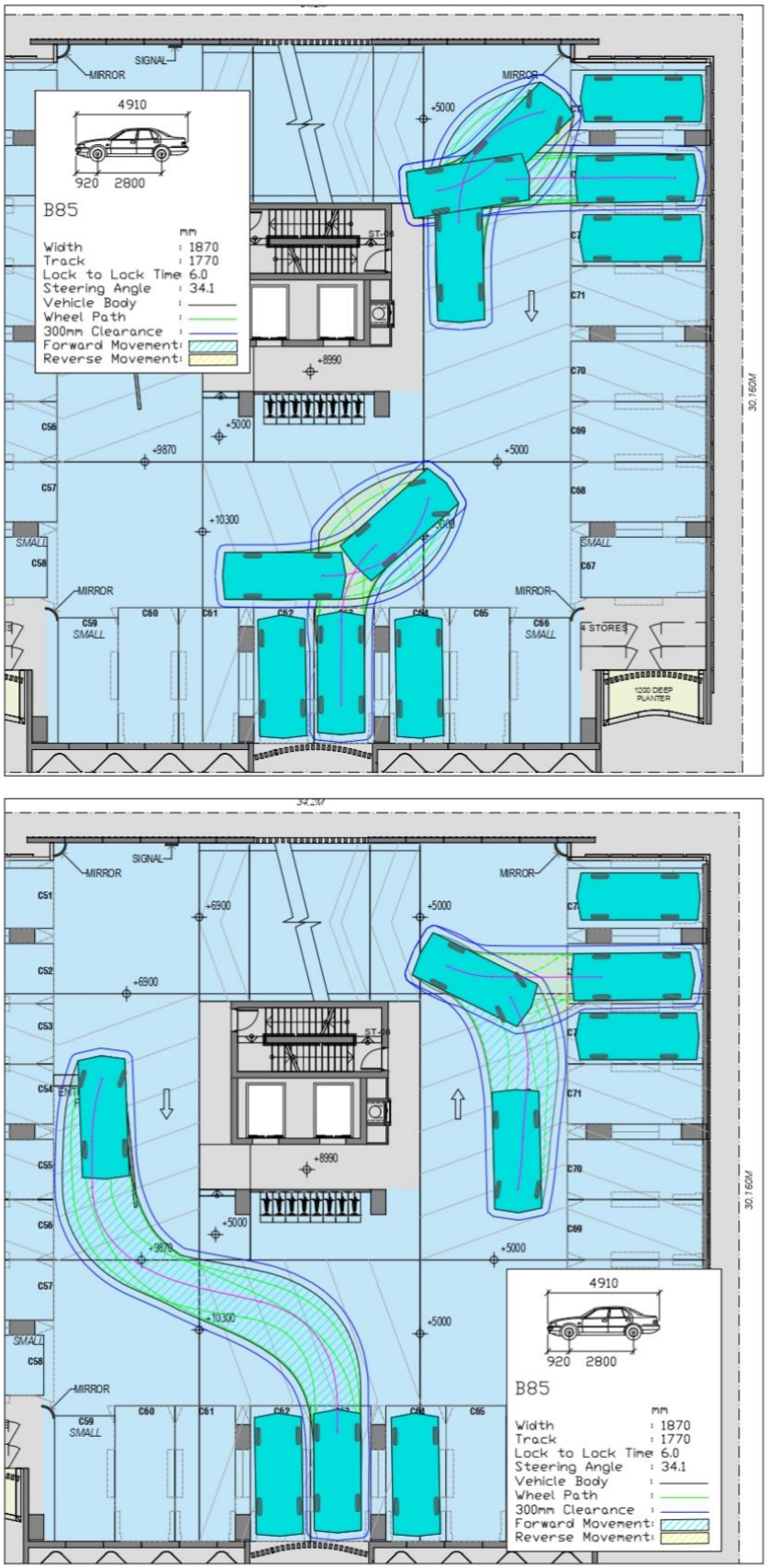


FIGURE 4.7 – B85 VEHICLE PATHS (CRITICAL CAR PARKING AND MANOEUVRES)

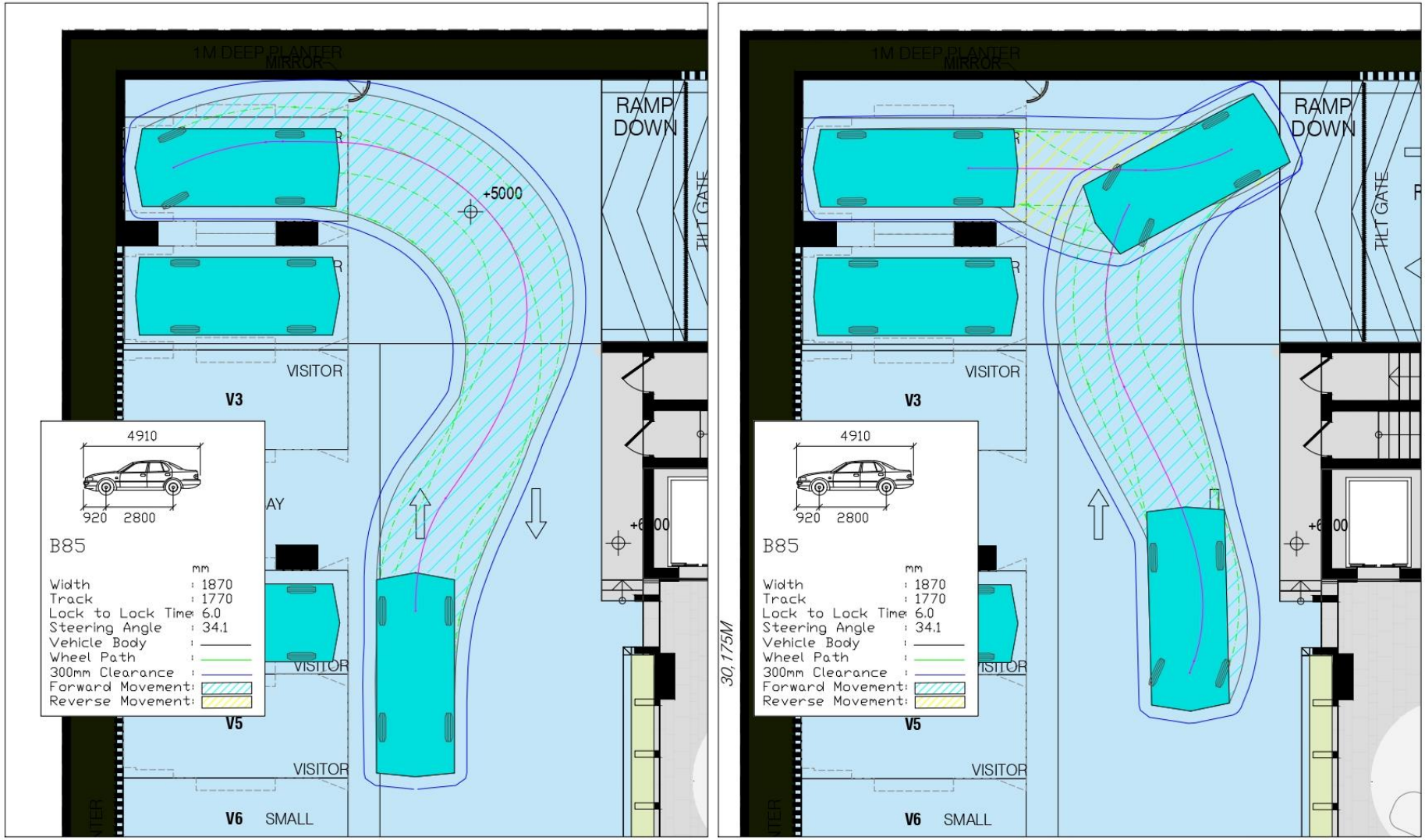


FIGURE 4.8 – B85 VEHICLE PATHS (CRITICAL CAR PARKING AND MANOEUVRES)

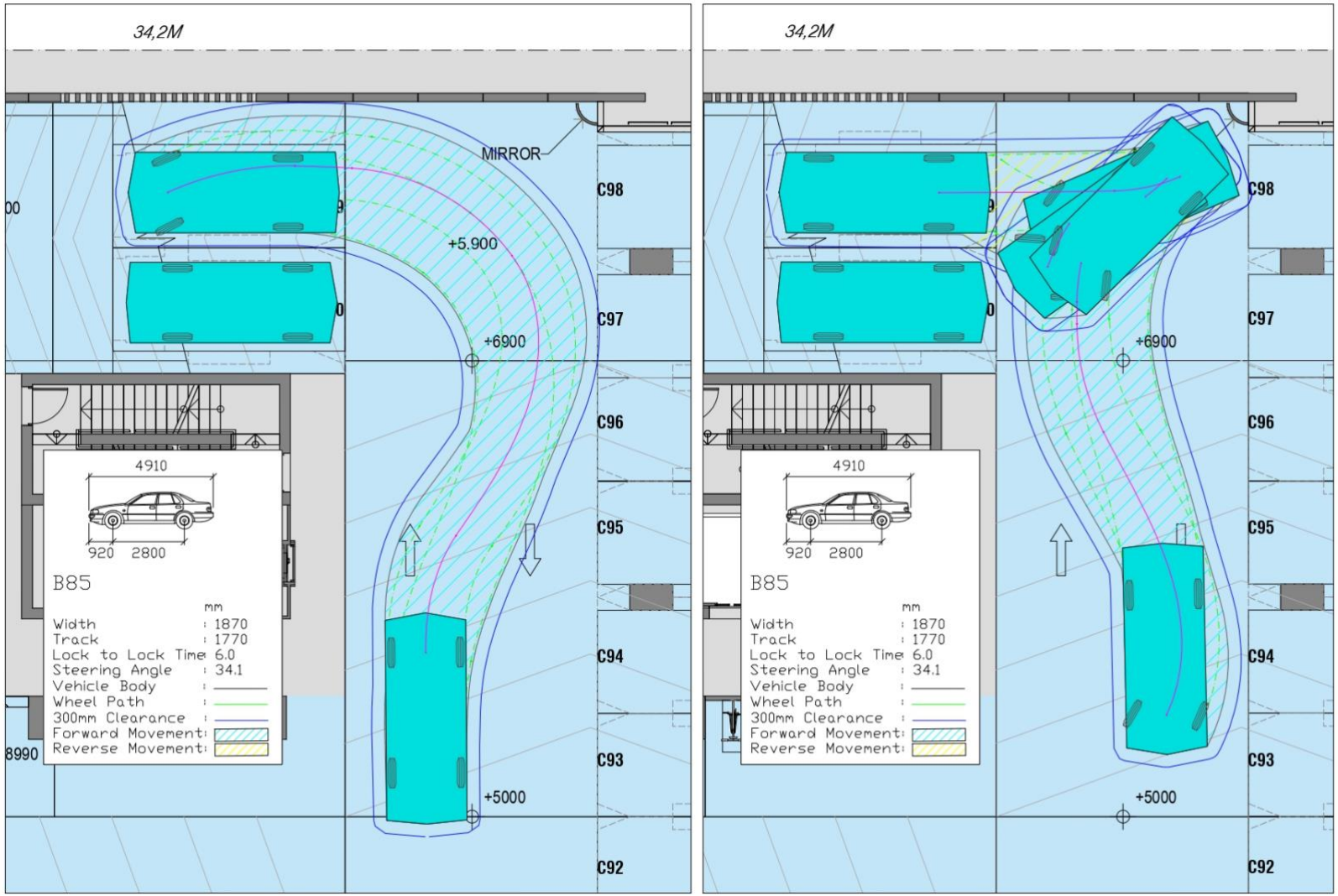


FIGURE 4.9 – B85 VEHICLE PATHS (CRITICAL CAR PARKING AND MANOEUVRES)

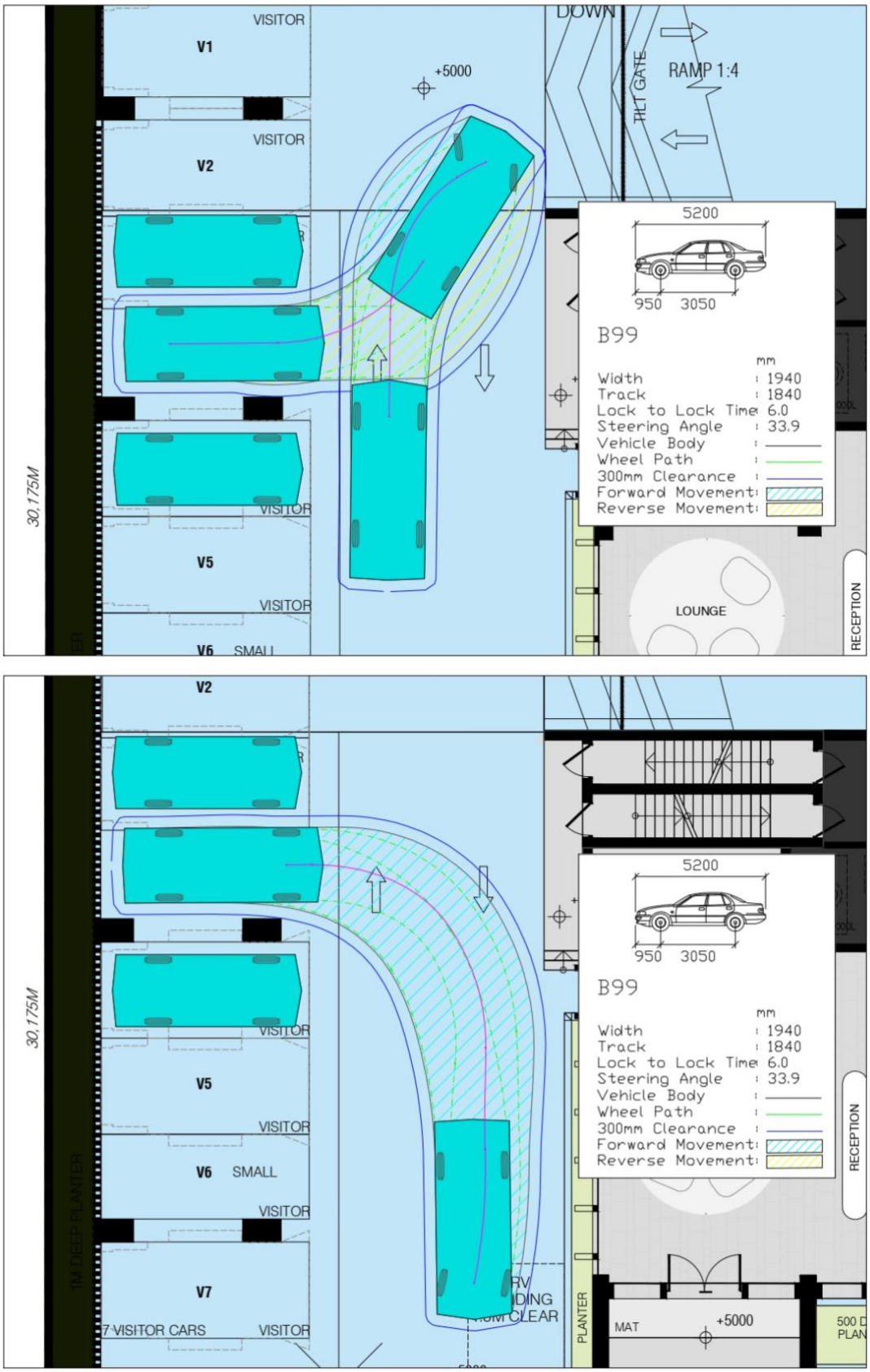


FIGURE 4.10– B99 VEHICLE PATHS (CRITICAL CAR PARKING AND MANOEUVRES)

5.0 RAMP MANAGEMENT

5.1 Operations

The proposed basement car parking layouts generally provide for two vehicles to pass on ramps, with only a need for one driver to give way to another at corners, which is typical of two-lane ramp systems. Convex mirrors will be implemented to manage these arrangements as required.

The proposed ramp management arrangements are shown in Figures 5.1 – 5.5.

5.2 Vehicle Queuing

The proposal will generate in the order of 29 vehicle movements per hour during peak period (ie 168 bedrooms x 0.17 trips). During the critical afternoon peak hour, approximately 18 vehicles will enter the site and 11 vehicles will exit. This equates to an arrival rate of 0.3 vehicles per minute (18 vehicles / 60 minutes).

Assuming a vehicle exits the site from Basement Level 2 or Podium Level 2 (worst case scenarios), the travel distance between the farthest level and ground floor, just past the vehicle standing to enter is, approximately 60 metres. With an estimated travel speed of 5km/hr (1.35m/s), a vehicle exiting would clear each ramp in approximately 44 seconds, and therefore, 1 minute and 30 seconds per vehicle (i.e. the service time) for both basement or podium levels.

Therefore, the proposal has the following parameters:

$$Arrival\ Rate\ (\lambda) = 0.3\ vehicles\ per\ minute$$
$$Service\ Rate\ (\mu) = \frac{1veh}{1.5min} = 0.667\ vehicles\ per\ minute$$

The system behaves as an M/M/1 queue because there is a single server (the entry/exit ramp) for each set of podium or basement levels.

$$Traffic\ Intensity\ (\rho) = \frac{\lambda}{\mu} = \frac{0.3}{0.667} = 0.45$$

This means that 45% of the time, the system is busy.

The 95th percentile of the queue length is the queue length (i.e. the number of vehicles) that is exceeded only 5% of the time. For an M/M/1 queue, the 95th percentile queue length can be approximated using the Poisson distribution for the system's queue length, which is given by:

$$P(n) = (1 - \rho) \times \rho^n$$

The queue length at which the cumulative probability reaches 95% is determined by identifying the smallest value of n satisfying the condition:

$$P(0) + P(1) + \cdots + P(n) \geq 0.95$$

Accordingly:

P(0): The probability of 0 vehicles in the system: $P(0) = (1 - 0.45) * 0.45^0 = 0.55$
P(1): The probability of 1 vehicles in the system: $P(1) = (1 - 0.45) * 0.45^1 = 0.2475$
P(2): The probability of 2 vehicles in the system: $P(2) = (1 - 0.45) * 0.45^2 = 0.1114$
P(3): The probability of 3 vehicles in the system: $P(3) = (1 - 0.45) * 0.45^3 = 0.0502$
P(4): The probability of 4 vehicles in the system: $P(4) = (1 - 0.45) * 0.45^4 = 0.0226$

Calculating the cumulative probability:

Cumulative P(0 to 1): $0.55 + 0.2475 = 0.798 = 79.8\%$
Cumulative P(0 to 2): $0.7975 + 0.111375 = 0.909 = 90.9\%$
Cumulative P(0 to 3): $0.908875 + 0.05011875 = 0.959 = 95.9\%$

Therefore, at n = 3, the cumulative probability exceeds 95%, meaning the 95th percentile queue length is 3 vehicles. This means that there is a 95% chance the queue will not exceed 3 vehicles during the peak period.

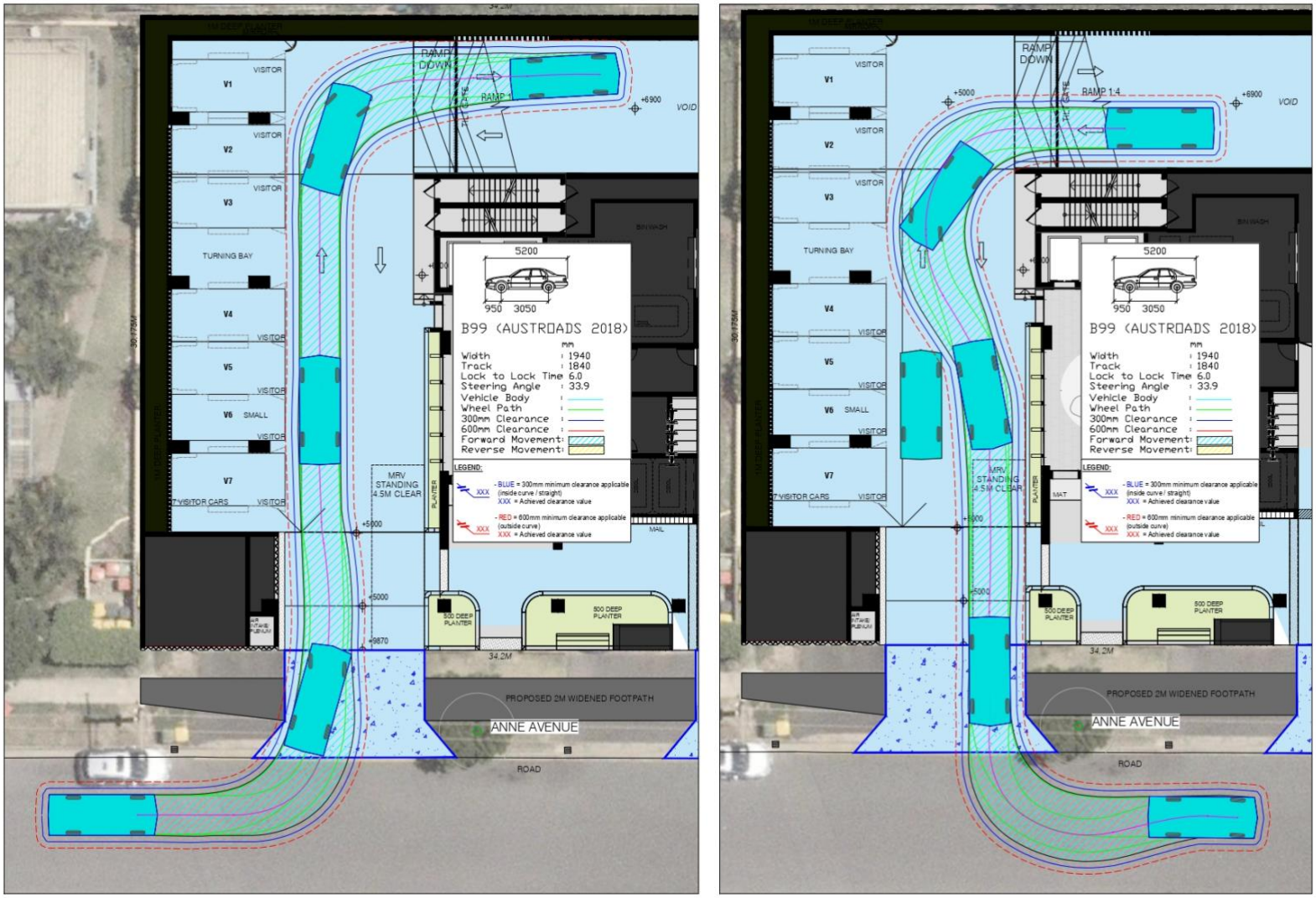


FIGURE 5.1 – B99 VEHICLE PATHS CIRCULATING (GROUND LEVEL)

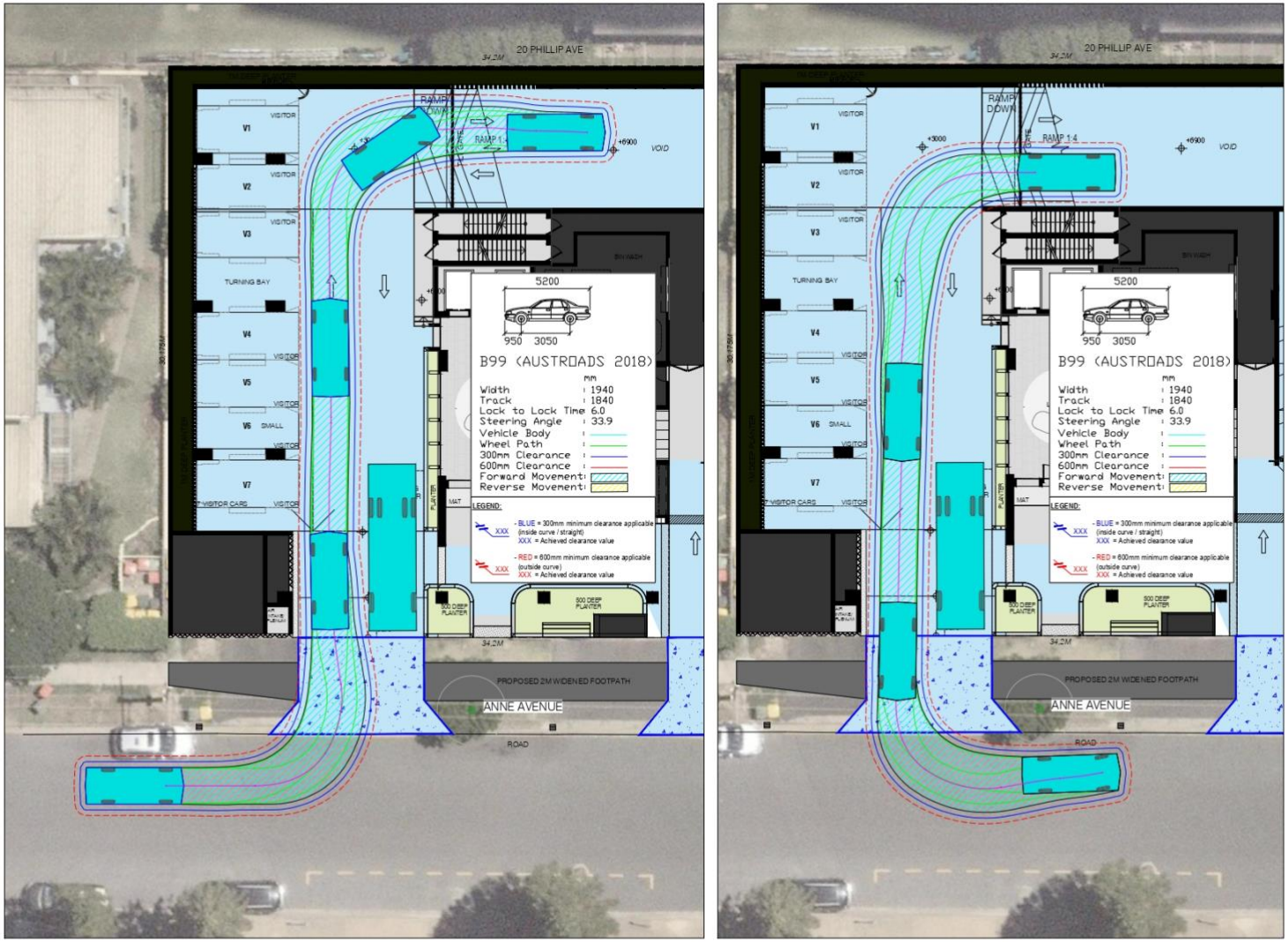


FIGURE 5.2 – B99 VEHICLE PATHS CIRCULATING (GROUND LEVEL)

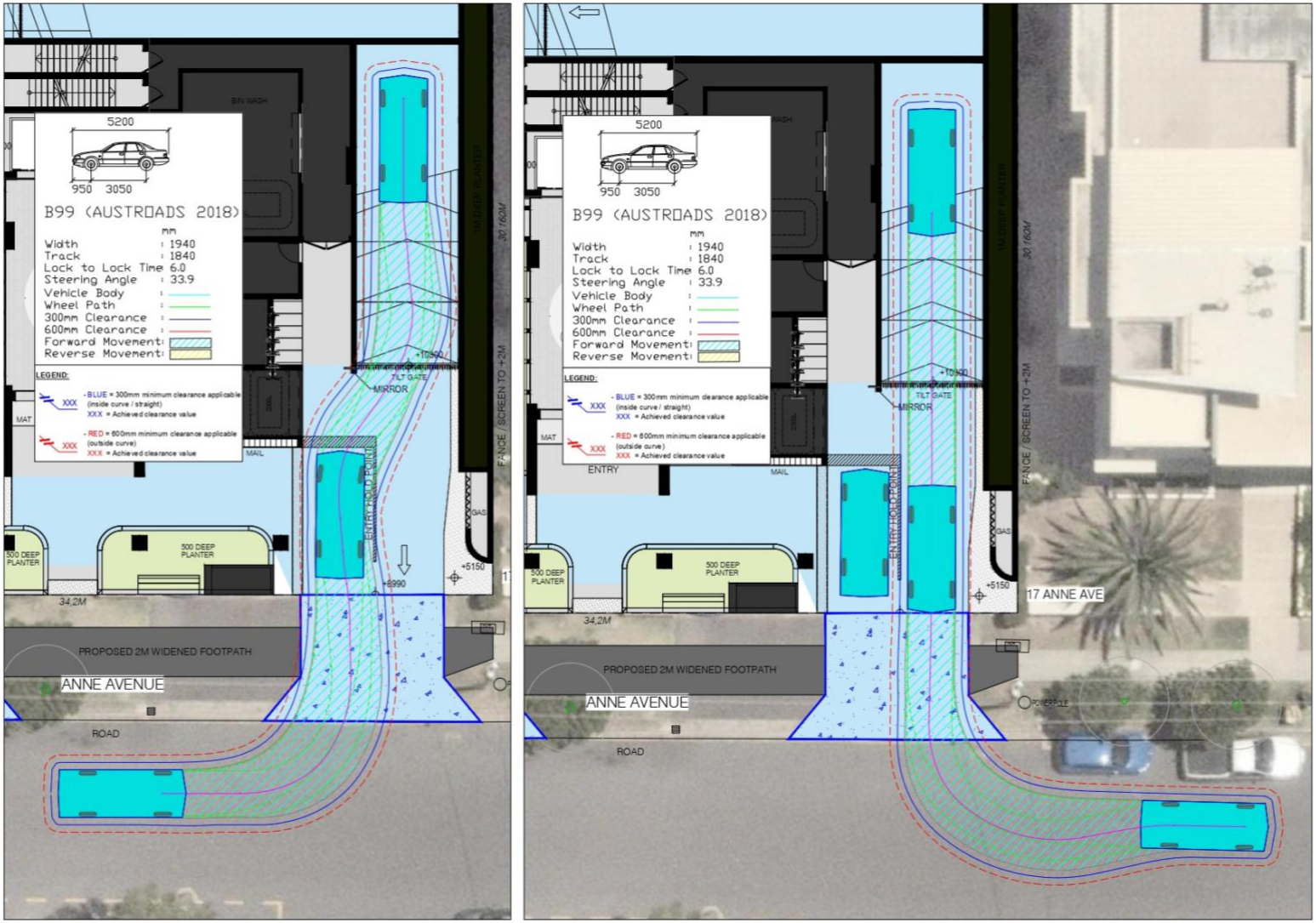


FIGURE 5.3 – B99 VEHICLE PATHS CIRCULATING (GROUND LEVEL)

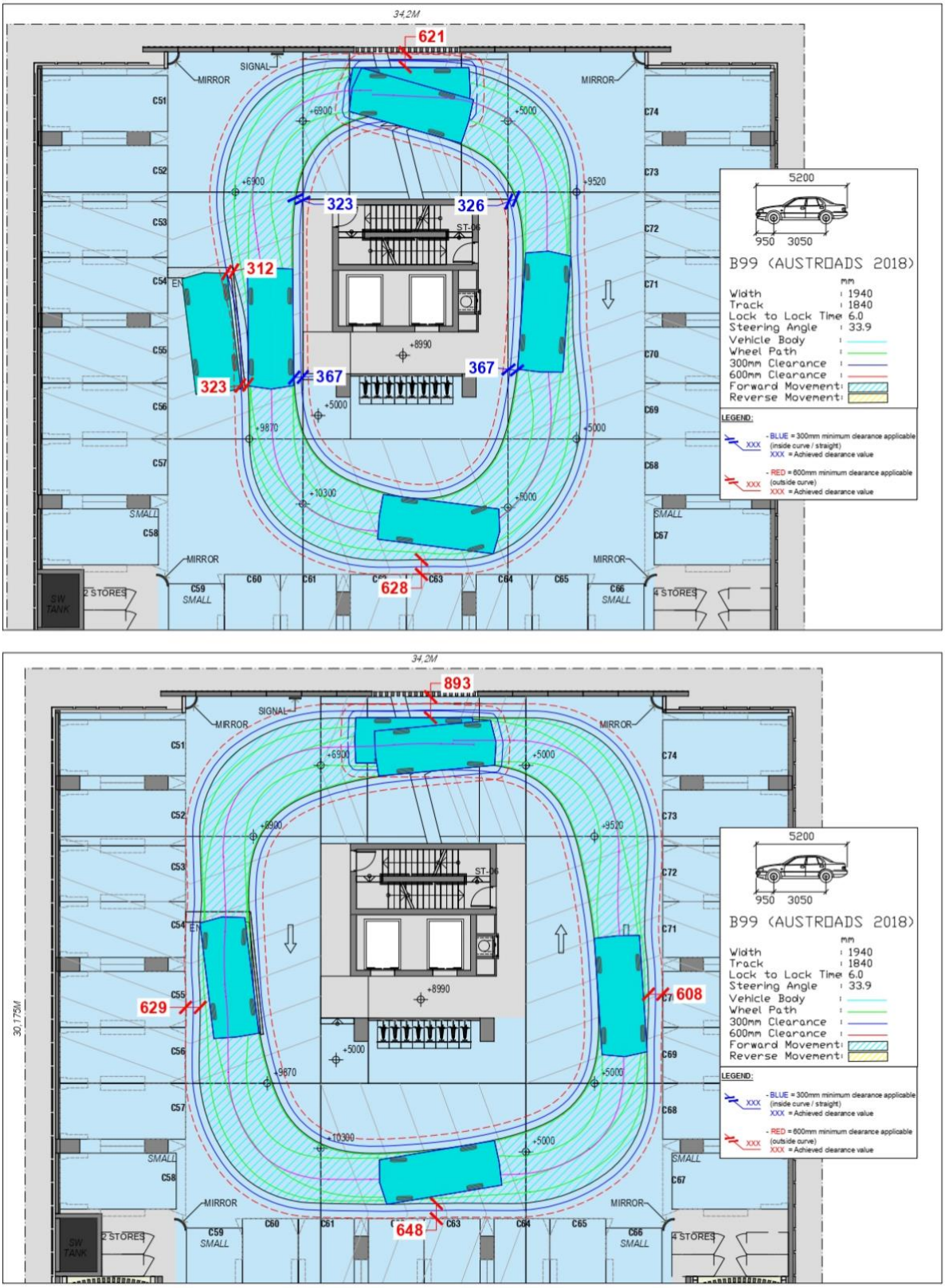


FIGURE 5.4 – B99 VEHICLE PATHS CIRCULATING (PODIUM LEVEL)

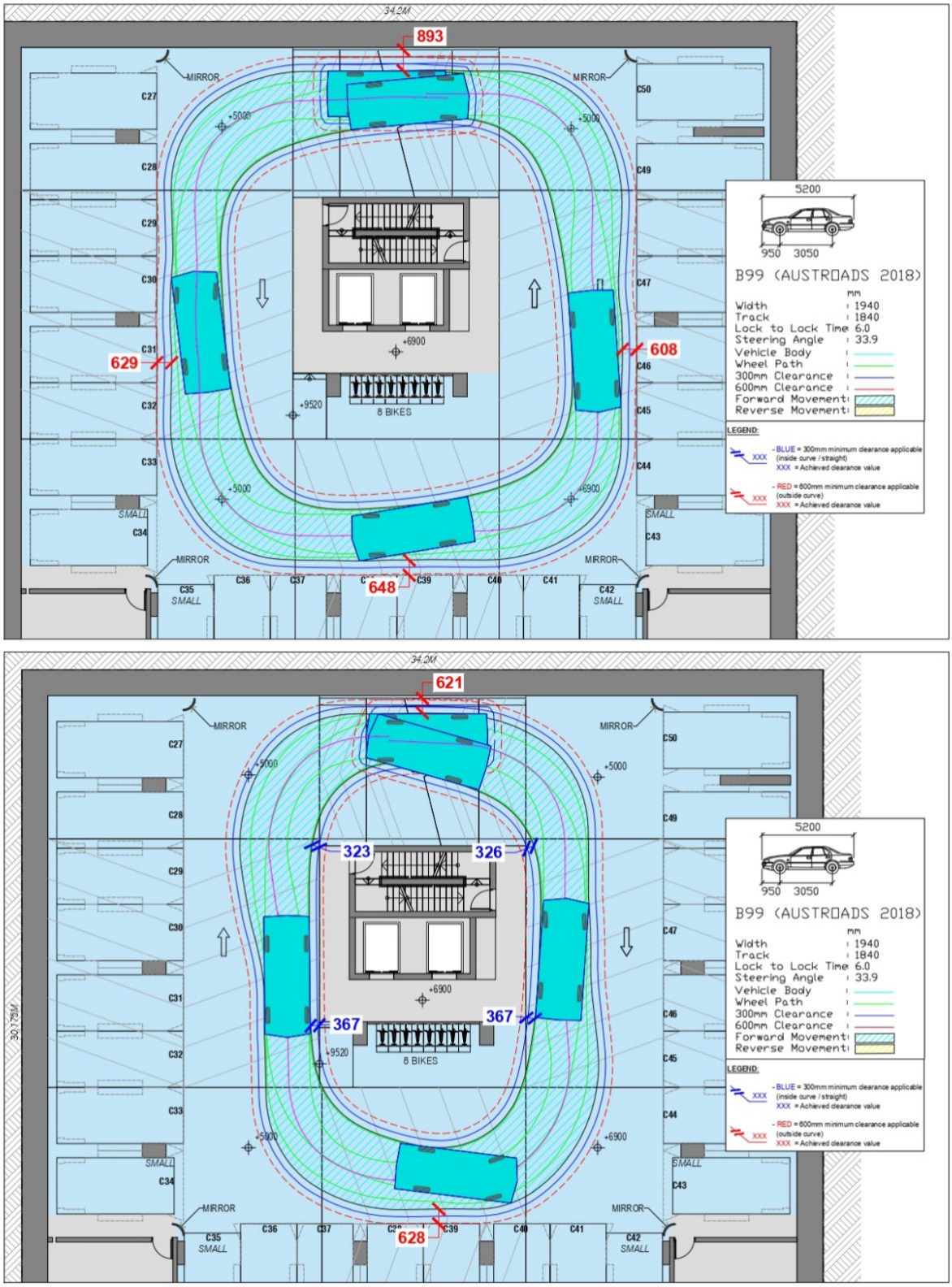


FIGURE 5.5 – B99 VEHICLE PATHS CIRCULATING (BASEMENT LEVEL)

6.0 PROPOSED ACCESS ARRANGEMENTS

Access is proposed via two crossovers located at either end of the road frontage.

As shown in Figure 6.1, a pedestrian sight splay in accordance with AS2890.1:2004. has been provided on each side of each crossover. The driveways have been designed in accordance with the IPWEA Standard Drawing RS-051.

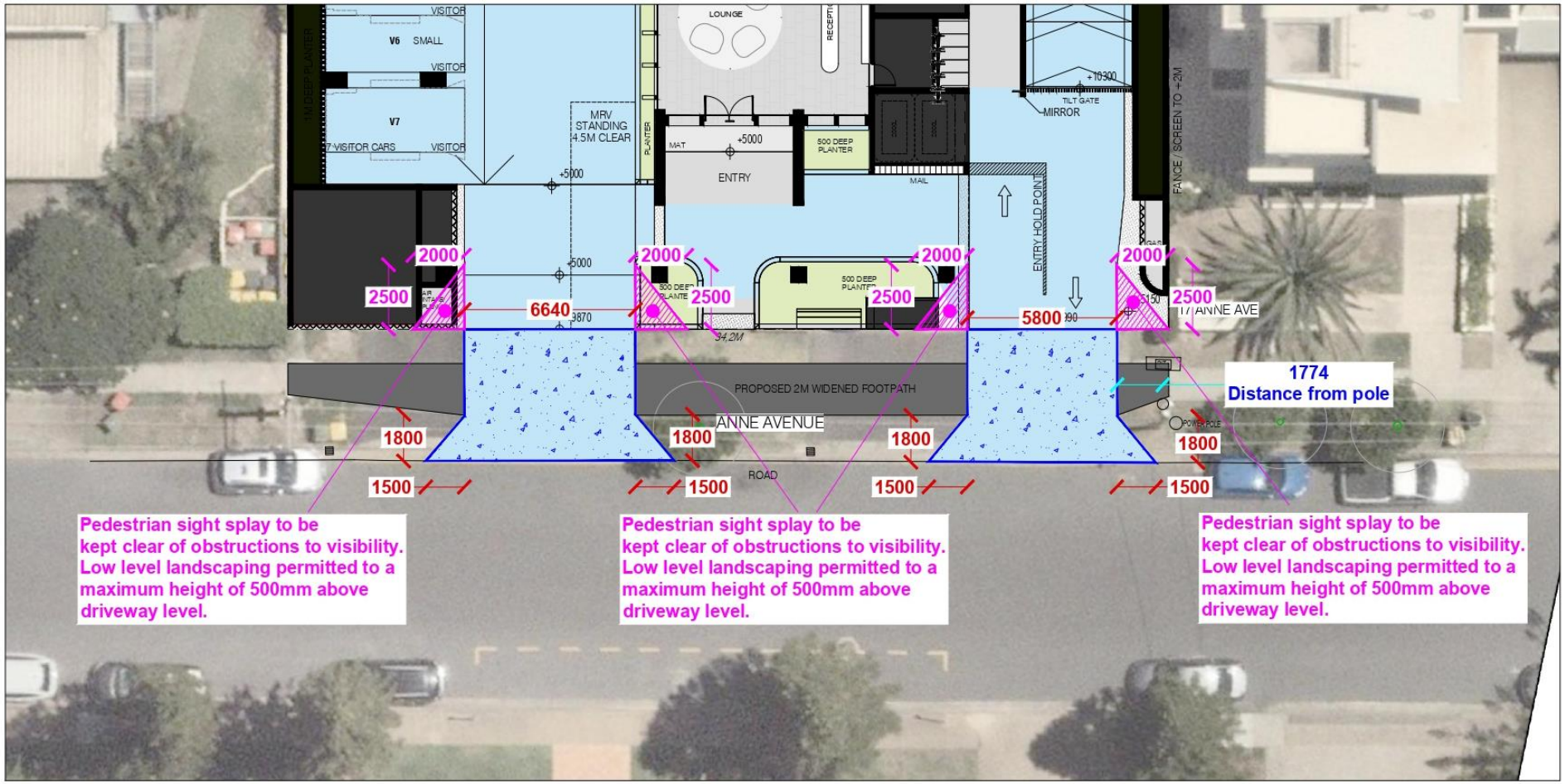


FIGURE 6.1 – PROPOSED LAYOUT AND DIMENSIONS OF VEHICLE CROSSOVERS

7.0 PROVISION FOR SERVICE VEHICLES

7.1 Acceptable Outcome

In accordance with Table 9.4.13-9 of the Transport Code, the proposal must provide satisfactory manoeuvring area suitable for service vehicles up to the size of a Medium Rigid Vehicle (MRV).

7.2 Proposed Outcome

The site allows for service vehicles up to the size of a Medium Rigid Vehicle (MRV) to load on-site. As shown in Figure 7.1, a MRV can satisfactorily stand on site without blocking access to the visitor parking and basement ramp.

A temporary bin storage area has been provided within five metres of the boundary. Bins will be serviced from the kerb.

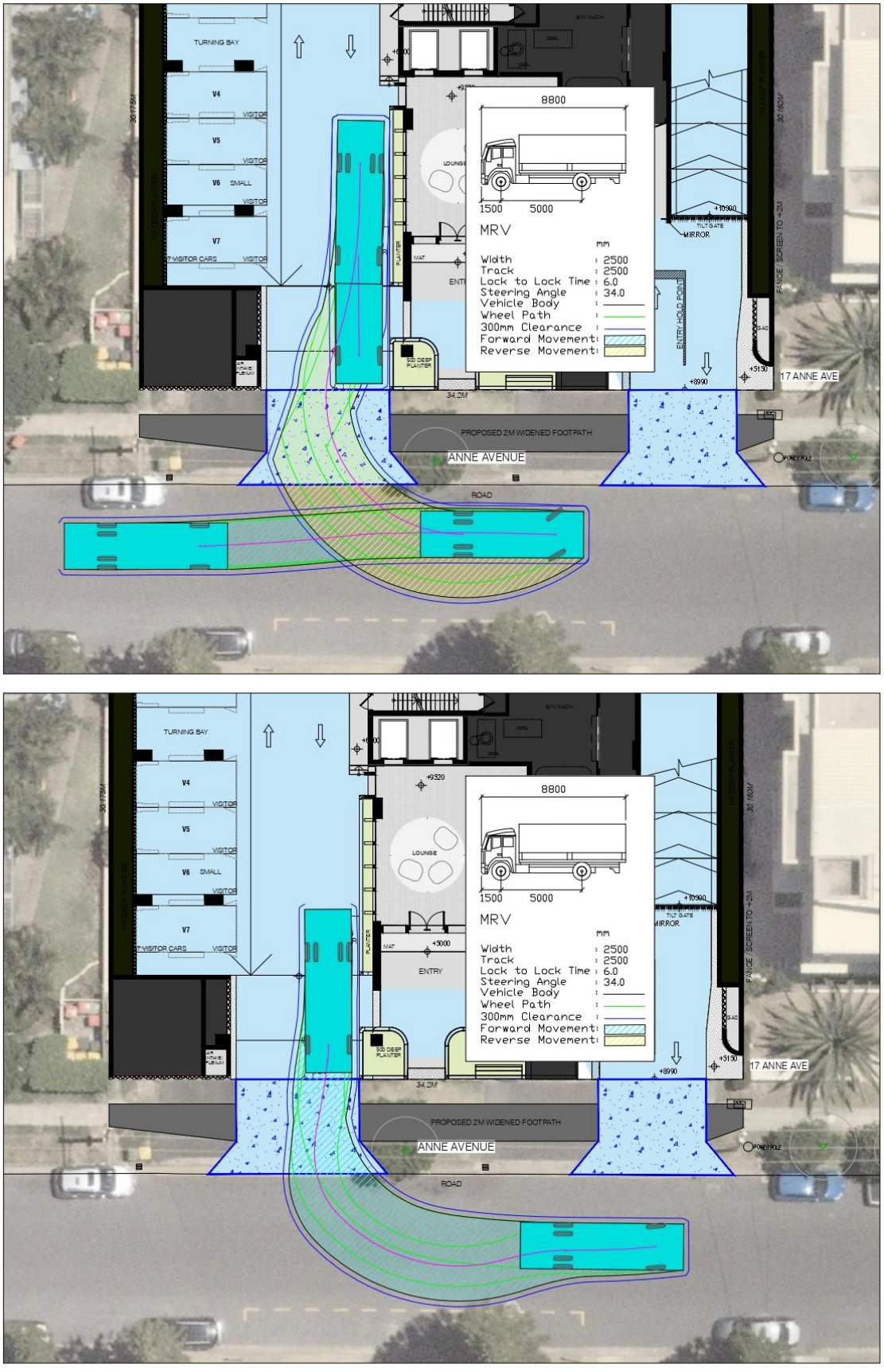


FIGURE 7.1 – MEDIUM RIGID VEHICLE (MRV) ACCESS AND MANOEUVRING

8.0 PROVISION FOR PEDESTRIANS AND BICYCLES

It is noted that the Transport Code nominates the following rates as an Acceptable Outcome for the provision of bicycle parking:

Multiple Dwelling:

- 1 space per unit for residents;
- 1 per 12 dwellings, to a maximum of 20 spaces

Given the scale of the development, application of the above rate would result in a relatively high number of residential bicycle spaces, of which a large proportion would not be used. As an alternative, it is recommended that the rates recommended by Austroads be complied with, which are:

Multiple Dwelling:

- 1 space per 3 units for residents;
- 1 space per 12 units for visitors.

Application of these rates results in the following requirements:

Table 8.1: Provision for Bicycle Parking Against Austroads Recommendations

Component	Required No. Spaces	Provided No. Spaces
Multiple Dwelling: 56 units	19 spaces	32 spaces
Visitor Parking: 56 units	5 spaces	5 spaces
TOTAL	**24 spaces**	**37 spaces**

As shown above, the proposal meets the bicycle parking requirements prescribed in Austroads recommendations. Bicycle parking has been designed in accordance with AS2890.3 with the following dimensions:

- Vertical parking - 1.2m x 0.5m
- Horizontal parking - 1.8m x 0.5m
- Parking aisle - 1.5m

The proposed ground floor plan provides good access for pedestrians, with dedicated entries linking the road frontage to the building entrance.

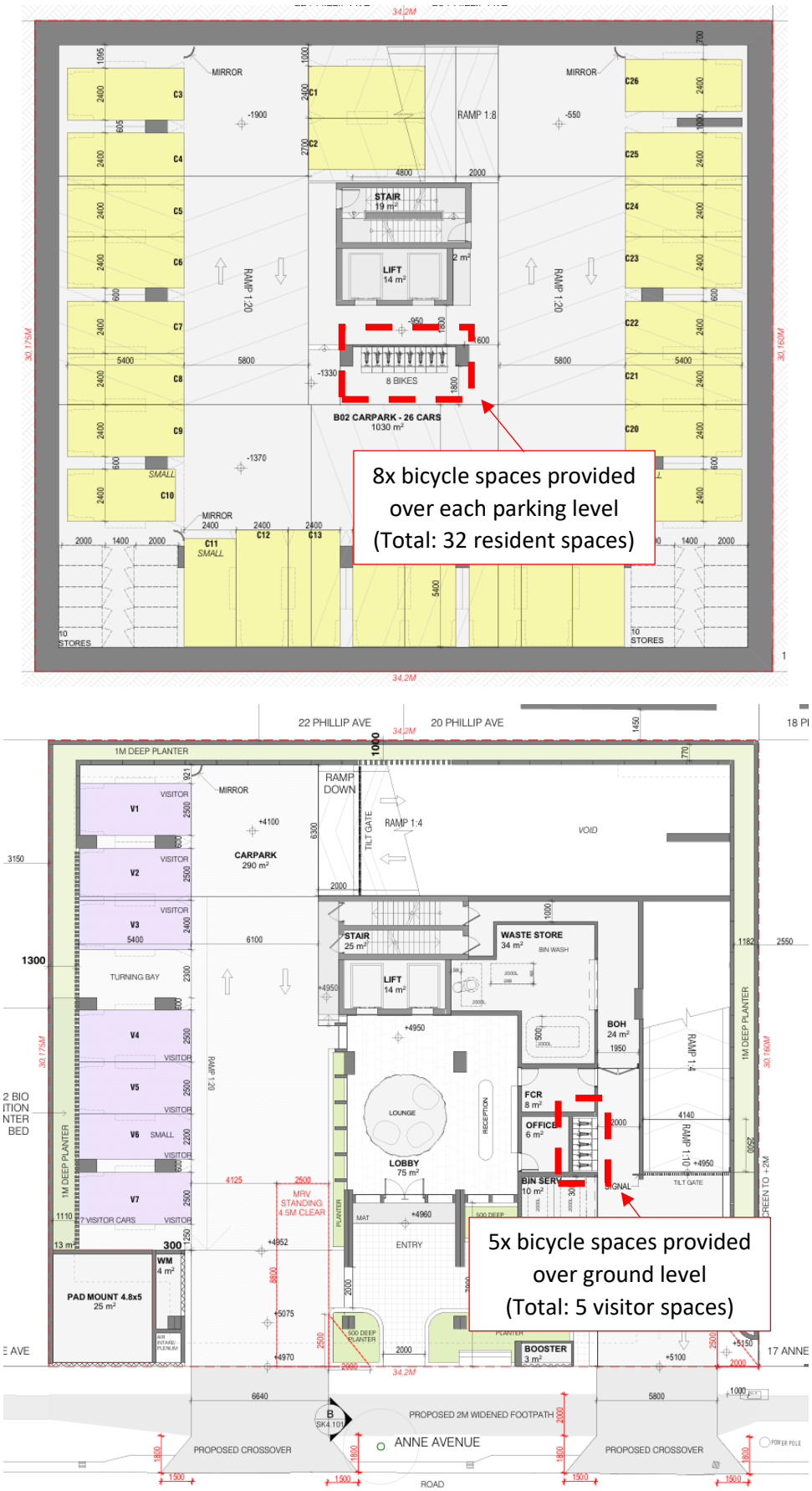


FIGURE 8.1 – PROPOSED BICYCLE PARKING PROVISIONS (PARKING LEVELS AND GROUND FLOOR)

9.0 DEVELOPMENT TRAFFIC ESTIMATES

9.1 Traffic Generation

In accordance with the *RMS: Guide to Traffic Generating Developments*, the following trip generations apply to the development. It is noted that the higher end of the 'Sydney Range' rate has been adopted given the accessible location of the site.

High Density Residential Flat Dwellings:
0.13 peak hour trips per bedroom (morning peak hour)
0.17 peak hour trips per bedroom (afternoon peak hour)

Application of the above rate, the proposed development yields the following trip generation estimates:

Table 9.1 - Estimated Development Traffic Generation

Component	Proposed Scale	Unit	Peak hour rate / unit		Total trips (peak hour)		AM peak hour		PM peak hour	
			AM	PM	AM	PM	In	Out	In	Out
Multiple units	168	Bedrooms	0.13	0.17	22	29	4	18	18	11

Peak Hour Distribution: Residential: AM – 20 /80, PM – 60 / 40

9.2 Traffic Distribution

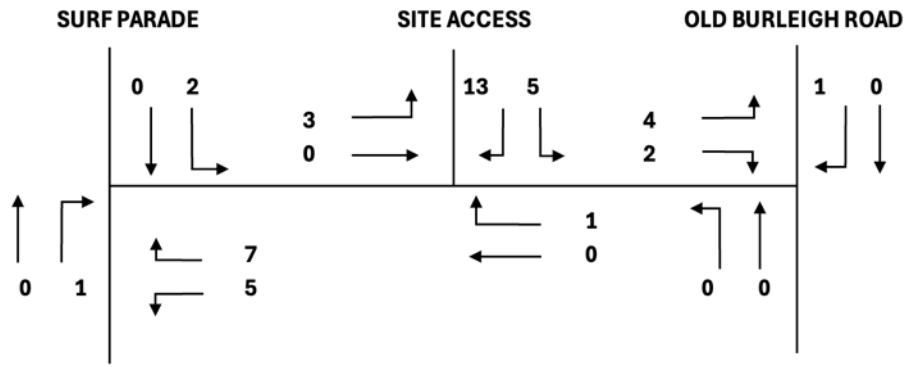
Given the location of the site in the context of the surrounding road network, the following traffic distribution is considered reasonable:

- To and from the south via Surf Parade - 30%
- To and from the south via Old Burleigh Road - 10%
- To and from the north via Surf Parade - 40%
- To and from the north via Old Burleigh Road - 20%

Resultant estimates of peak hour development traffic movements are shown in Figure 9.1.

Design (development traffic + background volumes) peak hour traffic movements for the proposal are shown in Figure 9.2.

AM PEAK HOUR TRAFFIC VOLUMES
Development Traffic Estimates



PM PEAK HOUR TRAFFIC VOLUMES

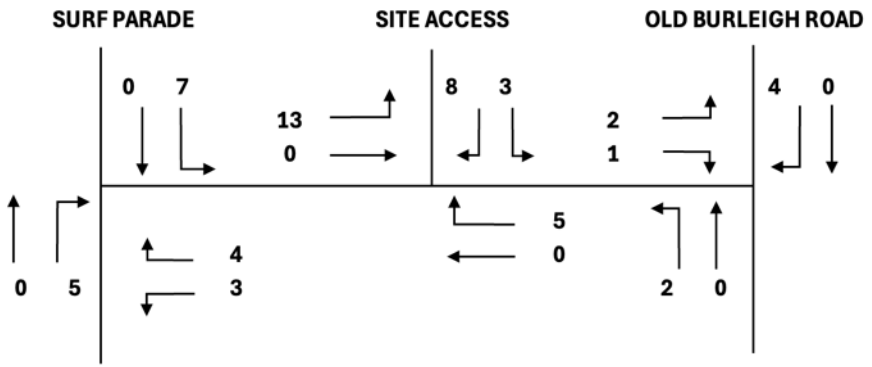
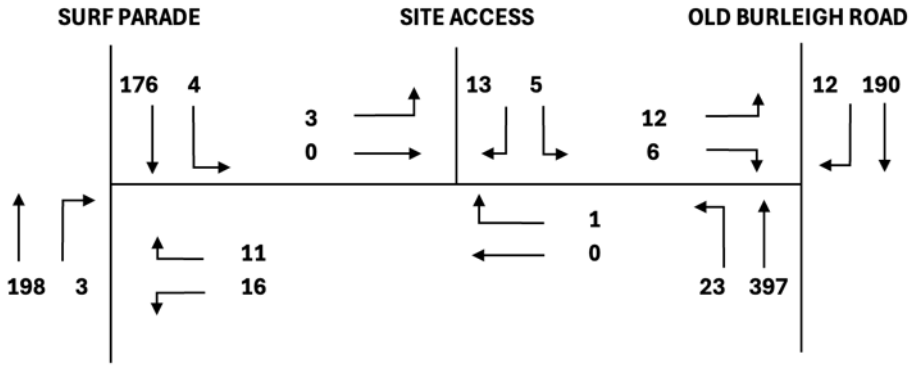


FIGURE 9.1 – PEAK HOUR DEVELOPMENT TRAFFIC ESTIMATES

AM PEAK HOUR TRAFFIC VOLUMES
Design Peak Period



PM PEAK HOUR TRAFFIC VOLUMES

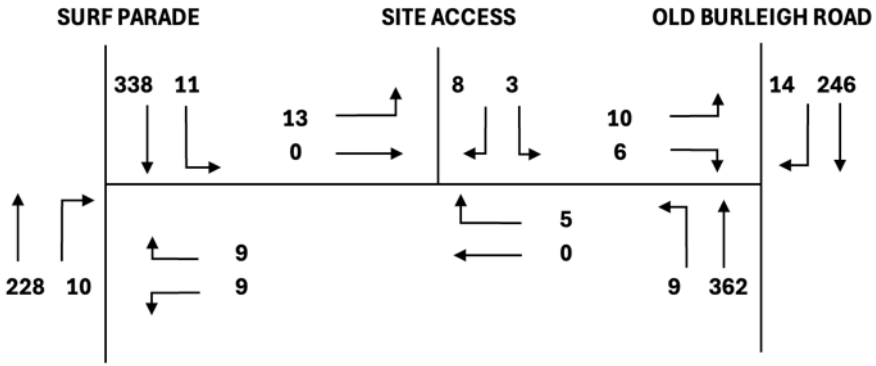


FIGURE 9.2 – DESIGN PEAK HOUR TRAFFIC ESTIMATES

9.3 Road Network Impact Assessment

An assessment of impacts has been prepared for the Surf Parade / Anne Avenue and Old Burleigh Road / Anne Avenue intersections.

The analysis was carried out for the base (without development) and design (with development) scenarios.

The results of the SIDRA analysis are presented in Appendix B and summarised below in Tables 9.2 – 9.3.

Table 9.2: SIDRA Results (Surf Parade / Anne Avenue intersection)

Scenario	Degree of Saturation	Total Average Delay (seconds)	Queue Length (metres)
AM Peak – without development	0.112	0.3	0.4
PM Peak – without development	0.191	0.3	0.4
AM Peak – with development	0.113	0.5	0.7
PM Peak – with development	0.195	0.5	0.7

Table 9.3: SIDRA Results (Old Burleigh Road / Anne Avenue intersection)

Scenario	Degree of Saturation	Total Average Delay (seconds)	Queue Length (metres)
AM Peak – without development	0.235	0.6	0.9
PM Peak – without development	0.206	0.4	0.7
AM Peak – with development	0.235	0.7	0.9
PM Peak – with development	0.207	0.5	1.0

As shown in Tables 9.2 – 9.3, the SIDRA modelling indicates the surrounding road network will function satisfactorily with the proposed development completed.

10.0 SUMMARY OF CONCLUSIONS & RECOMMENDATIONS

- The subject site is located on the northern side of Anne Avenue. The site is identified as Lot 1 – 4 on BUP1114 and has a site area of approximately 2,056m^2. The site is located within the mapped area of the Transport Hub, and is within 450 metres walking distance of the Broadbeach South light rail station.

- The proposed plan of development is for a multiple dwelling development comprising of 56x three-bedroom units.

- The proposal provides a total of 107 car parking spaces are proposed to be provided over two podium levels, ground floor and two basement levels.

- Under the Transport Code, the development requires a total of 57 car parking spaces, including 6 visitor spaces. The proposal provides a total of 107 car parking spaces, including 7 spaces for visitors, and therefore meets the Acceptable Outcome.

- The geometric layout of the proposed parking facilities has generally been designed to comply with the relevant requirements specified by the Transport Code.

- Access is proposed to be gained via two crossovers located at either end of the road frontage. A pedestrian sight splay in accordance with AS2890.1:2004. has been provided on both sides of each access. The driveways have been designed in accordance with the IPWEA Standard Drawing RS-051.

- In accordance with Table 9.4.13-9 of the Transport Code, the site allows for service vehicles up to the size of a Medium Rigid Vehicle (MRV) to load on-site. Swept path analysis indicates that a MRV can satisfactorily stand on the site.

- A temporary bin storage area has been provided within five metres of the boundary. Bins will be serviced from the kerb.

- The proposal meets the bicycle parking requirements prescribed in Austroads. The proposed ground floor plan provides good access for pedestrians, with dedicated entries linking the road frontage to the building entrance.

- The SIDRA modelling indicates the surrounding road network will function satisfactorily with the proposed development completed.

APPENDICES

APPENDIX A – SURVEYED TRAFFIC VOLUMES
APPENDIX B – SIDRA MODELLING RESULTS

APPENDIX A– SURVEYED TRAFFIC VOLUMES

MANUAL TRAFFIC SURVEY RESULTS

Unit Type: Camera
RTE ID:
Location: Old Burleigh Rd / Anne Ave
Date: Friday, 08 November 2024
Comments: Fine weather
Class **Light**

Time	N-Thru	N-Right	N-Left	S-Thru	S-Right	S-Left	E-Thru	E-Right	E-Left	W-Thru	W-Right	W-Left	Total	Cumul Tot
7:00	35	1		91		3					1	2	133	
7:15	37	2		77		4					2	2	124	
7:30	42	2		87		3					2	3	139	
7:45	39	1		90		5					1	2	138	534
8:00	55	3		99		6					2	2	167	701
8:15	57	3		100		5					1	1	167	611
8:30	45	3		101		6					0	3	158	630
8:45	33	2		97		6					1	2	141	633
9:00	45	2		96		4					0	1	148	614
9:15	52	1		90		3					1	3	150	597
9:30	59	2		95		3					2	2	163	602
9:45	62	1		99		4					1	1	168	629
10:00	57	2		90		3					0	1	153	634
10:15	38	2		75		3					1	0	119	603
10:30	42	1		77		2					2	1	125	565
10:45	51	1		68		2					1	2	125	522
AM PEAK HR	**190**	**11**	**0**	**397**	**0**	**23**	**0**	**0**	**0**	**0**	**4**	**8**	**633**	
Time	**N-Thru**	**N-Right**	**N-Left**	**S-Thru**	**S-Right**	**S-Left**	**E-Thru**	**E-Right**	**E-Left**	**W-Thru**	**W-Right**	**W-Left**	**Total**	**Cumul Tot**
14:00	44	4		88		2					2	2	142	
14:15	65	3		93		3					1	3	168	
14:30	59	3		98		2					1	3	166	
14:45	65	4		102		3					2	4	180	656
15:00	57	3		112		3					2	2	179	693
15:15	45	5		107		4					1	2	164	689
15:30	51	3		75		3					1	3	136	659
15:45	60	2		82		2					0	2	148	627
16:00	59	1		77		3					0	1	141	589
16:15	60	3		87		2					1	1	154	579
16:30	65	2		99		2					2	2	172	615
16:45	64	2		87		1					1	3	158	625
17:00	57	3		89		2					1	2	154	638
17:15	59	2		77		3					0	3	144	628
17:30	45	3		92		2					1	2	145	601
17:45	46	3		87		2					1	2	141	584
PM PEAK HR	**246**	**10**	**0**	**362**	**0**	**7**	**0**	**0**	**0**	**0**	**5**	**8**	**638**	

MANUAL TRAFFIC SURVEY RESULTS

Unit Type: Camera
RTE ID:
Location: Surf Parade / Anne Ave
Date: Friday, 08 November 2024
Comments: Fine weather
Class **Light**

Time	N-Thru	N-Right	N-Left	S-Thru	S-Right	S-Left	E-Thru	E-Right	E-Left	W-Thru	W-Right	W-Left	Total	Cumul Tot
7:00	45		1	41	1			1	1				90	
7:15	52		1	38	2			2	2				97	
7:30	45		2	45	1			3	3				99	
7:45	47		1	51	1			2	2				104	390
8:00	45		1	43	0			1	3				93	393
8:15	39		0	49	0			2	2				92	388
8:30	45		1	54	1			1	3				105	394
8:45	47		0	52	1			0	3				103	393
9:00	52		0	57	2			2	2				115	415
9:15	47		1	71	1			1	1				122	445
9:30	41		2	72	2			1	4				122	462
9:45	51		1	75	2			0	2				131	490
10:00	50		1	80	2			1	2				136	511
10:15	57		2	77	1			1	3				141	530
10:30	51		1	69	2			2	2				127	535
10:45	52		2	61	1			1	2				119	523
AM PEAK HR	**176**	**0**	**2**	**198**	**2**	**0**	**0**	**4**	**11**	**0**	**0**	**0**	**393**	
Time	**N-Thru**	**N-Right**	**N-Left**	**S-Thru**	**S-Right**	**S-Left**	**E-Thru**	**E-Right**	**E-Left**	**W-Thru**	**W-Right**	**W-Left**	**Total**	**Cumul Tot**
14:00	85		1	53	2			2	1				144	
14:15	77		2	64	1			1	1				146	
14:30	99		2	52	1			1	2				157	
14:45	91		1	59	2			0	1				154	601
15:00	92		0	65	0			2	2				161	618
15:15	87		1	72	1			1	1				163	635
15:30	79		2	69	1			2	2				155	633
15:45	101		1	47	2			3	2				156	635
16:00	95		2	55	1			2	1				156	630
16:15	95		0	61	2			2	2				162	629
16:30	87		2	63	2			2	2				158	632
16:45	89		0	55	1			0	1				146	622
17:00	67		2	49	0			1	1				120	586
17:15	77		1	51	2			0	2				133	557
17:30	59		1	53	2			1	2				118	517
17:45	54		2	37	1			2	1				97	468
PM PEAK HR	**338**	**0**	**4**	**228**	**5**	**0**	**0**	**5**	**6**	**0**	**0**	**0**	**586**	

APPENDIX B– SIDRA MODELLING RESULTS

SURF PARADE / ANNE AVENUE INTERSECTION

- Background AM peak hour (without proposal)
- Background AM peak hour (without proposal)
- Design (background plus proposal) AM peak hour (with proposal)
- Design (background plus proposal) PM peak hour (with proposal)

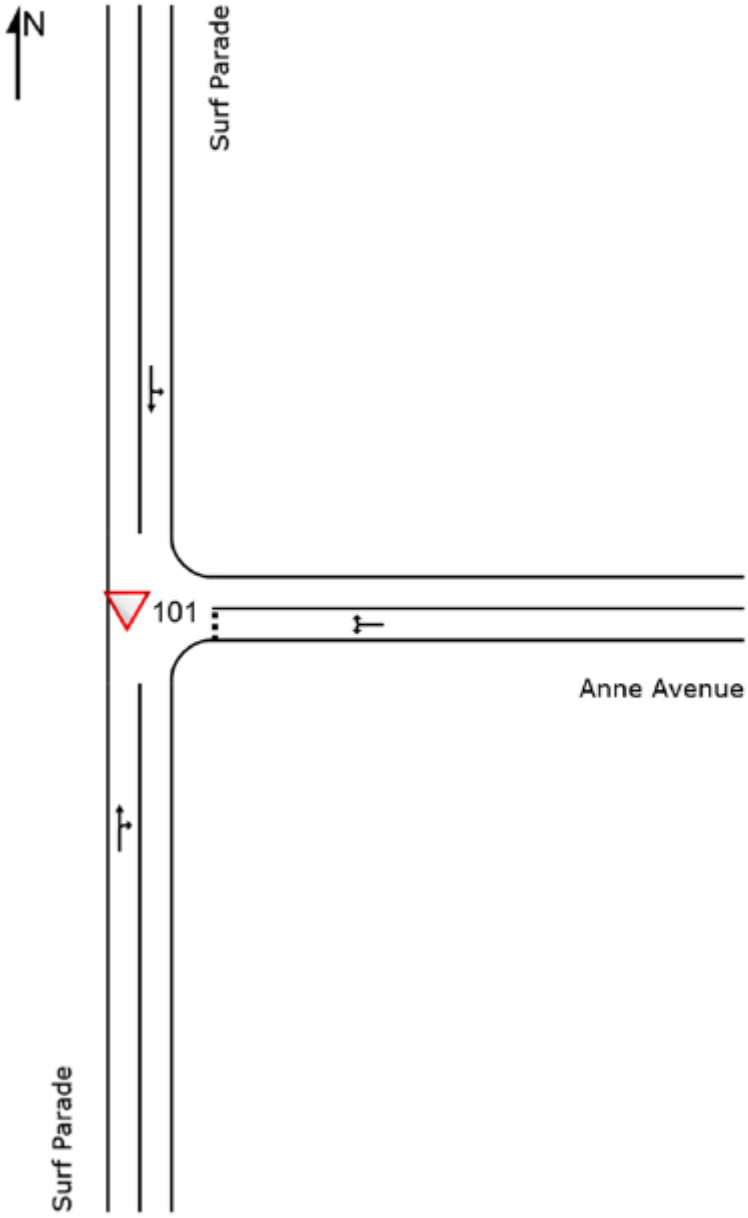
MODELLED LAYOUT

SITE LAYOUT

Site: 101 [Surveyed Peak Traffic AM (Site Folder: Surf Parade / Anne Avenue)]

Surf Parade / Anne Avenue
Site Category: (None)
Give-Way (Two-Way)

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



Background AM peak hour (without proposal)

MOVEMENT SUMMARY

Site: 101 [Surveyed Peak Traffic AM (Site Folder: Surf Parade / Anne Avenue)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Surf Parade / Anne Avenue
Site Category: (None)
Give-Way (Two-Way)

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: Surf Parade															
2	T1	All MCs	208	5.0	208	5.0	0.112	0.0	LOS A	0.0	0.1	0.01	0.01	0.01	59.9
3	R2	All MCs	2	5.0	2	5.0	0.112	5.6	LOS A	0.0	0.1	0.01	0.01	0.01	56.8
Approach			211	5.0	211	5.0	0.112	0.1	NA	0.0	0.1	0.01	0.01	0.01	59.9
East: Anne Avenue															
4	L2	All MCs	12	5.0	12	5.0	0.014	6.2	LOS A	0.0	0.4	0.30	0.56	0.30	51.8
6	R2	All MCs	4	5.0	4	5.0	0.014	7.2	LOS A	0.0	0.4	0.30	0.56	0.30	51.5
Approach			16	5.0	16	5.0	0.014	6.4	LOS A	0.0	0.4	0.30	0.56	0.30	51.7
North: Surf Parade															
7	L2	All MCs	2	5.0	2	5.0	0.099	5.6	LOS A	0.0	0.0	0.00	0.01	0.00	57.2
8	T1	All MCs	185	5.0	185	5.0	0.099	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.9
Approach			187	5.0	187	5.0	0.099	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.9
All Vehicles			414	5.0	414	5.0	0.112	0.3	NA	0.0	0.4	0.02	0.03	0.02	59.5

Background PM peak hour (without proposal)

MOVEMENT SUMMARY

Site: 101 [Surveyed Peak Traffic PM (Site Folder: Surf Parade / Anne Avenue)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Surf Parade / Anne Avenue
Site Category: (None)
Give-Way (Two-Way)

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: Surf Parade															
2	T1	All MCs	240	5.0	240	5.0	0.132	0.0	LOS A	0.0	0.4	0.03	0.03	0.03	59.8
3	R2	All MCs	5	5.0	5	5.0	0.132	6.8	LOS A	0.0	0.4	0.03	0.03	0.03	56.7
Approach			245	5.0	245	5.0	0.132	0.2	NA	0.0	0.4	0.03	0.03	0.03	59.7
East: Anne Avenue															
4	L2	All MCs	6	5.0	6	5.0	0.014	6.9	LOS A	0.0	0.3	0.44	0.62	0.44	51.2
6	R2	All MCs	5	5.0	5	5.0	0.014	8.5	LOS A	0.0	0.3	0.44	0.62	0.44	50.9
Approach			12	5.0	12	5.0	0.014	7.6	LOS A	0.0	0.3	0.44	0.62	0.44	51.1
North: Surf Parade															
7	L2	All MCs	4	5.0	4	5.0	0.191	5.6	LOS A	0.0	0.0	0.00	0.01	0.00	57.1
8	T1	All MCs	356	5.0	356	5.0	0.191	0.1	LOS A	0.0	0.0	0.00	0.01	0.00	59.8
Approach			360	5.0	360	5.0	0.191	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.8
All Vehicles			617	5.0	617	5.0	0.191	0.3	NA	0.0	0.4	0.02	0.03	0.02	59.6

Design (background plus proposal) AM peak hour (with proposal)

MOVEMENT SUMMARY

▽ Site: 101 [Design Peak Traffic AM (Site Folder: Surf Parade / Anne Avenue)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Surf Parade / Anne Avenue
Site Category: (None)
Give-Way (Two-Way)

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: Surf Parade															
2	T1	All MCs	208	5.0	208	5.0	0.113	0.0	LOS A	0.0	0.2	0.01	0.01	0.01	59.9
3	R2	All MCs	3	5.0	3	5.0	0.113	5.7	LOS A	0.0	0.2	0.01	0.01	0.01	56.8
Approach			212	5.0	212	5.0	0.113	0.1	NA	0.0	0.2	0.01	0.01	0.01	59.8
East: Anne Avenue															
4	L2	All MCs	17	5.0	17	5.0	0.026	6.2	LOS A	0.1	0.7	0.32	0.58	0.32	51.8
6	R2	All MCs	12	5.0	12	5.0	0.026	7.2	LOS A	0.1	0.7	0.32	0.58	0.32	51.5
Approach			28	5.0	28	5.0	0.026	6.6	LOS A	0.1	0.7	0.32	0.58	0.32	51.7
North: Surf Parade															
7	L2	All MCs	4	5.0	4	5.0	0.100	5.6	LOS A	0.0	0.0	0.00	0.01	0.00	57.1
8	T1	All MCs	185	5.0	185	5.0	0.100	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.8
Approach			189	5.0	189	5.0	0.100	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.8
All Vehicles			429	5.0	429	5.0	0.113	0.5	NA	0.1	0.7	0.03	0.05	0.03	59.2

Design (background plus proposal) PM peak hour (with proposal)

MOVEMENT SUMMARY

▽ Site: 101 [Design Peak Traffic PM (Site Folder: Surf Parade / Anne Avenue)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Surf Parade / Anne Avenue
Site Category: (None)
Give-Way (Two-Way)

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: Surf Parade															
2	T1	All MCs	240	5.0	240	5.0	0.136	0.1	LOS A	0.1	0.7	0.05	0.06	0.05	59.6
3	R2	All MCs	11	5.0	11	5.0	0.136	7.1	LOS A	0.1	0.7	0.05	0.06	0.05	56.5
Approach			251	5.0	251	5.0	0.136	0.4	NA	0.1	0.7	0.05	0.06	0.05	59.4
East: Anne Avenue															
4	L2	All MCs	9	5.0	9	5.0	0.023	6.9	LOS A	0.1	0.6	0.45	0.65	0.45	51.1
6	R2	All MCs	9	5.0	9	5.0	0.023	8.6	LOS A	0.1	0.6	0.45	0.65	0.45	50.8
Approach			19	5.0	19	5.0	0.023	7.7	LOS A	0.1	0.6	0.45	0.65	0.45	51.0
North: Surf Parade															
7	L2	All MCs	12	5.0	12	5.0	0.195	5.6	LOS A	0.0	0.0	0.00	0.02	0.00	57.0
8	T1	All MCs	356	5.0	356	5.0	0.195	0.1	LOS A	0.0	0.0	0.00	0.02	0.00	59.7
Approach			367	5.0	367	5.0	0.195	0.2	NA	0.0	0.0	0.00	0.02	0.00	59.6
All Vehicles			637	5.0	637	5.0	0.195	0.5	NA	0.1	0.7	0.03	0.05	0.03	59.3

OLD BURLEIGH ROAD / ANNE AVENUE INTERSECTION

- Background AM peak hour (without proposal)
- Background AM peak hour (without proposal)
- Design (background plus proposal) AM peak hour (with proposal)
- Design (background plus proposal) PM peak hour (with proposal)

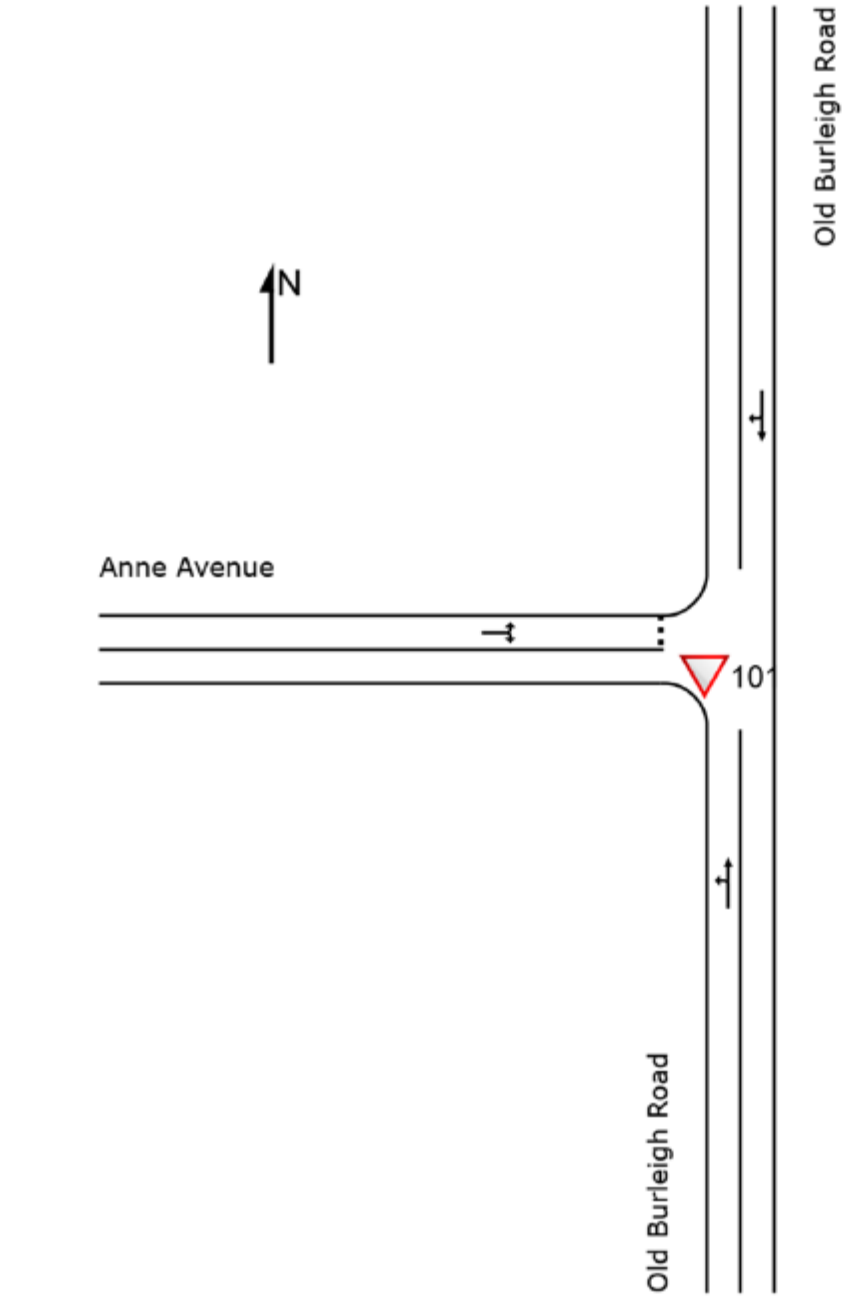
MODELLED LAYOUT

SITE LAYOUT

Site: 101 [Surveyed Peak Traffic AM (Site Folder: Old Burleigh Road / Anne Avenue)]

Old Burleigh Road / Anne Avenue
Site Category: (None)
Give-Way (Two-Way)

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



Background AM peak hour (without proposal)

MOVEMENT SUMMARY

▽ Site: 101 [Surveyed Peak Traffic AM (Site Folder: Old Burleigh Road / Anne Avenue)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Old Burleigh Road / Anne Avenue
Site Category: (None)
Give-Way (Two-Way)

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: Old Burleigh Road															
1	L2	All MCs	24	5.0	24	5.0	0.235	5.7	LOS A	0.0	0.0	0.00	0.03	0.00	56.9
2	T1	All MCs	418	5.0	418	5.0	0.235	0.1	LOS A	0.0	0.0	0.00	0.03	0.00	59.6
Approach			442	5.0	442	5.0	0.235	0.4	NA	0.0	0.0	0.00	0.03	0.00	59.4
North: Old Burleigh Road															
8	T1	All MCs	200	5.0	200	5.0	0.117	0.2	LOS A	0.1	0.9	0.07	0.09	0.07	59.4
9	R2	All MCs	12	5.0	12	5.0	0.117	7.5	LOS A	0.1	0.9	0.07	0.09	0.07	56.4
Approach			212	5.0	212	5.0	0.117	0.6	NA	0.1	0.9	0.07	0.09	0.07	59.2
West: Anne Avenue															
10	L2	All MCs	8	5.0	8	5.0	0.015	7.2	LOS A	0.1	0.4	0.46	0.64	0.46	51.1
12	R2	All MCs	4	5.0	4	5.0	0.015	8.8	LOS A	0.1	0.4	0.46	0.64	0.46	50.8
Approach			13	5.0	13	5.0	0.015	7.7	LOS A	0.1	0.4	0.46	0.64	0.46	51.0
All Vehicles			666	5.0	666	5.0	0.235	0.6	NA	0.1	0.9	0.03	0.06	0.03	59.2

Background PM peak hour (without proposal)

MOVEMENT SUMMARY

▽ Site: 101 [Surveyed Peak Traffic PM (Site Folder: Old Burleigh Road / Anne Avenue)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Old Burleigh Road / Anne Avenue
Site Category: (None)
Give-Way (Two-Way)

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: Old Burleigh Road															
1	L2	All MCs	7	5.0	7	5.0	0.206	5.6	LOS A	0.0	0.0	0.00	0.01	0.00	57.1
2	T1	All MCs	381	5.0	381	5.0	0.206	0.1	LOS A	0.0	0.0	0.00	0.01	0.00	59.8
Approach			388	5.0	388	5.0	0.206	0.2	NA	0.0	0.0	0.00	0.01	0.00	59.7
North: Old Burleigh Road															
8	T1	All MCs	259	5.0	259	5.0	0.146	0.1	LOS A	0.1	0.7	0.05	0.06	0.05	59.6
9	R2	All MCs	11	5.0	11	5.0	0.146	7.2	LOS A	0.1	0.7	0.05	0.06	0.05	56.5
Approach			269	5.0	269	5.0	0.146	0.4	NA	0.1	0.7	0.05	0.06	0.05	59.5
West: Anne Avenue															
10	L2	All MCs	8	5.0	8	5.0	0.016	7.0	LOS A	0.1	0.4	0.45	0.63	0.45	51.1
12	R2	All MCs	5	5.0	5	5.0	0.016	8.9	LOS A	0.1	0.4	0.45	0.63	0.45	50.8
Approach			14	5.0	14	5.0	0.016	7.7	LOS A	0.1	0.4	0.45	0.63	0.45	51.0
All Vehicles			672	5.0	672	5.0	0.206	0.4	NA	0.1	0.7	0.03	0.04	0.03	59.4

Design (background plus proposal) AM peak hour (with proposal)

MOVEMENT SUMMARY

Site: 101 [Design Peak Traffic AM (Site Folder: Old Burleigh Road / Anne Avenue)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Old Burleigh Road / Anne Avenue
Site Category: (None)
Give-Way (Two-Way)

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: Old Burleigh Road															
1	L2	All MCs	24	5.0	24	5.0	0.235	5.7	LOS A	0.0	0.0	0.00	0.03	0.00	56.9
2	T1	All MCs	418	5.0	418	5.0	0.235	0.1	LOS A	0.0	0.0	0.00	0.03	0.00	59.6
Approach			442	5.0	442	5.0	0.235	0.4	NA	0.0	0.0	0.00	0.03	0.00	59.4
North: Old Burleigh Road															
8	T1	All MCs	200	5.0	200	5.0	0.118	0.2	LOS A	0.1	0.9	0.08	0.09	0.08	59.3
9	R2	All MCs	13	5.0	13	5.0	0.118	7.5	LOS A	0.1	0.9	0.08	0.09	0.08	56.3
Approach			213	5.0	213	5.0	0.118	0.6	NA	0.1	0.9	0.08	0.09	0.08	59.2
West: Anne Avenue															
10	L2	All MCs	13	5.0	13	5.0	0.022	7.2	LOS A	0.1	0.6	0.46	0.65	0.46	51.1
12	R2	All MCs	6	5.0	6	5.0	0.022	8.9	LOS A	0.1	0.6	0.46	0.65	0.46	50.8
Approach			19	5.0	19	5.0	0.022	7.8	LOS A	0.1	0.6	0.46	0.65	0.46	51.0
All Vehicles			674	5.0	674	5.0	0.235	0.7	NA	0.1	0.9	0.04	0.07	0.04	59.1

Design (background plus proposal) PM peak hour (with proposal)

MOVEMENT SUMMARY

Site: 101 [Design Peak Traffic PM (Site Folder: Old Burleigh Road / Anne Avenue)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Old Burleigh Road / Anne Avenue
Site Category: (None)
Give-Way (Two-Way)

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: Old Burleigh Road															
1	L2	All MCs	9	5.0	9	5.0	0.207	5.6	LOS A	0.0	0.0	0.00	0.01	0.00	57.0
2	T1	All MCs	381	5.0	381	5.0	0.207	0.1	LOS A	0.0	0.0	0.00	0.01	0.00	59.8
Approach			391	5.0	391	5.0	0.207	0.2	NA	0.0	0.0	0.00	0.01	0.00	59.7
North: Old Burleigh Road															
8	T1	All MCs	259	5.0	259	5.0	0.150	0.2	LOS A	0.1	1.0	0.07	0.08	0.07	59.4
9	R2	All MCs	15	5.0	15	5.0	0.150	7.2	LOS A	0.1	1.0	0.07	0.08	0.07	56.4
Approach			274	5.0	274	5.0	0.150	0.5	NA	0.1	1.0	0.07	0.08	0.07	59.3
West: Anne Avenue															
10	L2	All MCs	11	5.0	11	5.0	0.020	7.0	LOS A	0.1	0.5	0.45	0.64	0.45	51.1
12	R2	All MCs	6	5.0	6	5.0	0.020	9.0	LOS A	0.1	0.5	0.45	0.64	0.45	50.8
Approach			17	5.0	17	5.0	0.020	7.7	LOS A	0.1	0.5	0.45	0.64	0.45	51.0
All Vehicles			681	5.0	681	5.0	0.207	0.5	NA	0.1	1.0	0.04	0.06	0.04	59.3