TRAFFIX
TRAFFIC AND TRANSPORT PLANNERS

TRAFFIC IMPACT ASSESSMENT (TIA)

Proposed Seniors Living and Registered Club Development
Forestville RSL Club

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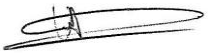
v06	21/05/2025	Tom Mojsiejuk	Vince Doan	

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1. INTRODUCTION

TRAFFIX has been commissioned by Forestville RSL Club to undertake a traffic impact assessment (TIA) in support of a development application (DA) relating to a seniors living and redevelopment of a registered club development. The development is located within the Northern Beaches Local Government Area (LGA) and has been assessed under that Council's controls.

This report documents the findings of our investigations and should be read in the context of the Statement of Environmental Effects (SEE) prepared separately.

The report is structured as follows:

- Section 2: Describes the site and its location
- Section 3: Documents existing traffic conditions
- Section 4: Describes the proposed development
- Section 5: Assesses the parking requirements
- Section 6: Assesses traffic impacts
- Section 7: Discusses access and internal design aspects
- Section 8: Response to request for information
- Section 9: Presents the overall study conclusions

2. LOCATION AND SITE

The subject site is known as Forestville RSL, which is located at 22 Melwood Avenue, Forestville. It is legally described as Lot 31 of DP 366454, Lot 11 of DP 626916 and Lot 2589 of DP 752038 and is located on the western side of Melwood Avenue. The site is located approximately 11.5 kilometres north of the Sydney CBD.

The site has a total site area of approximately 9,014m^2 and contains a two storey registered club building, at-grade car park and two bowling greens. The site has an eastern frontage of 120 metres to Melwood Avenue, a southern boundary of 80 metres to a Council carpark and Forestville War Memorial and playing fields and a western frontage of 100 metres to a laneway. It is bounded to the north by residential developments.

Vehicular access to the site is currently provided via two access driveways from the Melwood Avenue frontage being an entry only driveway (southern access) and an egress only driveway (northern access).

A Location Plan is presented in **Figure 1**, with a Site Plan presented in **Figure 2**.

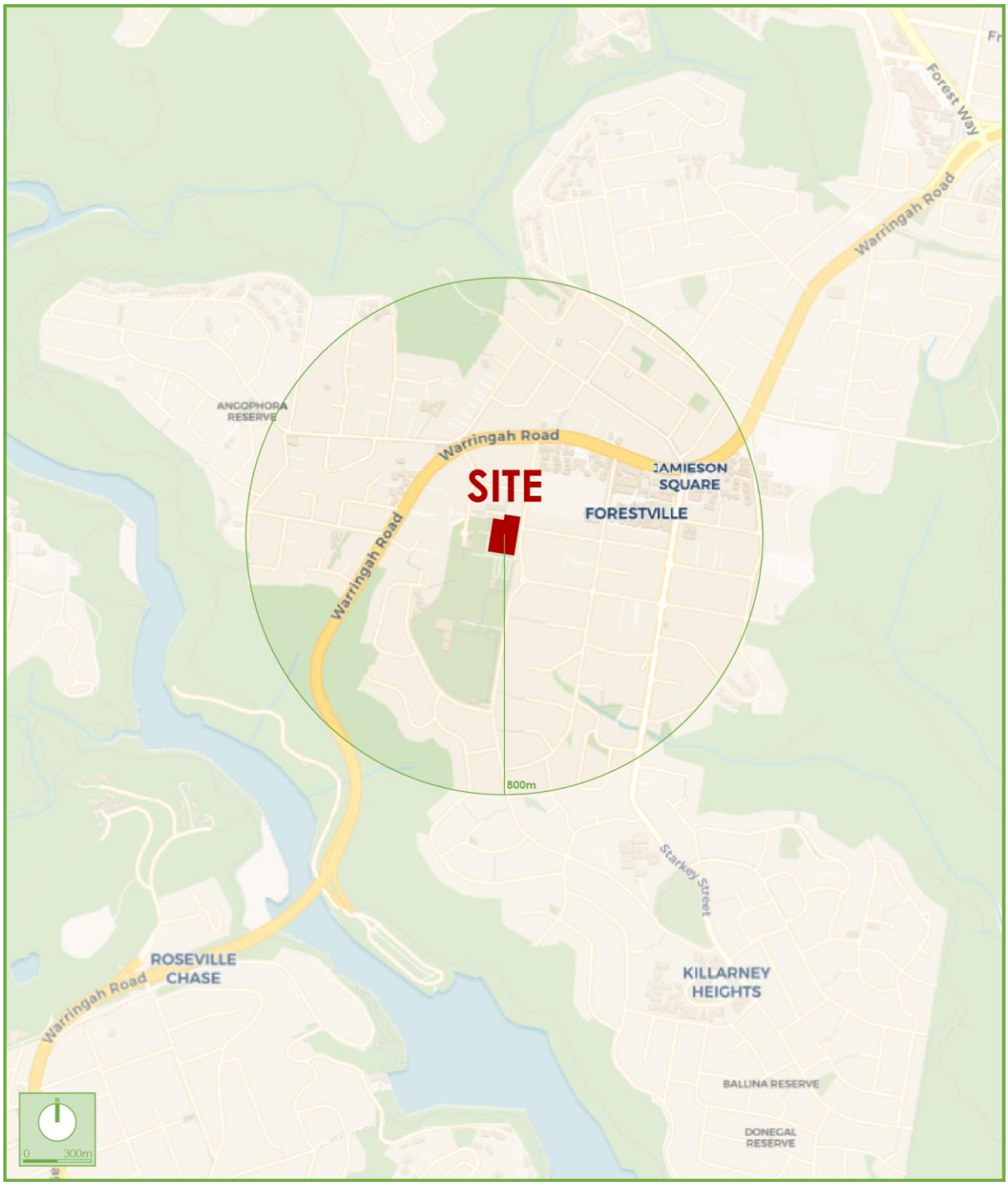


Figure 1: Location Plan

Figure 2: Site Plan

3. EXISTING TRAFFIC CONDITIONS

3.1 Road Network

The road hierarchy in the vicinity of the site is shown in **Figure 3** with the following roads of particular interest:

- Warringah Road: a TfNSW Main Road (MR 328) that traverses north-east to south-west between Dee Why in the north-east and Roseville in the south-west. In the vicinity of the site, Warringah Road carries about 51,846 vpd (2022 AADT) and is subject to 70km/h speed zoning local to the site. It generally consists of three traffic lanes in either direction separated by a median.
- Melwood Avenue: a local road that traverses north-south between Warringah Road in the north and Starkey Street in the south. It is subject to 50km/h speed zoning. Melwood Road carries a single lane of traffic in each direction and generally permits on-street parking along both sides. In addition, a bicycle lane is provided generally north of its intersection with Cannons Parade. Melwood Avenue provides vehicular access for the development.
- Bushland Avenue: a local road that generally traverses east-west between Darley Street in the east and Melwood Avenue in the west. It is subject to a 50km/h speed zoning, carries a single lane of traffic in each direction and generally permits unrestricted kerbside parallel parking along both sides.
- Darley Street a local road that generally traverses north-south between Warringah Road in the north and Melwood Avenue in the south. It is subject to 50km/h speed zoning, carries a single lane of traffic in each direction and generally permits unrestricted kerbside parallel parking along the both sides.

It can be seen from the road hierarchy presented in **Figure 3** below that access to the wider regional road network is provided via Warringah Road using Melwood Avenue or Darley Street.

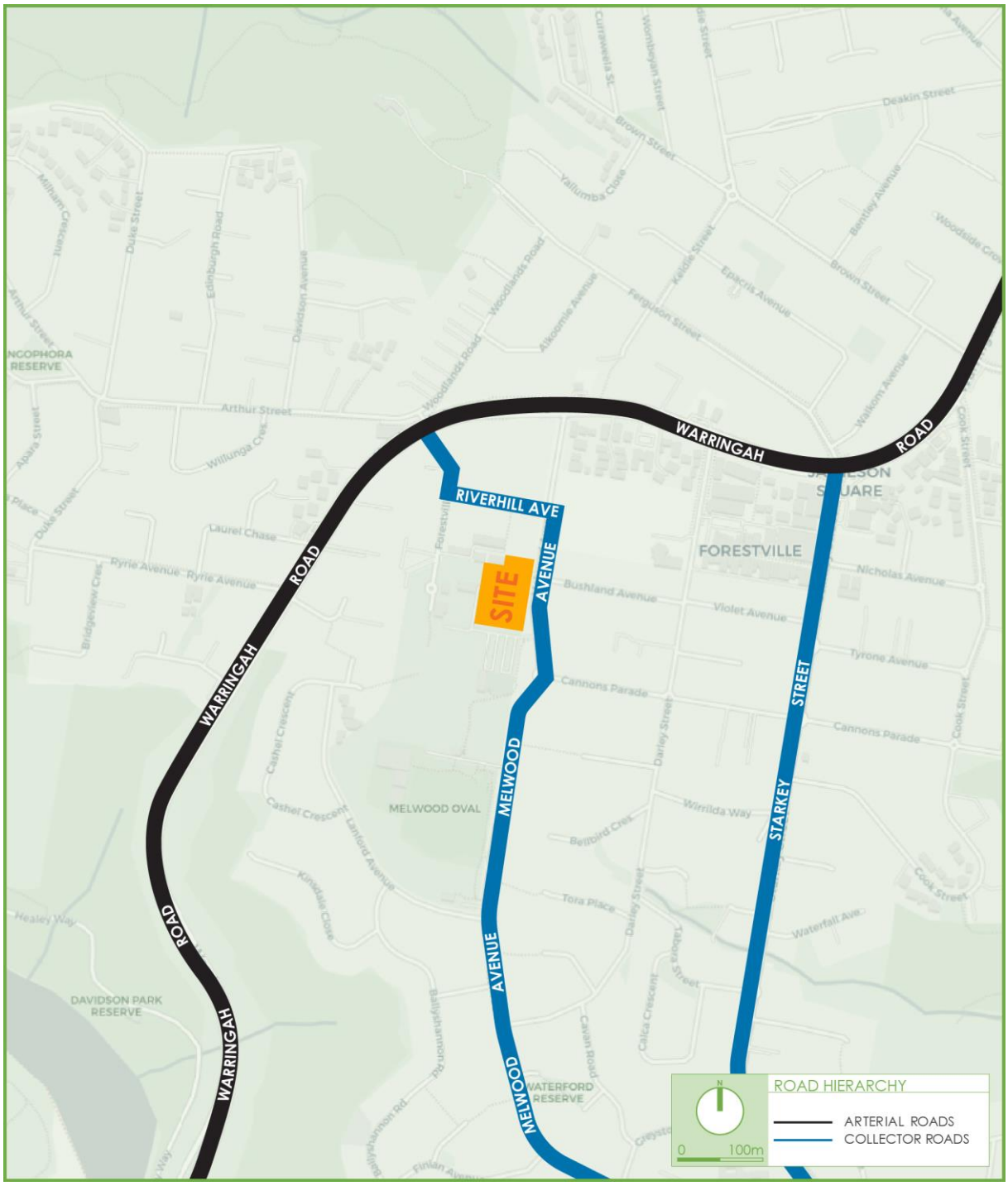


Figure 3: Road Hierarchy

3.2 Key Intersections

The key intersections in the vicinity of the site are shown below and provide an understanding of the existing road geometry and alignment.

3.2.1 Intersection of Forestville RSL Carpark / Melwood Avenue / Bushland Avenue

Figure 4: Intersection of Forestville RSL Carpark / Melwood Avenue / Bushland Avenue

It can be seen from **Figure 4** that the intersection of Forestville RSL Carpark / Melwood Avenue / Bushland Avenue is a four-legged cross intersection. The main attributes of each approach outlined as follows:

- Melwood Avenue (Main Road – north and south leg)
  - The northern approach provides single lane from which all movements are permitted.
  - The southern approach provides single lane from which all movements are permitted.
- Bushland Avenue (Minor Road – east leg)
  - The eastern approach provides a single lane from which all movements are permitted where vehicles are required to "Stop" before entering the intersection.
- Forestville Car Park Access (Carpark Access – west leg)
  - The eastern approach provides a single lane from which all movements are permitted where vehicles are required to "Stop" before entering the intersection.

3.2.2 Intersection of Warringah Road and Darley Road

Figure 5: Intersection of Warringah Road and Darley Road

It can be seen from **Figure 5** that the intersection of Warringah Road and Darley Road is a three-legged T intersection. The main attributes of each approach outlined as follows:

- Warringah Road (Main Road – east and west leg)
  - The eastern approach provides three lanes from which through movements are permitted. The kerbside lane is also shared with left turn movements.
  - The western approach provides three lanes from which through movements are permitted. In addition, a right turn short lane is provided, permitting right turn movements.
- Darley Road (Minor Road – south leg)
  - The southern approach provides two lanes from which left and right turn movements are permitted.

3.2.3 Intersection of Melwood Avenue and Cannons Parade

Figure 6: Intersection of Melwood Avenue and Cannons Parade

It can be seen from **Figure 6** that the intersection of Melwood Avenue and Cannons Parade is a three-legged roundabout intersection. The main attributes of each approach outlined as follows:

- Melwood Avenue (north and south leg)
  - The northern approach provides a single lane from which all movements are permitted.
  - The southern approach provides a single lane from which all movements are permitted.
  - A bicycle lane is provided along each Melwood Avenue approach.
- Cannons Parade (east leg)
  - The eastern approach provides a single lane from which all movements are permitted.

3.2.4 Intersection of Darley Street / Bushland Avenue / Violet Avenue

Figure 7: Intersection of Darley Street / Bushland Avenue / Violet Avenue

It can be seen from **Figure 7** that the intersection of Darley Street / Bushland Avenue / Violet Avenue is a four-legged cross intersection. The main attributes of each approach outlined as follows:

- Darley Street (Main Road – north and south leg)
  - The northern approach provides a single lane from which all movements are permitted.
  - The southern approach provides a single lane from which all movements are permitted.
- Bushland Avenue (Minor Road – east leg)
  - The eastern approach provides a single lane from which all movements are permitted where vehicles are required to "Stop" before entering the intersection.
- Violet Avenue (Minor Road – west leg)
  - The western approach provides a single lane from which all movements are permitted where vehicles are required to "Stop" before entering the intersection.

3.3 Public Transport

The existing bus services that operate in the locality are shown in **Figure 8.** The subject site is within optimal walking distance (200 metres) of existing bus services operating in the locality. These bus services and their frequencies are detailed in **Table 1** below.

Table 1: Bus Information

Bus No.	Route	Frequency		
		Weekday	Saturday	Sunday & Public Holidays
260	Terrey Hills to North Sydney	Limited to 8 services	No services	No services
270	Terry Hills to City QVB	Every 15-30 minutes	Every 30 minutes	Every 30 minutes
271	Belrose to City QVB	Every 15-30 minutes	Every 30 minutes	Every 30 minutes
274	Davidson to City QVB via Frenchs Forest	Limited to 7 services	No services	No services
279	Chatswood to Frenchs Forest (loop service)	Limited to 6 services	No services	No services
280	Warringah Mall to Chatswood	Every 20-30 minutes	Every 30 minutes	Every 30 minutes
281	Chatswood to Davidson (loop service)	Every 30 minutes to 1 hour	Every hour	Every hour
283	Chatswood to Belrose (loop service)	Every 30 minutes to 1 hour	Every hour	Every hour
284	Duffys Forest to Terrey Hills and Chatswood	Limited to 9 services	Limited to 7 services	Limited to 7 services

It is evident that the development benefits from good bus services with a bus stop being situated directly adjacent to the site on Melwood Avenue and within 400 metres on both sides of Warringah Road. These services provide connections to such centres as Warringah, Sydney CBD, North Sydney and Chatswood. These bus routes provide frequent services during the weekday peak hour periods.

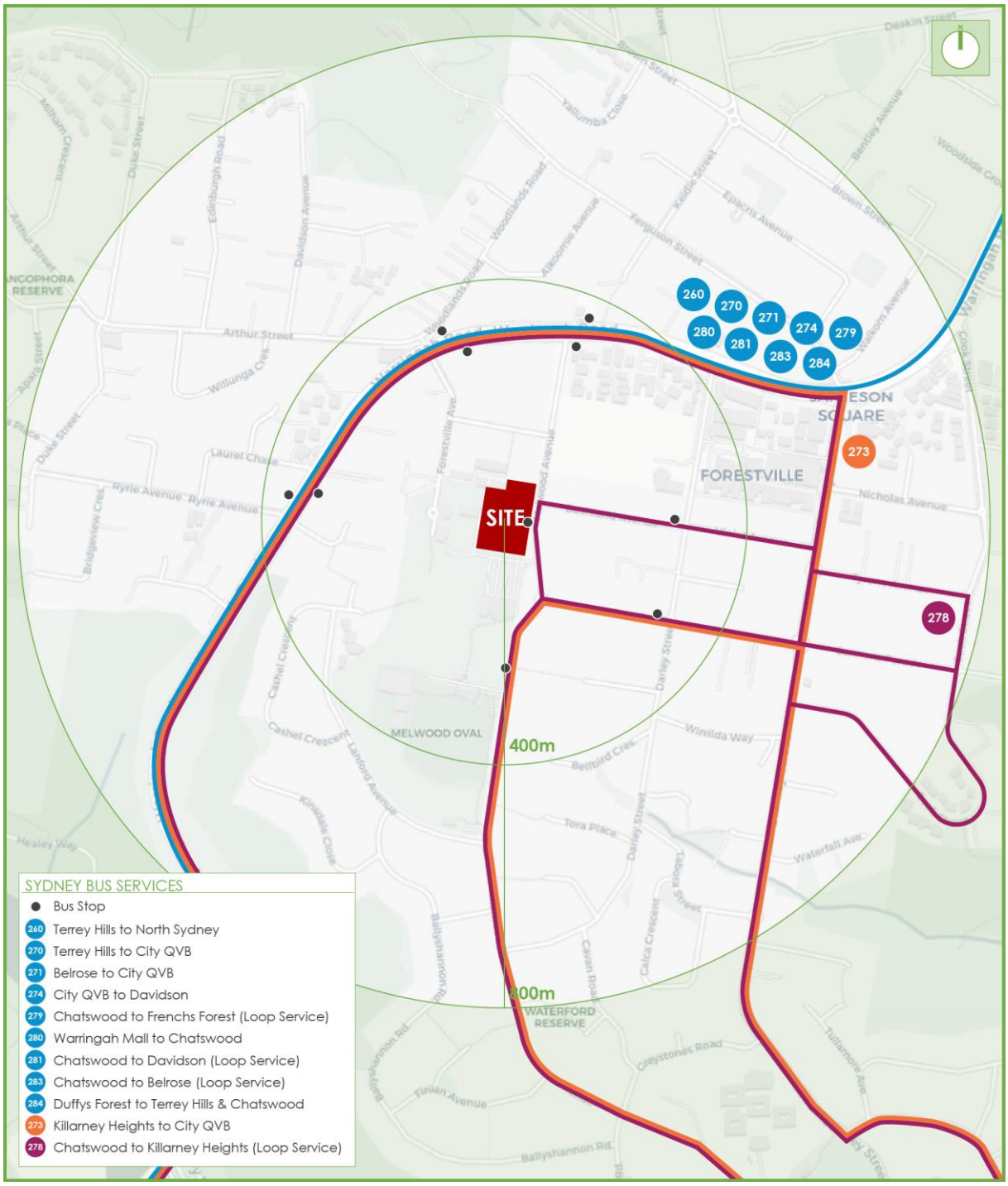


Figure 8: Public Transport

3.4 Questionnaire and Parking Surveys

In order to understand the unique travel patterns and parking characteristics of the Club's existing patrons, interview surveys were conducted between 6:00pm and 10:00pm on Friday the 2nd of August 2024 and between 6:00pm and 10:00pm Saturday the 3rd of August 2024. The travel mode characteristics based on the questionnaires are summarised in **Table 2** and **Table 3** respectively.

3.4.1 Questionnaire Surveys

Table 2 below details the modal split of patrons surveyed via questionnaire and average car occupancy. **Table 3** details the locations where patrons surveyed parked.

Table 2: Patron Modal Split

Date	Friday	Saturday	Average
Car Driver	55%	39%	47%
Car Passenger	30%	43%	36.5%
Car Passenger Drop-off	4%	5%	4.5%
Public Transport	0%	0%	0%
Taxi / Uber	1%	0%	0.5%
Motorcycle/ Cycle	0%	0%	0%
Walk	9%	9%	9%
Other	1%	4%	2.5%
Car Occupancy	1.54	2.12	1.75

Table 3: Location of Car Parking for Patrons that Drive

Day	On-Site	Off-Site
Friday	97%	3%
Saturday	95%	5%

It can be seen that the average modal split based on the days surveyed ranges from 39% to 55% for car drivers, 30% to 43% for car passengers, 4% to 5% for car passengers (drop off) and 9% for walking. The average car occupancy varies between 1.54 to 2.12 persons per vehicle with an average of 1.75 persons during the surveyed period.

In addition, on average 96% of patrons surveyed parked within the on-site parking spaces while 4% parked off-site despite there likely being on-site parking available. Reasons for this could include the ample on-street parking availability near the site which could offer more convenient parking locations for patrons.

3.4.2 Parking Occupancy Surveys

Chart 1 below presents the survey period for Friday, which indicates that at its busiest car parking period from 6:00-7:00pm, there were 86 vehicles parked in the car park (being 100% capacity of the existing club carpark). Based on the surveys and noting that on average 96% of patrons park their vehicles on-site while 4% parked off-site, this would equate to approximately four (4) additional vehicles parked on-street. It has been advised by the club that between 6:00-7:00pm the carpark was at peak occupancy during this time as a special event was being held which explains the zero-parking availability.

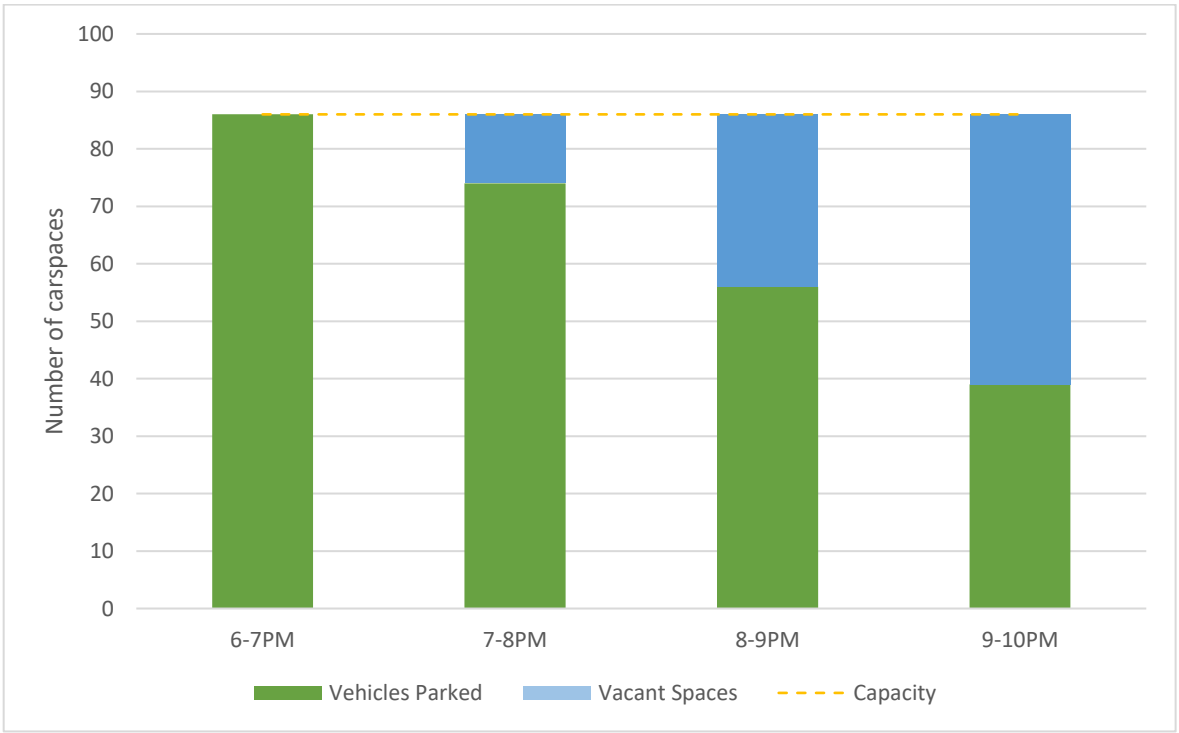


Chart 1: Car Parking Occupancy on Friday from 6:00pm to 10:00pm

Chart 2 presents the survey period for Saturday, which indicates that at its busiest car parking period from 7:00-8:00pm, there are 64 vehicles parked in the car park (being 74% capacity of the existing club carpark) with 22 spaces of spare capacity.

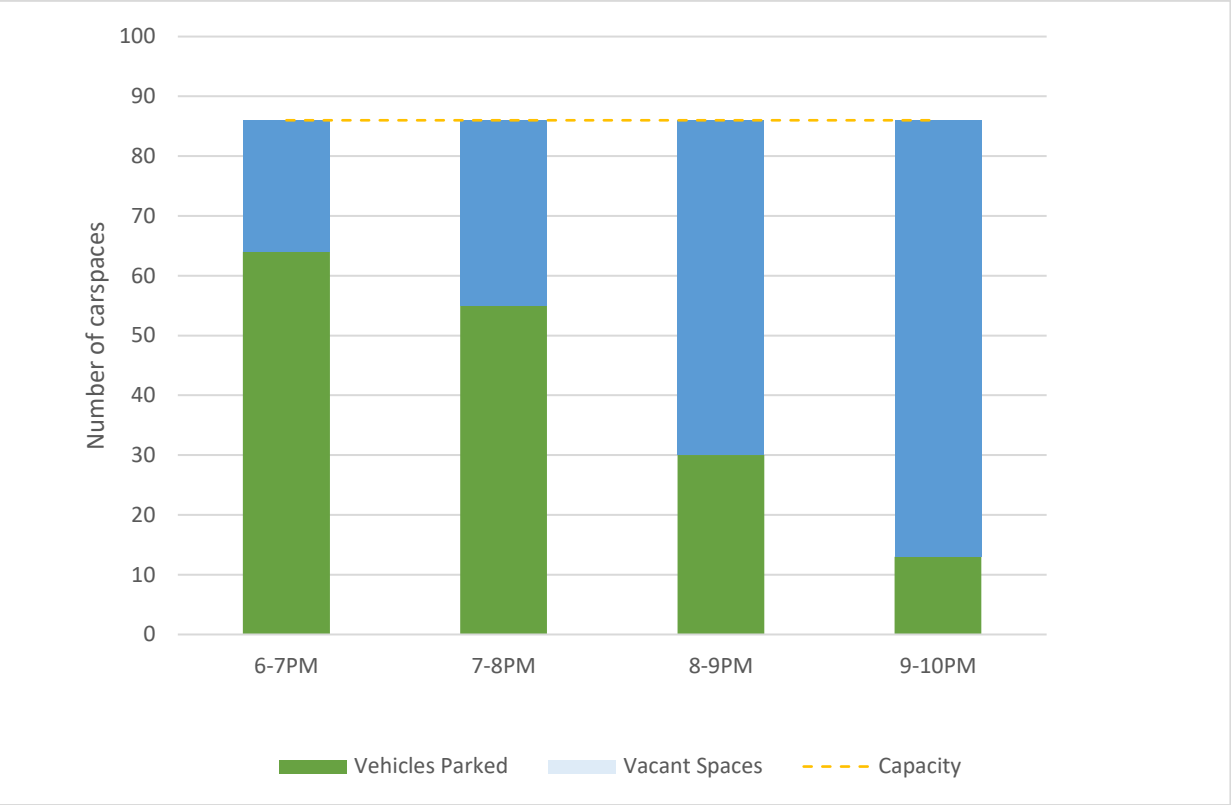


Chart 2: Car Parking Occupancy on Saturday from 6:00pm to 10:00pm

3.4.3 Parking Survey Summary

As shown in Table 2, the majority of patrons arrive to the club as either a driver or a passenger. On Friday, 55% of patrons drove to the club while 30% were passengers of a driver. However, on Saturday 39% of patrons drove to the club while 43% were passengers of a driver. The resultant average car occupancy rate of 1.75 persons supports the findings that carpooling is a common practice by patrons. Walking constituted the third most popular travel mode with 9% of patrons walking to club on Friday and Saturday suggesting a local clientele.

Charts 1 and 2 both identify with the exception of one period on Friday between 6:00-7:00pm where the existing car parking on site was at capacity, the clubs on site car parking (86 spaces) did not reach capacity. That is, the club peak demand would result in 90 vehicles. Noting that the existing club has a gross floor area (GFA) of 3,749m^2 this equates to a car parking demand for the existing club of 2.4 spaces per 100m^2 GFA (1 space per 41.6m^2 GFA).

4. DESCRIPTION OF PROPOSED DEVELOPMENT

A detailed description of the proposed development is provided in the Statement of Environmental Effects prepared separately. In summary, the development for which approval is sought is for a registered club and seniors housing development comprising the following:

Stage 1

- Construction of a three-level basement carpark
- Construction of a registered club with a 3,539m^2 GFA (decrease of 210m^2 of GFA)
- Construction of a new 16 Independent Living Units (ILUs) above the club building
- Car parking to accommodate:
  - 29 ILU residential spaces;
  - 9 ILU visitor spaces (including 3 on ground floor); and
  - 125 club spaces.

Stage 2

- Demolition of existing registered club on site.
- Construction of 36 Independent Living Units (ILUs) and ancillary uses.
- Construction of the remainder of a two-level basement car park.
- Car parking to accommodate:
  - 45 ILU residential spaces;
  - 3 ILU visitor spaces; and
  - 78 club spaces.

The parking and traffic impacts arising from the development are discussed in **Section 5** and **Section 6**. Reference should be made to the plans submitted separately to Council which are presented at reduced scale in **Appendix A**.

5. PARKING REQUIREMENTS

5.1 Car Parking

5.1.1 Council Controls

The Warringah Council Development Control Plan (DCP) 2011, Part H Appendix 1 does not specify car parking rates for seniors housing developments or any specific minimum requirements for registered club developments noting that "Comparisons must be drawn with developments for a similar purpose".

A parking assessment has been undertaken below for the registered club element having regard to Transport for New South Wales (TfNSW) (former RMS) Guidelines and similar club developments. In addition, an assessment against the minimum car parking requirements as prescribed for seniors housing developments under State Environmental Planning Policy (Housing) 2021 and the residential flat building rates (most similar development typology) under the Warringah DCP has been undertaken below.

5.1.2 Independent Living Units

The State Environmental Planning Policy (Housing) 2021 Part 5 Division 7 Clause 108 (j) provides parking requirements for independent living units (ILUs) developments by a non-social-housing provider. Car parking provision is to be provided at a rate of at least 0.5 car space per bedroom. It is noted that Clause 108 are non-discretionary development standards that if complied with, prevent the consent authority from requiring more onerous standards for the matters. Notwithstanding, as Council's DCP does not include minimum car parking rates for seniors living developments a comparative analysis has been undertaken making reference to the minimum car parking rates for residential flat buildings (the most similar development typology). The proposed ILU parking requirements and provision are shown in **Table 4** and **Table 5** below.

Table 4: ILU Car Parking Requirements and Provision for Stage 1

Type	Units (bedrooms)	Minimum Parking Rate (SEPP)	Minimum Parking Rate (DCP)	Minimum Parking Requirement (SEPP)	Minimum Parking Requirement (DCP)	Spaces Provided
2 Bedroom	4 (8)	0.5 spaces per bedroom	1.2 spaces	4	4.8 (5)	**29**
3 Bedroom	12 (36)		1.5 spaces	18	18	
Residential Visitor	-	-	1 per 5 units	-	3.2 (3)	**9**
Totals				**22**	**26**	**38**

Table 5: ILU Car Parking Requirements and Provision for Stage 2

Type	Units (bedrooms)	Min Parking Rate (SEPP)	Min Parking Rate (DCP)	Minimum Parking Requirement (SEPP)	Minimum Parking Requirement (DCP)	Spaces Provided
2 Bedroom	23 (46)	0.5 spaces per bedroom	1.2 spaces	23	27.6 (28)	**45**
3 Bedroom	13 (39)		1.5 spaces	19.5 (20)	19.5 (20)	
Residential Visitor	-	-	1 per 5 units	-	7.2 (7)	**3**
Totals				**43**	**53**	**48**

It can be seen from Table 4 and 5 above that the ILU development is required to provide a minimum of 65 car parking spaces under the SEPP for residents with no requirement for visitor carparking. Under the DCP, a comparable residential flat building would require the minimum provision of 79 car parking spaces for residents including 10 spaces for visitors. In response, the development proposes a total of 86 car parking spaces with 74 spaces for residents and 12 for residential visitors.

It is highly noteworthy that the seniors living development caters largely towards downsizers and due to the location and size of the ILU development, it is likely that some households would have more than one car therefore the provision of additional parking above the minimum SEPP requirements including visitor parking marginally above the minimum requirements for a comparable residential flat building is supported. The proposed ILU development complies with the minimum requirements of SEPP Housing 2021 and would ensure that all standard car parking for the seniors living component would be accommodated onsite.

5.1.3 Registered Club

The *Transport for New South Wales (former RMS) Guide to Traffic Generating Developments (2002)* (The Guide) recommends the following advice regarding the parking provision for 'club' developments:

> *"Off-street car parking must be provided to satisfy the average maximum demand. Research has indicated that the demand for parking varies substantially depending on the type of club and cannot readily be related to building floor areas or to the membership. The determination of the number of parking spaces required is therefore based on the characteristics of the proposed development. Comparisons must be drawn with similar clubs."*

In light of the above, the parking requirements for the proposed development can be determined based on the existing club and comparable surveyed rates of similar developments. TRAFFIX has had extensive experience with similar developments, which have comparable operational characteristics to the proposed development.

As such, an average parking rate can be derived from the existing and comparable developments based on their associated parking demand surveys. It is noted that the following comparable developments are located more than 800 metres from a railway station and also contain bar, lounge, and gaming space.

These comparable developments are outlined below:

- Forestville RSL Club (existing development) – Northern Beaches LGA
  - The surveyed parking demand rate equated to 1 space per 41.6m^2 GFA.
- Leagues Club – Cumberland LGA:
  - The surveyed parking demand rate equated to 1 space per 36.48m^2 GFA.
- Bowling Club – Central Coast LGA:
  - The surveyed parking demand rate equated to 1 space per 18.64m^2 GFA.

Accordingly, the average parking demand rate equated to 1 space per 31.57m^2 GFA (3.17 spaces per 100m^2 GFA). Application of the above demand rates to the proposed 3,539m^2 GFA (not LFA), results in the following outcomes in **Table 6** below.

Table 6: Assessment Based on Average Parking Supply and Peak Demand

Type of Rate	Proposed GFA	TRAFFIX Average Rate	Parking Required*	Parking Proposed
Existing GFA vs Parking Demand during Surveys				
Demand	3,539m²	3.17 spaces per 100m² GFA	(112.2) **113**	**203**

** Where calculations result in fractions, the fraction will be rounded up to the nearest whole number, as per DCP.*

It can be seen from Table 6 that the proposed development would be expected to provide a minimum car parking provision of 113 spaces based on the existing and comparable developments.

In response, the redevelopment of the club proposes a car parking provision of 203 club car parking spaces. This provision is 90 spaces above the minimum surveyed requirement however is considered supportable based on the following:

- The provision of an additional 90 spaces above the minimum surveyed requirement accommodates above the 85th percentile parking demand for large events, particularly Anzac Day, resulting in reduced demand for on-street parking at the nearby Forestville War Memorial Play Fields carpark and on-street. Reference should be made to **Appendix B** which illustrates the additional car parking demand experienced related to ANZAC day on 25 April 2025. It has been advised that no sporting games and/or other events were held at the Forestville War Memorial Play Fields during Forestville RSL Anzac Day event.
- The club seeks to future-proof and diversify its operations over time, and provide additional services in future, and provide a surplus of car parking to cater towards future car parking demand.

5.1.4 Car Parking Summary

It is evident there is a requirement to provide a minimum of 79 car parking spaces for the ILU element (in accordance with the DCP) and a minimum of 113 customer/guest parking spaces for the registered club element based on the existing development and comparison of similar registered clubs.

The development proposes a total of 86 car parking spaces for the senior's living element (including 12 spaces for visitors) and 203 for the club patrons resulting in a total 289 spaces.

Whilst the senior's living element has a surplus of car parking, it is noted that due to the location and size of the ILU development, it is likely that some households would have more than one

car, is comparable to the minimum car parking requirements for an RFB and still meets the minimum requirement under SEPP Housing.

The club would also have carparking surplus of 90 spaces above the minimum surveyed requirement. As discussed above, the intention of the parking surplus is to cater above the 85th percentile demand on ANZAC Day, reduce reliance on on-street and Council car parking by visitors and to future proof the club to diversify its operations over time and provide additional services and demand in the future. Reference should be made to **Appendix B** which includes a photographic record of the additional car parking demand during ANZAC day at the nearby Forestville War Memorial Play Fields carpark.

In summary, the car parking arrangement for the proposed development is supportable and ensures that all car parking demands will be readily accommodated on-site.

5.2 Accessible Parking

The accessible parking requirements have been assessed and signed off by the Accessibility Consultant. All accessible parking spaces to be designed in accordance with the requirements of SEPP Housing 2021 and AS 2890.6-2022. Reference is to be made to the Accessibility Consultant report prepared separately.

5.3 Bicycle Parking

The Council DCP does not specify any bicycle parking requirements for registered club but does specify the following minimum rates for seniors living developments:

- One (1) space per two (2) units for residents; and
- One (1) space per seven (7) units for visitors.

Based on the 52 ILU units, a minimum of 26 bicycle parking spaces for residents and seven (7) for visitors are required. In response, 36 resident and seven (7) visitor bicycle parking spaces have been provided in accordance with the DCP.

In relation to any club bicycle parking requirements, it is envisaged that any demonstrated future demand for bicycle parking spaces could readily be provided within the site based on future needs.

5.4 Motorcycle Parking

The Council DCP does not specify any motorcycle parking requirements for registered club and seniors living developments and none are provided in response. It is noted however, that there is a surplus of car parking spaces and motorcycles are able to park within these spaces.

5.5 Ambulance Bay

A covered ambulance bay is proposed within the at-grade car park adjacent to the seniors parking drop off which is accessed from Melwood Avenue for the ILU development.

5.6 Refuse Collection and Servicing

Residential waste collection is proposed undertaken from Melwood Avenue as advised by Council's waste team. Bins located in the waste collection room would be collected and carted via a nearby ramp to Council's waste collection vehicle which is understood to be 12.5m Heavy Rigid Vehicle (HRV).

With respect to club component, a loading dock has been provided on the site with access provided via Melwood Avenue and can accommodate two (2) vehicles up to and including a 10.5m long heavy rigid waste collection vehicle and a 6.4m small rigid vehicle (SRV). All club (private) waste collection and servicing requirements are proposed to be undertaken within the dedicated loading area and the club will enter into an arrangement with a private waste collection operator with a waste collection vehicle no larger than a 10.5m long heavy rigid waste collection vehicle. It is noted that a future Operational Management Plan (OMP) for the club will consider loading dock management.

6. TRAFFIC AND TRANSPORT IMPACTS

6.1 Existing Site Generation

The TfNSW Guide to Traffic Generating Developments 2002 recommends the analysis of traffic generation for a proposed 'club' development be based on surveys of similar existing clubs.

As such, the RMS Guide provides the following similar advice for 'Club' developments:

> *"Surveys of licensed clubs conducted by the RTA in 1978 indicate that it is difficult to generalise on their traffic generation because of the diversified nature of clubs. Traffic generation is affected by such factors as the provision of live entertainment, gambling facilities, number of members and club location. Behavioural changes since 1978, such as the introduction of random breath testing, also make such generalisations more difficult."*

Traffic generation rates are therefore not specified in the TfNSW Guide for this type of development and in any event, such a rate would not be as accurate or reliable. As such, the TfNSW Guide prefers a methodology based on a survey assessment of comparable developments. TRAFFIX has surveyed the existing vehicular access of Forestville RSL Club and note the existing development with 3,749m^2 GFA has a peak traffic generation as follows:

- 175 vehicle trips per hour during the evening peak period (89 in, 86 out)

However, given the proposal to demolish the existing club and construct a new club with a reduced GFA of 3,539m^2 (210m^2 reduction in GFA) for this assessment the existing traffic generation and proposed traffic generation for the club component is zero. This would allow for a conservative assessment of the independent living unit component despite the overall reduction in GFA of the existing club which would provide trip credits and likely offset the additional traffic generated by the proposed independent living units.

6.2 Development Trip Generation

6.2.1 Independent Living Units

The Transport for NSW Technical Direction (TDT 2013/04a) provides updated traffic generation rates for a number of land uses, including seniors living developments. Specifically, Appendix C2 provides site peak, morning (AM) network peak and evening (PM) network peak traffic

generation rates for seniors living developments, with the AM and PM network peaks the relevant rates for assessment. Appendix C2 recommends the following traffic generation rates:

- Site Peak 0.4 vehicle trips per dwelling;
- AM Peak 0.09 vehicle trips per dwelling (43% of PM Peak)
- PM Peak 0.2 vehicle trips per dwelling (Average of Sydney Metropolitan and Non-Metropolitan data).

Application of this rate to the proposed 52 ILU dwellings and adopting an 80/20 split results in the following:

- 5 vehicle trips per hour during the AM peak period (+1 in, +4 out).
- 11 vehicle trips per hour during the PM peak period (+9 in, +2 out).

6.3 Net Impacts

The proposed development has been assessed as a net increase of +5 vehicles per hour during the AM peak period and +11 per hour during the PM peak period. This level of trip generation is considered minimal and would not result in any significant or noticeable impacts to the existing traffic network. Notwithstanding, due to the type and size of the proposal, intersection performance testing was undertaken within Section 6.4 below.

6.4 Intersection Performance

6.4.1 Traffic Surveys

For the purposes of assessing the traffic impacts of this development, traffic surveys were obtained at the critical intersections within proximity of the site.

These surveys were conducted on Friday 2 August 2024 during the critical evening network peak between 5:00pm-8:00pm at the below following key intersections.

- The intersection of Warringah Road / Darley Street;
- The intersection of Melwood Avenue / Cannons Parade;
- The intersection of Melwood Avenue / Bushland Avenue / Forestville RSL Club access; and
- The intersection of Darley Street / Voilet Avenue / Bushland Avenue.

6.4.2 Trip Distribution

The adopted trip distribution is summarised below whereby it was assumed that traffic will be split across the surrounding road network which is generally consistent with surveys undertaken of the key intersections of interest.

- 45% of vehicles travel north to/from the site on Melwood Avenue.
- 55% of vehicles travel south to/from the site on Melwood Avenue.

6.4.3 Scenarios

To assess the potential traffic impacts of a proposed development, the following scenarios were identified:

- Existing Scenario; and
- Existing + Development Scenario.

6.4.4 SIDRA Intersection Analysis

The surveys were analysed using the SIDRA Intersection 9.1 computer program to determine their performance characteristics under existing traffic conditions. The SIDRA model produces a range of outputs, the most useful of which are the Degree of Saturation (DoS) and Average Vehicle Delay per vehicle (AVD). The AVD is in turn related to a level of service (LoS) criteria. These performance measures can be interpreted using the following explanations:

DoS the DoS is a measure of the operational performance of individual intersections. As both queue length and delay increase rapidly as DoS approaches 1, it is usual to attempt to keep DoS to less than 0.9. When DoS exceeds 0.9 residual queues can be anticipated, as occurs at many major intersections throughout the metropolitan area during peak periods. In this regard, a practical limit at 1.1 can be assumed. For intersections controlled by roundabout or give way / stop control, satisfactory intersection operation is generally indicated by a DoS of 0.8 or less.

AVD the AVD for individual intersections provides a measure of the operational performance of an intersection. In general, levels of acceptability of AVD for individual intersections depend on the time of day (motorists generally accept higher delays during peak commuter periods) and the road system being modelled (motorists are more likely to accept longer delays on side streets than on the main road system).

LoS this is a comparative measure which provides an indication of the operating performance of an intersection as shown in **Table 7**.

Table 7: Intersection Performance Indicators (TfNSW)

Level of Service (LoS)	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way and Stop Signs
A	less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory but accident study required
D	43 to 56	Operating near capacity	Near capacity and accident study required
E	57 to 70	At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode	At capacity and requires other control mode
F	More than 70	Unsatisfactory and requires additional capacity.	Unsatisfactory and requires other control mode or major treatment.

6.5 Traffic Impacts

A summary of the modelled results is provided in **Table 8**, reference should also be made to the SIDRA outputs provided in **Appendix C** which provide detailed results for each movement.

Table 8: Intersection Performance for Existing and Development

Intersection	Control Type	Scenario	Period	Degree of Saturation (DoS)	Average Delay	Level of Service
Warringah Road / Darley Street	Signalised	Existing	PM	0.842	17.5	B
		Existing + Development	PM	0.842	17.5	B
Melwood Avenue / Bushland Avenue / Forestville RSL Club	Priority Controlled	Existing	PM	0.123	9.9	A
Upgraded RSL access and Melwood Ave	Priority Controlled	Existing + Development	PM	0.111	9.0	A
Darley Street / Voilet Avenue / Bushland Avenue	Priority Controlled	Existing	PM	0.180	10.4	A
		Existing + Development	PM	0.180	10.4	A
Melwood Avenue / Cannons Parade	Priority Controlled	Existing	PM	0.170	11.2	A
		Existing + Development	PM	0.170	11.2	A

It can be seen from **Table 8** above that the intersection of Warringah Road / Darley Street operates at a level of service B during the weekday PM peak in the existing and development scenarios with no net increase in average delay or degree of saturation.

The intersection of Melwood Avenue / Bushland Avenue / Forestville RSL Club operates at a level of service A during the weekday PM peak in the existing development scenarios. The future access for the RSL club and Melwood Road operates at a level of service A during the PM peak in the development scenario with a 9.0 second average delay.

The intersection of Darley Street / Voilet Avenue / Bushland Avenue operates at a level of service A during the weekday PM peak in the existing and development scenarios with no net increase in average delay or degree of saturation.

The intersection of Avenue / Cannons Parade operates at a level of service A during the weekday PM peak in the existing and development scenarios with no net increase in average delay or degree of saturation.

It is emphasised that the above traffic generation and SIDRA Intersection modelling results are considered to be a conservative assessment, with the impact of anticipated traffic generation expected to be significantly less. This is due to the following reasons:

- The abovementioned traffic generation rate is based on the scenario that the proposed RSL club development would be replaced like-for-like and does not consider the significant reduction in GFA (210m^2) and associated existing trips already within the traffic network that could be offset and credited toward the redevelopment; and
- The abovementioned traffic generation rate is applicable to the proposed developments evening peak period. This evening peak period is not expected to coincide with the surrounding network PM peak period and as such, the anticipated traffic generation will have minimal impacts on the surrounding network.

Having regard for the above, it is evident there is no change to the level of service of any of the key intersections assessed as a result of the proposed development. Therefore, the impacts to traffic on the existing external road network and surrounding intersections are considered acceptable and consistent with existing intersection performance parameters.

7. ACCESS AND INTERNAL DESIGN ASPECTS

7.1 Site Vehicular Access

7.1.1 Vehicular Access to Basement 1

As per the above SIDRA Intersection modelling results, the development vehicular access would operate at a level of service A with the proposed development. It is noted that the proposed vehicular access would now be located away from the Bushland Avenue intersection providing an improved level of safety. As a result, the development proposes a 6.5 metre wide vehicular access arrangement. This is considered supportable and will meet the demands of the proposed development.

7.1.2 Loading Area and Basement 2 Entry

A proposed 6.0 metre combined entry and exit driveway provide access to the loading dock, and Basement 2 parking area which have been designed to accommodate the largest service vehicle required to access the proposed development being a 10.5m long heavy rigid waste collection vehicle.

7.1.3 Porte Cochere and At-Grade Parking Area

A proposed 3.37 metre wide entry only driveway and 3.85 metre wide exit only driveway provide access to the at-grade drop off and parking area which have been designed to accommodate the largest service vehicle required to access the subject porte cochere and at-grade parking area being an Ambulance vehicle.

7.1.4 Security / Separation of the Uses

A security door is proposed at the entry to Basement 1 which is dedicated for seniors living residents only therefore preventing unauthorised access. A separate ramp from the central access provides access to Basement 2 and 3 which are dedicated to club patron parking only. A separate two-way ramp is proposed for use by service vehicles only, providing access to the loading dock and servicing areas. This accessway would service the Stage 1 ILU carparking area and be closed upon the completion of Stage 2 reverted to a service vehicle access only with access by private vehicles restricted by a roller door thus separating movements by private vehicles and service vehicles.

7.1.5 Summary

The proposed vehicular accesses have been designed in accordance with the requirements of AS 2890.1-2004 and AS 2890.2-2018. Reference should be made to the swept path analysis provided in **Appendix D** showing the satisfactory operation of the access driveways.

7.2 Internal Design

The internal car park and loading areas complies with the requirements of AS 2890.1 (2004), AS 2890.2(2018) and AS 2890.6 (2022), and the following characteristics are noteworthy:

7.2.1 Parking Modules

- All standard car parking spaces have been designed in accordance with User Class 2 being for medium-term parking. These spaces are provided with a minimum space length of 5.4m, a minimum width of 2.5m and a minimum aisle width of 5.8m.
- All spaces located adjacent to obstructions of greater than 150mm in height are provided with an additional width of 300mm.
- Dead-end aisles are provided with the required 1.0m aisle extension in accordance with Figure 2.3 of AS2890.1 (2004).
- All accessible parking spaces have been designed in accordance with AS 2890.6 (2009), being 2.4m wide, 5.4m long and situated immediately adjacent to a dedicated shared area or the circulating aisle.

7.2.2 Ramps

- The internal ramps have a maximum gradient of 20% (1 in 5) with sag and summit transitions of 12.5% (1:8) respectively. These provisions satisfy the requirements of AS2890.1 (2004).
- The internal service vehicle ramps have a maximum gradient of 15.5% (1 in 6.5). The ground clearance test indicates the grade line and transitions of the ramp is acceptable with no scraping. These provisions satisfy the requirements of AS2890.2 (2018).

7.2.3 Clear Head Heights

- A minimum clear head height of 2.2m is to be provided for all areas within the car park as required by AS 2890.1 (2004).
- A minimum clear head height of 4.5m is to be provided for all areas accessed by the service vehicle as required by AS 2890.2 (2018).

- A minimum clear head height of 2.5m is to be provided above all accessible spaces in accordance with AS 2890.6 (2022).

7.2.4 Loading

- A minimum bay width of 3.5m and length of 10.5m is provided for the largest service vehicle required to access the subject development being a 10.5m long heavy rigid waste collection vehicle.

7.2.5 Other Considerations

- All columns are located outside of the parking space design envelope shown in Figure 5.2 of AS 2890.1 (2004).
- Visual splay has been provided at the access driveway in accordance with Figure 3.3 of AS 2890.1 (2004).
- Swept path analysis of all critical movements have been conducted and is included in Appendix D, demonstrating satisfactory operation.

7.3 Summary

In summary, the internal configuration of the car park and loading areas have been designed in accordance with AS 2890.1 (2004), AS 2890.2 (2018) and AS 2890.6 (2009). It is however envisaged that a condition of consent would be imposed requiring compliance with these standards and as such any minor amendments considered necessary (if any) can be dealt with prior to the release of a Construction Certificate.

8. RESPONSE TO REQUESTS FOR INFORMATION

TRAFFIX has received the following comments from Northern Beaches Council as per the Traffic Engineer Referral Response Letter dated 21/01/2025 provided in **Appendix E** for reference, and TRAFFIX has responded to each item as discussed below. It should be noted that this response is in reference to the original proposed development yields assessed in the original TIA prepared for the subject development (TRAFFIX report reference: 24.186r01v03), which has since been modified as discussed above.

Access

"Vehicular access to the development is provided at the southern end of the site. The location of the access driveways is situated in close proximity to the access driveway to the Council car park for the Forestville War Memorial Playing Fields. The location of two combined entry/exit driveways to large car park facilities each providing approximately 200 car park spaces is not supported. A central access driveway for the basement car parks should instead be located between the Club building and the three buildings for the Senior Housing development. This location is approximately midway between the access driveway to the Council car park and Bushland Avenue/Melwood Avenue intersection, providing good traffic sight distance and separation turning movements for vehicles entering and exiting onto Melwood Avenue. This arrangement was also recommended by the Design + Sustainability Advisory Panel (DSAP) at the meeting held on 28th November 2024. The DSAP also did not support the previous proposal as it required the residents to drive through the Club basement. The Transport Network team has greater concerns regarding club patrons driving through the private resident car park to access the Club parking spaces. Parking for residents should be separated by security shutters so that parking areas cannot be accessed by the public. The provision of a central access driveway would however address both the DSAP and Transport Network concerns if separate basement car park were provided for each user group."

TRAFFIX Response:

A combined central access driveway is proposed as detailed above. A security door is proposed at the entry to Basement 1 which is dedicated for seniors living residents only therefore preventing unauthorised access. A separate ramp from the central access provides access to Basement 2 and 3 which are dedicated to club patron parking only. A separate two-way ramp is proposed for use by service vehicles only, providing access to the loading dock and servicing areas. This accessway would service the Stage 1 ILU carparking area and be closed upon the completion of Stage 2 reverted to a service vehicle access only with

access by private vehicles restricted by a roller door thus separating movements by private vehicles and service vehicles.

Loading Area and Porte Cochere Access:

"A proposed 4.2m wide entry only driveway and 6.2m wide egress only driveway is provided for access to the loading dock, at grade drop off and parking area which have been designed to accommodate the largest service vehicle required to access the subject site being an 8.8m MRV. The 4.1m access ramp to the basement loading dock does not provide sufficient width for trucks to pass. The TIA notes that an Operational Management Plan (OMP) for the club will consider loading dock management, however a traffic signal system must be provided to manage the movement of trucks entering and entering the loading area. The TIA has provided swept paths for a 8.8m medium rigid vehicles (MRV). Waste Services have advised waste trucks are heavy rigid vehicles and typically 10.5m long, 2.5m wide, service height 4.5m, travel height 3.7m, and the loading dock should be designed to cater for the largest vehicle type. Consideration and provisions should also be made with respect to how goods and services will be provided to cater for the residents of the senior housing. A Loading Bay (minimum Small Rigid Vehicle access) should be provided for servicing, removalists and bulky goods deliveries.

It is preferable to provide separate accesses to loading facilities and car park areas. The access driveway to the loading dock should provide two-way access for safe and convenient access to/from Melwood Avenue. The recommended relocation of the main access to the centre of the site will enable the driveway to be widened accordingly. The current egress driveway can therefore be reduced in width and changed to entry only for the Porte Cochere access and at-grade car park which includes an Ambulance Bay. The TIA provides swept paths for an ambulance reversing into the bay and entering in a forward direction. The Architectural Plans shows a kerbed landscaped area at the back of the Ambulance Bay which should be removed as it obstructs the rear loading of the ambulance".

TRAFFIX Response:

A separate combined entry/exit accessway to the loading area is provided which has a width of six (6) metres and accommodates two-way flow, with sufficient passing opportunities at the entry, towards the loading/service area which will be used by the club and residents for servicing subject to a future Operational Management Plan. As discussed in **Section 5.6** and **Section 7.1** the proposed access is designed to accommodate a 10.5m long heavy rigid waste collection vehicle which is the largest design vehicle that would be entering the loading and servicing area. With respect to residential waste collection, as per Council's waste teams'

referral comments, Council offers a "wheel out/wheel in" service for residential bins provided that the residential bin storage holding rooms are within 6.5m of the property boundary and a service access pathway/ramp is provided.

Parking

"The existing club has a gross floor area (GFA) of 3749m2, providing 86 car park spaces. This equates to a car parking demand of 2.4 spaces per 100m2 GFA (1 space per 41.6m2 GFA).

A parking occupancy survey was conducted between 6:00pm and 10:00pm on Friday the 2nd of August 2024 and between 6:00pm and 10:00pm Saturday the 3rd of August 2024; to assess the travel patterns and parking demands for the Club.

The peak period was on Friday between 6:00-7:00pm, where the car park was at full capacity, with the survey indicating that the club peak demand would result in 90 vehicle parking spaces. The Club advised that a special event was held at this time resulting in the high parking demand.

The proposed club has a gross floor area (GFA) of 2948m2, proposing 99 car park spaces. The GFA for the proposed club is more than 20% less than the existing club, however an additional 13 spaces have been provided for the club. The number of club parking spaces provided seems excessive considering the reduction in GFA.

The proposed Seniors Housing portion of the development contains a total of 55 Independent Living Units (ILUs), comprising (27 x 2-bedroom and 28 x 3-bedroom units), which requires 69 resident spaces under the SEPP. A total of 11 resident visitor spaces is required, when applying the DCP rate of 1 visitor space per 5 units or part of dwellings.

The Traffic and Impact Assessment (TIA) incorrectly states that the development proposes a total of 99 car park spaces, comprising 90 spaces for residents and 9 spaces for visitors. The Architectural Plans however shows 84 spaces for residents and 15 visitor spaces.

The proposal therefore provides an excess of 15 resident parking spaces and 4 visitor spaces.

The Architectural Plans show that all resident parking spaces are 3.2m wide and 5.4 long. No resident parking spaces have been designed in accordance with AS/NZS 2890.6. Part 1 of Schedule 4 of the SEPP specifies for a group of 8 or more parking spaces, at least 15% of the parking spaces must comply with AS/NZS 2890.6. If the development proposes 84 resident parking spaces, then 13 spaces must be designed to comply with AS/NZS 2890.6.

The Traffic and Impact Assessment (TIA) states that the Council DCP does not specify any bicycle or motorcycle requirements for registered club and seniors living. This is not entirely correct as Part C3(A) of the WDCP specifies the minimum bicycle parking requirements for Seniors Housing. Some motorcycle and bicycle parking should also be provided for the Club to encourage more sustainable modes of transport, as well as the provision of publicly available electric vehicle charging points".

TRAFFIX Response:

The car parking requirements have been updated based on the parking assessment discussed in **Section 5.1** whereby the development is required to provide a minimum of 79 car parking spaces for the ILU element and a minimum of 113 customer/guest parking spaces for the registered club element based on the existing development and comparison of similar registered clubs.

The development proposes a total of 86 car parking spaces for the senior's living element (including 12 spaces for visitors) and 203 for the club patrons resulting in a total 289 spaces.

Whilst the senior's living element has a surplus of car parking, it is noted that due to the location and size of the ILU development, it is likely that some households would have more than one car, is comparable to the minimum car parking requirements for a residential flat building under Council's DCP and still meets the minimum requirement under SEPP Housing.

The club would also have carparking surplus of 90 spaces above the minimum surveyed requirement. As discussed above, the intention of the parking surplus is to cater above the 85th percentile demand on ANZAC Day, reduce reliance on on-street and Council car parking by visitors and to future proof the club to diversify its operations over time and provide additional services and demand in the future. Reference should be made to **Appendix B** which includes a photographic record of the additional car parking demand during ANZAC day at the nearby Forestville War Memorial Play Fields carpark.

In summary, the car parking arrangement for the proposed development is supportable and ensures that all car parking demands will be readily accommodated on-site

9. CONCLUSIONS

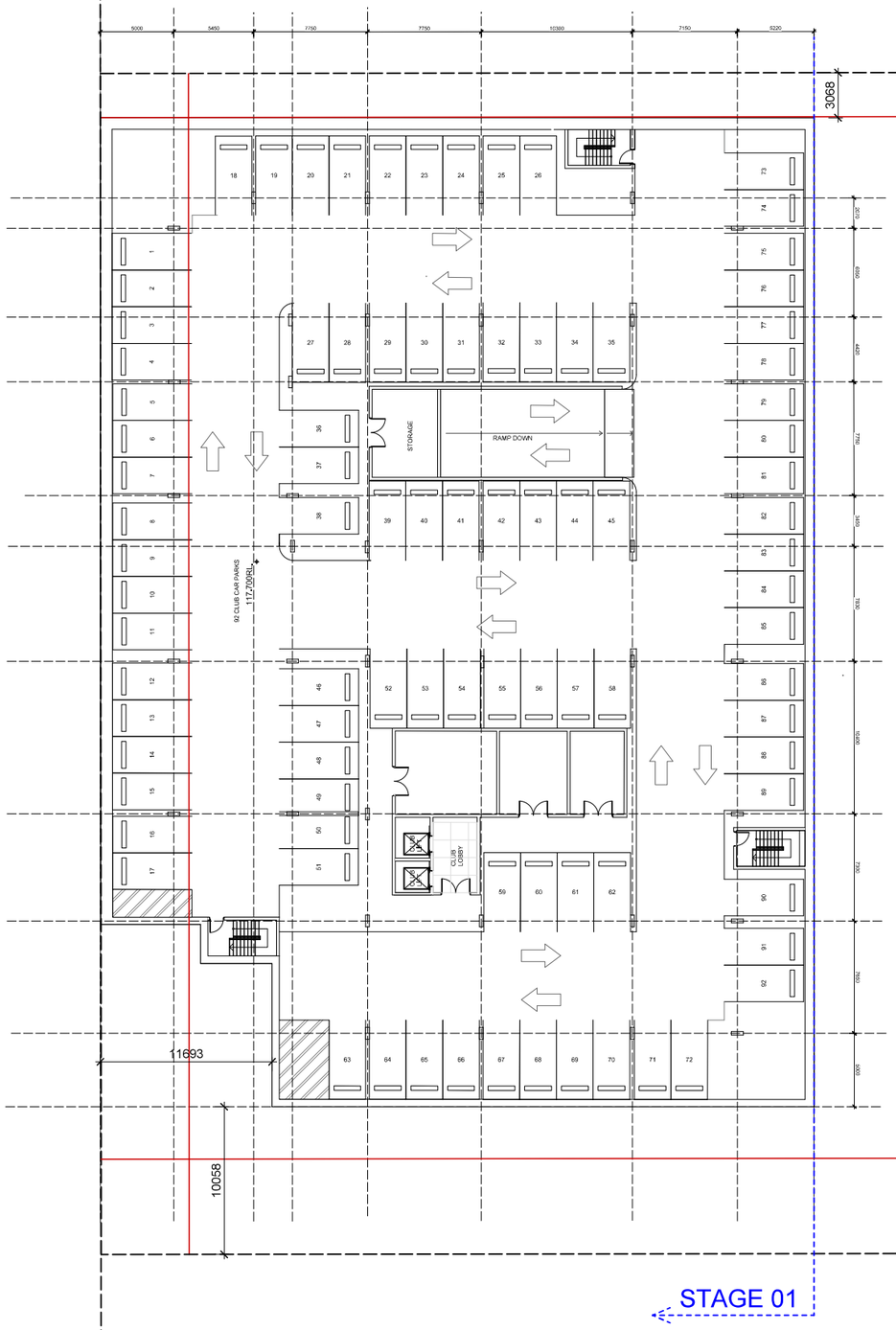
In summary:

- The proposal seeks approval for the staged redevelopment of the existing Forestville RSL Club. The Stage 1 works involve the construction of a 3,539m^2 GFA registered club and 16 independent living units over three levels of basement carparking. The Stage 2 works involve the demolition of the existing club and erection of three buildings with 36 independent living units over three levels of basement carparking.
- There is a car parking requirement to provide a minimum of 79 car parking spaces for the ILU element (in accordance with the DCP) and a minimum of 113 customer/guest parking spaces for the registered club element based on the existing development and comparison of similar registered clubs. The development proposes a total of 86 car parking spaces for the senior's living element (including 12 spaces for visitors) and 203 for the club patrons resulting in a total 289 spaces. In summary, the car parking arrangement for the proposed development is supportable and ensures that all standard and future car parking demands will be accommodated on-site.
- The traffic generation arising from the development has been assessed as a net change over existing conditions and equates to an additional 11 vehicle trips per hour during the critical Friday evening peak. Traffic impacts have been assessed using SIDRA Intersection and there are no changes in the Level of Service of each of the key intersection surveys surveyed in relation to the existing and proposed developments and traffic impacts are considered acceptable.
- The internal configuration of the car park and loading areas has been assessed to comply with the requirements of AS 2890.1 (2004), AS 2890.2 (2002) and AS 2890.6 (2009.
- Residential waste collection is proposed undertaken from Melwood Avenue as advised by Council's waste team.
- The club waste collection and servicing are to be undertaken onsite via the loading dock which can accommodate vehicles up to and including a 10.5m long heavy rigid waste collection vehicle.

This traffic impact assessment therefore demonstrates that the subject application is supportable on traffic engineering and transport planning grounds.

APPENDIX A

Reduced Plans



01 SITE PLAN - BASEMENT 3
scale 1:200

N

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Rev. No.	Date	Revision	By
A	16/11/2022	CLIENT MEETING	PJH
B	01/12/2023	CONCEPT UPDATE	PJH
C	12/04/2024	B5 ADDED	PJH
D	30/08/2024	DA	PH
E	14/02/2025	DA UPDATE	PH
F	11/04/2025	ISSUE TO CONSULTANTS	PJH
G	5/05/2025	DA RESUBMISSION	pjh

CLIENT
FORESTVILLE RSL

PROJECT
CLUB REDEVELOPMENT
22 MELWOOD AVE
LOT 2589 & LOT 31
DP752038 & DP 366454

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DRAWING
SITE PLAN - BASEMENT 3

MASTERPLAN SET

Scale at A1 1:200
Scale at A3 1:400
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Figured dimensions shall take precedence over scale. Contractors must verify all dimensions on job before commencing any work or making shop drawings.

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PROJECT #	SHEET #	REVISION #
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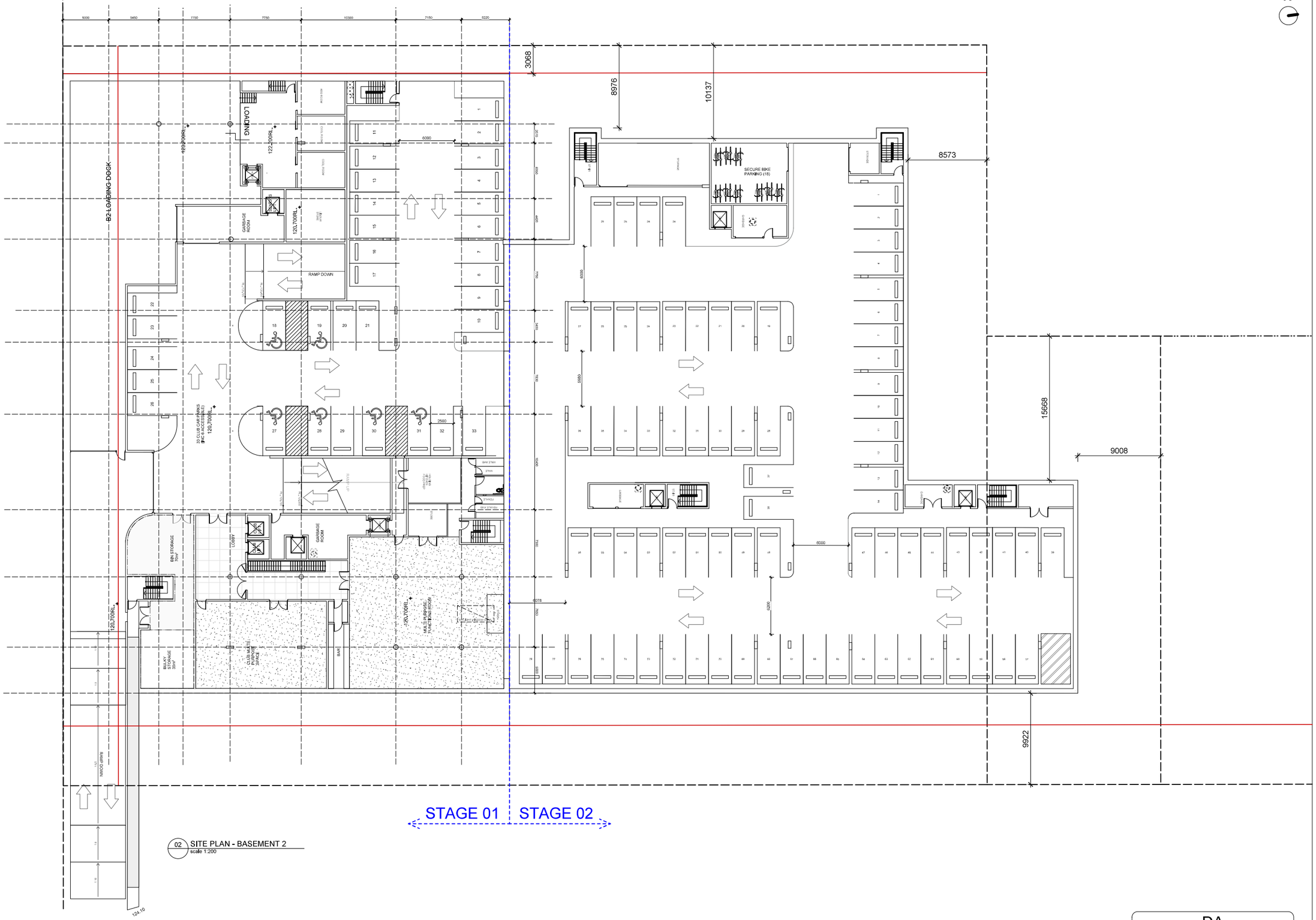

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DA

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DRAWING
SITE PLAN - BASEMENT 2

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Scale at A3 1:400
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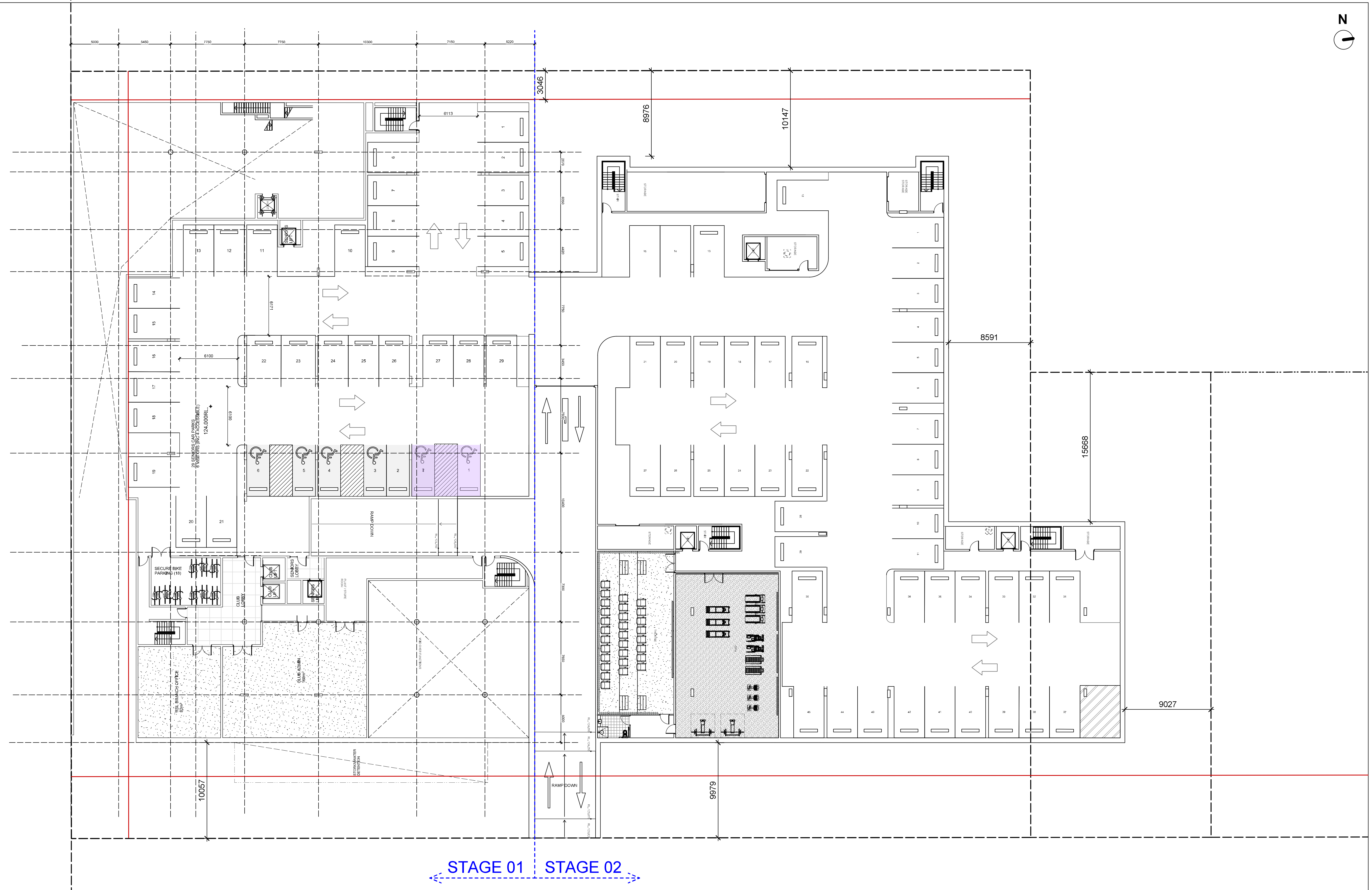

02 SITE PLAN - BASEMENT 1
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SITE PLAN - BASEMENT 1

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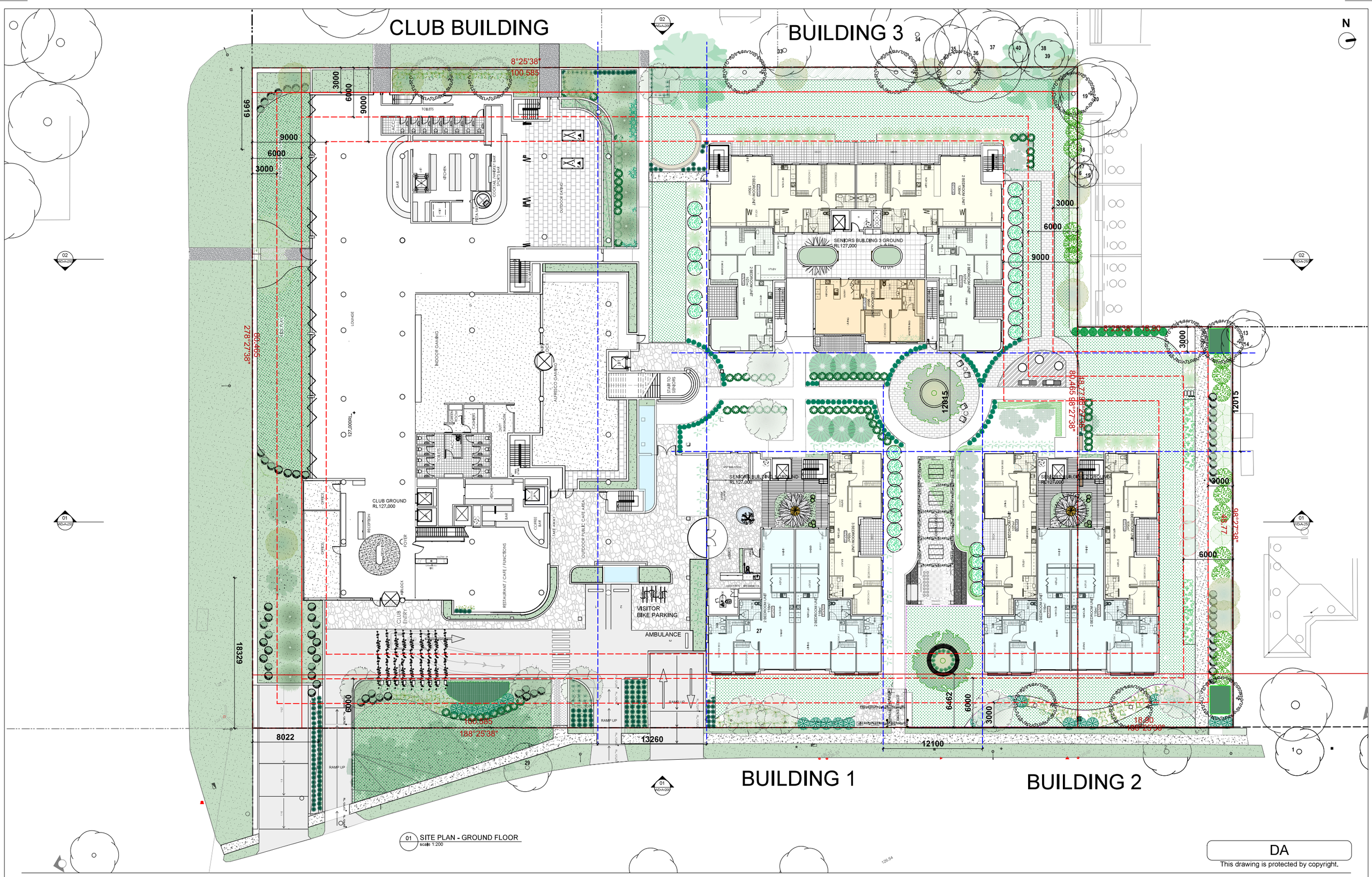

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scale 1:200

DA

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DRAWING
SITE PLAN - GROUND

Scale at A1 1:200
Scale at A3 1:400
0m 2.5 5 10 15 16

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MASTERPLAN SET

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PROJECT #	SHEET #	REVISION #
22-0716	DA_A_100	G

APPENDIX B

Photographic Record

View looking south towards the Forestville War Memorial Playing Fields Carpark

View looking south towards the Forestville War Memorial Playing Fields Carpark

View looking west along internal access road servicing the Forestville War Memorial Playing Fields Carpark

APPENDIX C

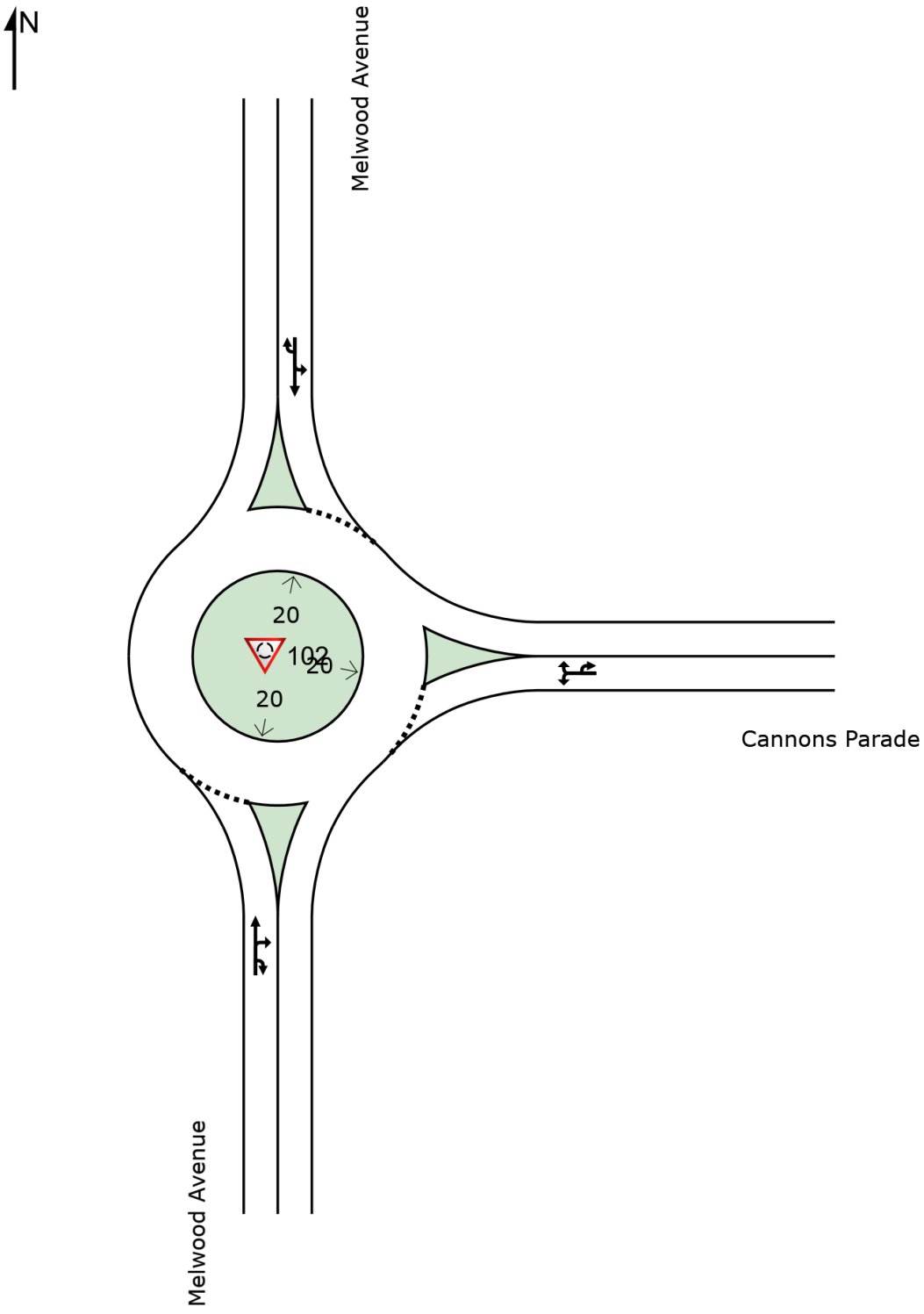
SIDRA Intersection Modelling Results

SITE LAYOUT

Site: 102 [Melwood x Cannons (Site Folder: Existing PM Peak)]

Melwood Avenue and Cannons Parade
Existing
Site Category: Existing Design
Roundabout

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



MOVEMENT SUMMARY

Site: 102 [Melwood x Cannons (Site Folder: Existing PM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Melwood Avenue and Cannons Parade
Existing
Site Category: Existing Design
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: Melwood Avenue															
2	T1	All MCs	146	0.0	146	0.0	0.170	3.2	LOS A	0.9	6.6	0.26	0.45	0.26	46.2
3	R2	All MCs	76	2.8	76	2.8	0.170	7.7	LOS A	0.9	6.6	0.26	0.45	0.26	45.6
3u	U	All MCs	3	0.0	3	0.0	0.170	11.2	LOS A	0.9	6.6	0.26	0.45	0.26	48.7
Approach			225	0.9	225	0.9	0.170	4.8	LOS A	0.9	6.6	0.26	0.45	0.26	46.0
East: Cannons Parade															
4	L2	All MCs	84	2.5	84	2.5	0.134	3.3	LOS A	0.7	5.0	0.26	0.51	0.26	45.6
6	R2	All MCs	86	0.0	86	0.0	0.134	7.7	LOS A	0.7	5.0	0.26	0.51	0.26	45.3
6u	U	All MCs	3	0.0	3	0.0	0.134	11.2	LOS A	0.7	5.0	0.26	0.51	0.26	48.4
Approach			174	1.2	174	1.2	0.134	5.7	LOS A	0.7	5.0	0.26	0.51	0.26	45.5
North: Melwood Avenue															
7	L2	All MCs	21	0.0	21	0.0	0.088	3.2	LOS A	0.5	3.2	0.23	0.36	0.23	46.8
8	T1	All MCs	91	0.0	91	0.0	0.088	3.1	LOS A	0.5	3.2	0.23	0.36	0.23	47.0
9u	U	All MCs	3	0.0	3	0.0	0.088	11.1	LOS A	0.5	3.2	0.23	0.36	0.23	49.7
Approach			115	0.0	115	0.0	0.088	3.4	LOS A	0.5	3.2	0.23	0.36	0.23	47.1
All Vehicles			514	0.8	514	0.8	0.170	4.8	LOS A	0.9	6.6	0.25	0.45	0.25	46.1

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: 102 [Melwood x Cannons (Site Folder: Post development PM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Melwood Avenue and Cannons Parade
Existing
Site Category: Existing Design
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: Melwood Avenue															
2	T1	All MCs	146	0.0	146	0.0	0.170	3.2	LOS A	0.9	6.6	0.26	0.45	0.26	46.2
3	R2	All MCs	76	2.8	76	2.8	0.170	7.7	LOS A	0.9	6.6	0.26	0.45	0.26	45.6
3u	U	All MCs	3	0.0	3	0.0	0.170	11.2	LOS A	0.9	6.6	0.26	0.45	0.26	48.7
Approach			225	0.9	225	0.9	0.170	4.8	LOS A	0.9	6.6	0.26	0.45	0.26	46.0
East: Cannons Parade															
4	L2	All MCs	84	2.5	84	2.5	0.134	3.3	LOS A	0.7	5.0	0.26	0.51	0.26	45.6
6	R2	All MCs	86	0.0	86	0.0	0.134	7.7	LOS A	0.7	5.0	0.26	0.51	0.26	45.3
6u	U	All MCs	3	0.0	3	0.0	0.134	11.2	LOS A	0.7	5.0	0.26	0.51	0.26	48.4
Approach			174	1.2	174	1.2	0.134	5.7	LOS A	0.7	5.0	0.26	0.51	0.26	45.5
North: Melwood Avenue															
7	L2	All MCs	21	0.0	21	0.0	0.088	3.2	LOS A	0.5	3.2	0.23	0.36	0.23	46.8
8	T1	All MCs	91	0.0	91	0.0	0.088	3.1	LOS A	0.5	3.2	0.23	0.36	0.23	47.0
9u	U	All MCs	3	0.0	3	0.0	0.088	11.1	LOS A	0.5	3.2	0.23	0.36	0.23	49.7
Approach			115	0.0	115	0.0	0.088	3.4	LOS A	0.5	3.2	0.23	0.36	0.23	47.1
All Vehicles			514	0.8	514	0.8	0.170	4.8	LOS A	0.9	6.6	0.25	0.45	0.25	46.1

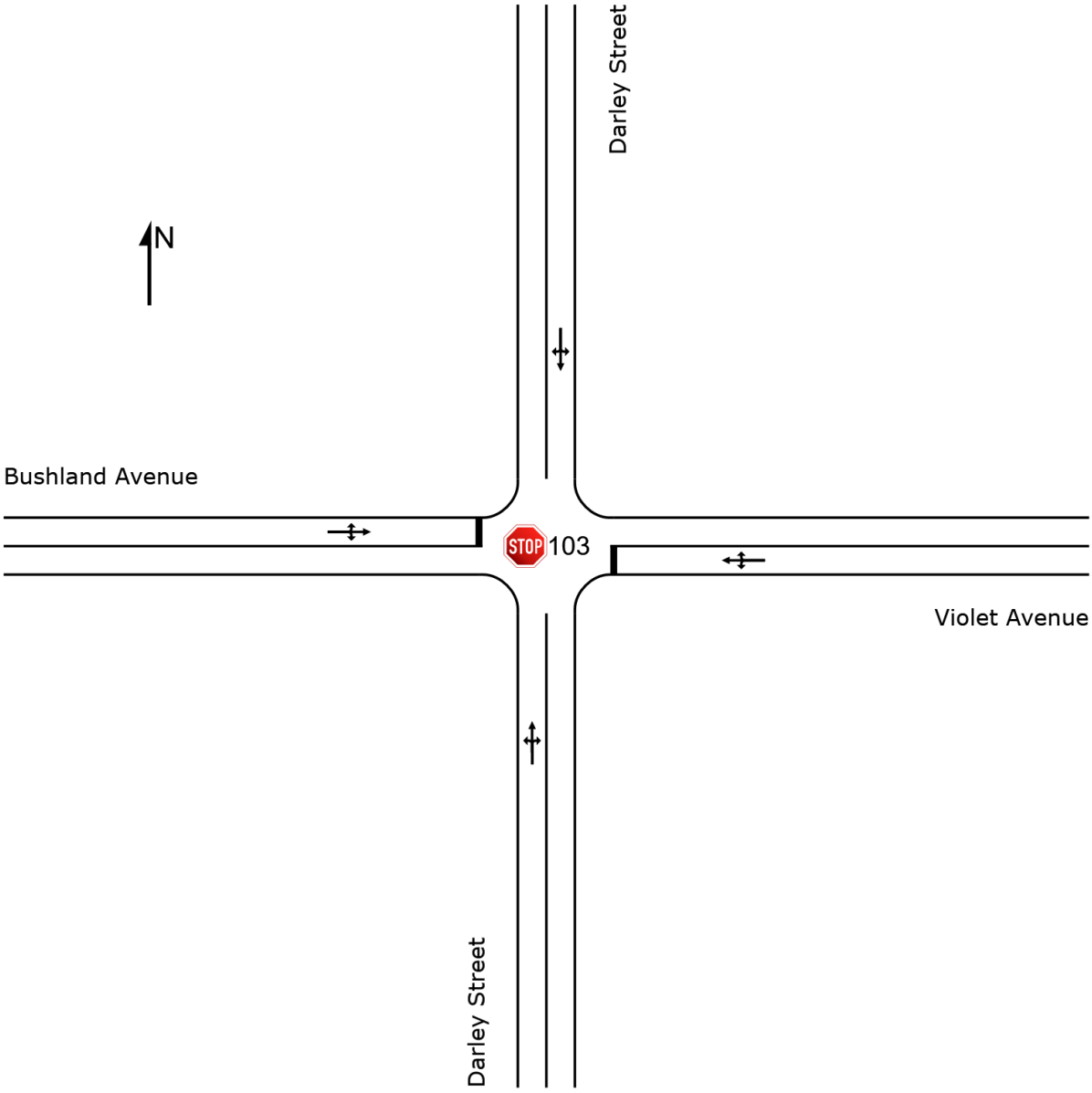
Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout 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.

SITE LAYOUT

Site: 103 [Darley x Bushland x Violet (Site Folder: Existing PM Peak)]

Darley Street, Bushland Avenue and Violet Avenue
Existing
Site Category: Existing Design
Stop (Two-Way)

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



MOVEMENT SUMMARY

Site: 103 [Darley x Bushland x Violet (Site Folder: Existing PM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Darley Street, Bushland Avenue and Violet Avenue
Existing
Site Category: Existing Design
Stop (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: Darley Street															
1	L2	All MCs	1	0.0	1	0.0	0.050	5.4	LOS A	0.0	0.2	0.04	0.05	0.04	48.5
2	T1	All MCs	91	0.0	91	0.0	0.050	0.1	LOS A	0.0	0.2	0.04	0.05	0.04	49.7
3	R2	All MCs	4	0.0	4	0.0	0.050	5.5	LOS A	0.0	0.2	0.04	0.05	0.04	48.3
Approach			96	0.0	96	0.0	0.050	0.4	NA	0.0	0.2	0.04	0.05	0.04	49.6
East: Violet Avenue															
4	L2	All MCs	9	0.0	9	0.0	0.027	8.5	LOS A	0.1	0.7	0.41	0.89	0.41	43.9
5	T1	All MCs	9	0.0	9	0.0	0.027	9.5	LOS A	0.1	0.7	0.41	0.89	0.41	43.9
6	R2	All MCs	3	0.0	3	0.0	0.027	10.4	LOS A	0.1	0.7	0.41	0.89	0.41	43.7
Approach			22	0.0	22	0.0	0.027	9.2	LOS A	0.1	0.7	0.41	0.89	0.41	43.9
North: Darley Street															
7	L2	All MCs	20	0.0	20	0.0	0.180	4.8	LOS A	0.4	3.1	0.09	0.15	0.09	47.8
8	T1	All MCs	258	0.0	258	0.0	0.180	0.1	LOS A	0.4	3.1	0.09	0.15	0.09	49.0
9	R2	All MCs	59	0.0	59	0.0	0.180	4.9	LOS A	0.4	3.1	0.09	0.15	0.09	47.6
Approach			337	0.0	337	0.0	0.180	1.2	NA	0.4	3.1	0.09	0.15	0.09	48.7
West: Bushland Avenue															
10	L2	All MCs	46	0.0	46	0.0	0.055	7.8	LOS A	0.2	1.5	0.24	0.89	0.24	44.2
11	T1	All MCs	14	0.0	14	0.0	0.055	9.7	LOS A	0.2	1.5	0.24	0.89	0.24	44.2
12	R2	All MCs	1	0.0	1	0.0	0.055	10.1	LOS A	0.2	1.5	0.24	0.89	0.24	44.0
Approach			61	0.0	61	0.0	0.055	8.2	LOS A	0.2	1.5	0.24	0.89	0.24	44.2
All Vehicles			516	0.0	516	0.0	0.180	2.2	NA	0.4	3.1	0.12	0.25	0.12	48.1

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.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control 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: 103 [Darley x Bushland x Violet (Site Folder: Post development PM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Darley Street, Bushland Avenue and Violet Avenue
Existing
Site Category: Existing Design
Stop (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: Darley Street															
1	L2	All MCs	1	0.0	1	0.0	0.050	5.4	LOS A	0.0	0.2	0.04	0.05	0.04	48.5
2	T1	All MCs	91	0.0	91	0.0	0.050	0.1	LOS A	0.0	0.2	0.04	0.05	0.04	49.7
3	R2	All MCs	4	0.0	4	0.0	0.050	5.5	LOS A	0.0	0.2	0.04	0.05	0.04	48.3
Approach			96	0.0	96	0.0	0.050	0.4	NA	0.0	0.2	0.04	0.05	0.04	49.6
East: Violet Avenue															
4	L2	All MCs	9	0.0	9	0.0	0.027	8.5	LOS A	0.1	0.7	0.41	0.89	0.41	43.9
5	T1	All MCs	9	0.0	9	0.0	0.027	9.5	LOS A	0.1	0.7	0.41	0.89	0.41	43.9
6	R2	All MCs	3	0.0	3	0.0	0.027	10.4	LOS A	0.1	0.7	0.41	0.89	0.41	43.7
Approach			22	0.0	22	0.0	0.027	9.2	LOS A	0.1	0.7	0.41	0.89	0.41	43.9
North: Darley Street															
7	L2	All MCs	20	0.0	20	0.0	0.180	4.8	LOS A	0.4	3.1	0.09	0.15	0.09	47.8
8	T1	All MCs	258	0.0	258	0.0	0.180	0.1	LOS A	0.4	3.1	0.09	0.15	0.09	49.0
9	R2	All MCs	59	0.0	59	0.0	0.180	4.9	LOS A	0.4	3.1	0.09	0.15	0.09	47.6
Approach			337	0.0	337	0.0	0.180	1.2	NA	0.4	3.1	0.09	0.15	0.09	48.7
West: Bushland Avenue															
10	L2	All MCs	46	0.0	46	0.0	0.055	7.8	LOS A	0.2	1.5	0.24	0.89	0.24	44.2
11	T1	All MCs	14	0.0	14	0.0	0.055	9.7	LOS A	0.2	1.5	0.24	0.89	0.24	44.2
12	R2	All MCs	1	0.0	1	0.0	0.055	10.1	LOS A	0.2	1.5	0.24	0.89	0.24	44.0
Approach			61	0.0	61	0.0	0.055	8.2	LOS A	0.2	1.5	0.24	0.89	0.24	44.2
All Vehicles			516	0.0	516	0.0	0.180	2.2	NA	0.4	3.1	0.12	0.25	0.12	48.1

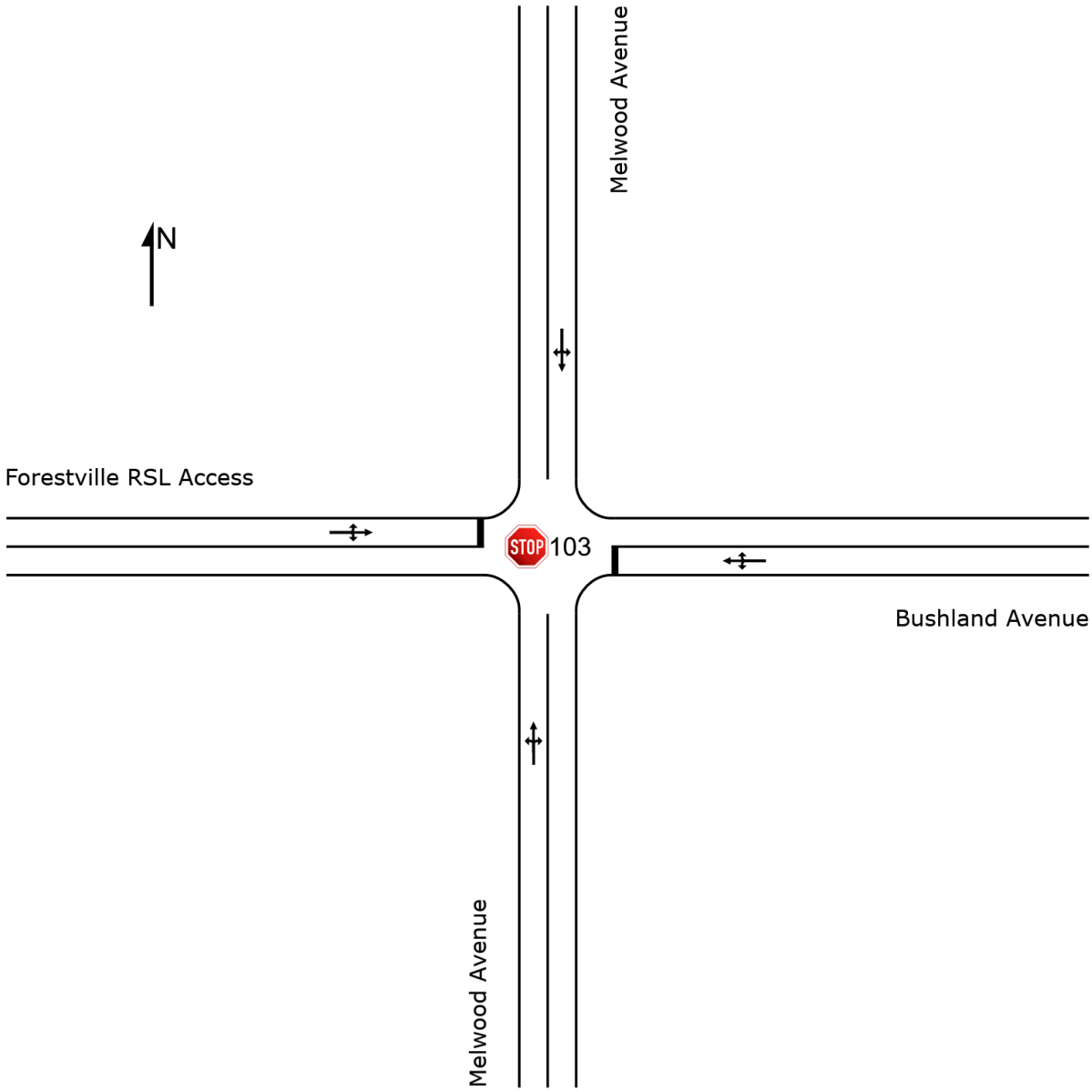
Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control 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.

SITE LAYOUT

Site: 103 [Melwood x Bushland x Site Access (Site Folder: Existing PM Peak)]

New Site
Site Category: (None)
Stop (Two-Way)

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



MOVEMENT SUMMARY

Site: 103 [Melwood x Bushland x Site Access (Site Folder: Existing PM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Stop (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: Melwood Avenue															
1	L2	All MCs	27	0.0	27	0.0	0.123	4.8	LOS A	0.2	1.5	0.08	0.15	0.08	47.9
2	T1	All MCs	178	0.0	178	0.0	0.123	0.1	LOS A	0.2	1.5	0.08	0.15	0.08	49.1
3	R2	All MCs	26	0.0	26	0.0	0.123	5.0	LOS A	0.2	1.5	0.08	0.15	0.08	47.7
Approach			232	0.0	232	0.0	0.123	1.2	NA	0.2	1.5	0.08	0.15	0.08	48.8
East: Bushland Avenue															
4	L2	All MCs	22	0.0	22	0.0	0.077	7.8	LOS A	0.3	1.9	0.34	0.88	0.34	43.8
5	T1	All MCs	8	0.0	8	0.0	0.077	9.5	LOS A	0.3	1.9	0.34	0.88	0.34	43.8
6	R2	All MCs	32	0.0	32	0.0	0.077	9.9	LOS A	0.3	1.9	0.34	0.88	0.34	43.7
Approach			62	0.0	62	0.0	0.077	9.1	LOS A	0.3	1.9	0.34	0.88	0.34	43.7
North: Melwood Avenue															
7	L2	All MCs	28	0.0	28	0.0	0.106	5.1	LOS A	0.4	2.9	0.24	0.32	0.24	46.8
8	T1	All MCs	99	0.0	99	0.0	0.106	0.4	LOS A	0.4	2.9	0.24	0.32	0.24	48.0
9	R2	All MCs	58	0.0	58	0.0	0.106	5.2	LOS A	0.4	2.9	0.24	0.32	0.24	46.6
Approach			185	0.0	185	0.0	0.106	2.6	NA	0.4	2.9	0.24	0.32	0.24	47.4
West: Forestville RSL Access															
10	L2	All MCs	21	0.0	21	0.0	0.111	8.2	LOS A	0.4	2.8	0.42	0.91	0.42	43.8
11	T1	All MCs	17	0.0	17	0.0	0.111	9.5	LOS A	0.4	2.8	0.42	0.91	0.42	43.7
12	R2	All MCs	46	0.0	46	0.0	0.111	9.9	LOS A	0.4	2.8	0.42	0.91	0.42	43.6
Approach			84	0.0	84	0.0	0.111	9.4	LOS A	0.4	2.8	0.42	0.91	0.42	43.7
All Vehicles			563	0.0	563	0.0	0.123	3.8	NA	0.4	2.9	0.21	0.40	0.21	46.9

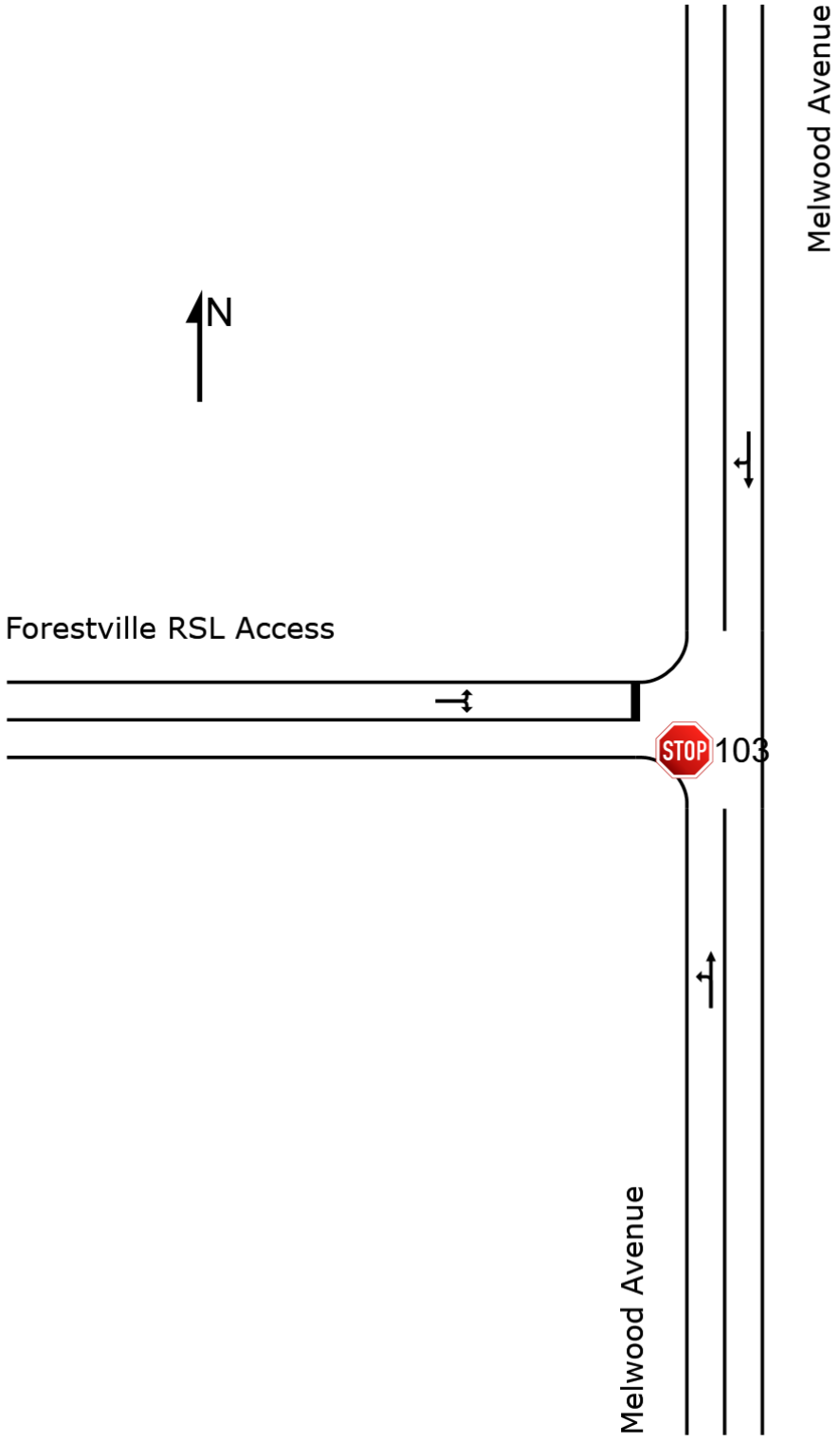
Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control 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.

SITE LAYOUT

Site: 103 [Melwood x Proposed Site Access (Site Folder: Post development PM Peak)]

New Site
Site Category: (None)
Stop (Two-Way)

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



MOVEMENT SUMMARY

Site: 103 [Melwood x Proposed Site Access (Site Folder: Post development PM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Stop (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: Melwood Avenue															
1	L2	All MCs	33	0.0	33	0.0	0.109	4.6	LOS A	0.0	0.0	0.00	0.08	0.00	48.3
2	T1	All MCs	178	0.0	178	0.0	0.109	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	49.5
Approach			211	0.0	211	0.0	0.109	0.7	NA	0.0	0.0	0.00	0.08	0.00	49.3
North: Melwood Avenue															
8	T1	All MCs	121	0.0	121	0.0	0.111	0.4	LOS A	0.4	3.1	0.24	0.29	0.24	48.3
9	R2	All MCs	71	0.0	71	0.0	0.111	5.3	LOS A	0.4	3.1	0.24	0.29	0.24	46.9
Approach			192	0.0	192	0.0	0.111	2.2	NA	0.4	3.1	0.24	0.29	0.24	47.7
West: Forestville RSL Access															
10	L2	All MCs	33	0.0	33	0.0	0.100	8.2	LOS A	0.4	2.5	0.37	0.89	0.37	44.1
12	R2	All MCs	58	0.0	58	0.0	0.100	9.0	LOS A	0.4	2.5	0.37	0.89	0.37	43.9
Approach			91	0.0	91	0.0	0.100	8.7	LOS A	0.4	2.5	0.37	0.89	0.37	43.9
All Vehicles			493	0.0	493	0.0	0.111	2.8	NA	0.4	3.1	0.16	0.31	0.16	47.6

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.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control 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.

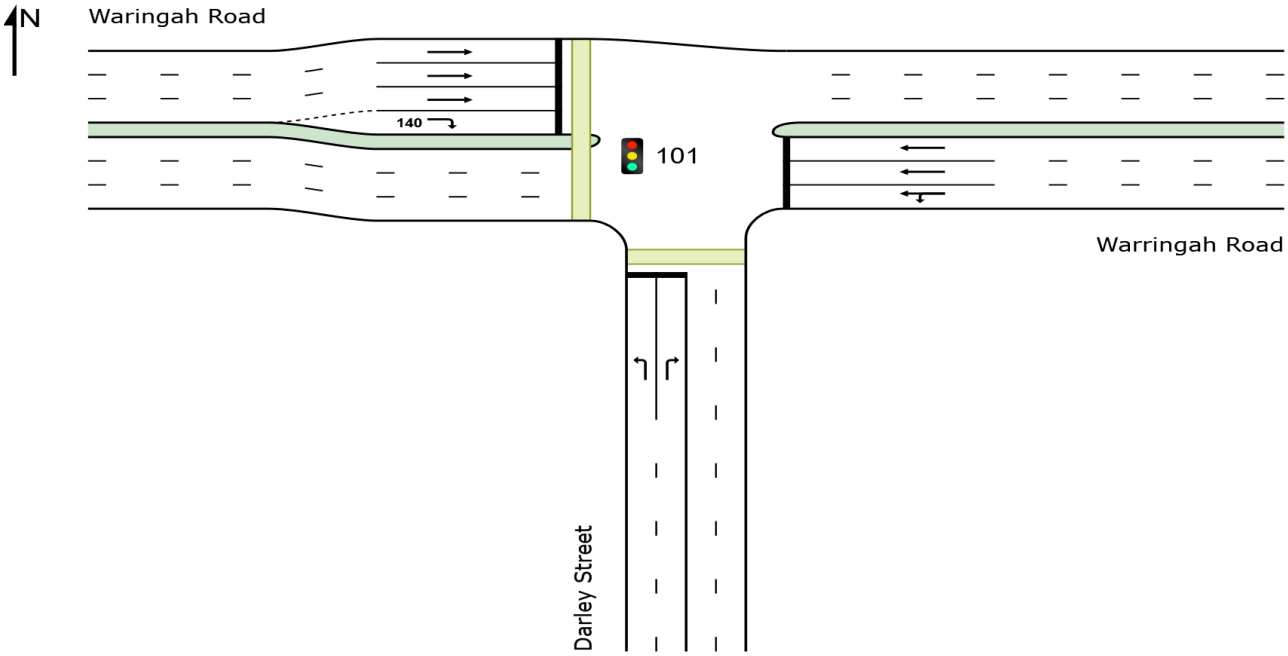
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

Site: 101 [Warringah x Darley (Site Folder: Existing PM Peak)]

Warringah Rd and Darley Street
Existing
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Isolated

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



MOVEMENT SUMMARY

Site: 101 [Warringah x Darley (Site Folder: Existing PM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Warringah Rd and Darley Street
Existing
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	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: Darley Street															
1	L2	All MCs	61	0.0	61	0.0	0.123	36.3	LOS C	2.6	17.9	0.79	0.72	0.79	32.9
3	R2	All MCs	140	0.0	140	0.0	* 0.754	65.8	LOS E	8.6	60.0	1.00	0.89	1.14	26.1
Approach			201	0.0	201	0.0	0.754	56.9	LOS E	8.6	60.0	0.94	0.84	1.04	27.8
East: Warringah Road															
4	L2	All MCs	129	0.0	129	0.0	0.842	17.4	LOS B	45.2	324.4	0.89	0.84	0.91	41.4
5	T1	All MCs	2679	3.3	2679	3.3	* 0.842	23.7	LOS B	45.4	326.9	0.89	0.83	0.91	48.4
Approach			2808	3.2	2808	3.2	0.842	23.4	LOS B	45.4	326.9	0.89	0.83	0.91	48.0
West: Waringah Road															
11	T1	All MCs	2667	1.4	2667	1.4	0.575	4.7	LOS A	18.8	133.5	0.40	0.37	0.40	64.3
12	R2	All MCs	255	0.8	255	0.8	* 0.677	56.3	LOS D	13.7	96.6	0.98	1.00	0.99	32.7
Approach			2922	1.4	2922	1.4	0.677	9.2	LOS A	18.8	133.5	0.45	0.43	0.45	59.3
All Vehicles			5932	2.2	5932	2.2	0.842	17.5	LOS B	45.4	326.9	0.68	0.63	0.69	51.6

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.
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 Green.
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.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Darley Street												
P1	Full	10	11	15.0	LOS B	0.0	0.0	0.50	0.50	168.9	200.0	1.18
West: Waringah Road												
P4	Full	10	11	54.2	LOS E	0.0	0.0	0.95	0.95	208.0	200.0	0.96
All Pedestrians		20	21	34.6	LOS D	0.0	0.0	0.73	0.73	188.4	200.0	1.06

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [Warringah x Darley (Site Folder: Post development PM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Warringah Rd and Darley Street
Existing
Site Category: Existing Design
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site Optimum Cycle Time - Minimum Delay)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	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: Darley Street															
1	L2	All MCs	61	0.0	61	0.0	0.123	36.3	LOS C	2.6	17.9	0.79	0.72	0.79	32.9
3	R2	All MCs	140	0.0	140	0.0	* 0.754	65.8	LOS E	8.6	60.0	1.00	0.89	1.14	26.1
Approach			201	0.0	201	0.0	0.754	56.9	LOS E	8.6	60.0	0.94	0.84	1.04	27.8
East: Warringah Road															
4	L2	All MCs	129	0.0	129	0.0	0.842	17.4	LOS B	45.2	324.4	0.89	0.84	0.91	41.4
5	T1	All MCs	2679	3.3	2679	3.3	* 0.842	23.7	LOS B	45.4	326.9	0.89	0.83	0.91	48.4
Approach			2808	3.2	2808	3.2	0.842	23.4	LOS B	45.4	326.9	0.89	0.83	0.91	48.0
West: Waringah Road															
11	T1	All MCs	2667	1.4	2667	1.4	0.575	4.7	LOS A	18.8	133.5	0.40	0.37	0.40	64.3
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All Vehicles			5932	2.2	5932	2.2	0.842	17.5	LOS B	45.4	326.9	0.68	0.63	0.69	51.6

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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.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Darley Street												
P1	Full	10	11	15.0	LOS B	0.0	0.0	0.50	0.50	168.9	200.0	1.18
West: Waringah Road												
P4	Full	10	11	54.2	LOS E	0.0	0.0	0.95	0.95	208.0	200.0	0.96
All Pedestrians		20	21	34.6	LOS D	0.0	0.0	0.73	0.73	188.4	200.0	1.06

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

APPENDIX D

Swept Path Analysis

Notes:

This drawing is prepared for information purposes only. It is not to be used for construction.

TRAFFIX is responsible for vehicle swept path diagrams and/or drawing mark-ups only. Base drawing prepared by others.

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Rev.	Revision Note	By.	Date
A	Swept Path Analysis	TM	12-09-24
B	RFI - Swept Path Analysis	TM	07-05-25

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Quattro Architecture

Client
Forestville RSL Club

Scale / Plan Orientation

0 2 4 6 8m
1:250 @ A3

Project Description
Forestville RSL Redevelopment

Drawing Prepared By

TRAFFIX
TRAFFIC AND TRANSPORT PLANNERS
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PO Box 1124
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Drawing Title
Ground Floor
10.5m Heavy Rigid Vehicle (HRV)
Left: Entry down to the basement from to the street
Right: Egress from the ramp and turning out of the basement to the street

Drawn:	Checked:	Date:
TM	VD	12-09-24

24.186d08v03 TRAFFIX [250506 Plans] Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
24.186	DA	TX.01	B

Notes:

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Rev.	Revision Note	By.	Date
A	Swept Path Analysis	TM	12-09-24
B	RFI - Swept Path Analysis	TM	07-05-25

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Quattro Architecture

Client
Forestville RSL Club

Scale / Plan Orientation

0 2 4 6 8m
1:250 @ A3

Project Description
Forestville RSL Redevelopment

Drawing Prepared By

TRAFFIX
TRAFFIC AND TRANSPORT PLANNERS

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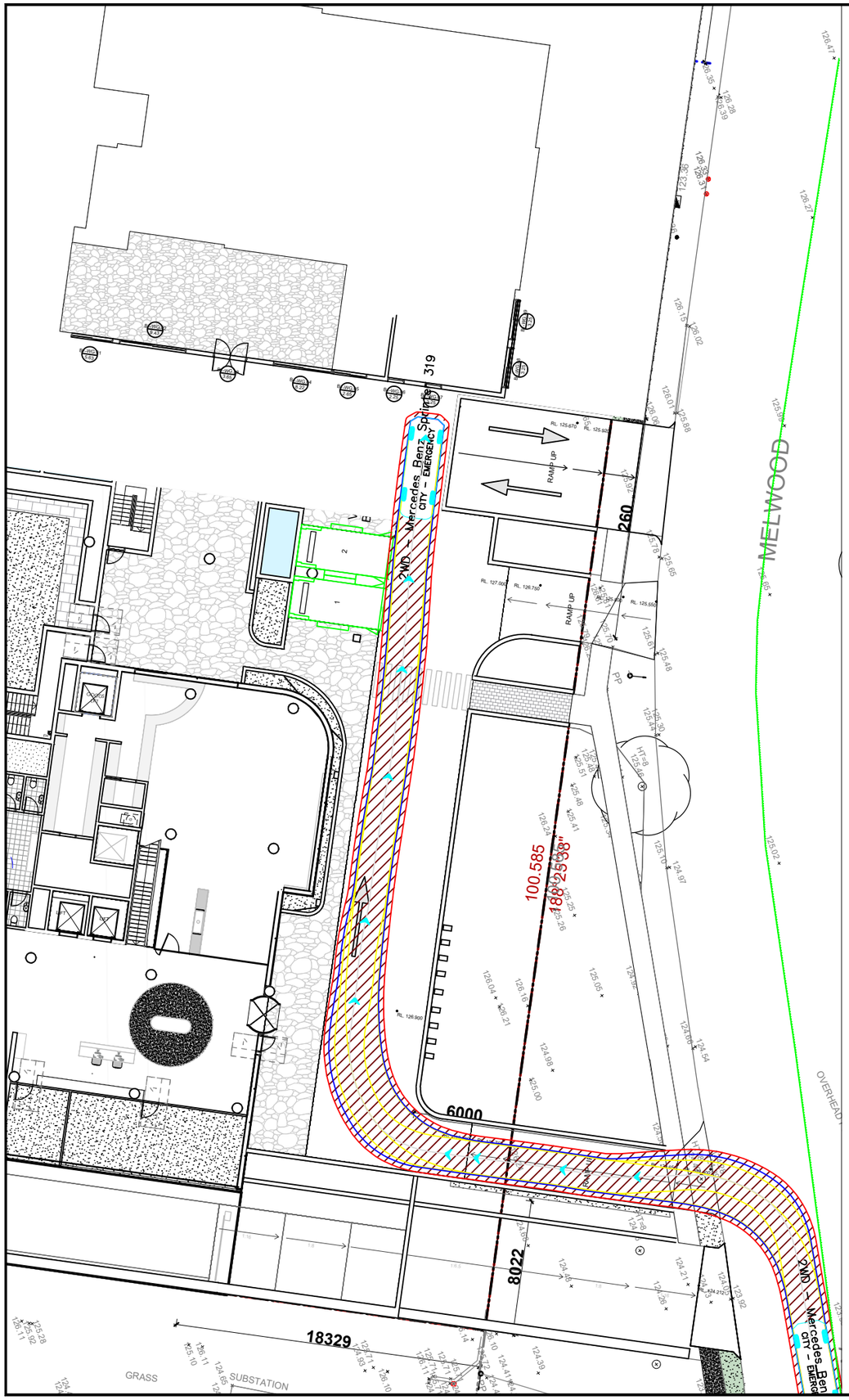
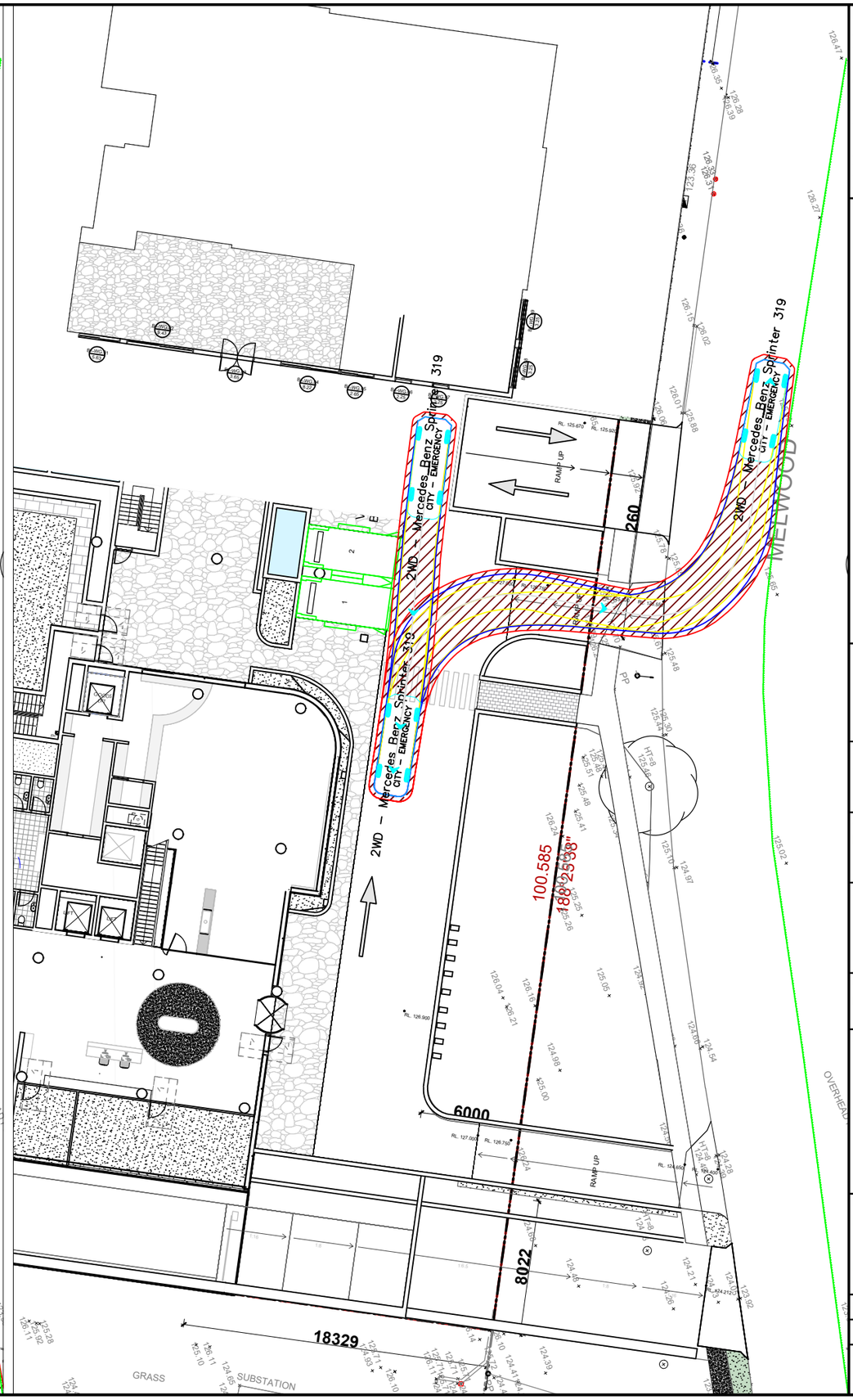
Drawing Title
Ground Floor
B85 and B99 design vehicles
Left: B99 vehicle from street through porte-cochere and back to street.
Right: B99 entry and B85 exit to/from Basement

Drawn:	Checked:	Date:
TM	VD	12-09-24

24.186d08v03 TRAFFIX [250506 Plans] Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
24.186	DA	TX.02	B





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Rev.	Revision Note	By.	Date
A	Swept Path Analysis	TM	12-09-24
B	RFI - Swept Path Analysis	TM	07-05-25

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Quattro Architecture

Client
Forestville RSL Club

Scale / Plan Orientation
0 2 4 6 8m
1:300 @ A3

Project Description
Forestville RSL Redevelopment

Drawing Prepared By

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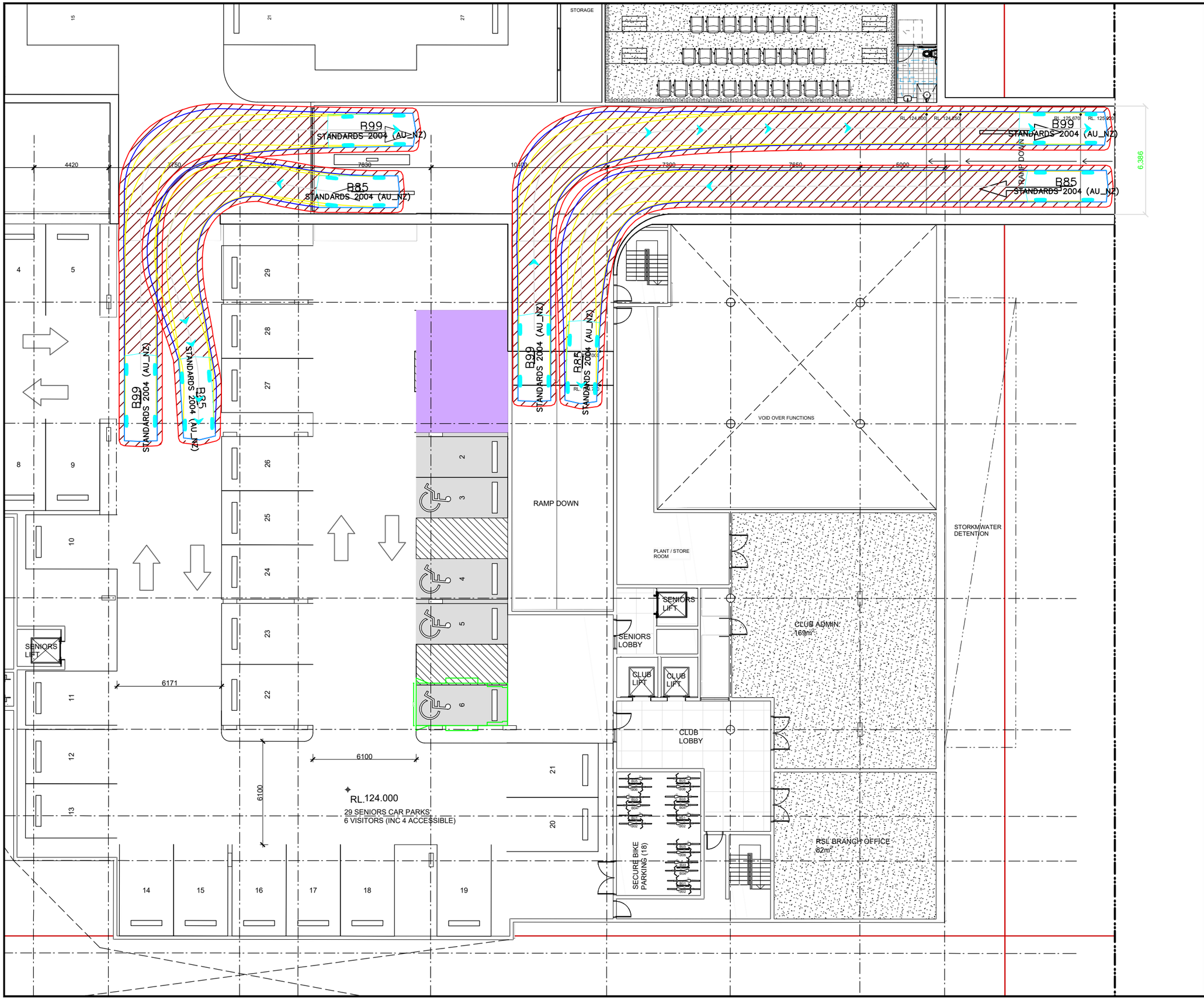
Drawing Title
Design Review
Ground Floor
Ambulance
Left: Ambulance vehicle in
Right: Ambulance vehicle out

Drawn:	Checked:	Date:
TM	VD	12-09-24

24.186d08v03 TRAFFIX [250506 Plans] Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
24.186	DA	TX.03	B



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Rev.	Revision Note	By.	Date
A	Swept Path Analysis	TM	12-09-24
B	RFI - Swept Path Analysis	TM	07-05-25

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Quattro Architecture

Client
Forestville RSL Club

Scale / Plan Orientation

0 2 4 6 8m
1:250 @ A3

Project Description
Forestville RSL Redevelopment

Drawing Prepared By

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Strawberry Hills, NSW 2012
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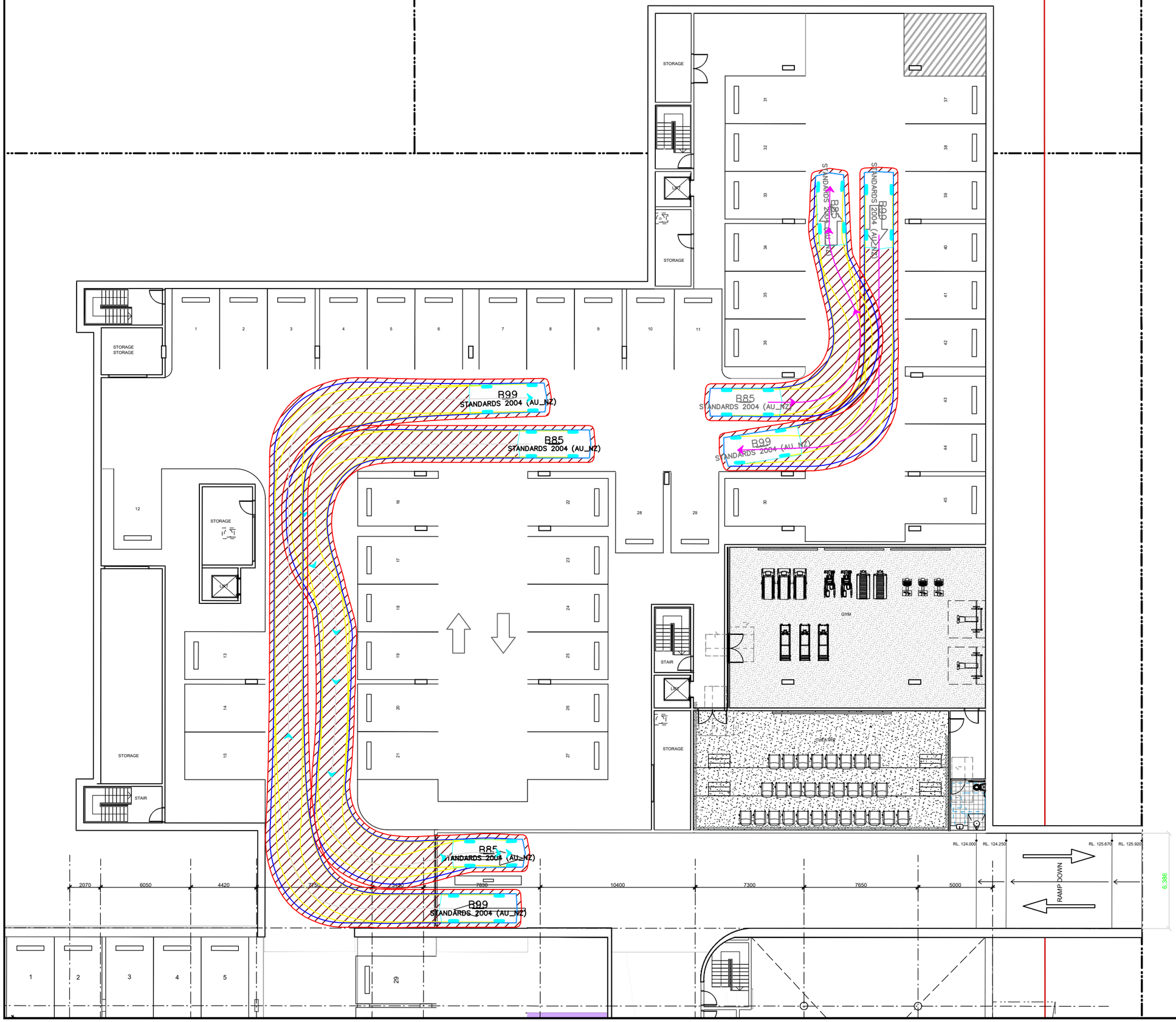
f: +61 2 9830 4481
w: www.traffix.com.au

Drawing Title
Basement Level 1 - Stage 1
B99 and B85
Circulation

Drawn:	Checked:	Date:
TM	VD	12-09-24

24.186d08v03 TRAFFIX [250506 Plans] Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
24.186	DA	TX.04	B



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Rev.	Revision Note	By.	Date
A	Swept Path Analysis	TM	12-09-24
B	RFI - Swept Path Analysis	TM	07-05-25

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Quattro Architecture

Client
Forestville RSL Club

Scale / Plan Orientation

0 2 4 6 8m
1:250 @ A3

Project Description
Forestville RSL Redevelopment

Drawing Prepared By

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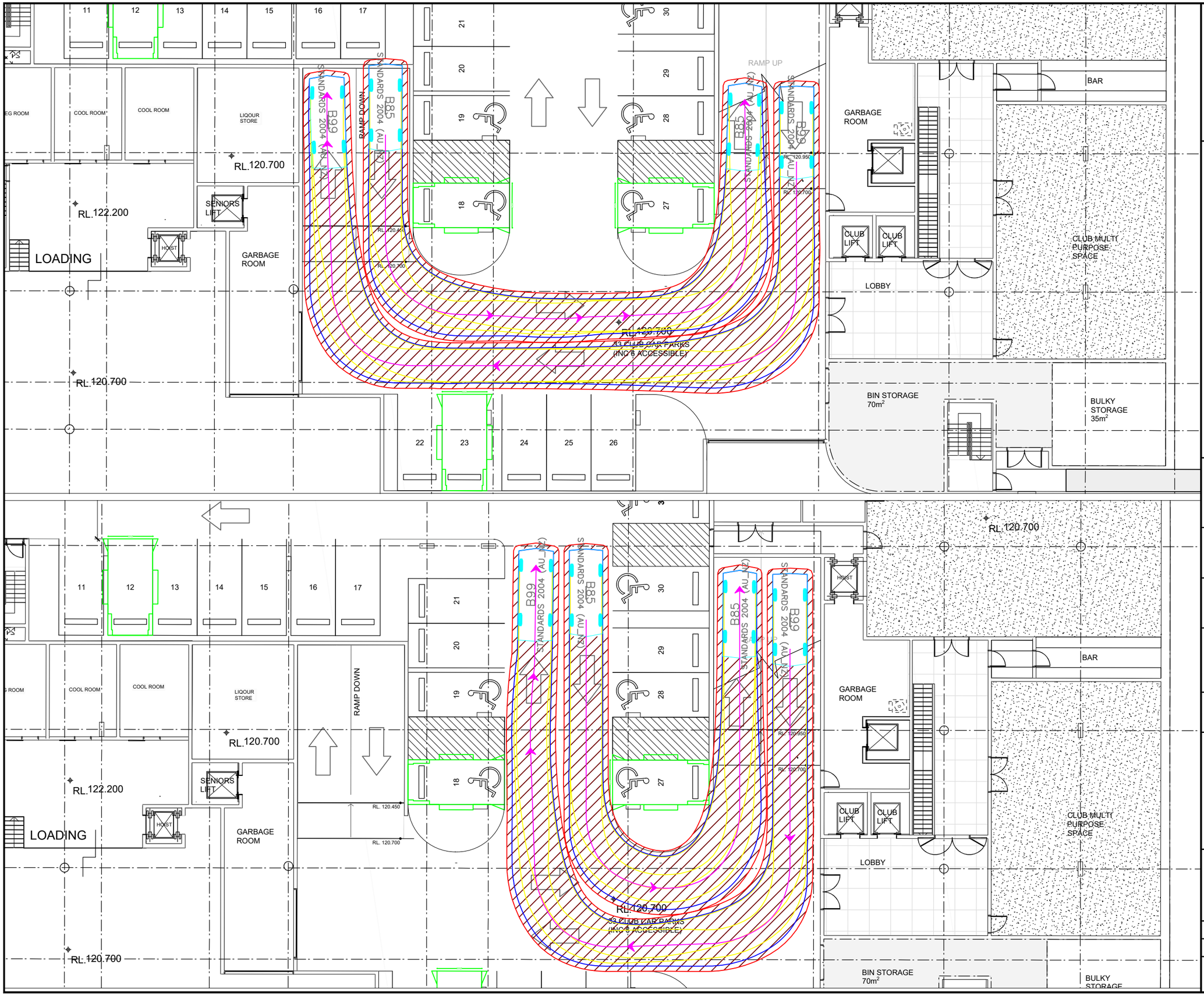
w: www.traffix.com.au

Drawing Title
Basement Level 1 - Stage 2
B99 and B85
Circulation

Drawn:	Checked:	Date:
TM	VD	12-09-24

24.186d08v03 TRAFFIX [250506 Plans] Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
24.186	DA	TX.05	B



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Rev.	Revision Note	By.	Date
A	Swept Path Analysis	TM	12-09-24
B	RFI - Swept Path Analysis	TM	07-05-25

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Quattro Architecture

Client
Forestville RSL Club

Scale / Plan Orientation

0 2 4 6 8m
1:250 @ A3

Project Description
Forestville RSL Redevelopment

Drawing Prepared By

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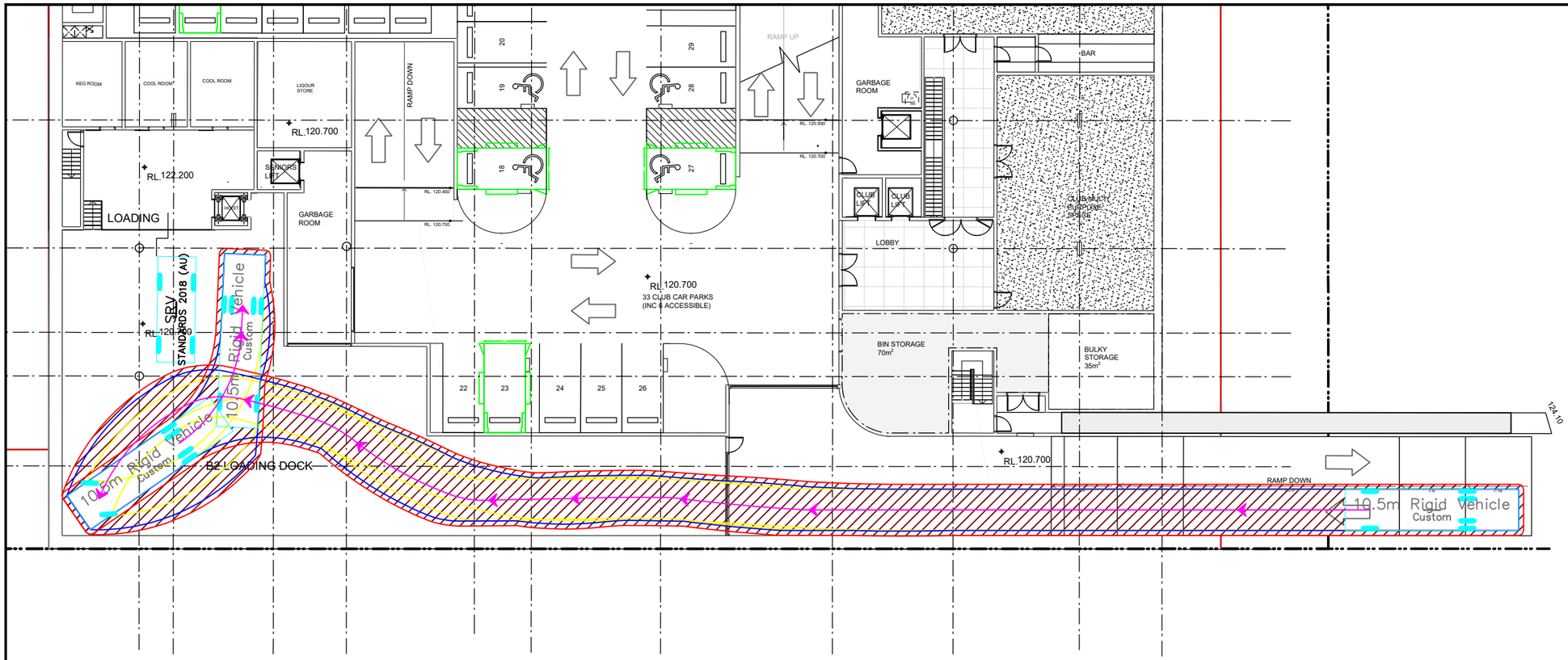
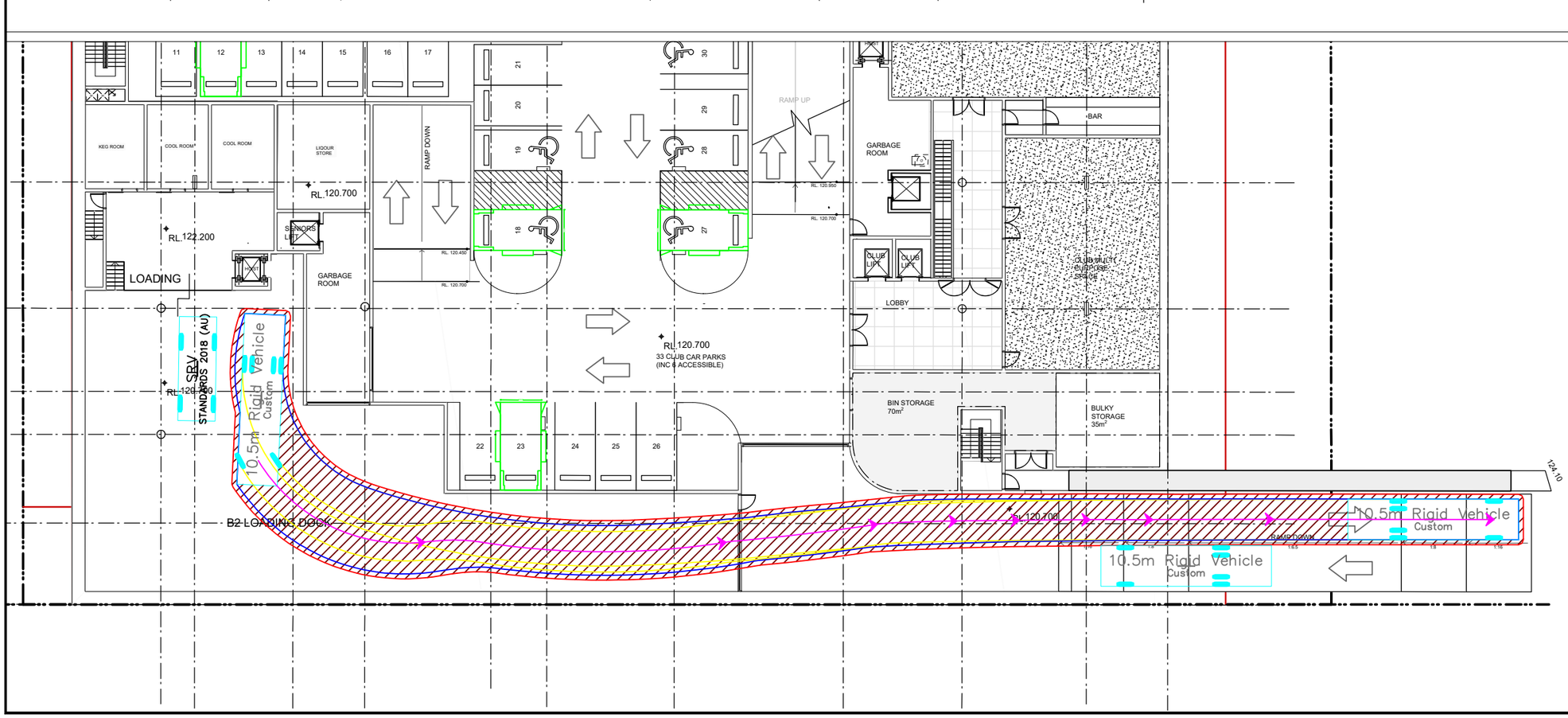
Drawing Title
Basement Level 2 - Stage 1
B99 and B85
Top: B99 circulating passing B85 at three points
Bottom: B85 circulating passing B99 at three points

Drawn:	Checked:	Date:
TM	VD	12-09-24

24.186d08v03 TRAFFIX [250506 Plans] Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
24.186	DA	TX.06	B





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Rev.	Revision Note	By.	Date
A	Swept Path Analysis	TM	12-09-24
B	RFI - Swept Path Analysis	TM	07-05-25

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Quattro Architecture

Client
Forestville RSL Club

Scale / Plan Orientation
0 2 4 6 8m
1:200 @ A3

Project Description
Forestville RSL Redevelopment

Drawing Prepared By

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PO Box 1124
Strawberry Hills, NSW 2012
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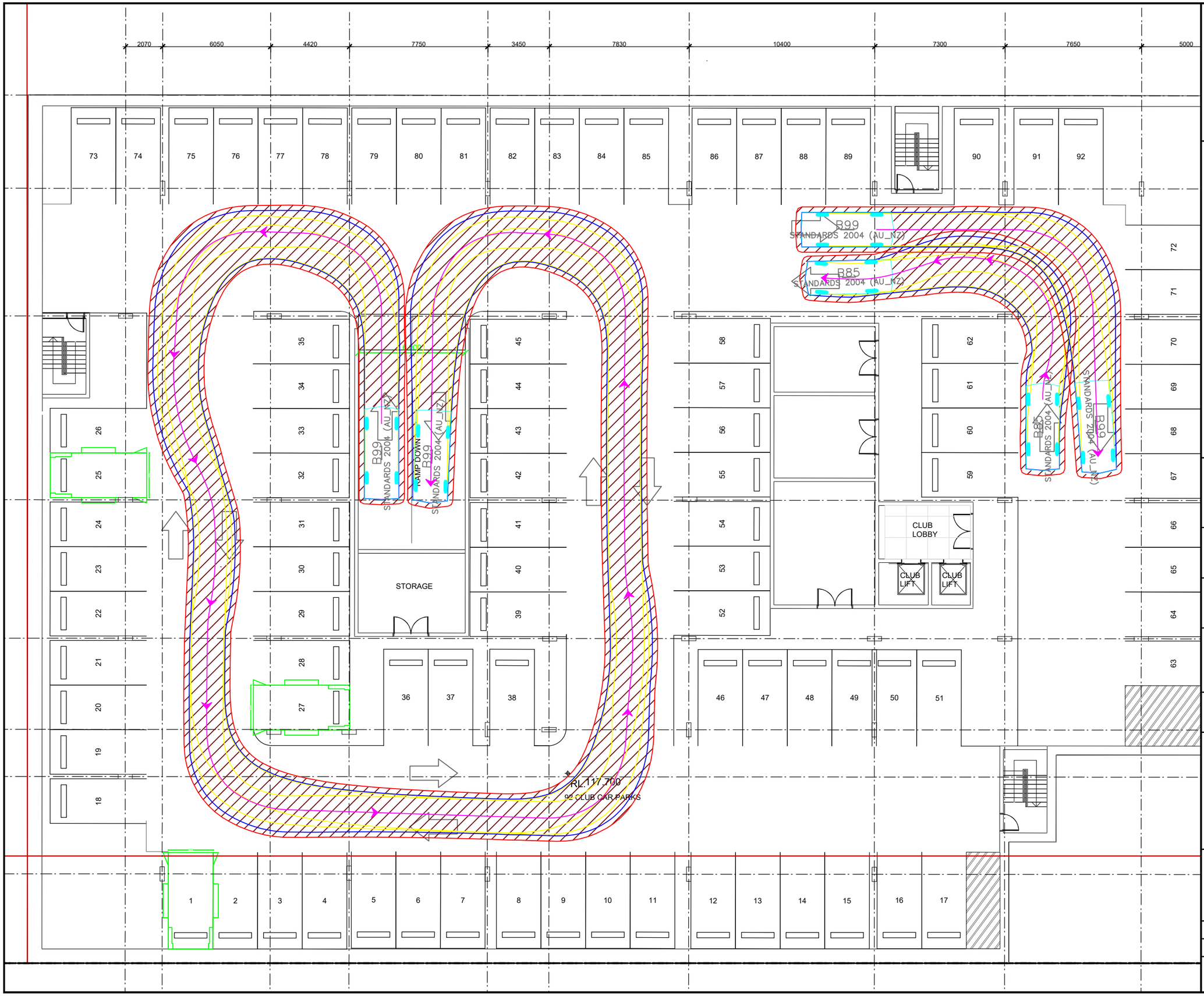
w: www.traffix.com.au

Drawing Title
Basement Level 3 - Stage 1
10.5m Heavy Rigid Vehicle (HRV)
Top: HRV entry
Bottom: HRV egress

Drawn:	Checked:	Date:
TM	VD	12-09-24

24.186d08v03 TRAFFIX [250506 Plans] Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
24.186	DA	TX.07	B



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Rev.	Revision Note	By.	Date
A	Swept Path Analysis	TM	12-09-24
B	RFI - Swept Path Analysis	TM	07-05-25

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Quattro Architecture

Client
Forestville RSL Club

Scale / Plan Orientation
0 2 4 6 8m
1:200 @ A3

Project Description
Forestville RSL Redevelopment

Drawing Prepared By

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f: +61 2 9830 4481
w: www.traffix.com.au

Drawing Title
Basement Level 3 - Stage 1
B85 and B99
B85 and B99 Circulation

Drawn:	Checked:	Date:
TM	VD	12-09-24

24.186d08v03 TRAFFIX [250506 Plans] Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
24.186	DA	TX.08	B

APPENDIX E

Traffic Engineer Referral Response

Traffic Engineer Referral Response

Application Number:	DA2024/1303
Proposed Development:	Two (2) staged redevelopment of the Forestville RSL club involving the construction of a registered club and fifty five (55) independent living units and ancillary uses
Date:	21/01/2025
Responsible Officer	
Land to be developed (Address):	Lot 11 DP 626916 , 11 / 0 Melwood Avenue FORESTVILLE NSW 2087 Lot 31 DP 366454 , 20 Melwood Avenue FORESTVILLE NSW 2087 Lot 2589 DP 752038 , 22 Melwood Avenue FORESTVILLE NSW 2087

Officer comments

Referral comment 16/01/2025
Not supported.

Access
Vehicular access to the development is provided at the southern end of the site. The location of the access driveways is situated in close proximity to the access driveway to the Council car park for the Forestville War Memorial Playing Fields. The location of two combined entry/exit driveways to large car park facilities each providing approximately 200 car park spaces is not supported. A central access driveway for the basement car parks should instead be located between the Club building and the three buildings for the Senior Housing development. This location is approximately midway between the access driveway to the Council car park and Bushland Avenue/Melwood Avenue intersection, providing good traffic sight distance and separation turning movements for vehicles entering and exiting onto Melwood Avenue. This arrangement was also recommended by the Design + Sustainability Advisory Panel (DSAP) at the meeting held on 28th November 2024. The DSAP also did not support the previous proposal as it required the residents to drive through the Club basement. The Transport Network team has greater concerns regarding club patrons driving through the private resident car park to access the Club parking spaces. Parking for residents should be separated by security shutters so that parking areas cannot be accessed by the public. The provision of a central access driveway would however address both the DSAP and Transport Network concerns if separate basement car park were provided for each user group.

Loading Area and Porte Cochere Access
A proposed 4.2m wide entry only driveway and 6.2m wide egress only driveway is provided for access to the loading dock, at grade drop off and parking area which have been designed to accommodate the largest service vehicle required to access the subject site being an 8.8m MRV. The 4.1m access ramp to the basement loading dock does not provide sufficient width for trucks to pass. The TIA notes that an Operational Management Plan (OMP) for the club will consider loading dock management, however a traffic signal system must be provided to manage the movement of trucks entering and entering the loading area. The TIA has provided swept paths for a 8.8m medium rigid vehicles (MRV). Waste Services have advised waste trucks are heavy rigid vehicles and typically 10.5m long, 2.5m wide, service height 4.5m, travel height 3.7m, and the loading dock should be designed to cater for the

largest vehicle type. Consideration and provisions should also be made with respect to how goods and services will be provided to cater for the residents of the senior housing. A Loading Bay (minimum Small Rigid Vehicle access) should be provided for servicing, removalists and bulky goods deliveries.

It is preferable to provide separate accesses to loading facilities and car park areas. The access driveway to the loading dock should provide two-way access for safe and convenient access to/from Melwood Avenue. The recommended relocation of the main access to the centre of the site will enable the driveway to be widened accordingly. The current egress driveway can therefore be reduced in width and changed to entry only for the Porte Cochere access and at-grade car park which includes an Ambulance Bay. The TIA provides swept paths for an ambulance reversing into the bay and entering in a forward direction. The Architectural Plans shows a kerbed landscaped area at the back of the Ambulance Bay which should be removed as it obstructs the rear loading of the ambulance.

Parking
The existing club has a gross floor area (GFA) of 3749m2, providing 86 car park spaces. This equates to a car parking demand of 2.4 spaces per 100m2 GFA (1 space per 41.6m2 GFA).
A parking occupancy survey was conducted between 6:00pm and 10:00pm on Friday the 2nd of August 2024 and between 6:00pm and 10:00pm Saturday the 3rd of August 2024; to assess the travel patterns and parking demands for the Club.
The peak period was on Friday between 6:00-7:00pm, where the car park was at full capacity, with the survey indicating that the club peak demand would result in 90 vehicle parking spaces. The Club advised that a special event was held at this time resulting in the high parking demand.
The proposed club has a gross floor area (GFA) of 2948m2, proposing 99 car park spaces. The GFA for the proposed club is more than 20% less than the existing club, however an additional 13 spaces have been provided for the club. The number of club parking spaces provided seems excessive considering the reduction in GFA.

The proposed Seniors Housing portion of the development contains a total of 55 Independent Living Units (ILUs), comprising (27 x 2-bedroom and 28 x 3-bedroom units), which requires 69 resident spaces under the SEPP. A total of 11 resident visitor spaces is required, when applying the DCP rate of 1 visitor space per 5 units or part of dwellings.
The Traffic and Impact Assessment (TIA) incorrectly states that the development proposes a total of 99 car park spaces, comprising 90 spaces for residents and 9 spaces for visitors. The Architectural Plans however shows 84 spaces for residents and 15 visitor spaces.
The proposal therefore provides an excess of 15 resident parking spaces and 4 visitor spaces.
The Architectural Plans show that all resident parking spaces are 3.2m wide and 5.4 long. No resident parking spaces have been designed in accordance with AS/NZS 2890.6. Part 1 of Schedule 4 of the SEPP specifies for a group of 8 or more parking spaces, at least 15% of the parking spaces must comply with AS/NZS 2890.6. If the development proposes 84 resident parking spaces, then 13 spaces must be designed to comply with AS/NZS 2890.6.

The Traffic and Impact Assessment (TIA) states that the Council DCP does not specify any bicycle or motorcycle requirements for registered club and seniors living. This is not entirely correct as Part C3(A) of the WDCP specifies the minimum bicycle parking requirements for Seniors Housing. Some motorcycle and bicycle parking should also be provided for the Club to encourage more sustainable modes of transport, as well as the provision of publicly available electric vehicle charging points.

The proposal is therefore unsupported.

Note: Should you have any concerns with the referral comments above, please discuss these with the Responsible Officer.

Recommended Traffic Engineer Conditions:

Nil.