Traffic & Parking Assessment Report

1-3 Careel Head Road, Avalon Beach

Proposed Mixed Use Development

Ref 23187

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1. Introduction

1.1 Project Summary

CJP has been engaged by Jonathan Odiso to prepare a Traffic & Parking Assessment Report (TPAR) in support of a Development Application (DA) to Northern Beaches Council, involving a new mixed use retail/childcare centre development located at 1-3 Careel Head Road, Avalon Beach.

In summary, the DA involves the demolition of the existing local shopping village and dwelling house on the site and the construction of a new two-storey mixed use development, comprising four ground floor retail tenancies (including a Dan Murphys bottle shop) and a childcare centre located on the first floor level. The proposed cumulative retail floor area is 674m^2 whilst the childcare centre seeks to accommodate 60 children at any given time and operate between 7am-6pm Monday-Friday.

Off-street parking is proposed for a total of 41 cars, comprising 10 spaces (including 2 accessible spaces and 2 click & collect spaces) within a new outdoor at-grade parking area fronting Barrenjoey Road, plus a further 31 spaces (including 3 accessible spaces) within a new single-level basement parking area.

Vehicular access to the site is proposed to be provided via the existing entry and exit driveways located off the Careel Head Road and Barrenjoey Road site frontages, respectively.

The architectural design for the proposed development has been prepared by CDArchitects and are reproduced in Appendix A.

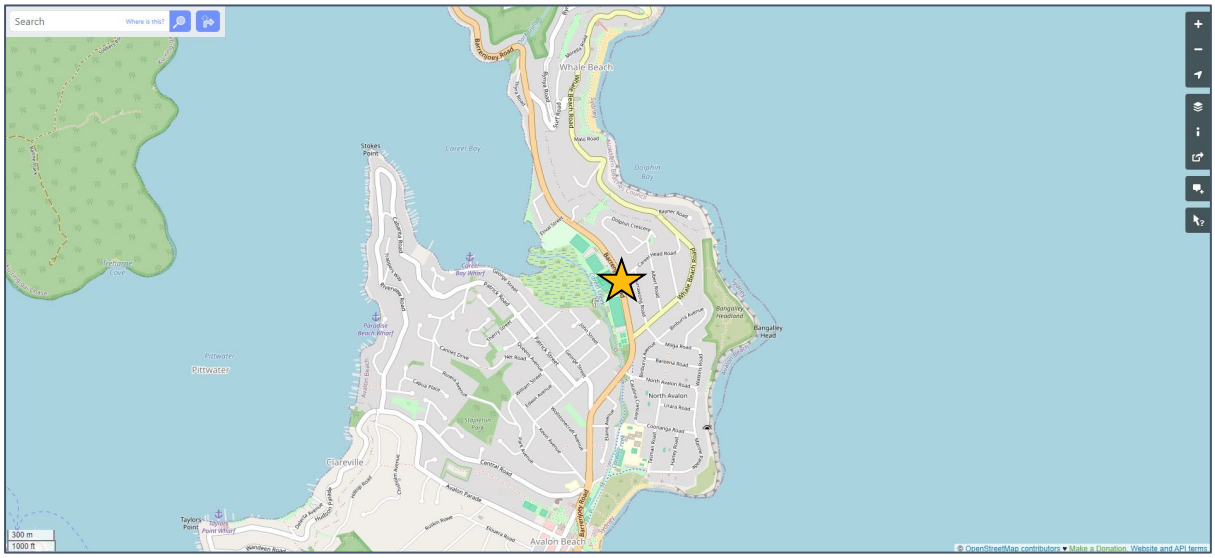

Figure 1.1 – Site Location (Source: OpenStreetMap)

Based on State Environmental Policy (Transport & Infrastructure) 2021, Schedule 3, the proposed development is classified as a *traffic generating development*, as the proposed shops have a floor area greater than 500m^2, therefore referral to Transport for NSW is required.

1.2 Assessment Tasks

The purpose of this TPAR is to assess the traffic, parking, access, transport and servicing characteristics of the DA, and the associated impacts of the proposal on the surrounding road network, parking and transport environment. This can be briefly summarised below:

- Description of the existing site and its location
- Existing traffic and parking conditions
- Public and active transport infrastructure
- Traffic generation potential of the proposal and its impacts on the surrounding road network
- Off-street parking/loading/access requirements and provisions
- Design of access driveway, parking and loading area layout

1.3 Relevant Planning Controls

The site lies within the Northern Beaches Council (Council) Local Government Area (LGA), such that the relevant Council planning controls and strategies referenced in this TPAR include:

- Pittwater Local Environmental Plan 2014
- Pittwater 21 Development Control Plan

1.4 Traffic, Transport & Parking Guidelines & Standards

In preparing this TPAR, references are also made to the following site access, traffic and parking guidelines:

- Roads & Maritime Service's Guide to Traffic Generating Developments 2002 (RMS Guide)
- Roads & Maritime Service's Technical Direction Updated Traffic Surveys 2013 (TDT)
- State Environmental Planning Policy (Transport & Infrastructure) 2021
- Australian Standards 2890.1:2004 – Off-Street Car Parking (AS2890.1)
- Australian Standards 2890.2:2018 – Off-Street Commercial Vehicle Facilities (AS2890.2)
- Australian Standards 2890.3:2015 – Bicycle Parking (AS2890.3)
- Australian Standards 2890.6:2022 – Off-Street Parking for People with Disabilities (AS2890.6)
- NSW Government's Planning Guidelines for Walking & Cycling (December 2004)
- National Construction Code Series Building Code of Australia (BCA)
- NSW Government's Child Care Planning Guideline (CCPG)

2. Existing Conditions

2.1 Site Location & Description

The development site is located on the south-eastern corner of the Barrenjoey Road and Careel Head Road intersection and comprises the following properties:

- 1 Careel Head Road, Avalon Beach
- 3 Careel Head Road, Avalon Beach

The site has street frontages of approximately 50 metres in length to Careel Head Road and approximately 40 metres in length to Barrenjoey Road. The site covers a total area of approximately 1,771m^2 and is legally described as Lot 1 in SP 32656 and Lot B in DP 385973.

A copy of the site's survey plan, prepared by Geometra Consulting, is reproduced below.

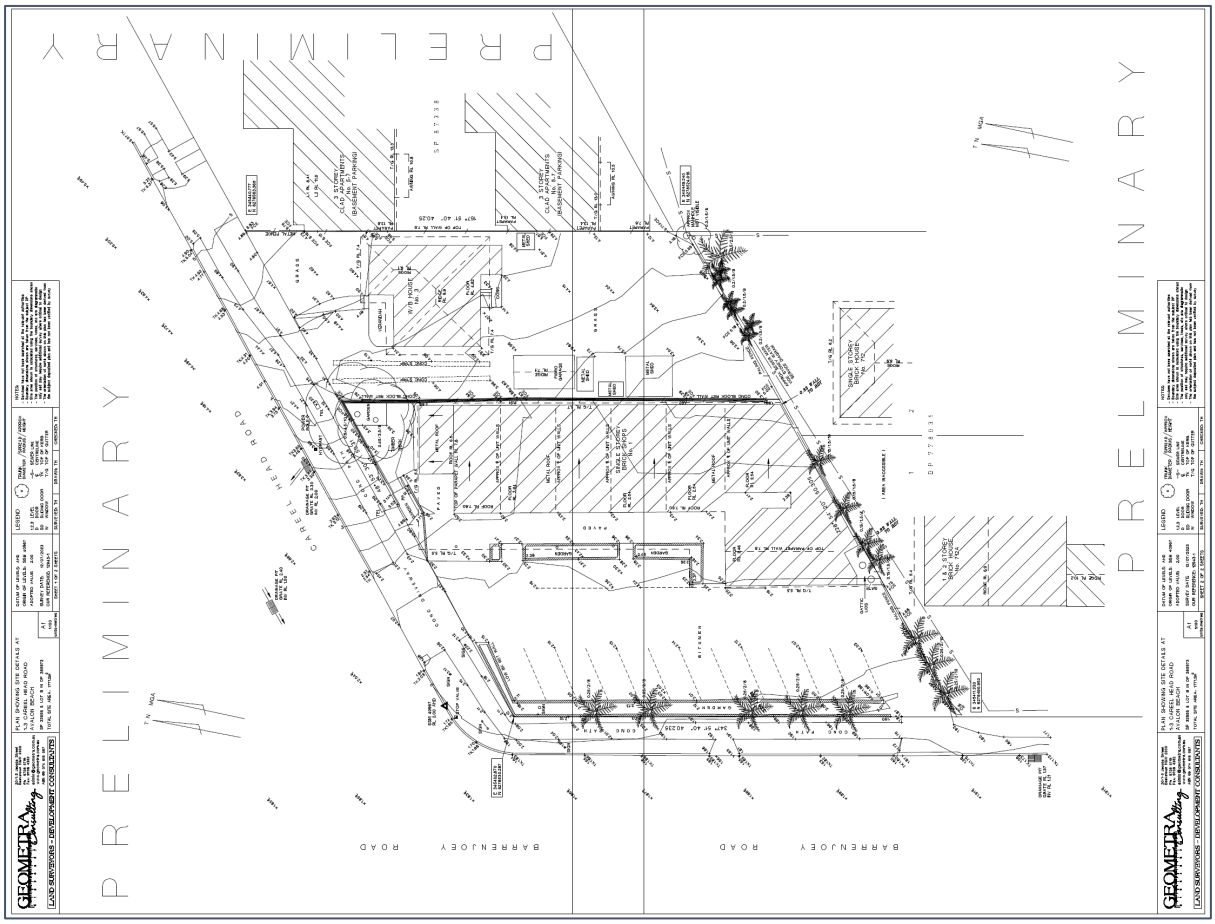

Figure 2.1 – Survey plan (Source: Geometra Consulting)

No.1 Careel Head Road (the corner allotment) is currently occupied by a single-storey commercial building, comprising 7 small tenancies including a pizza café, pie shop, chicken shop, café and massage. The cumulative floor area of the existing local shopping village is 344m^2 GLFA.

Off-street parking for the shopping village is provided for 14 cars within an outdoor at-grade parking area on the western portion of the property, fronting Barrenjoey Road. Vehicular ingress to the site is currently provided via an entry-only driveway located towards the western end of the Careel Head Road site frontage, whilst vehicular egress is provided via an exit-only driveway located at the southern end of the Barrenjoey Road site frontage.

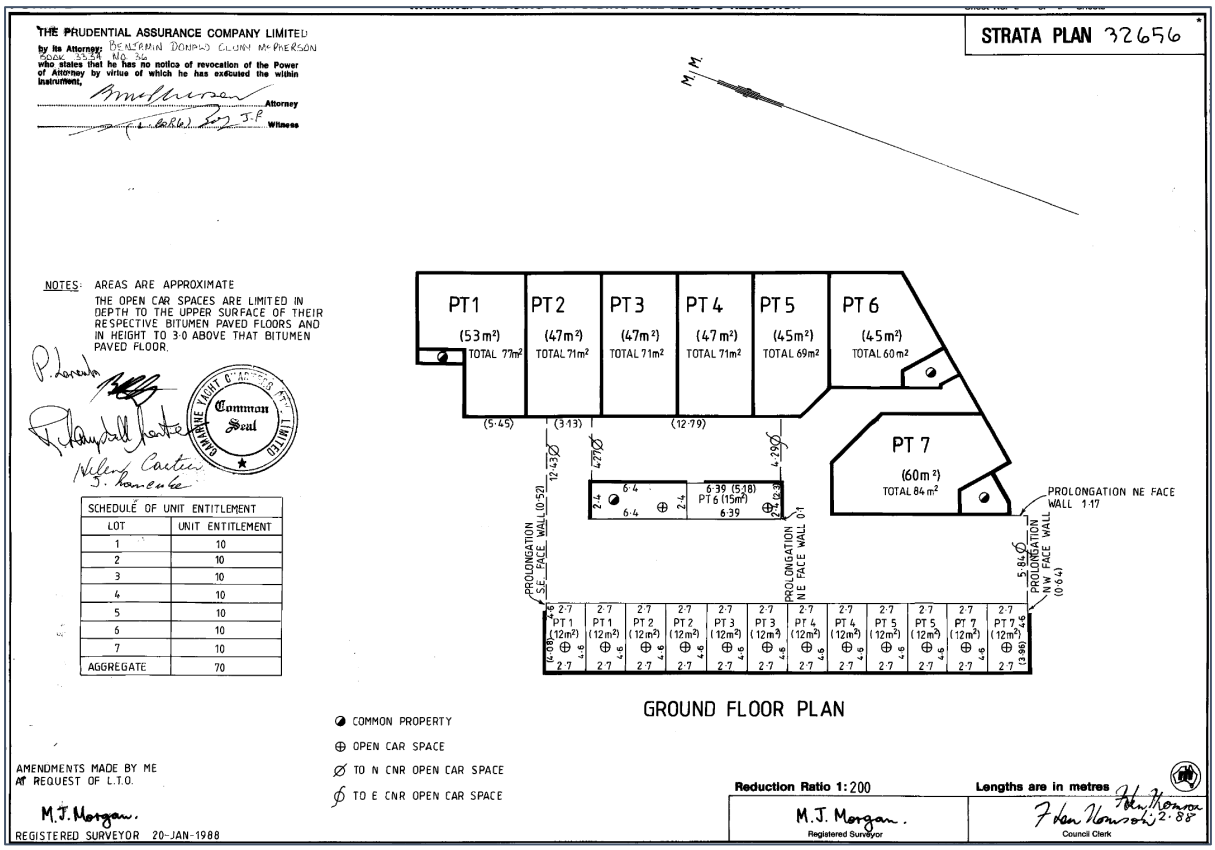

Figure 2.2 – Existing strata plan (Source: CD Architects)

No.3 Careel Head Road is currently occupied by a single-storey residential dwelling house with off-street parking. Vehicular access to the property is provided via a single driveway located at the western end of its Careel Head Road site frontage.

A recent aerial image of the site and its surroundings, along with a series of Streetview images, is reproduced below and on the following page.

Figure 2.3 – Aerial map (Source: Nearmap)

Figure 2.4 – Streetview image of Barrenjoey Road site frontage, looking north (Source: Google Maps)

Figure 2.5 – Streetview image of site frontage from Barrenjoey Rd & Careel Head Rd intersection (Source: Google Maps)

Figure 2.6 – Streetview image of Careel Head Road site frontage, looking south-west (Source: Google Maps)

2.2 Planning Context

The site is zoned E1 Local Centre under Pittwater Local Environmental Plan 2014, as indicated in the map below. The maximum height of the building is 8.5 metres.

The proposed development is permissible in the zone, subject to development consent.

Figure 2.7 – Land zoning map (Source: ePlanning Spatial Viewer)

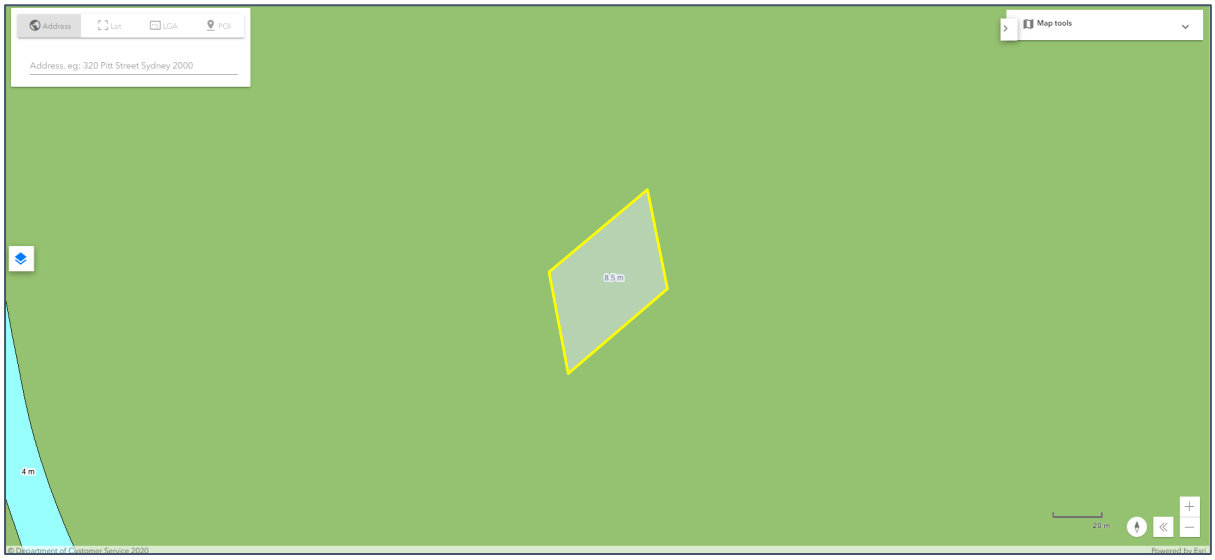

Figure 2.8 – Height of building map (Source: ePlanning Spatial Viewer)

2.3 Existing Road Network

The Transport for NSW (TfNSW) road hierarchy comprises the following road classifications:

- State Roads: Freeways, Motorways and Primary Arterial Roads (TfNSW managed)
- Regional Roads: Secondary or Sub-Arterial (Council managed, partly funded by the State)
- Local Roads: Collector and Local Access Roads (Council managed)

The existing road hierarchy in the vicinity of the site is shown in the figure below, whilst the key roads and intersections are summarised as follows:

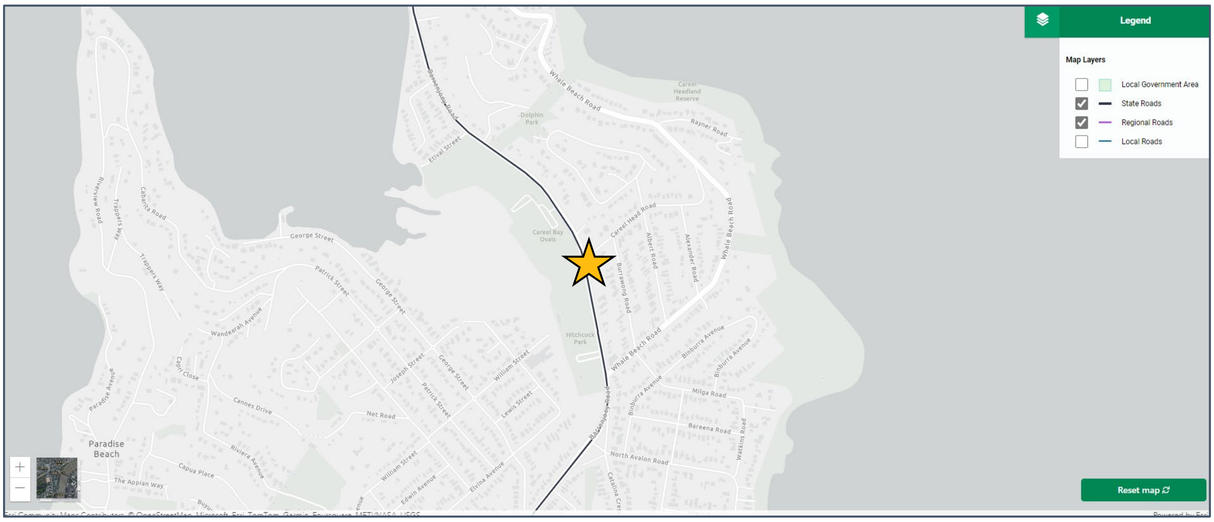

Figure 2.9 – Road Hierarchy (Source: Transport for NSW)

- Barrenjoey Road is classified as a State Road which serves as a site frontage. It is a road with north-south alignment that connects several suburbs including Mona Vale, Newport, Avalon Beach, Whale Beach and Palm Beach. It typically has one lane of traffic in each direction in the vicinity of the site and a posted speed limit of 60km/h.

- Whale Beach Road is classified as a Local Road which performs the function of a collector route through the peninsula. It features one lane of traffic in each direction, with kerbside parking generally permitted, subject to signposted restrictions and road/shoulder width.

- Careel Head Road is classified as a Local Road that provides vehicular and pedestrian access to frontage properties, including the subject site. It features one lane of traffic in each direction and links Barrenjoey Road to Whale Beach Road. Kerbside parking is also generally permitted, subject to signposted restrictions and road/shoulder width.

2.4 Existing Road Network Peak Traffic Volumes

In order to understand the existing traffic volumes on the surrounding road network, traffic surveys were undertaken at the intersection of Barrenjoey Road and Careel Head Road during the weekday AM & PM road network peak periods on Thursday, 13 June 2024, as well as the weekend midday peak period on Saturday, 15 June 2024. The results of the surveys are reproduced in Appendix B and summarised below and in the diagrams on the following page.

- Two-way traffic volumes along Barrenjoey Road, south of the subject site, are typically in the order of 750-900 vehicles per hour (vph) during the weekday AM/PM and Saturday road network peak periods

- Two-way traffic volumes along Barrenjoey Road, north of Careel Head Road and the subject site, are slightly less and typically in the order of 600-700 vph during the weekday AM/PM and Saturday road network peak periods

- Two-way traffic volumes along Careel Head Road are less still, and typically in the order of 170-200 vph during the weekday AM/PM and Saturday road network peak periods

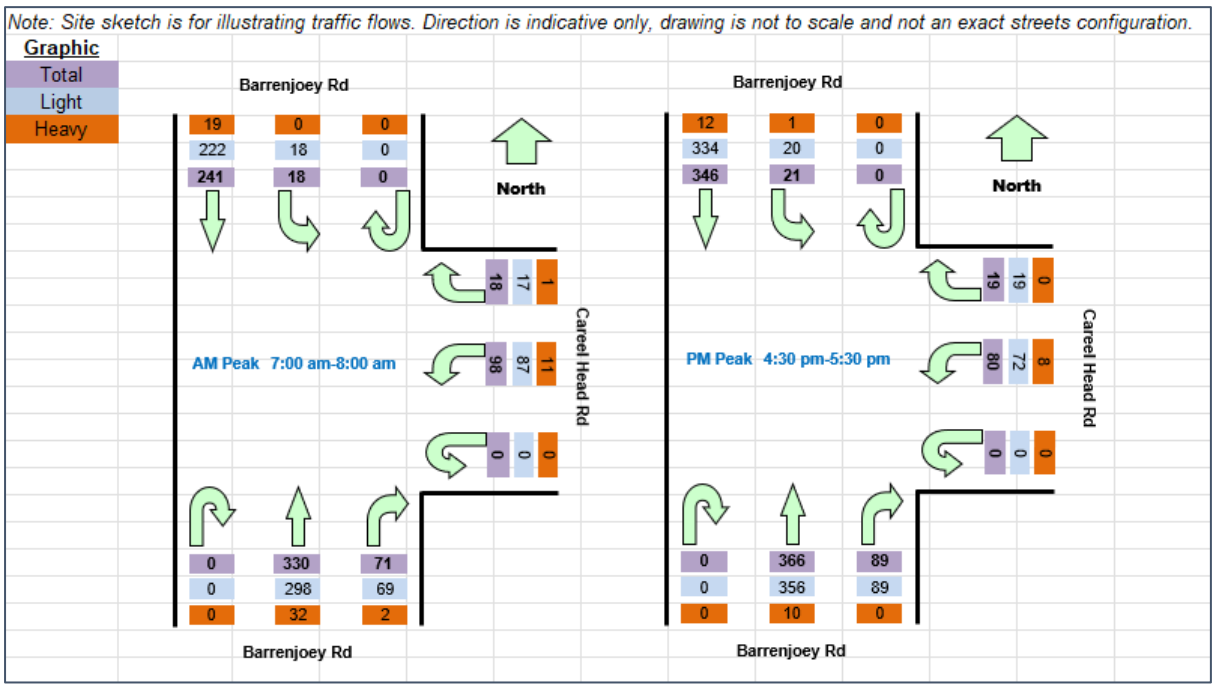

Figure 2.10 – Existing Weekday AM/PM Peak Traffic Volumes (Source: Trans Traffic Survey)

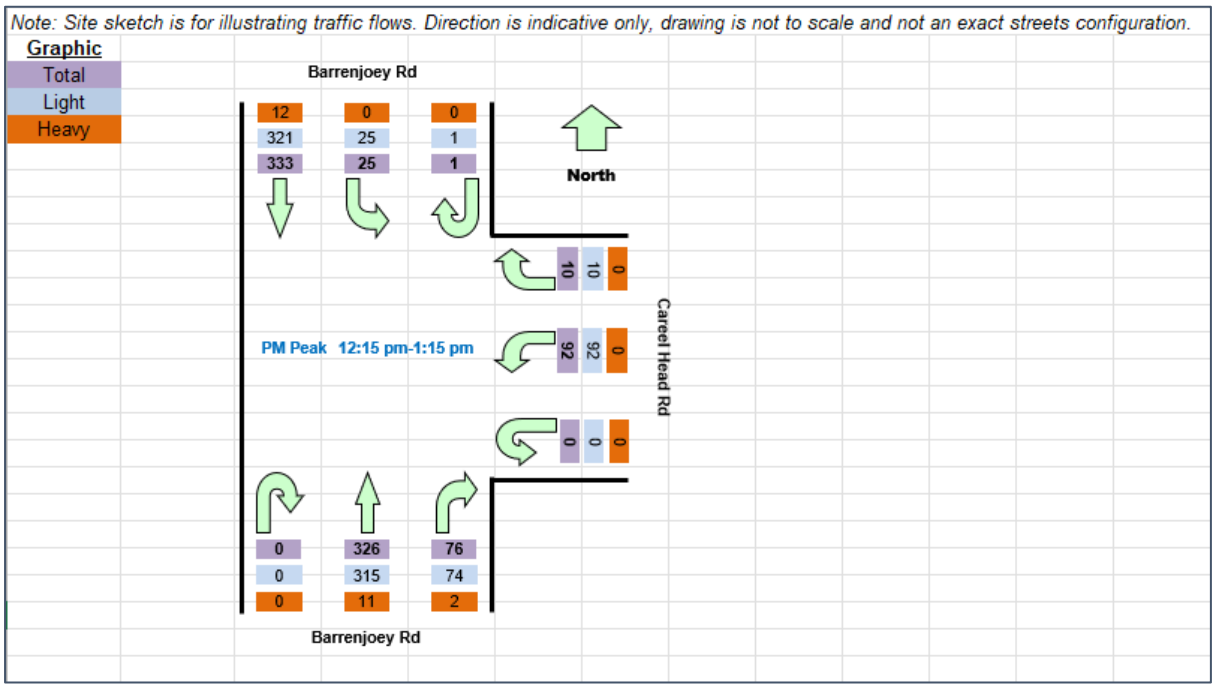

Figure 2.11 – Existing Saturday Peak Traffic Volumes (Source: Trans Traffic Survey)

2.5 Public & Active Transport

The existing public transport services available in the vicinity of the site are illustrated in Figure 2.12. Conveniently, the nearest bus stop is located directly across Barrenjoey Road, opposite the site, for northbound services. The southbound bus stop is located on the eastern side of Barrenjoey Road, just north of Careel Head Road. They are serviced by Bus Route 199 which operates between Palm Beach and Manly via Mona Vale & Dee Why. It runs extensively daily, with buses arriving every 10 minutes during peak periods and every 15 minutes during off-peak periods.

In addition, the 190X operates weekday peak period express services between City Wynyard and North Avalon, with the nearest bus stop located on Careel Head Road, just west of Burrawong Road.

Figure 2.12 – Existing Public Transport Map within the vicinity of the site (Source: Transport for NSW)

Research suggests that proximity to bus services influence the travel mode choice for areas within 400m (approximately 5 minutes) of a bus stop. As such, the proposed development has potential for future staff, parents and visitors to utilise bus for their trip to/from the site.

In addition to the public transport services available in the vicinity of the site, there is also a fair level of pedestrian connectivity in the immediate vicinity of the site, with sealed footpaths located on the eastern side of Barrenjoey Road and on the southern side of Careel Head Road.

The existing bicycle network in the vicinity of the site is reproduced in Figure 2.13. It can be seen that Barrenjoey Road is the key road along the cycling network.

The *Planning Guidelines for Walking and Cycling* identifies a number of city-scale design principles that can assist the creation of walkable and cyclable cities and neighbourhoods. These principles emphasise urban renewal and the creation of compact, mixed use, accessible centres around public transport stops. At the neighbourhood scale, design principles can be reinforced through the creation of local and accessible centres and neighbourhoods with connected street patterns and road design which aim to reinforce local walking and cycling networks.

In particular, the *Guidelines* note that increased population density is an important element in creating a walkable and cyclable city. A compact development brings activities close together, making them more accessible by foot or by bicycle, without the need to use a car. Increased population density also enhances the viability of public transport services.

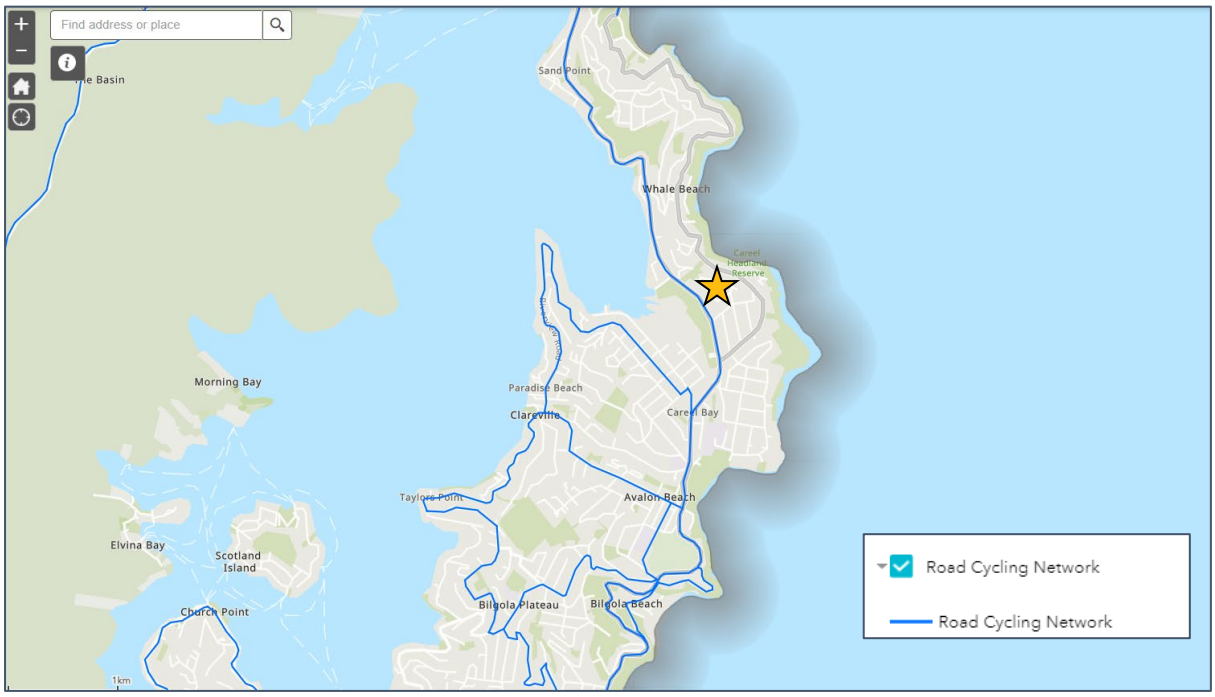

Figure 2.13 – Existing cycling network map (Source: Northern Beaches Council)

2.6 Existing Surrounding Traffic Controls

The existing traffic controls in the vicinity of the site comprise:

- a 60km/h speed limit which applies to Barrenjoey Road
- a 40km/h speed limit which applies to Careel Head Road and Whale Beach Road
- Give-way restrictions in Careel Head Road and also Whale Beach Road where they intersect with Barrenjoey Road

2.7 Existing Surrounding Parking Restrictions

The existing on-street parking restrictions in the surrounding area comprise:

- No Stopping restrictions in the vicinity of the Barrenjoey Road & Careel Head Road intersection
- No Stopping restrictions along Barrenjoey Road in the vicinity of the site, including along the site frontage
- Bus Zones located at regular intervals along both sides of Barrenjoey Road, including directly opposite the site
- a Bus Zone located on the southern side of Careel Head Road, just west of Burrawong Road
- generally unrestricted kerbside parking elsewhere along both sides of Careel Head Road, including the majority of the site frontage
- No Parking restrictions along the western side of Barrenjoey Road in the vicinity of the site (Motor Vehicles Excepted), in order to prevent the long-term parking of boats and trailers

3. Proposed Development

3.1 Development Description

The proposed development involves the demolition of the existing local shopping village on the site and the subsequent construction of a new mixed use development in its place. The proposed development comprises 3 retail premises and a bottle shop (Dan Murphy's) on the ground floor, with a childcare centre located on the first floor. Key data of the proposed development is provided in the table below.

Table 3.1 – Proposed Development Schedule

Component	Key Parameters
Retail specialty shops	174m^2
Bottle shop	500m^2
Childcare centre	60 children & 9 staff

A copy of the ground floor plan of the proposed development, prepared by CD Architects, is reproduced below.

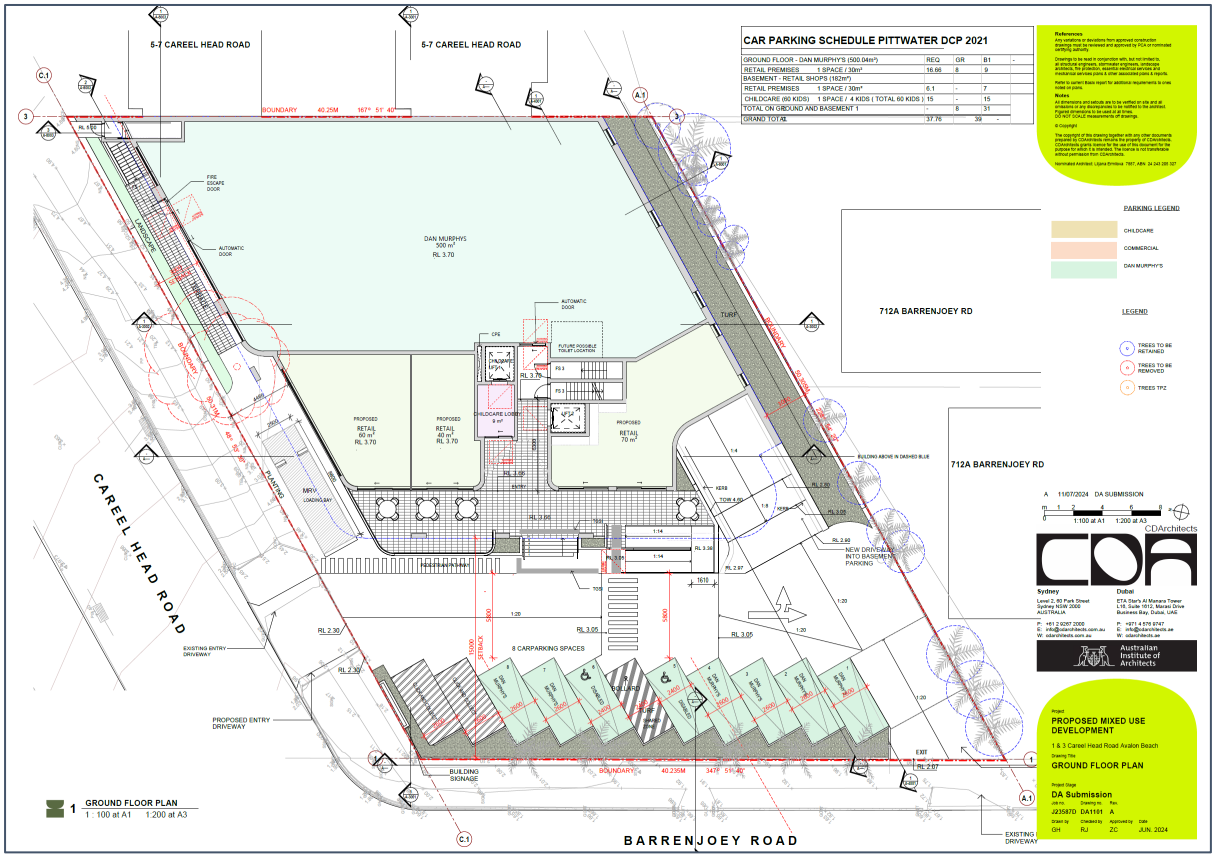

Figure 3.1 – Ground floor of the proposed development (Source: CDArchitects)

3.2 Parking Arrangements

Off-street parking is proposed for a total of 41 cars, comprising 10 spaces on the ground floor level and 31 spaces within the basement parking area. The breakdown of the number of car parking spaces per component of the development is shown below.

Table 3.2 – Schedule of Car Parking Spaces

Component	Number of ground floor spaces	Number of basement spaces	Total parking spaces
Retail specialty shops	-	6 standard spaces 1 accessible space	7 spaces
Bottle shop	6 standard spaces 2 accessible spaces 2 click & collect spaces	8 standard spaces 1 accessible space	19 spaces
Childcare centre	-	14 standard spaces 1 accessible space	15 spaces
Total	**10 spaces**	**31 spaces**	**41 spaces**

3.3 Loading & Servicing

Deliveries to the proposed bottle shop will be undertaken by a variety of commercial vehicles such as vans, utilities and the like, up to and including small and medium rigid flat-bed trucks. In this regard, a dedicated loading bay is proposed to be provided on the ground floor level, alongside the northern retail tenancy.

Deliveries to the proposed retail specialty shops will be undertaken by a variety of light commercial vehicles such as vans, utilities and the like, which are capable of fitting into a conventional parking space. Deliveries will therefore be scheduled to occur *outside* of peak periods when the car spaces will be largely vacant. In addition, a dedicated service bay is also proposed within the basement parking area, directly outside the lifts.

Waste collection is proposed to be undertaken by a private contractor using a small-to-medium garbage truck from the dedicated on-site ground floor level loading bay. Importantly, bins will *not* be lined up along the kerbside for collection.

3.4 Vehicular Access

Vehicular access to the site is proposed to essentially remain via the existing, separate entry and exit driveways located off Careel Head Road and Barrenjoey Road, respectively. The proposed retention of these driveways is considered acceptable given the length of time the existing driveways have been operational without apparent issue.

It is also worth noting that Careel Head Road rises as it gets further back from Barrenjoey Road. One of the key design criteria when designing vehicular access points is to provide the driveway at the low point on the site, thereby minimising excavation and maximising the effectiveness of the ground floor plate of the building. Importantly, vehicles will continue to be able to enter and exit the site in a forward direction at all times, as they currently do.

4. Traffic Impact Assessment

4.1 Traffic Generation Guidelines

The traffic implications of development proposals primarily concern the *nett change* in the traffic generation potential of a site compared to its existing and/or approved uses, and its impact on the operational performance of the surrounding road network, particularly during the weekday morning and afternoon road network peak periods.

An indication of the traffic generation potential of the existing and proposed uses on the site is provided by reference to the following documents:

- RMS Guide to Traffic Generating Developments 2002 (RMS Guide)
- RMS Technical Direction 2013/04a (TDT)

4.2 Existing Development Traffic Generation

In order to determine the traffic generation of the existing local shopping village on the site, traffic surveys were undertaken at the site's entry and exit driveways on the same days and times of the Barrenjoey Road & Careel Head Road intersection surveys discussed in Section 2.4 of this TPAR. The results of the driveway surveys are also reproduced in Appendix B and summarised below.

- the existing shopping village generates in the order of 42 vph during the weekday AM road network peak period (in and out combined)

- the existing shopping village generates in the order of 27 vph during the weekday PM road network peak period (in and out combined)

- the existing shopping village generates in the order of 86 vph during the Saturday road network peak period (in and out combined)

In addition, it has also been assumed that the existing dwelling house located at No.3 Careel Head Road generates 1 vehicle trip during the weekday AM/PM and Saturday road network peak periods,.

The existing land uses on the site are defined by the RMS Guide as a "dwelling house" and a "retail – shopping centre".

4.3 Proposed Development Traffic Generation

The proposal involves the demolition of the existing structures on the site and the construction of a new mixed use building, comprising 3 retail tenancies and bottle shop on the ground floor level as well as a long-day centre-based childcare facility on the first floor.

Based on the RMS trip generation rates for retail shops (specialty shops) and childcare centres, the proposed development is expected to generate 62 vph during the weekday morning peak, approximately 73 vph during the weekday afternoon peak period, and approximately 72 during the Saturday peak, as set out in Table 4.1.

In terms of the AM trip rates, the bottle shop will be closed during the weekday AM road network peak, therefore a trip rate of 25% of the PM has been adopted in this instance. The retail shops, however, may be a café, bakery, or similar, which may be open during the weekday AM road network peak, therefore the same trip rate has been applied as the PM.

Table 4.1 – Proposed Peak Period Traffic Generation							
Land Use	**Key Parameters**	**Trip Rate**			**Traffic Generation***		
		AM	**PM**	**SAT**	**AM**	**PM**	**SAT**
Bottle shop	500m²	1.2 trips/100m²	4.6 trips/100m²	10.7 trips/100m²	6 vph	23 vph	54 vph
Retail shops	174m²	4.6 trips/100m²	4.6 trips/100m²	10.7 trips/100m²	8 vph	8 vph	18 vph
Childcare	60 children	0.8 trips/child	0.7 trips/child	-	48 vph	42 vph	-
Total					**62 vph**	**73 vph**	**72 vph**

* entry/exit combined

4.4 Nett Traffic Generation

As noted above, the traffic implications of development proposals primarily concern the *nett change* in the traffic generation potential of a site compared to its existing and/or approved uses.

Based on the RMS trip generation rates and the above tables, the proposed development is expected to result in a *nett increase* of 20 vehicle trips during the weekday morning peak, a *nett increase* of 46 vehicle trips during the weekday afternoon peak, and a *nett reduction* of 14 vehicle trips during the Saturday peak.

Table 4.2 – Nett Peak Traffic Generation			
Period	**Proposed Peak Trips**	**Existing Peak Trips**	**Nett Peak Trips**
AM Peak Hour	62 vph	42 vph	+20 vph
PM Peak Hour	73 vph	27 vph	+46 vph
SAT Peak Hour	72 vph	86 vph	-14 vph

That projected increase in traffic activity as a consequence of the subject site is consistent with the planning controls which apply to the site and will not have any unacceptable traffic implications in terms of road network capacity or traffic-related environmental effects, as is demonstrated in the following section of this report.

5.6 Road Network Capacity & Traffic Impact

An important consideration in determining the impact of a development proposal on the road network is to assess the effect on traffic efficiency, the objective of which is to maintain the existing level of service. Adverse effects must be identified, and corrective measures designed. The level of service is used as the performance standard and is broken down into six ratings. This is a qualitative assessment of the quantitative effect of factors such as speed, volume of traffic, geometric features, traffic interruptions, delays and freedom of manoeuvres.

The traffic implications of development proposals primarily concern the effects that any *additional* traffic flows may have on the operational performance of the nearby road network. Those effects can be assessed using the SIDRA 9.1 NETWORK program which is widely used by TfNSW and most LGAs for this purpose. TfNSW's criteria for evaluating the results of SIDRA analysis are summarised in the table below.

Table 4.3 – Level of Service Criteria for Intersections (Table 4.2 of RMS Guide)			
Level of Service	**Average Delay per Vehicle (secs/veh)**	**Traffic Signals, Roundabouts**	**Give Way & Stop Signs**
A	<14	Good operation	Good operation
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays. Roundabouts require other control mode	At capacity, requires other control mode
F	>70	Unsatisfactory, requires additional capacity	Unsatisfactory, requires other control mode or major treatment

Whilst Table 4.2 of this TPAR indicates that the *nett changes* in peak period traffic generation are relatively modest, for the purposes of sensitivity testing, the traffic generation estimates provided in Table 4.1 have been applied to the existing road network – i.e. assuming that the existing site generates zero traffic.

The individual SIDRA movements summaries of each intersection are reproduced in Appendix C and summarised in Table 4.4 below. In essence, the SIDRA modelling confirms that the Barrenjoey Road & Careel Head Road intersection *and* the site access driveways are currently operating at Level of Service A on *all* approaches, and will continue to do so under the proposed development scenario, with increases in AVD of *less than* 1 second/vehicle.

Importantly, the 95th percentile back-of-queue length for vehicles waiting to exit Careel Head Road back onto Barrenjoey Road is just 2.4m – i.e. *less than* 1 vehicle length – which will *not* change as a result of the proposed increase in associated vehicle movements.

Table 4.4 – Summary of SIDRA NETWORK analysis of surrounding road network						
Modelling intersections & key indicators	**Existing Traffic Demand (no development)**			**Proposed Traffic Demand (with development)**		
	AM	**PM**	**SAT**	**AM**	**PM**	**SAT**
Barrenjoey Road & Careel Head Rd						
LOS	A (A)	A (A)	A (A)	A (A)	A (A)	A (A)
DOS	0.230	0.263	0.231	0.257	0.284	0.255
AVD (sec/veh)	1.2 (5.6)	1.3 (6.1)	1.2 (5.6)	1.3 (5.6)	1.4 (6.5)	1.4 (5.8)
Careel Head Rd & entry driveway						
LOS	A (A)	A (A)	A (A)	A (A)	A (A)	A (A)
DOS	0.064	0.059	0.056	0.068	0.075	0.076
AVD (sec/veh)	0.3 (3.5)	0.2 (3.5)	0.5 (3.5)	0.6 (3.5)	0.6 (3.5)	0.8 (3.5)
Barrenjoey Rd & exit driveway						
LOS	A (A)	A (A)	A (A)	A (A)	A (A)	A (A)
DOS	0.212	0.237	0.222	0.224	0.248	0.222
AVD (sec/veh)	0.1 (4.9)	0.1 (6.0)	0.2 (5.6)	0.3 (5.3)	0.2 (6.5)	0.3 (6.0)

LOS – Level of Service; DOS – Degree of Saturation; AVD – Average Vehicle Delays
Worst turning movements and respective delays indicated in brackets (sign-controlled intersections only)

Accordingly, the proposed development is not expected to result in any unacceptable traffic implications on the surrounding road network, nor in any safety or operational issues. The proposal is therefore supportable on traffic grounds, including the retention of the existing access driveways.

5. Access, Parking & Servicing Assessment

5.1 Applicable Car Parking Rates

The off-street parking rates applicable for the retail premises and the bottle shop components of the proposed development are specified in Council*'s 21 Development Control Plan, Section B General Controls, Item B6 Access and Parking, Sub-item B6.3 Off-Street Vehicle Parking Requirements, Table 1: Onsite Car Parking requirements,* in the following terms:

Development Type	Minimum Number of. Car Spaces
Retail Premises (Not including Shopping Centre Developments)	1 per 30m² GLA Parking spaces are to be accessible to the public. Adequate space for delivery vehicles is to be provided. Provision of accessible parking spaces for people with disabilities must be at the rate of 3% of the required car parking spaces or part thereof, or 1 space, whichever is greater.

(Source: Pittwater 21 DCP, Section B, Item B6, Sub-item B6.3, Table 1)

Council's 21 DCP also notes that for developments not included in the relevant table, parking requirements must be determined *based on the Roads and Maritime Services Guide to Traffic Generating Development or analysis drawn from surveyed data for similar development uses.* Accordingly, the off-street parking requirements for the childcare centre has been derived from the RMS Guide, which is *one space for every four children in attendance*.

Furthermore, the off-street parking rates provided in the Child Care Planning Guideline are shown below. Since the site is not located within 400 metres of a railway or metro station, a rate of *1 space per 4 children* is specified, which aligns with the RMS Guide.

Within 400 metres of a railway or Metro station within Greater Sydney:

- 1 space per 10 children
- 1 space per 2 staff. Staff parking may be stack or tandem parking with no more than 2 spaces in each tandem space.

In other areas:

- 1 space per 4 children.

(Source: Child care planning guideline)

5.2 Car Parking Requirements

Based on the various components of the proposed mixed use development, being, retail specialty shops, bottle shop, and a childcare centre, the proposed development requires the provision of 38 car parking spaces, as set out in Table 5.1.

Table 5.1 – Off-street Car Parking Requirements

Use	Pittwater 21 DCP and RMS Guide		
	Rate	Quantum	Requirement
Retail specialty shops	1 space/30 m²	174m²	5.8 spaces
Bottle shop	1 space/30 m²	500 m²	16.7 spaces
Childcare centre	1 space/4 children	60 children	15.0 spaces
Total			**37.5 spaces**

5.3 Accessible Parking

The Council's 21 DCP specifies that the retail premises must provide parking for people with disabilities at a rate of *3% of the required car parking spaces or part thereof, or 1 space, whichever is greater*. With a total minimum car parking requirement of 22 retail spaces, a minimum of 1 accessible space is required.

In terms of the childcare centre, the Building Code of Australia (BCA) provides car parking rate for people with disabilities. Childcare centres are classified as Class 9b building which requires *1 space for every 100 car parking spaces or part thereof.*

Based on the above BCA rate, the proposed childcare centre component of the development requires the provision of 0.15 accessible space, rounded up to 1 accessible space.

The above requirements are satisfied by the proposed provision of 5 accessible parking spaces, comprising 2 outdoor at-grade spaces plus a further 3 spaces within the basement parking area.

5.4 Proposed Car Parking Provisions

The proposed development makes provision for a total of 41 car parking spaces, comprising 10 car spaces within an outdoor at-grade parking area and a further 31 car spaces within a basement parking area, thereby satisfying the numerical requirements of the DCP and RMS Guide.

Table 5.2 – Off-street Car Parking Requirements & Provision

Use	Pittwater 21 DCP and RMS Guide			Provision
	Rate	Quantum	Requirement	
Retail specialty shops	1 space/30 m²	174m²	5.8 spaces	6 standard spaces 1 accessible space
Bottle shop	1 space/30 m²	500 m²	16.7 spaces	14 standard spaces 3 accessible spaces 2 click & collect spcaes
Childcare centre	1 space/4 children	60 children	15.0 spaces	14 standard spaces 1 accessible space
Total			**37.5 spaces**	**41 spaces**

5.5 Bicycle and Motorcycle Parking

Council's 21 DCP specifies a bicycle parking rate for business/industrial developments, comprising 200m² GFA or more, of *1 bicycle rack per 1,000m² GFA*. This is applicable to both the retail premises and the bottle shop. However, Council's 21 DCP does not specify a bicycle parking rate for childcare centres. Based on the above DCP's retail rate, the proposed development requires the provision of 1 bicycle parking space. That requirement is satisfied by the proposed provision of 4 bicycle parking spaces within the basement parking area.

Additionally, the Council's 21 DCP specifies a motorcycle parking rate for business/industrial developments, comprising 200m² GFA or more, of *1 motorcycle parking space per 100 motor vehicle spaces*. This is again applicable to both the retail premises and the bottle shop, whilst no specification has been made for childcare centres. Based on the above DCP rate, the proposed development requires the provision of 1 motorcycle parking space. That requirement is satisfied by the proposed provision of 1 motorcycle parking space, also within the basement parking area.

6. Design Assessment

6.1 Applicable Design Standards

The following design standards have been used as the basis for compliance with respect to the vehicular access, parking and loading requirements:

- Australian Standards 2890.1:2004 – Off-Street Car Parking (AS2890.1)
- Australian Standards 2890.2:2018 – Off-Street Commercial Vehicle Facilities (AS2890.2)
- Australian Standards 2890.3:2015 – Bicycle Parking (AS2890.3)
- Australian Standards 2890.6:2022 – Off-Street Parking for People with Disabilities (AS2890.6)

Whilst the vehicular access, parking and loading area has been designed in accordance with the above Australian Standards, it is expected that a condition of consent would be imposed requiring reconfirmation of compliance at the Construction Certificate stage (CC). Any minor amendments required to the current DA design can therefore be addressed at the CC stage.

6.2 Vehicular Access and Circulation Design

The following key compliances are noted with respect to the vehicular access design and circulation system:

- existing separate entry and exit driveways located off the Careel Head Road and Barrenjoey Road site frontages, respectively, are to be retained
- both driveways located outside of the 6m “prohibited” tangent point of an intersection
- maximum gradient throughout the ground floor parking and internal circulation aisle of 5% (1:20)
- 6.1m wide basement access ramp
- maximum gradient on the basement access ramp of 25% (1:4)
- 2m long top and bottom transitions @ 12.5% (1:8) for the basement access ramp
- 5.8m wide aisle within the outdoor at-grade parking area, in excess of User Class 3A requirements
- 6.1m wide circulation aisle within the basement parking area
- Dedicated turning bay located at the far end of the basement car park
- minimum 2.2m overhead clearance provided throughout the vehicular circulation system in the basement parking area

Further to the above, the vehicular access and internal circulation arrangements have been designed to accommodate the swept turning path requirements of the B99 design vehicle as specified in AS2890.1, allowing them to circulate through the at-grade outdoor parking area and the basement parking area within the site without difficulty. Similarly, the ground floor at-grade parking area has also been designed to accommodate the swept path requirements of the 8.8m long MRV. Importantly, all vehicles are able to enter and exit the site in a forward direction at all times. Swept turn path diagrams are reproduced in Appendix D.

6.3 Parking & Loading Design

The following key compliances are noted with respect to the parking area design:

- 5.4m long x 2.6m wide standard car parking spaces
- 5.4m long x 2.4m wide accessible car parking spaces *plus* 5.4m long x 2.4m wide "shared area", in accordance with AS2890.6
- additional 300mm width for parking spaces located against walls
- minimum 2.5m overhead clearance provided above accessible parking spaces and adjacent shared area in the basement parking area
- minimum 2.2m overhead clearance provided above all other parking spaces in the basement parking area
- columns in parking areas generally located ~750mm back from the edge of the parking aisle
- no obstructions within the "design envelope" of any car parking spaces
- all vehicles are able to enter and exit the site in a forward direction at all times
- 12m long x 4.5m wide ground floor loading bay with an overhead clearance of 3.8m, capable of accommodating small and medium rigid vehicles, including garbage trucks, as per the example vehicle below.

REAR LIFT COLLECTION

VEHICLE SPECIFICATIONS	
Overall length	8.0m
Overall width	2.5m
Height (travel)	3.4m
Height (in operation)	3.4m
Weight (vehicle only)	13.0t
Weight (payload)	9.5t
Turning circle	25.0m

*** Vehicle specifications are approximate and may vary by location.*

Figure 6.1 – Example garbage truck specifications (Source: www.sita.com.au)

7. Conclusion

In summary, the DA involves the demolition of the existing local shopping village and dwelling house on the site and the construction of a new two-storey mixed use development, comprising four ground floor retail tenancies (including a Dan Murphys bottle shop) with a cumulative floor area of 670m^2 and a 60-place childcare centre located on the first-floor level.

Off-street parking is proposed within a new outdoor at-grade parking area fronting Barrenjoey Road, plus a single-level basement parking area.

Vehicular access to the site is proposed to be provided via the existing entry and exit driveways located off the Careel Head Road and Barrenjoey Road site frontages, respectively.

Based on the findings contained within this report, the following conclusions are made:

- the site is conveniently located in close proximity to bus stops on Barrenjoey Road and Careel Head Road, with regular services provided, 7 days per week
- the proposed development is expected to generate in the order of 62-73 vehicle trips during the weekday AM/PM and Saturday peak periods
- when compared to the existing local shopping village on the site, the proposed development is expected to result in a *nett increase* of 20-46 trips during the weekday peak periods, however, a *nett reduction* of 14 trips during the Saturday peak period
- in any event, the proposal is not expected to result in any unacceptable implications in terms of road network capacity or safety
- the proposed development makes provision for 41 car parking spaces (including 5 accessible spaces and 2 click & collect spaces), which satisfies the numerical requirements specified in Council's 21 DCP and the RMS Guide
- the proposed development also makes provision for 4 bicycle spaces and 1 motorcycle
- the proposed vehicular access, parking and loading area design complies with the relevant requirements specified in the AS2890 series, having regard to the retention of the existing entry and exit driveways.

In light of the foregoing assessment, it is therefore concluded that the proposed development is supportable on vehicular access, traffic, parking and servicing grounds and will not result in any unacceptable implications.

CJP | CONSULTING ENGINEERS

Appendix A

Proposed Architectural Plans

CAR PARKING SCHEDULE PITTWATER DCP 2021

GROUND FLOOR - DAN MURPHY'S (500.04m²)		REQ	GR	B1	-
RETAIL PREMISES	1 SPACE / 30m²	16.66	8	9	
BASEMENT - RETAIL SHOPS (182m²)					
RETAIL PREMISES	1 SPACE / 30m²	6.1	-	7	
CHILDCARE (60 KIDS)	1 SPACE / 4 KIDS (TOTAL 60 KIDS)	15	-	15	
TOTAL ON GROUND AND BASEMENT 1		-	8	31	
GRAND TOTAL		37.76	39	-	
MOTORBIKE	-	1	1	-	
BYCYCLE	-	1	1	-	

1 BASEMENT 1
1 : 100 at A1 1:200 at A3

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Nominated Architect: Liljana Ermilova 7887, ABN 24 243 205 327

PARKING LEGEND

- CHILDCARE
- COMMERCIAL
- DAN MURPHY'S

A 15/07/2024 DA SUBMISSION

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0
1:100 at A1 1:200 at A3

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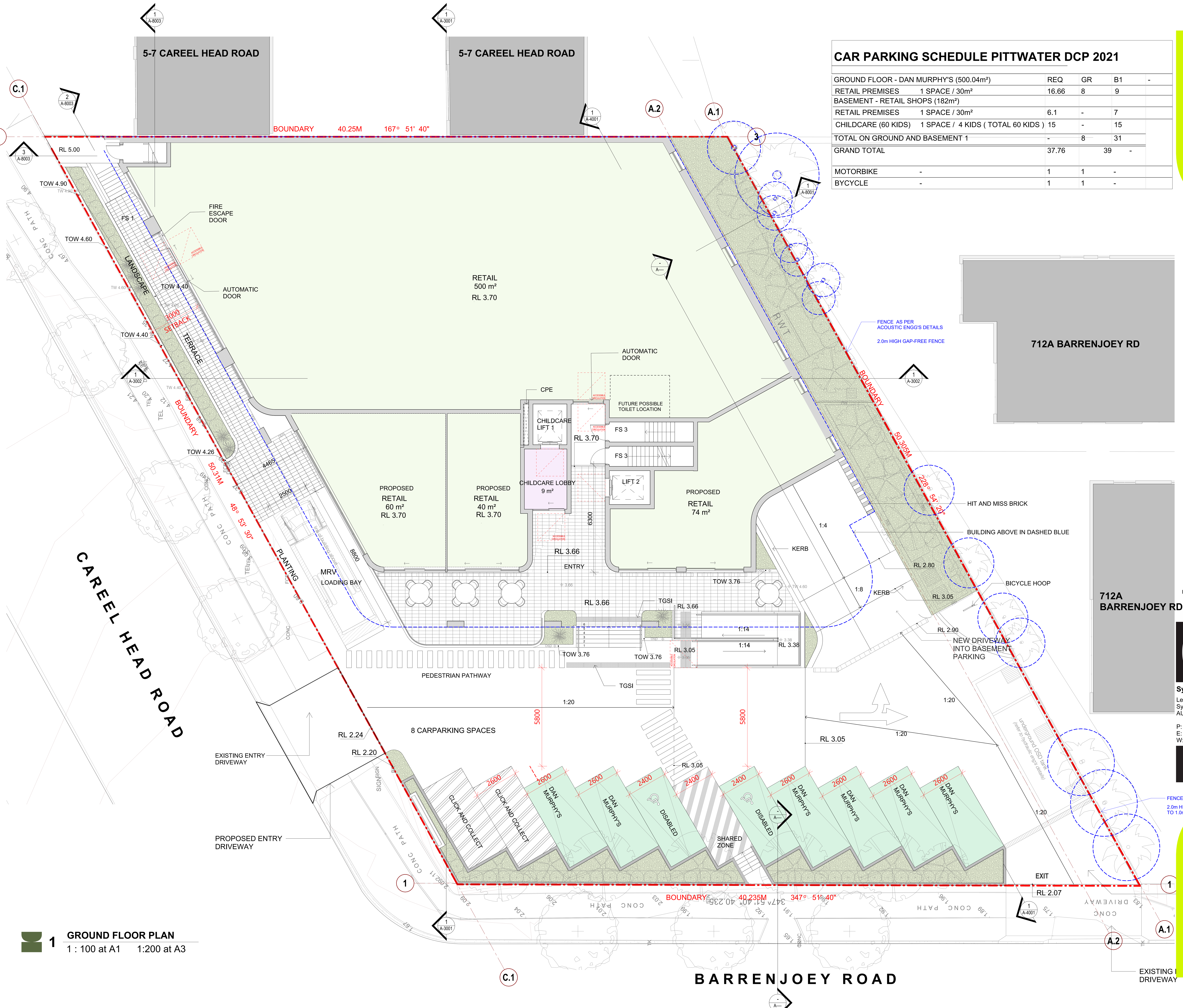
Project
PROPOSED MIXED USE DEVELOPMENT
1 & 3 CAREEL HEAD ROAD, AVALON BEACH, NEW SOUTH WALES 2107

Drawing Title
BASEMENT 1 FLOOR PLAN

Project Stage
DA Submission

Job no.	Drawing no.	Rev.
J23587D	DA1100	A

Drawn by	Checked by	Approved by	Date
GH	RJ	ZC	JULY. 2024



CAR PARKING SCHEDULE PITTWATER DCP 2021

GROUND FLOOR - DAN MURPHY'S (500.04m²)		REQ	GR	B1	-
RETAIL PREMISES	1 SPACE / 30m²	16.66	8	9	
BASEMENT - RETAIL SHOPS (182m²)					
RETAIL PREMISES	1 SPACE / 30m²	6.1	-	7	
CHILDCARE (60 KIDS)	1 SPACE / 4 KIDS (TOTAL 60 KIDS)	15	-	15	
TOTAL ON GROUND AND BASEMENT 1		-	8	31	
GRAND TOTAL		37.76	39	-	
MOTORBIKE	-	1	1	-	
BYCYCLE	-	1	1	-	

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PARKING LEGEND

- CHILDCARE
- COMMERCIAL
- DAN MURPHY'S

LEGEND

- TREES TO BE RETAINED
- TREES TO BE REMOVED
- TREES TPZ

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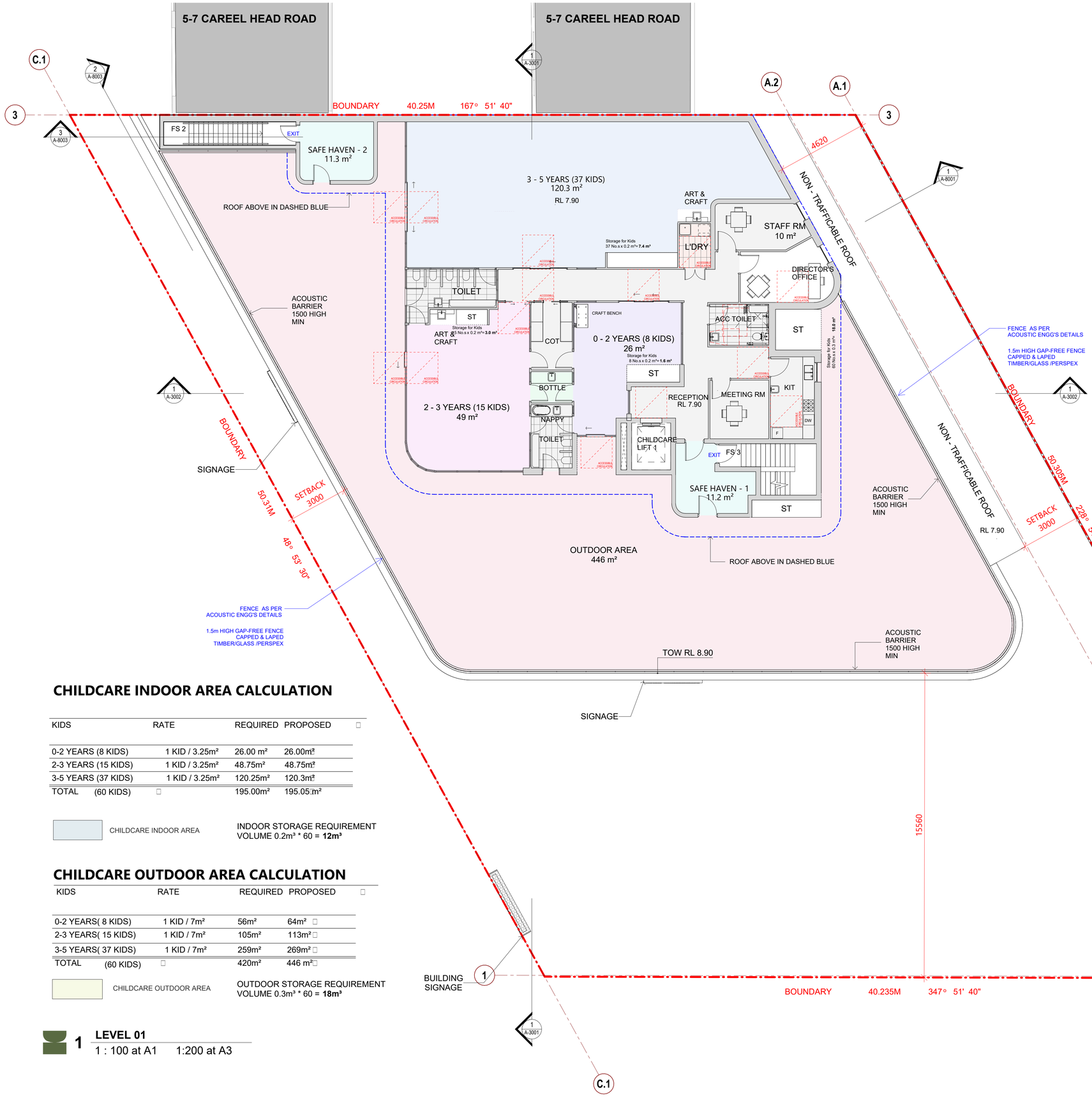
1 & 3 CAREEL HEAD ROAD, AVALON BEACH, NEW SOUTH WALES 2107

Drawing Title
GROUND FLOOR PLAN

Project Stage
DA Submission

Job no.	Drawing no.	Rev.	
J23587D	DA1101	A	
Drawn by	Checked by	Approved by	Date
GH	RJ	ZC	JULY. 2024



CHILDCARE INDOOR AREA CALCULATION

KIDS	RATE	REQUIRED	PROPOSED
0-2 YEARS (8 KIDS)	1 KID / 3.25m²	26.00 m²	26.00m²
2-3 YEARS (15 KIDS)	1 KID / 3.25m²	48.75m²	48.75m²
3-5 YEARS (37 KIDS)	1 KID / 3.25m²	120.25m²	120.3m²
TOTAL (60 KIDS)		195.00m²	195.05 m²

CHILDCARE INDOOR AREA

INDOOR STORAGE REQUIREMENT
VOLUME 0.2m³ * 60 = **12m³**

CHILDCARE OUTDOOR AREA CALCULATION

KIDS	RATE	REQUIRED	PROPOSED
0-2 YEARS(8 KIDS)	1 KID / 7m²	56m²	64m²
2-3 YEARS(15 KIDS)	1 KID / 7m²	105m²	113m²
3-5 YEARS(37 KIDS)	1 KID / 7m²	259m²	269m²
TOTAL (60 KIDS)		420m²	446 m²

CHILDCARE OUTDOOR AREA

OUTDOOR STORAGE REQUIREMENT
VOLUME 0.3m³ * 60 = **18m³**

1 LEVEL 01
1 : 100 at A1 1:200 at A3

References
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Nominated Architect: Liljana Ermilova 7887, ABN 24 243 205 327

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Project
PROPOSED MIXED USE DEVELOPMENT
1 & 3 CAREEL HEAD ROAD, AVALON BEACH, NEW SOUTH WALES 2107

Drawing Title
LEVEL 01 FLOOR PLAN

Project Stage
DA Submission

Job no.	Drawing no.	Rev.
J23587D	**DA1102**	**A**

Drawn by	Checked by	Approved by	Date
GH	RJ	ZC	JULY. 2024

5-7 CAREEL HEAD ROAD

5-7 CAREEL HEAD ROAD

C.1

2 A-8003

3 A-8003

3

RL 7.90

RL 7.90

RL 11.00

RL 11.00

BOUNDARY 40.25M 167° 51' 40"

1 A-3001

A.1

3

FIRE STAIRS
DN 35.8°

RL 7.90

TOH 11.20

TOH 11.00

PHOTOVOLTAIC PANELS
AREA - **270m²**

A-...

1 A-3002

1 A-3002

BOUNDARY

50.31M

48° 53' 30"

RL 11.00

RL 11.05
LIFT
OVERRUN

RL 11.00

BOUNDARY

50.305M

228° 54' 20"

712A
BARRENJOEY RD

712A
BARRENJOEY
RD

1

1

BOUNDARY 40.235M 347° 51' 40"

1 A-3001

A.1

C.1

1 **ROOF PLAN**
1 : 100 at A1 1:200 at A3

References

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PROPOSED MIXED USE DEVELOPMENT
1 & 3 CAREEL HEAD ROAD, AVALON BEACH, NEW SOUTH WALES 2107

Drawing Title
ROOF PLAN

Project Stage
DA Submission

Job no.	Drawing no.	Rev.
J23587D	**DA1103**	**A**

Drawn by	Checked by	Approved by	Date
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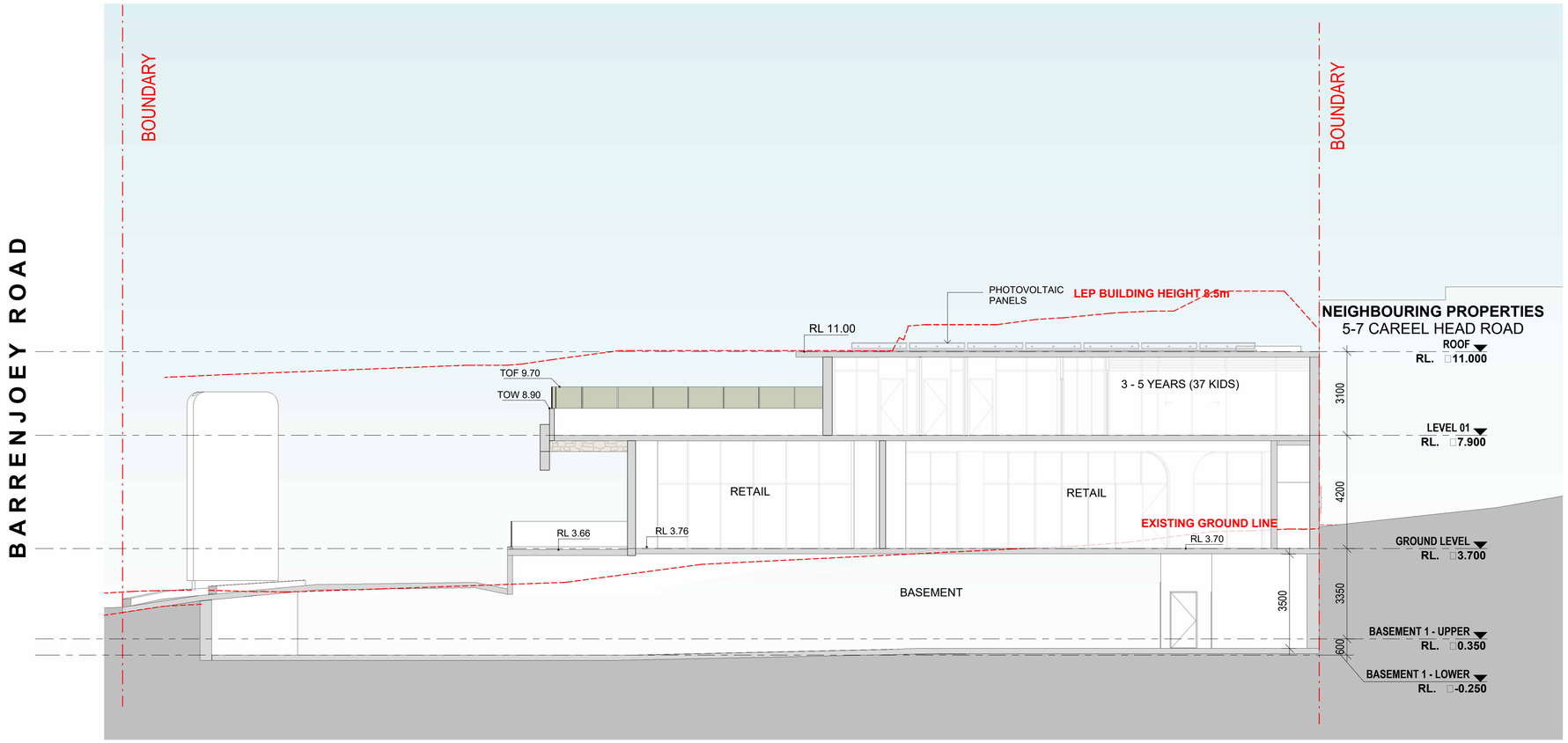

1 **SECTION A**
1 : 100 at A1 1:200 at A3

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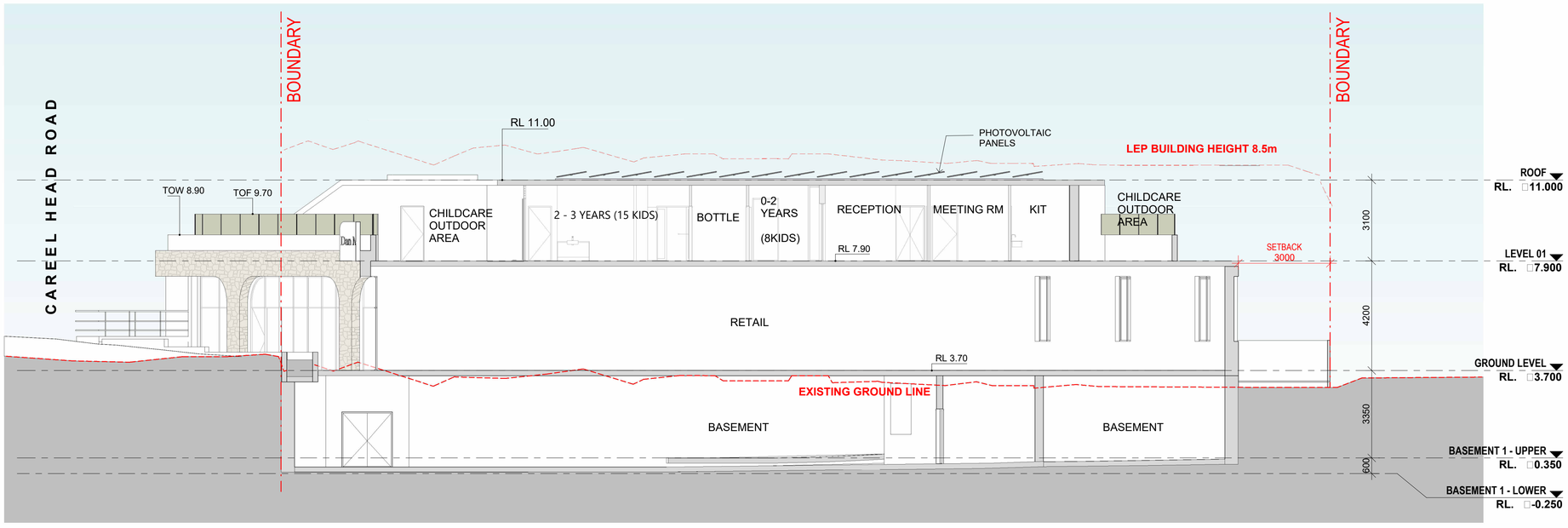
PROPOSED MIXED USE DEVELOPMENT
1 & 3 CAREEL HEAD ROAD, AVALON BEACH, NEW SOUTH WALES 2107

Drawing Title
SECTION A

Project Stage
DA Submission

Job no.	Drawing no.	Rev.
J23587D	DA3001	A

Drawn by	Checked by	Approved by	Date
GH	RJ	ZC	JULY. 2024



1 SECTION B
1 : 100 at A1 1:200 at A3

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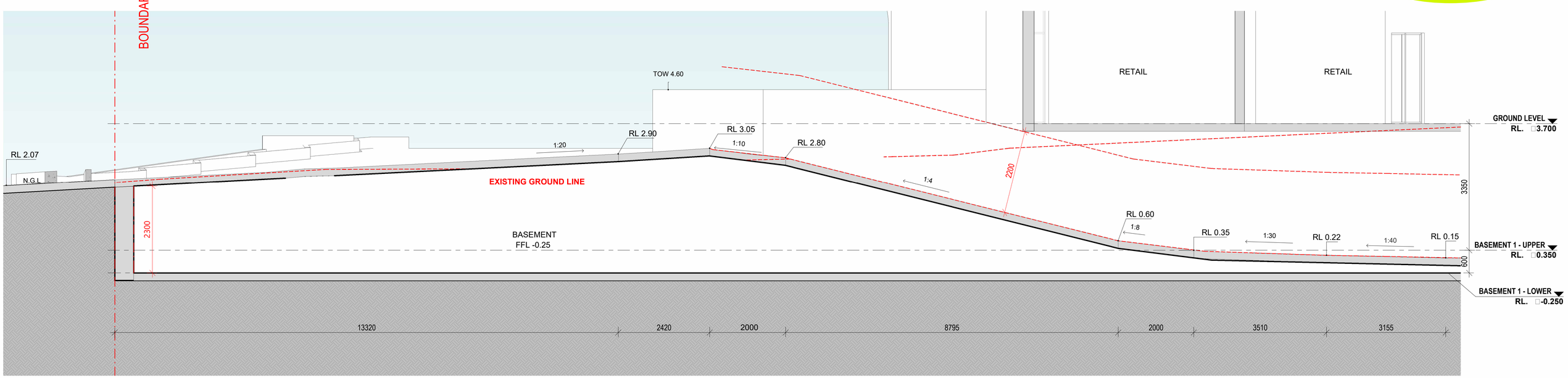
PROPOSED MIXED USE DEVELOPMENT
1 & 3 CAREEL HEAD ROAD, AVALON BEACH, NEW SOUTH WALES 2107

Drawing Title
SECTION B

Project Stage
DA Submission

Job no.	Drawing no.	Rev.
J23587D	DA3002	A

Drawn by	Checked by	Approved by	Date
GH	RJ	ZC	JULY. 2024



1 **RAMP SECTION**
1 : 50 at A1 1:200 at A3

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Project
PROPOSED MIXED USE DEVELOPMENT
1 & 3 CAREEL HEAD ROAD, AVALON BEACH, NEW SOUTH WALES 2107

Drawing Title
RAMP SECTION

Project Stage
DA Submission

Job no.	Drawing no.	Rev.		
J23587D	**DA4001**	**A**		
Drawn by	Checked by	Approved by	Date	
GH	RJ	ZC	JULY. 2024	

Appendix B

Traffic Survey Results

TRANS TRAFFIC SURVEY

trafficsurvey.com.au

TURNING MOVEMENT SURVEY

Intersection of Careel Head Rd and Barrenjoey Rd, Avalo

GPS *-33.621727, 151.333323*

Date:	Thu 13/06/24
Weather:	Overcast
Suburban:	Avalon
Customer:	CJP

North:	Barrenjoey Rd
East:	Careel Head Rd
South:	Barrenjoey Rd
West:	N/A

Survey Period	AM:	7:00 AM-9:00 AM
	PM:	4:00 PM-6:00 PM
Traffic Peak	AM:	7:00 AM-8:00 AM
	PM:	4:30 PM-5:30 PM

All Vehicles

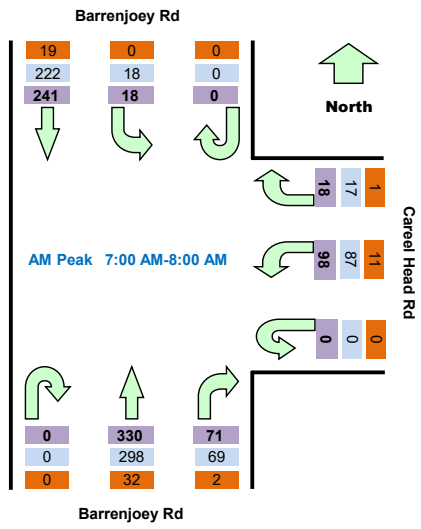
Time		orth Approach Barrenjoey R			ast Approach Careel Head R			outh Approach Barrenjoey R			Hourly Total	
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	Hour	Peak
7:00	7:15	0	56	4	0	4	16	0	33	109	776	Peak
7:15	7:30	0	44	3	0	4	24	0	15	83	731	
7:30	7:45	0	75	9	0	4	28	0	11	72	744	
7:45	8:00	0	66	2	0	6	30	0	12	66	728	
8:00	8:15	0	62	4	0	8	22	1	9	71	759	
8:15	8:30	0	71	4	0	5	16	0	18	72		
8:30	8:45	0	61	4	0	2	31	0	10	75		
8:45	9:00	0	87	5	0	9	28	0	15	69		
16:00	16:15	0	73	4	0	12	17	0	21	100	839	
16:15	16:30	0	80	3	0	4	17	0	23	72	887	
16:30	16:45	0	65	4	0	3	37	0	25	84	921	Peak
16:45	17:00	0	69	2	0	3	13	0	16	92	858	
17:00	17:15	0	104	10	0	7	12	0	22	120	834	
17:15	17:30	0	108	5	0	6	18	0	26	70		
17:30	17:45	0	53	4	0	3	8	0	13	74		
17:45	18:00	0	55	1	0	4	10	0	18	83		

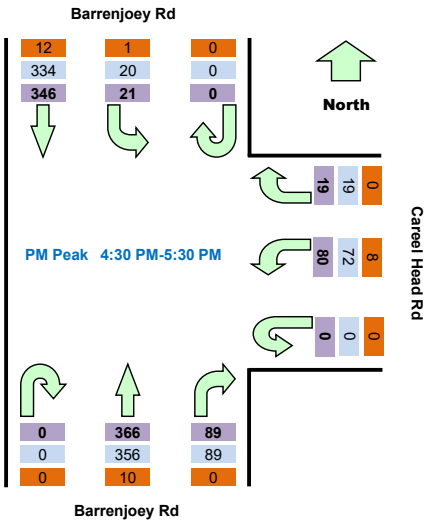
Peak Time		orth Approach Barrenjoey R			ast Approach Careel Head R			outh Approach Barrenjoey R			Peak
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	total
7:00	8:00	0	241	18	0	18	98	0	71	330	776
16:30	17:30	0	346	21	0	19	80	0	89	366	921

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

Total
Light
Heavy





TRANS TRAFFIC SURVEY

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TURNING MOVEMENT SURVEY

Intersection of Careel Head Rd and Shopping Village Entr

GPS *-33.621677, 151.333487*

Date:	Thu 13/06/24
Weather:	Overcast
Suburban:	Avalon
Customer:	CJP

North:	N/A
East:	Careel Head Rd
South:	Shopping Village Entry-Only
West:	Careel Head Rd

Survey Period	AM:	7:00 AM-9:00 AM
	PM:	4:00 PM-6:00 PM
Traffic Peak	AM:	7:00 AM-8:00 AM
	PM:	4:30 PM-5:30 PM

All Vehicles

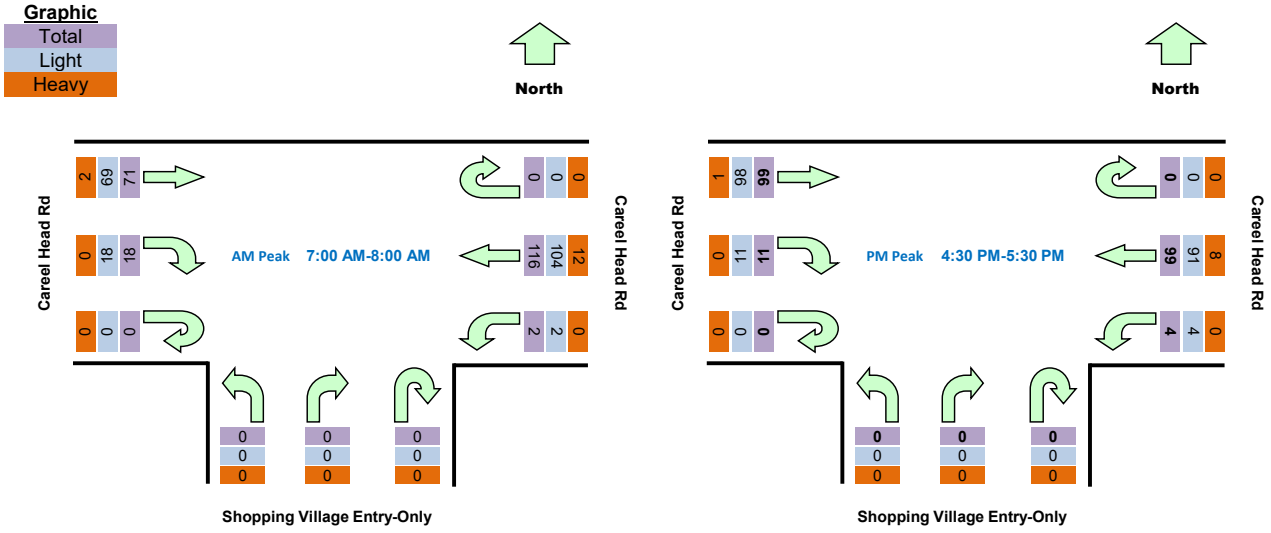
Time		ast Approach Careel Head R			pproach Shopping Village E			est Approach Careel Head F			Hourly Total	
Period Start	Period End	U	WB	L	U	R	L	U	R	EB	Hour	Peak
7:00	7:15	0	20	0	0	0	0	0	12	25	207	Peak
7:15	7:30	0	28	0	0	0	0	0	2	16	195	
7:30	7:45	0	32	1	0	0	0	0	4	16	193	
7:45	8:00	0	36	1	0	0	0	0	0	14	189	
8:00	8:15	0	30	2	0	0	0	0	3	10	195	
8:15	8:30	0	21	1	0	0	0	0	5	17		
8:30	8:45	0	33	2	0	0	0	0	4	10		
8:45	9:00	0	37	0	0	0	0	0	5	15		
16:00	16:15	0	29	0	0	1	0	0	3	22	207	
16:15	16:30	0	21	0	0	0	0	0	6	20	204	
16:30	16:45	0	40	1	0	0	0	0	1	28	213	Peak
16:45	17:00	0	16	1	0	0	0	0	2	16	171	
17:00	17:15	0	19	1	0	0	0	0	2	30	169	
17:15	17:30	0	24	1	0	0	0	0	6	25		
17:30	17:45	0	11	0	0	0	0	0	2	15		
17:45	18:00	0	14	0	0	0	0	0	1	18		

Peak Time		ast Approach Careel Head R			pproach Shopping Village E			est Approach Careel Head F			Peak
Period Start	Period End	U	WB	L	U	R	L	U	R	EB	total
7:00	8:00	0	116	2	0	0	0	0	18	71	207
16:30	17:30	0	99	4	0	0	0	0	11	99	213

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

Total
Light
Heavy



TRANS TRAFFIC SURVEY

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TURNING MOVEMENT SURVEY

Intersection of Shopping Village Exit-Only and Barrenjoey

GPS *-33.622175, 151.333435*

Date:	Thu 13/06/24
Weather:	Overcast
Suburban:	Avalon
Customer:	CJP

North:	Barrenjoey Rd
East:	Shopping Village Exit-Only
South:	Barrenjoey Rd
West:	N/A

Survey Period	AM:	7:00 AM-9:00 AM
	PM:	4:00 PM-6:00 PM
Traffic Peak	AM:	7:00 AM-8:00 AM
	PM:	4:30 PM-5:30 PM

All Vehicles

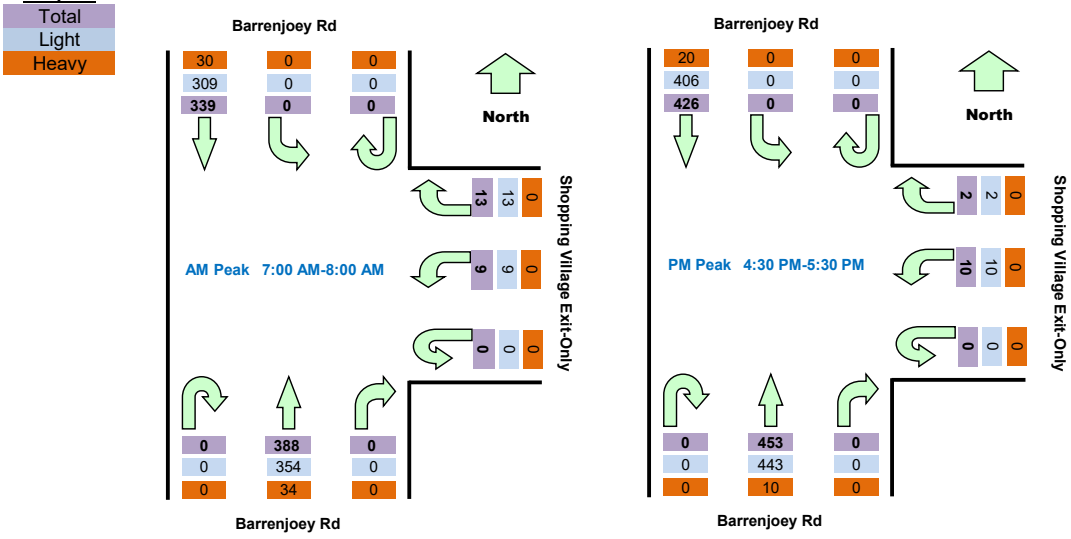
Time		orth Approach Barrenjoey R			pproach Shopping Village E			outh Approach Barrenjoey R			Hourly Total	
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	Hour	Peak
7:00	7:15	0	72	0	0	8	4	0	0	134	749	Peak
7:15	7:30	0	68	0	0	1	1	0	0	97	704	
7:30	7:45	0	103	0	0	3	1	0	0	80	716	
7:45	8:00	0	96	0	0	1	3	0	0	77	711	
8:00	8:15	0	85	0	0	1	7	0	0	80	733	
8:15	8:30	0	87	0	0	1	2	0	0	89		
8:30	8:45	0	92	0	0	2	5	0	0	83		
8:45	9:00	0	115	0	0	3	0	0	0	81		
16:00	16:15	0	90	0	0	0	2	0	0	121	815	
16:15	16:30	0	97	0	0	0	6	0	0	95	863	
16:30	16:45	0	102	0	0	0	1	0	0	109	891	Peak
16:45	17:00	0	82	0	0	0	2	0	0	108	828	
17:00	17:15	0	116	0	0	1	3	0	0	141	805	
17:15	17:30	0	126	0	0	1	4	0	0	95		
17:30	17:45	0	61	0	0	1	1	0	0	86		
17:45	18:00	0	65	0	0	2	3	0	0	99		

Peak Time		orth Approach Barrenjoey R			pproach Shopping Village E			outh Approach Barrenjoey R			Peak
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	total
7:00	8:00	0	339	0	0	13	9	0	0	388	749
16:30	17:30	0	426	0	0	2	10	0	0	453	891

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

Total
Light
Heavy



TRANS TRAFFIC SURVEY

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TURNING MOVEMENT SURVEY

Intersection of Careel Head Rd and Barrenjoey Rd, Avalo

GPS *-33.621727, 151.333323*

Date:	Sat 15/06/24
Weather:	Overcast
Suburban:	Avalon
Customer:	CJP

North:	Barrenjoey Rd
East:	Careel Head Rd
South:	Barrenjoey Rd
West:	N/A

Survey Period	AM:	10:00 AM-12:00 PM
	PM:	12:00 PM-2:00 PM
Traffic Peak	AM:	10:45 AM-11:45 AM
	PM:	12:15 PM-1:15 PM

All Vehicles

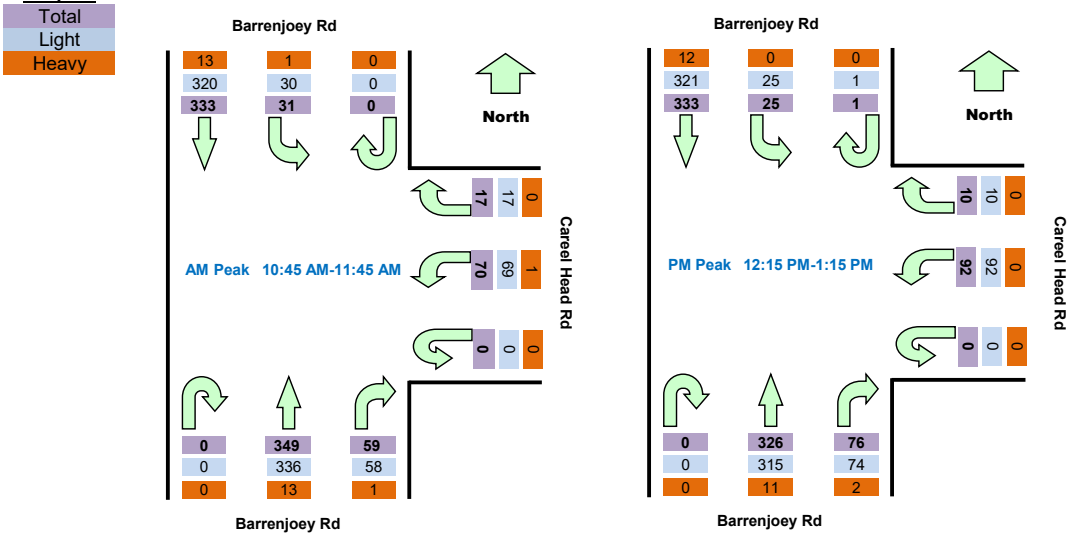
Time		orth Approach Barrenjoey R			ast Approach Careel Head R			outh Approach Barrenjoey R			Hourly Total	
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	Hour	Peak
10:00	10:15	0	77	4	0	2	25	0	14	48	796	
10:15	10:30	0	92	12	0	4	23	1	14	63	844	
10:30	10:45	0	83	11	0	0	23	0	24	68	854	
10:45	11:00	0	89	10	0	8	15	0	16	70	859	Peak
11:00	11:15	0	88	4	0	2	19	0	15	90	849	
11:15	11:30	0	75	7	0	3	17	0	15	102		
11:30	11:45	0	81	10	0	4	19	0	13	87		
11:45	12:00	0	66	7	0	3	18	0	19	85		
12:00	12:15	0	71	5	0	3	11	0	32	85	856	
12:15	12:30	0	91	6	0	3	29	0	22	86	863	Peak
12:30	12:45	0	87	5	0	2	22	0	18	68	831	
12:45	13:00	0	71	8	0	2	23	0	21	85	835	
13:00	13:15	1	84	6	0	3	18	0	15	87	797	
13:15	13:30	0	81	6	0	4	15	0	21	78		
13:30	13:45	0	72	8	0	7	18	0	21	80		
13:45	14:00	0	43	4	0	3	19	0	20	83		

Peak Time		orth Approach Barrenjoey R			ast Approach Careel Head R			outh Approach Barrenjoey R			Peak
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	total
10:45	11:45	0	333	31	0	17	70	0	59	349	859
12:15	13:15	1	333	25	0	10	92	0	76	326	863

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

Total
Light
Heavy



TRANS TRAFFIC SURVEY

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TURNING MOVEMENT SURVEY

Intersection of Careel Head Rd and Shopping Village Entr

GPS *-33.621677, 151.333487*

Date:	Sat 15/06/24
Weather:	Overcast
Suburban:	Avalon
Customer:	CJP

North:	N/A
East:	Careel Head Rd
South:	Shopping Village Entry-Only
West:	Careel Head Rd

Survey Period	AM:	10:00 AM-12:00 PM
	PM:	12:00 PM-2:00 PM
Traffic Peak	AM:	10:00 AM-11:00 AM
	PM:	12:00 PM-1:00 PM

All Vehicles

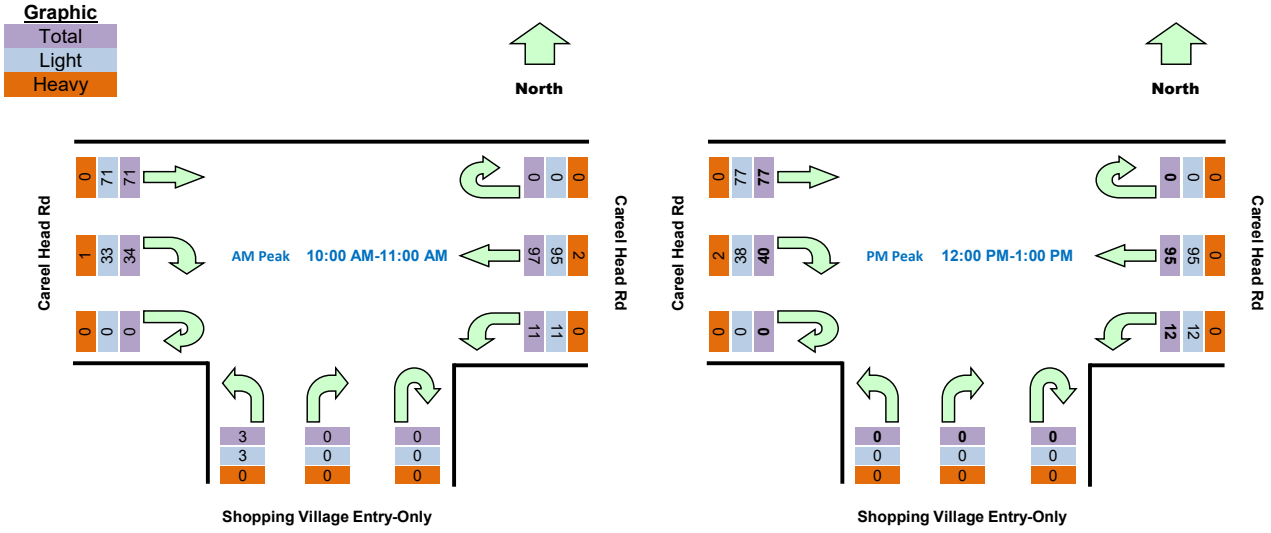
Time		ast Approach Careel Head R			pproach Shopping Village E			est Approach Careel Head F			Hourly Total	
Period Start	**Period End**	**U**	**WB**	**L**	**U**	**R**	**L**	**U**	**R**	**EB**	**Hour**	**Peak**
10:00	10:15	0	26	3	0	0	1	0	2	16	216	Peak
10:15	10:30	0	27	5	0	0	0	0	10	16	208	
10:30	10:45	0	23	2	0	0	0	0	12	23	194	
10:45	11:00	0	21	1	0	0	2	0	10	16	183	
11:00	11:15	0	20	0	0	0	1	0	4	15	186	
11:15	11:30	0	20	2	0	0	0	0	6	16		
11:30	11:45	0	23	3	0	0	0	0	7	16		
11:45	12:00	0	21	6	0	0	0	0	12	14		
12:00	12:15	0	14	8	0	0	0	0	12	25	224	Peak
12:15	12:30	0	32	1	0	0	0	0	10	18	207	
12:30	12:45	0	24	2	0	0	0	0	8	15	196	
12:45	13:00	0	25	1	0	0	0	0	10	19	203	
13:00	13:15	0	20	0	0	0	1	0	7	14	196	
13:15	13:30	0	19	4	0	0	0	0	15	12		
13:30	13:45	0	25	2	0	0	0	0	10	19		
13:45	14:00	0	22	2	0	0	0	0	10	14		

Peak Time		ast Approach Careel Head R			pproach Shopping Village E			est Approach Careel Head F			Peak
Period Start	**Period End**	U	WB	L	U	R	L	U	R	EB	**total**
10:00	11:00	0	97	11	0	0	3	0	34	71	216
12:00	13:00	0	95	12	0	0	0	0	40	77	224

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

Total
Light
Heavy



TRANS TRAFFIC SURVEY

trafficsurvey.com.au

TURNING MOVEMENT SURVEY

Intersection of Shopping Village Exit-Only and Barrenjoey

GPS *-33.622175, 151.333435*

Date:	Sat 15/06/24
Weather:	Overcast
Suburban:	Avalon
Customer:	CJP

North:	Barrenjoey Rd
East:	Shopping Village Exit-Only
South:	Barrenjoey Rd
West:	N/A

Survey Period	AM:	10:00 AM-12:00 PM
	PM:	12:00 PM-2:00 PM
Traffic Peak	AM:	11:00 AM-12:00 PM
	PM:	12:15 PM-1:15 PM

All Vehicles

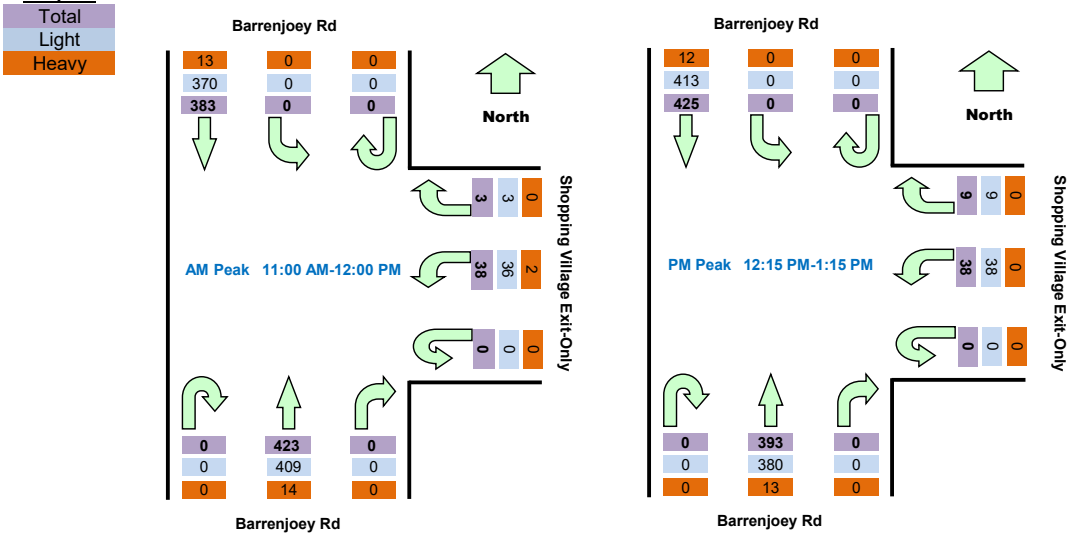
Time		orth Approach Barrenjoey R			pproach Shopping Village E			outh Approach Barrenjoey R			Hourly Total	
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	Hour	Peak
10:00	10:15	0	102	0	0	1	3	0	0	61	774	
10:15	10:30	0	116	0	0	2	5	0	0	76	828	
10:30	10:45	0	106	0	0	1	16	0	0	91	843	
10:45	11:00	0	104	0	0	1	4	0	0	85	842	
11:00	11:15	0	107	0	0	0	9	0	0	105	847	Peak
11:15	11:30	0	92	0	0	1	5	0	0	116		
11:30	11:45	0	100	0	0	0	13	0	0	100		
11:45	12:00	0	84	0	0	2	11	0	0	102		
12:00	12:15	0	82	0	0	5	9	0	0	112	860	
12:15	12:30	0	120	0	0	3	14	0	0	105	865	Peak
12:30	12:45	0	109	0	0	5	9	0	0	81	831	
12:45	13:00	0	94	0	0	1	6	0	0	105	827	
13:00	13:15	0	102	0	0	0	9	0	0	102	792	
13:15	13:30	0	96	0	0	2	13	0	0	97		
13:30	13:45	0	90	0	0	9	9	0	0	92		
13:45	14:00	0	62	0	0	4	6	0	0	99		

Peak Time		orth Approach Barrenjoey R			pproach Shopping Village E			outh Approach Barrenjoey R			Peak total
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	
11:00	12:00	0	383	0	0	3	38	0	0	423	847
12:15	13:15	0	425	0	0	9	38	0	0	393	865

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

Total
Light
Heavy



CJP | CONSULTING ENGINEERS

Appendix C

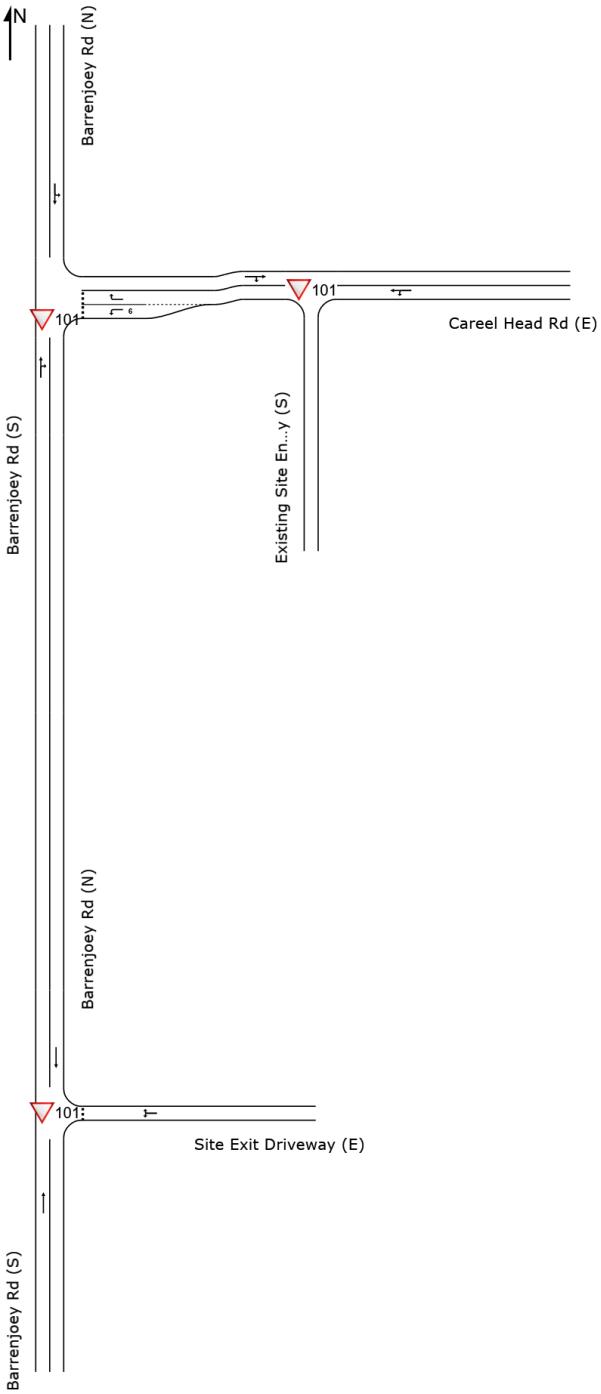
SIDRA Movement Summaries

NETWORK LAYOUT

Network: N101 [Existing Network AM (Network Folder: General)]

New Network
Network Category: (None)

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



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
▽101	NA	Barrenjoey Rd & Careel Head Rd Existing AM
▽101	NA	Careel Head Rd & Site Entry Driveway Existing AM
▽101	NA	Barrenjoey Rd & Site Exit Driveway Existing AM

MOVEMENT SUMMARY

Site: 101 [Barrenjoey Rd & Careel Head Rd Existing AM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Existing Network AM (Network Folder: General)]

Barrenjoey Rd & Careel Head Rd, Avalon
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Barrenjoey Rd (S)															
2	T1	All MCs	330	10.0	330	10.0	0.230	0.3	LOS A	0.6	4.2	0.16	0.19	0.16	58.0
3	R2	All MCs	71	0.0	71	0.0	0.230	4.7	LOS A	0.6	4.2	0.16	0.19	0.16	45.3
Approach			401	8.2	401	8.2	0.230	1.1	NA	0.6	4.2	0.16	0.19	0.16	57.7
East: Careel Head Rd (E)															
4	L2	All MCs	98	10.0	98	10.0	0.080	2.8	LOS A	0.3	2.4	0.34	0.49	0.34	18.1
6	R2	All MCs	18	0.0	18	0.0	0.028	5.0	LOS A	0.1	0.6	0.50	0.65	0.50	47.0
Approach			116	8.4	116	8.4	0.080	3.1	LOS A	0.3	2.4	0.37	0.51	0.37	35.2
North: Barrenjoey Rd (N)															
7	L2	All MCs	18	0.0	18	0.0	0.141	5.6	LOS A	0.0	0.0	0.00	0.04	0.00	59.1
8	T1	All MCs	241	10.0	241	10.0	0.141	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	59.1
Approach			259	9.3	259	9.3	0.141	0.4	NA	0.0	0.0	0.00	0.04	0.00	59.1
All Vehicles			776	8.6	776	8.6	0.230	1.2	NA	0.6	4.2	0.14	0.19	0.14	56.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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: 101 [Careel Head Rd & Site Entry Driveway Existing AM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Existing Network AM (Network Folder: General)]

Careel Head Rd & Site Entry Driveway, Avalon
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Careel Head Rd (E)															
4	L2	All MCs	2	0.0	2	0.0	0.064	3.5	LOS A	0.0	0.0	0.00	0.01	0.00	39.1
5	T1	All MCs	116	10.0	116	10.0	0.064	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	39.9
Approach			118	9.8	118	9.8	0.064	0.1	NA	0.0	0.0	0.00	0.01	0.00	39.9
West: Careel Head Rd (W)															
11	T1	All MCs	71	3.0	71	3.0	0.048	0.1	LOS A	0.1	0.8	0.10	0.14	0.10	39.5
12	R2	All MCs	18	0.0	18	0.0	0.048	2.3	LOS A	0.1	0.8	0.10	0.14	0.10	22.8
Approach			89	2.4	89	2.4	0.048	0.6	NA	0.1	0.8	0.10	0.14	0.10	38.8
All Vehicles			207	6.6	207	6.6	0.064	0.3	NA	0.1	0.8	0.04	0.06	0.04	39.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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: 101 [Barrenjoey Rd & Site Exit Driveway Existing AM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Existing Network AM (Network Folder: General)]

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

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Barrenjoey Rd (S)															
2	T1	All MCs	388	10.0	388	10.0	0.212	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			388	10.0	388	10.0	0.212	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.9
East: Site Exit Driveway (E)															
4	L2	All MCs	9	0.0	9	0.0	0.029	1.2	LOS A	0.1	0.7	0.49	0.45	0.49	44.7
6	R2	All MCs	13	0.0	13	0.0	0.029	4.9	LOS A	0.1	0.7	0.49	0.45	0.49	13.9
Approach			22	0.0	22	0.0	0.029	3.4	LOS A	0.1	0.7	0.49	0.45	0.49	36.5
North: Barrenjoey Rd (N)															
8	T1	All MCs	339	10.0	339	10.0	0.185	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			339	10.0	339	10.0	0.185	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
All Vehicles			749	9.7	749	9.7	0.212	0.1	NA	0.1	0.7	0.01	0.01	0.01	59.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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: 101 [Barrenjoey Rd & Careel Head Rd Existing PM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Existing Network PM (Network Folder: General)]

Barrenjoey Rd & Careel Head Rd, Avalon
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Barrenjoey Rd (S)															
2	T1	All MCs	366	3.0	366	3.0	0.263	0.5	LOS A	0.8	5.7	0.22	0.25	0.22	57.5
3	R2	All MCs	89	0.0	89	0.0	0.263	5.3	LOS A	0.8	5.7	0.22	0.25	0.22	42.3
Approach			455	2.4	455	2.4	0.263	1.4	NA	0.8	5.7	0.22	0.25	0.22	57.0
East: Careel Head Rd (E)															
4	L2	All MCs	80	10.0	80	10.0	0.073	3.3	LOS A	0.3	2.1	0.41	0.53	0.41	16.6
6	R2	All MCs	19	0.0	19	0.0	0.035	6.1	LOS A	0.1	0.7	0.58	0.73	0.58	45.7
Approach			99	8.1	99	8.1	0.073	3.8	LOS A	0.3	2.1	0.44	0.57	0.44	35.1
North: Barrenjoey Rd (N)															
7	L2	All MCs	21	0.0	21	0.0	0.192	5.6	LOS A	0.0	0.0	0.00	0.03	0.00	59.3
8	T1	All MCs	346	3.0	346	3.0	0.192	0.1	LOS A	0.0	0.0	0.00	0.03	0.00	59.3
Approach			367	2.8	367	2.8	0.192	0.4	NA	0.0	0.0	0.00	0.03	0.00	59.3
All Vehicles			921	3.2	921	3.2	0.263	1.3	NA	0.8	5.7	0.16	0.20	0.16	57.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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: 101 [Careel Head Rd & Site Entry Driveway Existing PM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Existing Network PM (Network Folder: General)]

Careel Head Rd & Site Entry Driveway, Avalon
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Careel Head Rd (E)															
4	L2	All MCs	4	0.0	4	0.0	0.056	3.5	LOS A	0.0	0.0	0.00	0.02	0.00	39.0
5	T1	All MCs	99	10.0	99	10.0	0.056	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	39.9
Approach			103	9.6	103	9.6	0.056	0.2	NA	0.0	0.0	0.00	0.02	0.00	39.8
West: Careel Head Rd (W)															
11	T1	All MCs	99	3.0	99	3.0	0.059	0.0	LOS A	0.1	0.5	0.05	0.07	0.05	39.8
12	R2	All MCs	11	0.0	11	0.0	0.059	2.3	LOS A	0.1	0.5	0.05	0.07	0.05	23.7
Approach			110	2.7	110	2.7	0.059	0.3	NA	0.1	0.5	0.05	0.07	0.05	39.5
All Vehicles			213	6.0	213	6.0	0.059	0.2	NA	0.1	0.5	0.03	0.04	0.03	39.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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: 101 [Barrenjoey Rd & Site Exit Driveway Existing PM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Existing Network PM (Network Folder: General)]

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

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Barrenjoey Rd (S)															
2	T1	All MCs	453	3.0	453	3.0	0.237	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			453	3.0	453	3.0	0.237	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.9
East: Site Exit Driveway (E)															
4	L2	All MCs	10	0.0	10	0.0	0.013	1.5	LOS A	0.0	0.3	0.47	0.33	0.47	45.6
6	R2	All MCs	2	0.0	2	0.0	0.013	6.0	LOS A	0.0	0.3	0.47	0.33	0.47	15.6
Approach			12	0.0	12	0.0	0.013	2.2	LOS A	0.0	0.3	0.47	0.33	0.47	44.3
North: Barrenjoey Rd (N)															
8	T1	All MCs	426	5.0	426	5.0	0.226	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			426	5.0	426	5.0	0.226	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
All Vehicles			891	3.9	891	3.9	0.237	0.1	NA	0.0	0.3	0.01	0.00	0.01	59.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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: 101 [Barrenjoey Rd & Careel Head Rd Existing SAT (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Existing Network SAT (Network Folder: General)]

Barrenjoey Rd & Careel Head Rd, Avalon
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Barrenjoey Rd (S)															
2	T1	All MCs	326	3.0	326	3.0	0.231	0.5	LOS A	0.7	4.7	0.21	0.24	0.21	57.6
3	R2	All MCs	76	0.0	76	0.0	0.231	5.2	LOS A	0.7	4.7	0.21	0.24	0.21	43.1
Approach			402	2.4	402	2.4	0.231	1.4	NA	0.7	4.7	0.21	0.24	0.21	57.2
East: Careel Head Rd (E)															
4	L2	All MCs	92	0.0	92	0.0	0.077	3.0	LOS A	0.3	2.1	0.39	0.53	0.39	17.4
6	R2	All MCs	10	0.0	10	0.0	0.017	5.5	LOS A	0.1	0.4	0.54	0.66	0.54	46.5
Approach			102	0.0	102	0.0	0.077	3.3	LOS A	0.3	2.1	0.40	0.54	0.40	30.5
North: Barrenjoey Rd (N)															
7	L2	All MCs	25	0.0	25	0.0	0.188	5.6	LOS A	0.0	0.0	0.00	0.04	0.00	59.1
8	T1	All MCs	333	3.0	333	3.0	0.188	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	59.1
Approach			358	2.8	358	2.8	0.188	0.4	NA	0.0	0.0	0.00	0.04	0.00	59.1
All Vehicles			862	2.3	862	2.3	0.231	1.2	NA	0.7	4.7	0.14	0.19	0.14	57.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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: 101 [Careel Head Rd & Site Entry Driveway Existing SAT (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Existing Network SAT (Network Folder: General)]

Careel Head Rd & Site Entry Driveway, Avalon
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Careel Head Rd (E)															
4	L2	All MCs	4	0.0	4	0.0	0.054	3.5	LOS A	0.0	0.0	0.00	0.02	0.00	39.0
5	T1	All MCs	101	0.0	101	0.0	0.054	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	39.9
Approach			105	0.0	105	0.0	0.054	0.1	NA	0.0	0.0	0.00	0.02	0.00	39.8
West: Careel Head Rd (W)															
11	T1	All MCs	66	0.0	66	0.0	0.056	0.2	LOS A	0.2	1.4	0.15	0.21	0.15	39.2
12	R2	All MCs	35	0.0	35	0.0	0.056	2.2	LOS A	0.2	1.4	0.15	0.21	0.15	21.9
Approach			101	0.0	101	0.0	0.056	0.9	NA	0.2	1.4	0.15	0.21	0.15	37.8
All Vehicles			206	0.0	206	0.0	0.056	0.5	NA	0.2	1.4	0.07	0.11	0.07	39.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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: 101 [Barrenjoey Rd & Site Exit Driveway Existing SAT (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Existing Network SAT (Network Folder: General)]

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

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Barrenjoey Rd (S)															
2	T1	All MCs	393	3.0	393	3.0	0.205	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			393	3.0	393	3.0	0.205	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.9
East: Site Exit Driveway (E)															
4	L2	All MCs	38	0.0	38	0.0	0.052	1.6	LOS A	0.2	1.3	0.47	0.39	0.47	45.6
6	R2	All MCs	9	0.0	9	0.0	0.052	5.6	LOS A	0.2	1.3	0.47	0.39	0.47	15.5
Approach			47	0.0	47	0.0	0.052	2.3	LOS A	0.2	1.3	0.47	0.39	0.47	43.9
North: Barrenjoey Rd (N)															
8	T1	All MCs	425	3.0	425	3.0	0.222	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			425	3.0	425	3.0	0.222	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
All Vehicles			865	2.8	865	2.8	0.222	0.2	NA	0.2	1.3	0.03	0.02	0.03	58.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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.

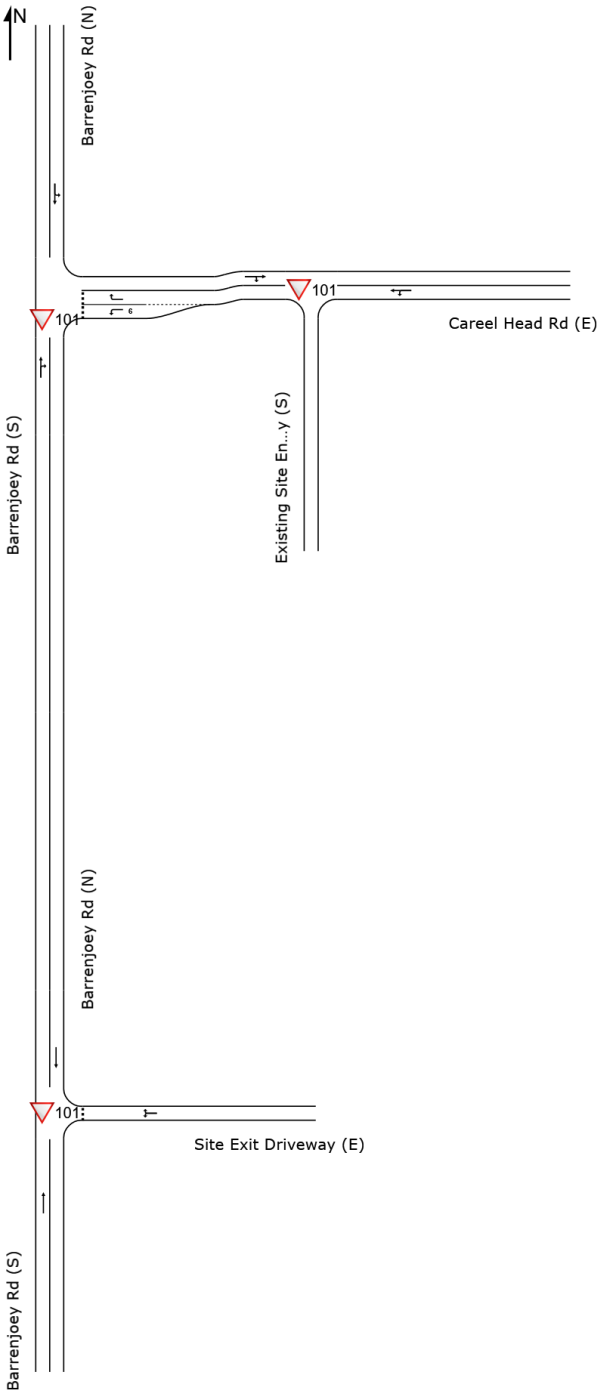
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

NETWORK LAYOUT

Network: N101 [Proposed Network AM (Network Folder: General)]

New Network
Network Category: (None)

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



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
▽101	NA	Barrenjoey Rd & Careel Head Rd Proposed AM
▽101	NA	Careel Head Rd & Site Entry Driveway Proposed AM
▽101	NA	Barrenjoey Rd & Site Exit Driveway Proposed AM

MOVEMENT SUMMARY

Site: 101 [Barrenjoey Rd & Careel Head Rd Proposed AM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Proposed Network AM (Network Folder: General)]

Barrenjoey Rd & Careel Head Rd, Avalon
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Barrenjoey Rd (S)															
2	T1	All MCs	345	10.0	345	10.0	0.257	0.4	LOS A	0.8	5.8	0.20	0.24	0.20	57.6
3	R2	All MCs	97	0.0	97	0.0	0.257	4.8	LOS A	0.8	5.8	0.20	0.24	0.20	42.7
Approach			442	7.8	442	7.8	0.257	1.3	NA	0.8	5.8	0.20	0.24	0.20	57.0
East: Careel Head Rd (E)															
4	L2	All MCs	98	10.0	98	10.0	0.080	2.8	LOS A	0.3	2.4	0.34	0.49	0.34	18.1
6	R2	All MCs	18	0.0	18	0.0	0.029	5.4	LOS A	0.1	0.6	0.53	0.67	0.53	46.6
Approach			116	8.4	116	8.4	0.080	3.2	LOS A	0.3	2.4	0.37	0.52	0.37	35.0
North: Barrenjoey Rd (N)															
7	L2	All MCs	23	0.0	23	0.0	0.144	5.6	LOS A	0.0	0.0	0.00	0.05	0.00	58.9
8	T1	All MCs	241	10.0	241	10.0	0.144	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	58.9
Approach			264	9.1	264	9.1	0.144	0.5	NA	0.0	0.0	0.00	0.05	0.00	58.9
All Vehicles			822	8.3	822	8.3	0.257	1.3	NA	0.8	5.8	0.16	0.22	0.16	56.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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: 101 [Careel Head Rd & Site Entry Driveway Proposed AM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Proposed Network AM (Network Folder: General)]

Careel Head Rd & Site Entry Driveway, Avalon
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Careel Head Rd (E)															
4	L2	All MCs	5	0.0	5	0.0	0.066	3.5	LOS A	0.0	0.0	0.00	0.02	0.00	39.0
5	T1	All MCs	116	10.0	116	10.0	0.066	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	39.8
Approach			121	9.6	121	9.6	0.066	0.2	NA	0.0	0.0	0.00	0.02	0.00	39.8
West: Careel Head Rd (W)															
11	T1	All MCs	74	3.0	74	3.0	0.068	0.2	LOS A	0.3	1.8	0.18	0.24	0.18	39.1
12	R2	All MCs	46	0.0	46	0.0	0.068	2.3	LOS A	0.3	1.8	0.18	0.24	0.18	21.5
Approach			120	1.9	120	1.9	0.068	1.0	NA	0.3	1.8	0.18	0.24	0.18	37.4
All Vehicles			241	5.7	241	5.7	0.068	0.6	NA	0.3	1.8	0.09	0.13	0.09	38.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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: 101 [Barrenjoey Rd & Site Exit Driveway Proposed AM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Proposed Network AM (Network Folder: General)]

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

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Barrenjoey Rd (S)															
2	T1	All MCs	411	10.0	411	10.0	0.224	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			411	10.0	411	10.0	0.224	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.9
East: Site Exit Driveway (E)															
4	L2	All MCs	22	0.0	22	0.0	0.072	1.2	LOS A	0.2	1.7	0.50	0.49	0.50	44.5
6	R2	All MCs	31	0.0	31	0.0	0.072	5.3	LOS A	0.2	1.7	0.50	0.49	0.50	13.6
Approach			53	0.0	53	0.0	0.072	3.6	LOS A	0.2	1.7	0.50	0.49	0.50	36.3
North: Barrenjoey Rd (N)															
8	T1	All MCs	339	10.0	339	10.0	0.185	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			339	10.0	339	10.0	0.185	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
All Vehicles			803	9.3	803	9.3	0.224	0.3	NA	0.2	1.7	0.03	0.03	0.03	58.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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: 101 [Barrenjoey Rd & Careel Head Rd Proposed PM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Proposed Network PM (Network Folder: General)]

Barrenjoey Rd & Careel Head Rd, Avalon
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Barrenjoey Rd (S)															
2	T1	All MCs	371	3.0	371	3.0	0.284	0.6	LOS A	1.0	7.0	0.26	0.30	0.26	57.0
3	R2	All MCs	111	0.0	111	0.0	0.284	5.3	LOS A	1.0	7.0	0.26	0.30	0.26	40.1
Approach			482	2.3	482	2.3	0.284	1.7	NA	1.0	7.0	0.26	0.30	0.26	56.3
East: Careel Head Rd (E)															
4	L2	All MCs	80	10.0	80	10.0	0.073	3.3	LOS A	0.3	2.1	0.41	0.53	0.41	16.6
6	R2	All MCs	19	0.0	19	0.0	0.036	6.5	LOS A	0.1	0.8	0.60	0.75	0.60	45.4
Approach			99	8.1	99	8.1	0.073	3.9	LOS A	0.3	2.1	0.44	0.58	0.44	35.0
North: Barrenjoey Rd (N)															
7	L2	All MCs	26	0.0	26	0.0	0.195	5.6	LOS A	0.0	0.0	0.00	0.04	0.00	59.1
8	T1	All MCs	346	3.0	346	3.0	0.195	0.1	LOS A	0.0	0.0	0.00	0.04	0.00	59.1
Approach			372	2.8	372	2.8	0.195	0.4	NA	0.0	0.0	0.00	0.04	0.00	59.1
All Vehicles			953	3.1	953	3.1	0.284	1.4	NA	1.0	7.0	0.18	0.23	0.18	56.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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: 101 [Careel Head Rd & Site Entry Driveway Proposed PM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Proposed Network PM (Network Folder: General)]

Careel Head Rd & Site Entry Driveway, Avalon
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Careel Head Rd (E)															
4	L2	All MCs	14	0.0	14	0.0	0.062	3.5	LOS A	0.0	0.0	0.00	0.06	0.00	38.8
5	T1	All MCs	99	10.0	99	10.0	0.062	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	39.6
Approach			113	8.8	113	8.8	0.062	0.4	NA	0.0	0.0	0.00	0.06	0.00	39.5
West: Careel Head Rd (W)															
11	T1	All MCs	100	3.0	100	3.0	0.075	0.1	LOS A	0.2	1.6	0.13	0.18	0.13	39.4
12	R2	All MCs	37	0.0	37	0.0	0.075	2.3	LOS A	0.2	1.6	0.13	0.18	0.13	22.3
Approach			137	2.2	137	2.2	0.075	0.7	NA	0.2	1.6	0.13	0.18	0.13	38.4
All Vehicles			250	5.2	250	5.2	0.075	0.6	NA	0.2	1.6	0.07	0.12	0.07	38.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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: 101 [Barrenjoey Rd & Site Exit Driveway Proposed PM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Proposed Network PM (Network Folder: General)]

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

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Barrenjoey Rd (S)															
2	T1	All MCs	474	3.0	474	3.0	0.248	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			474	3.0	474	3.0	0.248	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.9
East: Site Exit Driveway (E)															
4	L2	All MCs	41	0.0	41	0.0	0.054	1.6	LOS A	0.2	1.4	0.48	0.39	0.48	45.5
6	R2	All MCs	8	0.0	8	0.0	0.054	6.5	LOS A	0.2	1.4	0.48	0.39	0.48	15.4
Approach			49	0.0	49	0.0	0.054	2.4	LOS A	0.2	1.4	0.48	0.39	0.48	44.1
North: Barrenjoey Rd (N)															
8	T1	All MCs	426	5.0	426	5.0	0.226	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			426	5.0	426	5.0	0.226	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
All Vehicles			949	3.7	949	3.7	0.248	0.2	NA	0.2	1.4	0.02	0.02	0.02	58.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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: 101 [Barrenjoey Rd & Careel Head Rd Proposed SAT (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Proposed Network SAT (Network Folder: General)]

Barrenjoey Rd & Careel Head Rd, Avalon
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Barrenjoey Rd (S)															
2	T1	All MCs	332	3.0	332	3.0	0.255	0.6	LOS A	0.9	6.2	0.26	0.29	0.26	57.1
3	R2	All MCs	101	0.0	101	0.0	0.255	5.2	LOS A	0.9	6.2	0.26	0.29	0.26	40.3
Approach			433	2.3	433	2.3	0.255	1.7	NA	0.9	6.2	0.26	0.29	0.26	56.4
East: Careel Head Rd (E)															
4	L2	All MCs	92	0.0	92	0.0	0.077	3.0	LOS A	0.3	2.1	0.39	0.53	0.39	17.4
6	R2	All MCs	10	0.0	10	0.0	0.017	5.8	LOS A	0.1	0.4	0.56	0.68	0.56	46.1
Approach			102	0.0	102	0.0	0.077	3.3	LOS A	0.3	2.1	0.41	0.54	0.41	30.4
North: Barrenjoey Rd (N)															
7	L2	All MCs	33	0.0	33	0.0	0.192	5.6	LOS A	0.0	0.0	0.00	0.05	0.00	58.9
8	T1	All MCs	333	3.0	333	3.0	0.192	0.1	LOS A	0.0	0.0	0.00	0.05	0.00	58.9
Approach			366	2.7	366	2.7	0.192	0.5	NA	0.0	0.0	0.00	0.05	0.00	58.9
All Vehicles			901	2.2	901	2.2	0.255	1.4	NA	0.9	6.2	0.17	0.22	0.17	56.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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: 101 [Careel Head Rd & Site Entry Driveway Proposed SAT (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Proposed Network SAT (Network Folder: General)]

Careel Head Rd & Site Entry Driveway, Avalon
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Careel Head Rd (E)															
4	L2	All MCs	8	0.0	8	0.0	0.056	3.5	LOS A	0.0	0.0	0.00	0.03	0.00	38.9
5	T1	All MCs	101	0.0	101	0.0	0.056	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	39.8
Approach			109	0.0	109	0.0	0.056	0.3	NA	0.0	0.0	0.00	0.03	0.00	39.7
West: Careel Head Rd (W)															
11	T1	All MCs	67	0.0	67	0.0	0.076	0.2	LOS A	0.3	2.3	0.19	0.28	0.19	38.9
12	R2	All MCs	67	0.0	67	0.0	0.076	2.3	LOS A	0.3	2.3	0.19	0.28	0.19	20.9
Approach			134	0.0	134	0.0	0.076	1.3	NA	0.3	2.3	0.19	0.28	0.19	36.2
All Vehicles			243	0.0	243	0.0	0.076	0.8	NA	0.3	2.3	0.11	0.17	0.11	38.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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: 101 [Barrenjoey Rd & Site Exit Driveway Existing SAT (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Network: N101 [Proposed Network SAT (Network Folder: General)]

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

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Barrenjoey Rd (S)															
2	T1	All MCs	417	3.0	417	3.0	0.218	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			417	3.0	417	3.0	0.218	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.9
East: Site Exit Driveway (E)															
4	L2	All MCs	67	0.0	67	0.0	0.092	1.6	LOS A	0.3	2.3	0.48	0.42	0.48	45.4
6	R2	All MCs	16	0.0	16	0.0	0.092	6.0	LOS A	0.3	2.3	0.48	0.42	0.48	15.3
Approach			83	0.0	83	0.0	0.092	2.5	LOS A	0.3	2.3	0.48	0.42	0.48	43.8
North: Barrenjoey Rd (N)															
8	T1	All MCs	425	3.0	425	3.0	0.222	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			425	3.0	425	3.0	0.222	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
All Vehicles			925	2.7	925	2.7	0.222	0.3	NA	0.3	2.3	0.04	0.04	0.04	58.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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.

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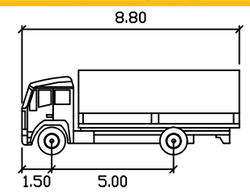
Appendix D

Swept Turn Paths

SWEPT PATH KEY:

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 300mm CLEARANCE FROM VEHICLE BODY



MRV

	meters
Width	: 2.50
Track	: 2.50
Lock to Lock Time	6.0
Steering Angle	: 34.0

5-7 CAREEL HEAD ROAD

5-7 CAREEL HEAD ROAD

712A BARRENJOEY RD

712A BARRENJOEY RD

CAREEL HEAD ROAD

BARRENJOEY ROAD

MRV - Medium Rigid Vehicle

MRV - Medium Rigid Vehicle

Plotted by CJP CONSULTING ENGRS

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PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY SUBJECT TO CHANGE WITHOUT NOTIFICATION

WARNING
THE LOCATIONS OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY.
THE EXACT LOCATIONS SHALL BE PROVEN ON SITE.
ALL EXISTING SERVICES SHOWN ARE NOT GUARANTEED.

1-3 CAREEL HEAD ROAD, AVALON BEACH
CAR PARK COMPLIANCE REVIEW
MRV ENTRY AND EXIT PATH

SCALE 0 3.0 6.0 1:300 @ A3

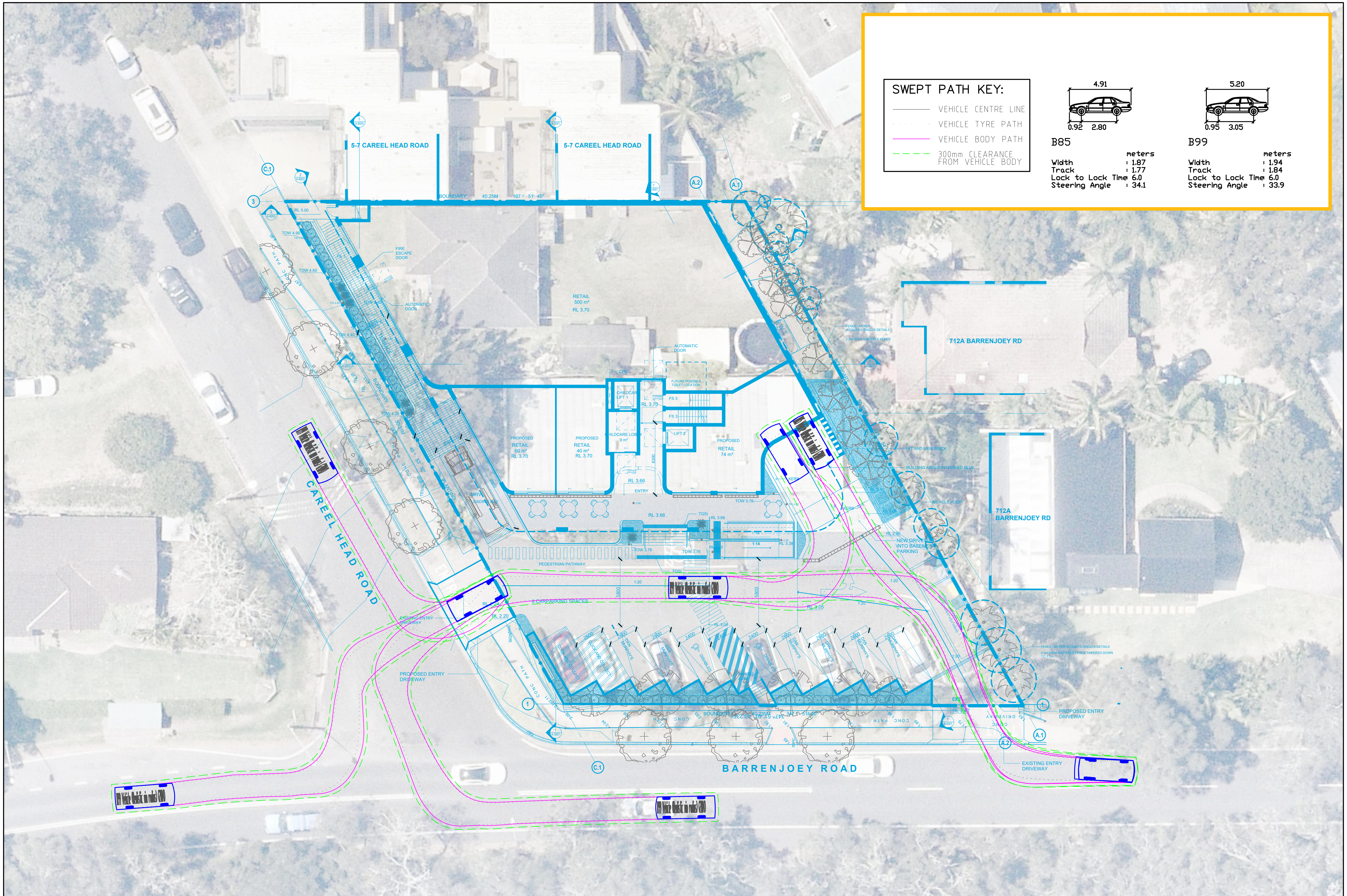
DRAWING NO. 23187-D01-V3

SHEET NO. 01 OF 06

ISSUE DATE 9 August 2024

DRAWN BY D. ALOC

REVIEWED BY C. PALMER



SWEPT PATH KEY:
VEHICLE CENTRE LINE
VEHICLE TYRE PATH
VEHICLE BODY PATH
300mm CLEARANCE FROM VEHICLE BODY
4.91
0.92 2.80
B85
meters
Width : 1.87
Track : 1.77
Lock to Lock Time 6.0
Steering Angle : 34.1
5.20
0.95 3.05
B99
meters
Width : 1.94
Track : 1.84
Lock to Lock Time 6.0
Steering Angle : 33.9
5-7 CAREEL HEAD ROAD
5-7 CAREEL HEAD ROAD
712A BARRENJOEY RD
712A BARRENJOEY RD
CAREEL HEAD ROAD
BARRENJOEY ROAD
RETAIL 500 m² RL 3.70
PROPOSED RETAIL 60 m² RL 3.70
PROPOSED RETAIL 40 m² RL 3.70
PROPOSED RETAIL 74 m²
PEDESTRIAN PATHWAY
EXISTING ENTRY DRIVEWAY
PROPOSED ENTRY DRIVEWAY
PROPOSED ENTRY DRIVEWAY
EXISTING ENTRY DRIVEWAY
NEW DRIVEWAY INTO BASEMENT PARKING

Plotted by CJP CONSULTING ENGRS

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PRELIMINARY PLAN

FOR DISCUSSION PURPOSES ONLY SUBJECT TO CHANGE WITHOUT NOTIFICATION

WARNING

THE LOCATIONS OF UNDERGROUND SERVICES ARE APPROXIMATE ONLY. THE EXACT LOCATIONS SHALL BE PROVEN ON SITE. ALL EXISTING SERVICES SHOWN ARE NOT GUARANTEED.

1-3 CAREEL HEAD ROAD, AVALON BEACH
CAR PARK COMPLIANCE REVIEW
B99 ENTRY PATH AND B85 EXIT PATH

SCALE 0 3.0 6.0 1:300 @ A3

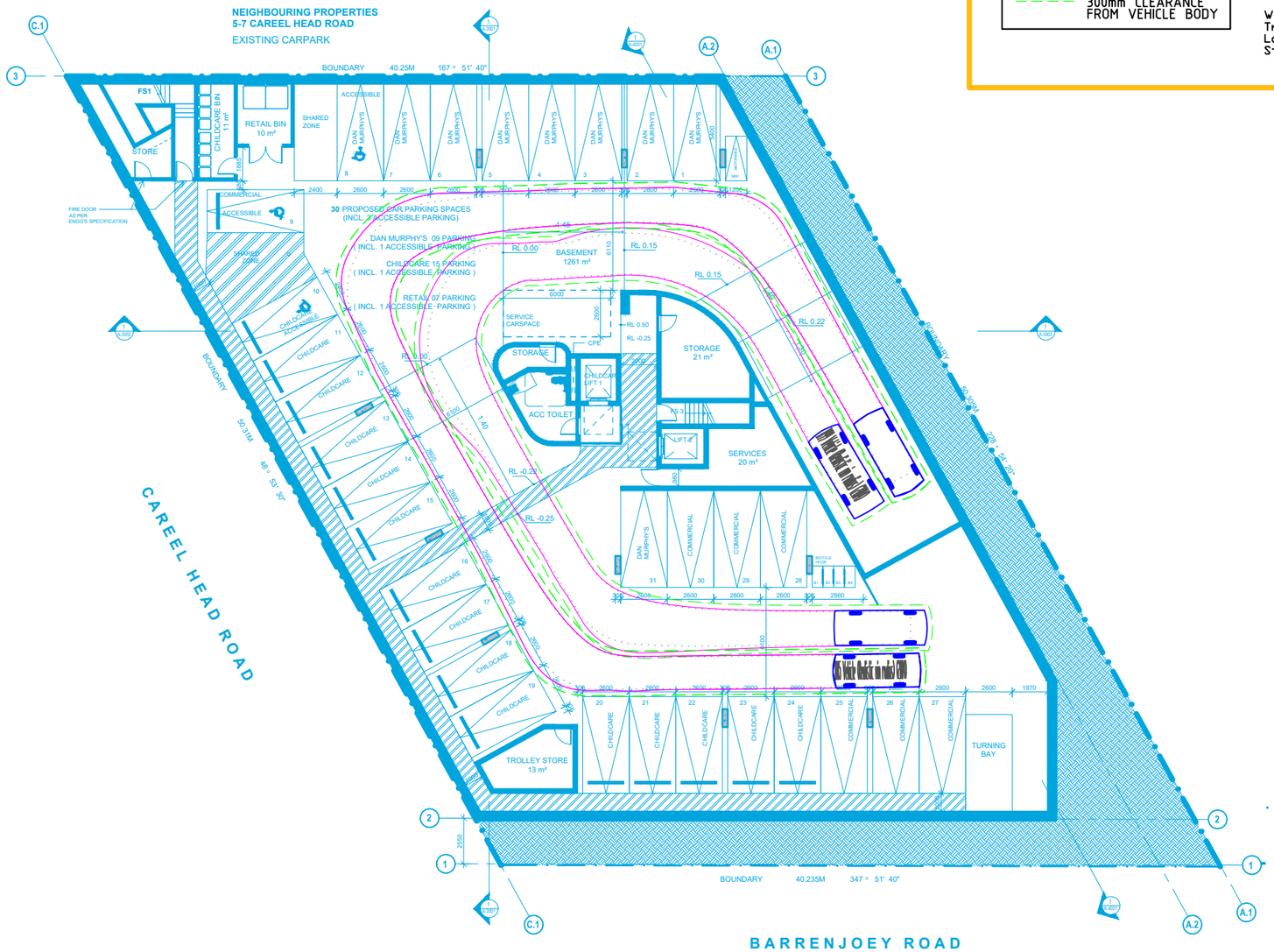
DRAWING NO. 23187-D01-V3

SHEET NO. 02 OF 06

ISSUE DATE 9 August 2024

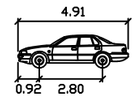
DRAWN BY D. ALOC

REVIEWED BY C. PALMER



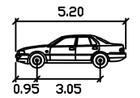
SWEPT PATH KEY:

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 300mm CLEARANCE FROM VEHICLE BODY



B85

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



B99

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

Plotted by CJP CONSULTING ENGRS

CJP CONSULTING ENGINEERS

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PRELIMINARY PLAN

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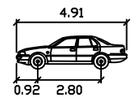

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CAR PARK COMPLIANCE REVIEW
B85 ENTRY AND EXIT PATHS

N

SCALE 0 3.0 6.0 1:300 @ A3

DRAWING NO. 23187-D01-V3
SHEET NO. 04 OF 06
ISSUE DATE 9 August 2024
DRAWN BY D. ALOC
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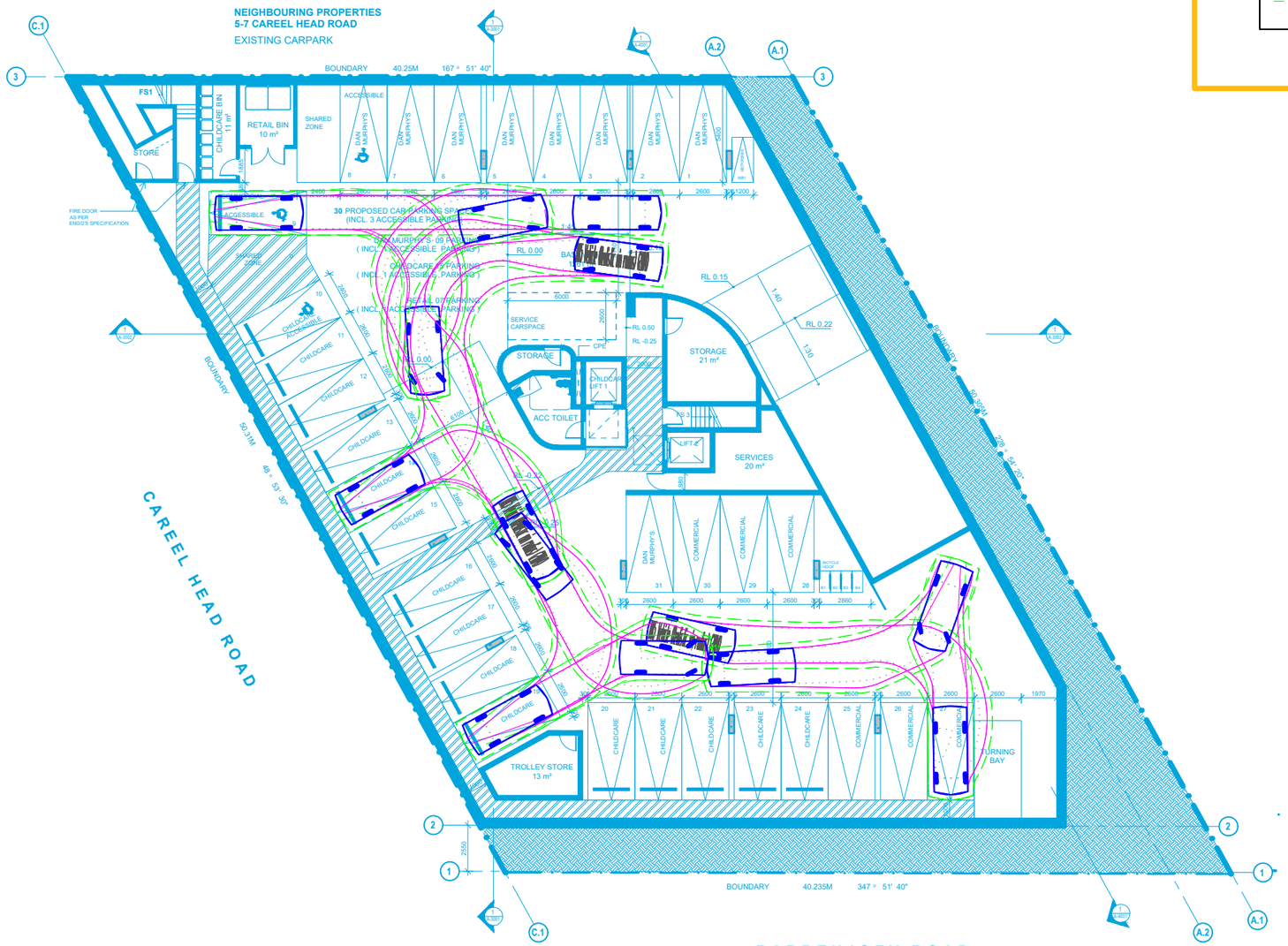

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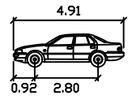
- 300mm CLEARANCE FROM VEHICLE BODY



B85

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

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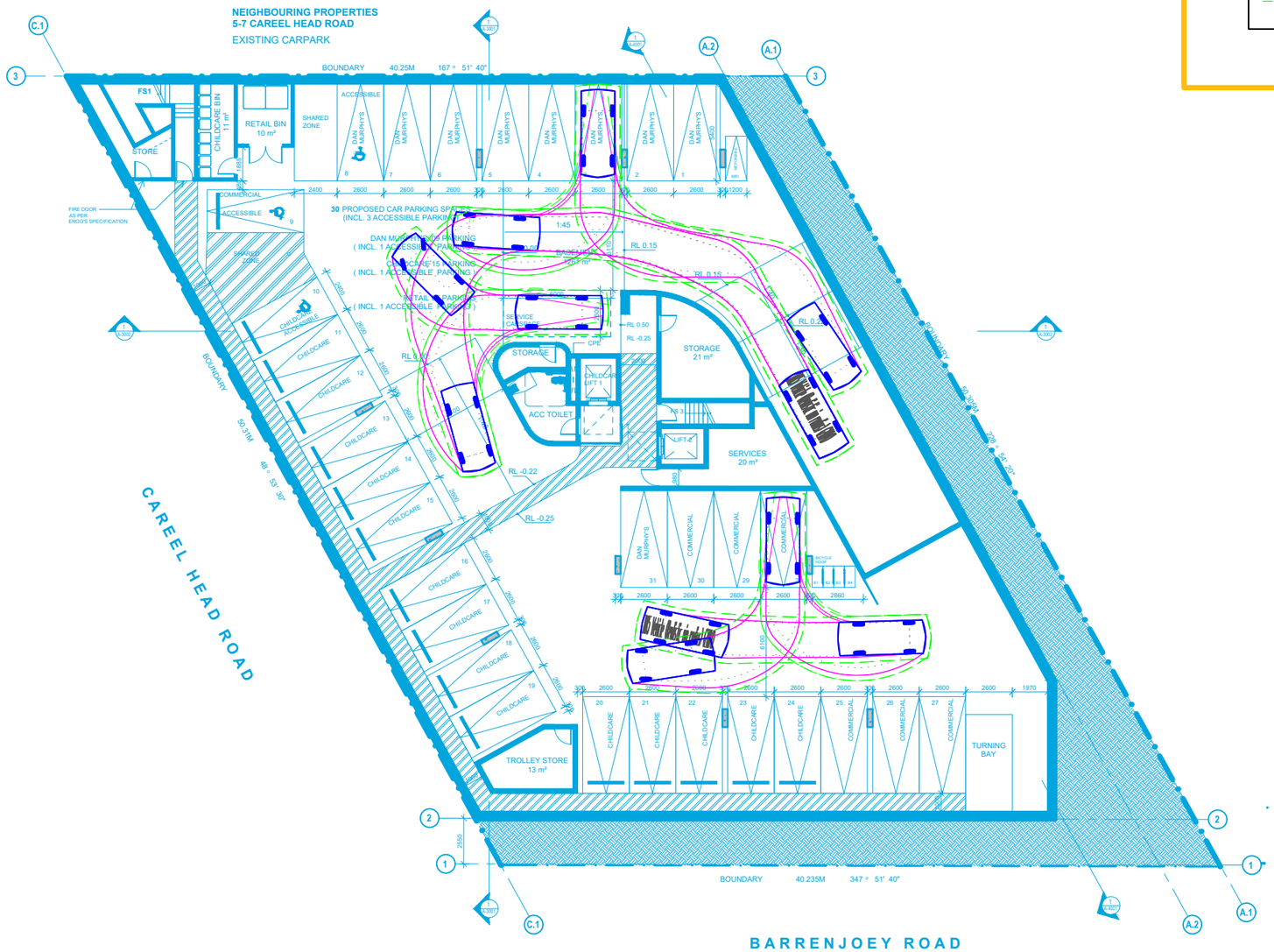
DRAWING NO. 23187-D01-V3 | SHEET NO. 05 OF 06

ISSUE DATE 9 August 2024 | DRAWN BY D. ALOC | REVIEWED BY C. PALMER



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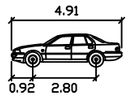
- VEHICLE BODY PATH
- 300mm CLEARANCE FROM VEHICLE BODY



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SHEET NO. 06 OF 06

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