



# Traffic Impact Assessment

**Proposed Club and Seniors Living Development  
221-223 Fisher Road North, Cromer**

Reference: 15.291r02v2  
Date: September 2017

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## Document Verification

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v1	Prepared by:	KB	17 July 2017	<i>Keelin Zellmer</i>
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# 1. Introduction

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TRAFFIX has been commissioned by Dee Why Bowling & Recreation Club Ltd to prepare a Traffic Impact Assessment of a proposed club and seniors living development at 221-223 Fisher Road North, Cromer. An accompanying development application seeks approval for the demolition of the existing Dee Why Bowling Club and for the construction of a new club building and separate building containing 25 independent living units.

The development is situated in the Northern Beaches local government area and has been assessed under the controls of *Warringah Development Control Plan 2011*.

This report documents the findings of our investigations and should be read in the context of the Statement of Environmental Effects prepared separately. The development is not of a size or a scale that requires referral to the Roads and Maritime Services (RMS) under the provisions of *State Environmental Planning Policy (Infrastructure) 2007*.

The report is structured as follows:

- ➊ Section 2: Describes the site and its location
- ➋ Section 3: Documents existing traffic conditions
- ➌ Section 4: Describes the proposed development
- ➍ Section 5: Assesses the parking requirements
- ➎ Section 6: Assesses traffic impacts
- ➏ Section 7: Discusses access and internal design aspects
- ➐ Section 8: Presents the overall study conclusions.



## 2. Location and Site

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The site comprises of the property at 221-223 Fisher Road North in Cromer and is located on the eastern side of this road, opposite Ryrie Avenue. In a regional context, it is situated approximately 2.1 kilometres northwest of Dee Why Beach and 16 kilometres north of the Sydney central business district.

The site has an irregular shaped configuration and has a site area of 11,505m<sup>2</sup>. It has a sole frontage to Fisher Road North to the west that measures 17.55 metres. The site is also bound to the west and south by low density residential developments, industrial developments to the north and east as well as a public reserve to the southeast.

The existing development on-site operates as a club known as the Dee Why Bowling Club. This comprises of a two-storey club building containing 766.46m<sup>2</sup> gross floor area and three bowling greens. The club floor space accommodates bar, dining and ancillary function uses.

The site presently has 39 formally line marked parking spaces, with ample grassed areas that allow for overflow parking. A single vehicular access at Fisher Road North serves the development.

A Location Plan is presented in **Figure 1**, with a Site Plan presented in **Figure 2**. Reference should also be made to the Photographic Record presented in **Appendix A**, which provides an appreciation of the general character of roads and other key attributes in proximity to the site.



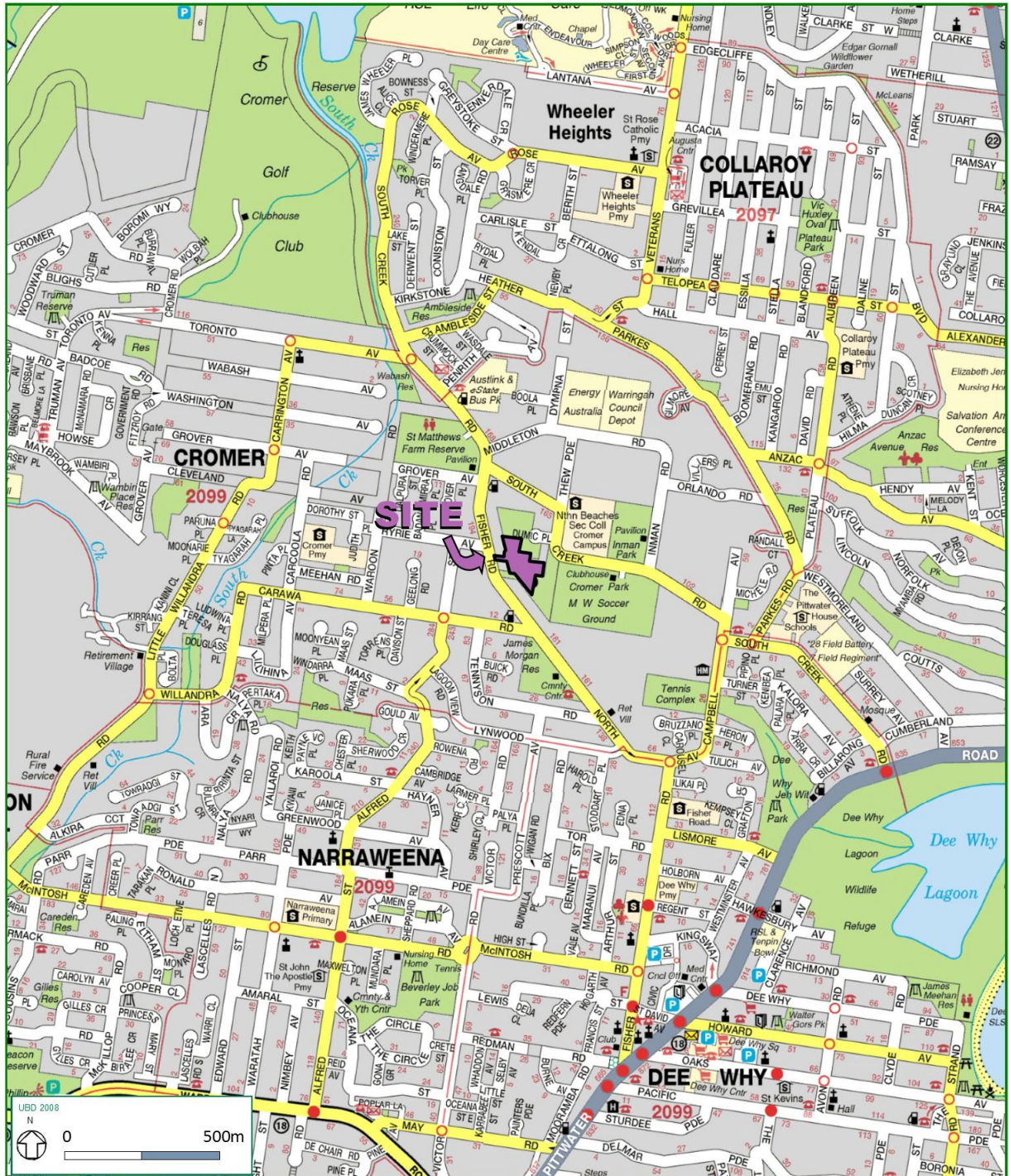


Figure 1: Location Plan





**Figure 2: Site Plan**



## 3. Existing Traffic Conditions

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### 3.1 Road Network

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

- ➊ Pittwater Road: forms part of the RMS Main Road (MR164) and generally runs in a north-south direction between McCarrs Creek Road in the north and Belgrave Street to the south. It carries approximately 47,000 vehicles per day in the vicinity of the site. In the vicinity of the site, Pittwater Road is subject to a 60km/h speed zoning and generally carries three lanes of traffic in either direction within a divided carriageway.
- ➋ Fisher Road North: a local road in the vicinity of the site which forms a Regional Collector Road (RR 7365) south of its intersection with Carawa Road, south of the site. It generally runs in a northwest-southeast direction between Grover Avenue in the north and Fisher Road in the south. Fisher Road North is subject to a 50km/h speed zoning and carries a single lane of traffic in either direction along an undivided carriageway of width 11.5 metres. Parking is generally unrestricted on both kerbsides within the vicinity of the site.
- ➌ Ryrie Avenue: a local road that runs in an east-west direction between Fisher Road North in the east and Waroon Road in the west. It is subject to a 50km/h speed zoning and generally carries a single lane of traffic in either direction within an undivided carriageway of width 10.5 metres.

It can be seen from Figure 3 that the site is conveniently located with respect to the arterial and local road systems serving the region. It is therefore able to effectively distribute traffic onto the wider road network, minimising traffic impacts.



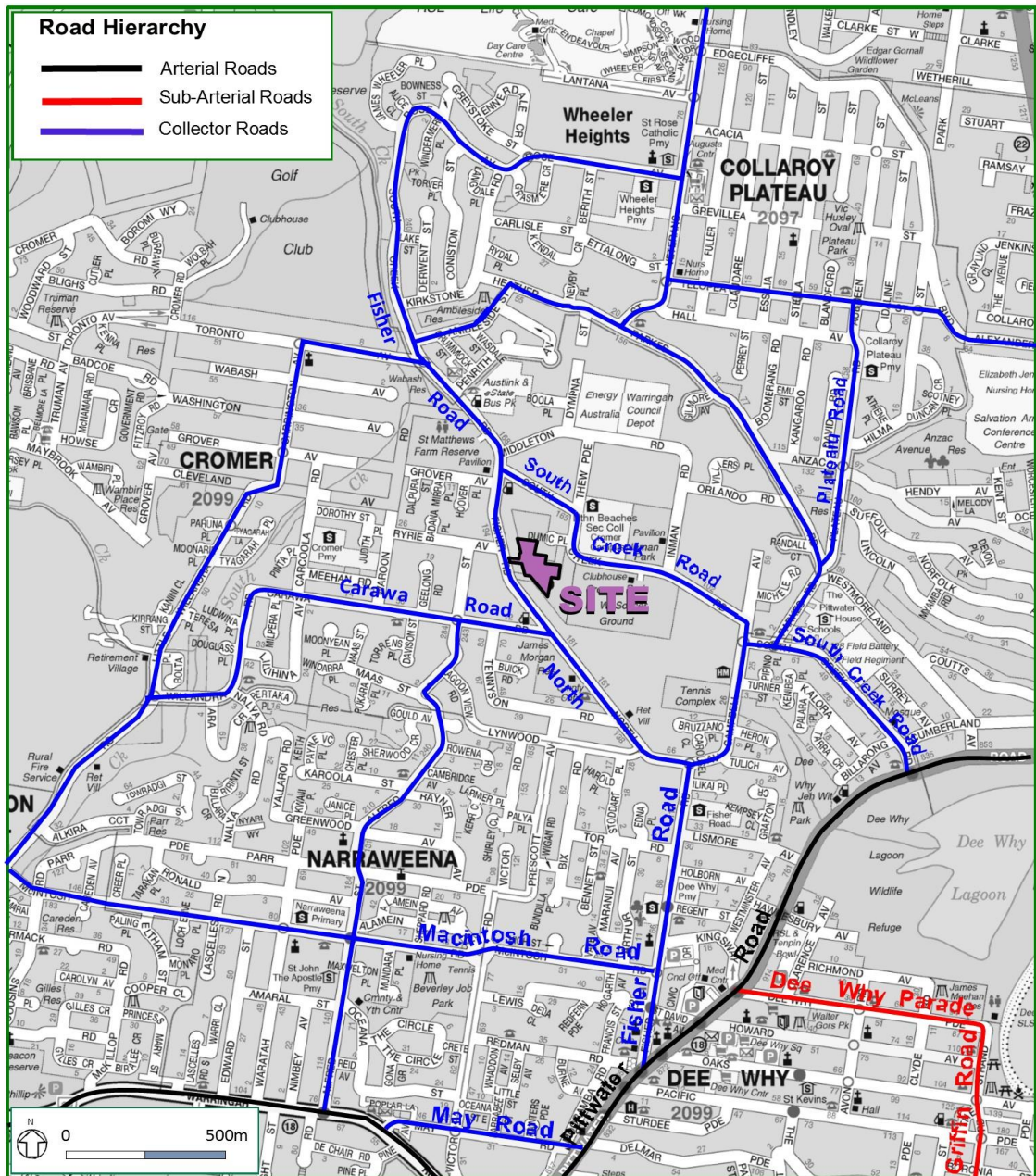


Figure 3: Road Hierarchy



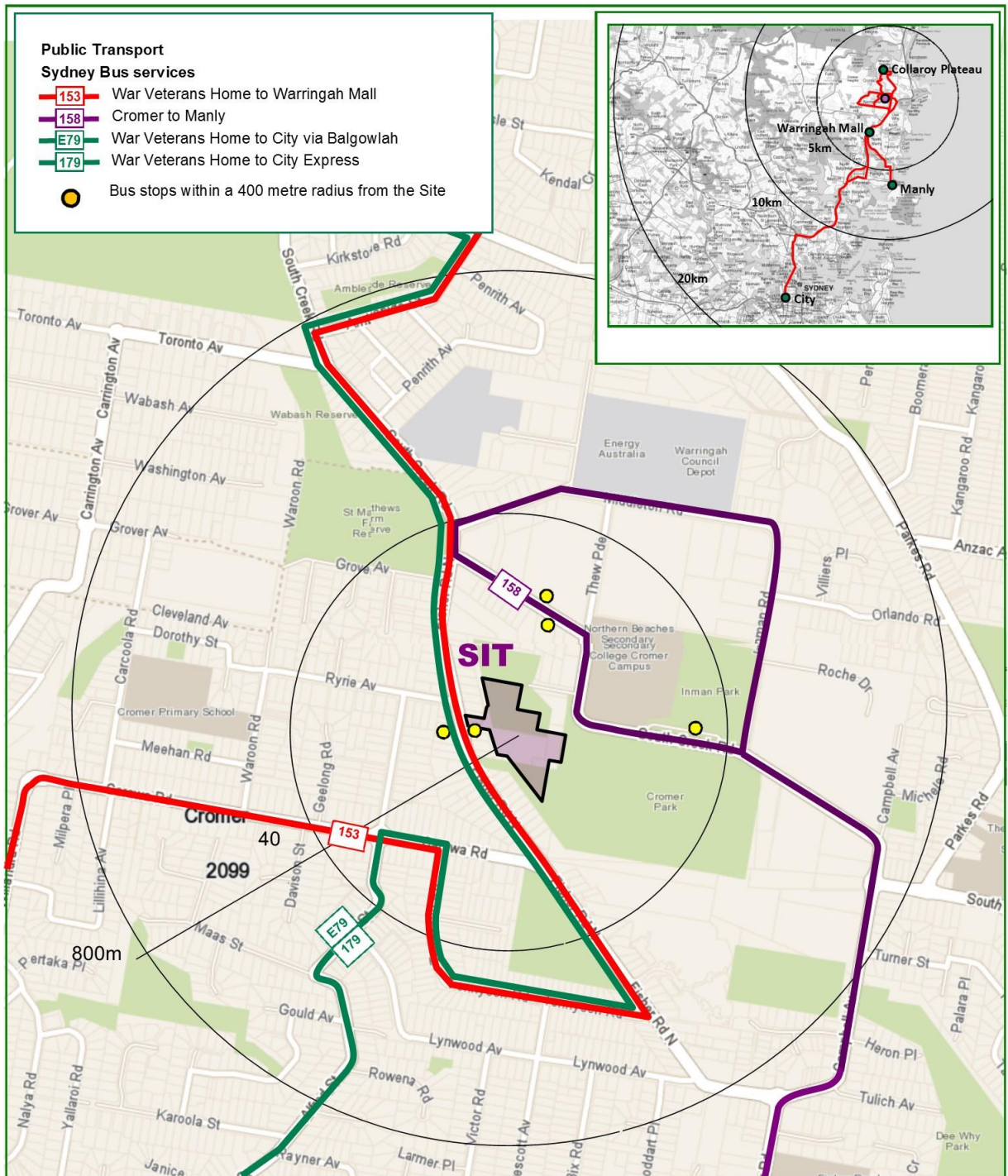
## 3.2 Public Transport

The existing public transport network operating in the locality is shown in **Figure 4**. There is an extensive bus network that operates in the locality with multiple bus stops situated within walking distance of the site, providing high frequency bus service along the Northern Beaches generally, in addition to connections with the City and other regional networks. In this regard, Pittwater Road forms a significant public transport corridor serving the wider region.

The bus stops located immediately adjacent to the site along either side of Fisher Road North near the intersection with Ryrie Avenue provide high frequency bus services in both directions from the War Veterans Memorial in the north to the Sydney central business district in the south via the North Shore (route 179). The bus stops near the intersection with Ryrie Avenue also provide services in both directions from the War Veterans Memorial in the north to Warringah Mall in the south (route 153) providing a limited number of bus services to Warringah Mall via the Northern Beaches.

As such, the site is considered to be well connected to the surrounding area and key regional destinations.





15.291r02v2 TRAFFIX Dee Why Bowling Club - Traffic Impact Assessment





### 3.3 Existing Site Generation

Surveys of the site have previously been undertaken during the regular network AM and PM peak periods on a typical Wednesday in July 2015. A copy of the results are presented in **Appendix B**, which reveal the existing Dee Why Bowling Club generated the following traffic:

- ➡ 1 vehicle trip per hour during the AM peak period (0 in, 1 out); and
- ➡ 54 vehicle trips per hour during the PM peak period (9 in, 45 out).



## 4. Description of Proposed Development

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A detailed description of the proposed development is provided in the Statement of Environmental Effects prepared separately. In summary, approval is sought for the demolition of the existing club building and one bowling green, and for construction of two separate buildings to comprise the following mixed use development:

- ➊ A new club building for the Dee Why Bowling Club which will now comprise of:
  - 1,020m<sup>2</sup> gross floor area of bar, dining and function space;
  - Retention of two (2) bowling greens;
  - Provision for 68 (formalised) parking spaces;
- ➋ A seniors living development containing 25 independent living units, comprising of:
  - 5 x 1 bedroom units;
  - 19 x 2 bedroom units;
  - 1 x 3 bedroom units; and
  - Provision for 30 parking spaces.

The parking requirements and traffic impacts arising from the development are discussed in Sections 5 and 6, respectively. Reference should be made to the plans submitted separately to Council which are presented in **Appendix A**.



## 5. Parking Requirements

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### 5.1 Car Parking

#### 5.1.1 Dee Why Bowling Club

The *Warringah Development Control Plan (DCP) 2011* stipulates that parking for registered club developments should be drawn with developments for a similar purpose.

In this respect, the proposed Dee Why Bowling Club will operate with almost identical operating characteristics, given that the same uses will be retained. Accordingly, parking surveys were undertaken of the existing development on Sunday 26 November 2016 and Friday 2 December 2016, accounting for the busiest trading days for the club. The results, presented in **Appendix C**, reveal that a maximum of 54 vehicles were parked on Friday at 6:45pm and 49 vehicles were parked on Saturday at 2:30pm.

While the car parking demands for both days were similar, a substantially higher peak headcount of 103 patrons (and staff) were recorded for Friday than the peak 62 patrons recorded on Saturday. It was thereafter clarified that an annual Christmas raffle event took place on the Friday which boosted patron numbers above normal levels. A parking demand of 49 vehicles has therefore been adopted as the typical weekday mean peak, whilst the Friday results are considered to be representative of an absolute peak scenario, occurring under extraordinary circumstances.

Based on the existing 766.46m<sup>2</sup> gross floor area of club space, Dee Why Bowling Club generates a typical mean peak demand for 6.39 parking spaces per 100m<sup>2</sup> gross floor area. When this rate is applied to the proposed 1,020m<sup>2</sup> gross floor area of club space, the proposed club would generate a maximum demand for 65 parking spaces.

In response, the proposed development has been designed to accommodate 68 parking spaces for club use, and is therefore expected to contain all regular parking demands generated by Dee Why Bowling Club. Indeed, it is noteworthy that a higher car occupancy on extraordinary days will limit overflow of parking, as evidenced by the Friday survey results.





### 5.1.2 Seniors Living Development

The *Warringah Development Control Plan (DCP) 2011* does not stipulate any parking requirements for Seniors Living Developments. In turn, *State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004* (Seniors Housing SEPP) states that a consent authority must not refuse consent to a development application for a self-contained dwelling on parking grounds if the provision complies with application of the minimum rate shown listed in **Table 1** (where the applicant is not a social housing provider).

**Table 1: Seniors Housing SEPP Rate and Provision**

Unit	Number	Bedrooms	Minimum Parking Rate	Minimum Spaces Required	Spaces Provided
1 Bedroom	5	5	0.5 spaces per bedroom	23	30
2 Bedroom	19	38			
3 Bedroom	1	3			

It can be seen from Table 1 that the proposed development is required to provide a minimum of 23 parking spaces to comply with the Seniors Housing SEPP parking rate. In response, provision for 30 parking spaces has been made, inclusive of five (5) visitor parking spaces, and is therefore compliant with all relevant controls and considered satisfactory.

## 5.2 Accessible Parking

Reference should be made to the report prepared by the applicant's accessibility consultant, regarding all details of accessible parking.



## 5.3 Bicycle Parking

The DCP requires compliance with the following conditions regarding bicycle parking requirements:

- ➊ Bicycle parking facilities must be provided for new buildings and for alterations or to existing buildings. In the case of or additions to existing buildings bicycle parking facilities are required for the additional floor area only.
- ➋ Bicycle parking shall be designed and constructed in accordance with Australian Standard AS 2890.3 – Bicycle Parking Facilities
- ➌ Bicycle parking facilities shall be designed to be an integral part of the development and where visible from public places or streets, will complement the visual quality of the public domain.

Accordingly, it is expected that all bicycle parking facilities will be constructed in compliance with the above conditions. The DCP requires bicycle parking spaces to be provided at the rates outlined in **Table 2** and **Table 3**.

**Table 2: DCP Bicycle Rates and Provision (High-Medium security level spaces) - Resident**

Type	Number of units	Council Parking Rates MINIMUM (High-Medium security level)	Spaces required	Spaces to be provided (High-medium security level)
Independent living units	25	1 per 2 Independent living units	13	13



**Table 3: Council Bicycle Rates and Provision (High-Low security level spaces) – Visitor**

Type	Number of units	Council Parking Rates MINIMUM (High-low security level)	Spaces required	Spaces to be provided (High-Low security level)
Independent living units	25	1 space per 12 Independent living units	2	2

In response, provision for 14 bicycle rails has been made in the basement car park, whilst two visitor bicycle rails could easily be provided on the ground level. It is envisaged that bicycle parking would be designed to be wholly compliant prior to the release of a construction certificate.

## 5.4 Servicing

The DCP states that facilities for the loading and unloading of service, delivery and emergency vehicles are to be appropriate to the size and nature of the development.

In this regard, the Dee Why Bowling Club seeks to retain similar servicing and waste arrangements as per their existing operation. It is advised that the largest vehicle to serve the site would be a 6.4m Small Rigid Vehicle (SRV), where food and beverage deliveries would be consolidated to minimise frequencies.

The proposed development has been designed to allow for servicing within the circulation aisle, with a swept path analysis shown in **Appendix D**, demonstrating how manoeuvring would take place. The nominated point is situated adjacent to the waste and storage rooms, with the basement car park entrance to remain clear. It is noteworthy that two parking spaces will need to be vacant for vehicles from the seniors living development to pass and as such, these spaces will be allocated exclusively for staff use. Deliveries and waste collection for Dee Why Bowling Club will be coordinated and limited to non-peak periods, with details finalised in a management plan.





Waste collection for the seniors living development is proposed on-street from Fisher Road North, and is considered appropriate having regard for the low demands expected.



## 6. Traffic Impacts

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### 6.1 Trip Generation

#### 6.1.1 Proposed Dee Why Bowling Club

Based on the traffic survey of the existing site as outlined in Section 3.3, the proposed Dee Why Bowling Club, being 133% proportionally larger in floor space, is estimated to generate the following traffic:

- ② 1 vehicle trip per hour during the AM peak period (0 in, 1 out); and
- ② 72 vehicle trips per hour during the PM peak period (12 in, 60 out).

#### 6.1.2 Senior Living Development

The RMS *Technical Direction TDT 2013/04a* which supplements the *Guide to Traffic Generating Developments* provides updated traffic generation rates for seniors housing developments. It recommends an hourly trip generation rate of 0.4 vehicle trips per dwelling during both AM and PM peak periods. The Direction also states that the morning peak traffic generation does not generally coincide with the network peak hour. Application of this rate to the proposed 25 independent living units results in the following traffic generation:

- ② 10 vehicle trips per hour during the AM peak period (2 in, 8 out); and
- ② 10 vehicle trips per hour during the PM peak period (8 in, 2 out).

#### 6.1.3 Combined Traffic Generation

The proposed Dee Why Bowling Club and seniors living development are collectively estimated to generate the following traffic:

- ② 11 vehicle trips per hour during the AM peak period (2 in, 9 out); and
- ② 82 vehicle trips per hour during the PM peak period (20 in, 62 out).



#### 6.1.4 Net Traffic Generation

When accounting for the approved use of the site, the proposal is expected to result in the following net increase in traffic generation over existing conditions:

- ② 10 vehicle trips per hour during the AM peak period (0 in, 1 out); and
- ② 28 vehicle trips per hour during the PM peak period (11 in, 17 out).

## 6.2 Peak Period Intersection Performances

For the purposes of the assessment of traffic impacts of this development, surveys were undertaken of the most critical intersection formed by the sites access driveway with Fisher Road North. These were undertaken between the 7-9AM and 4-6PM peak periods.

The results of these surveys, included in **Appendix C**, were analysed using the SIDRA computer program to determine their performance characteristics under existing traffic conditions. The SIDRA model produces a range of outputs, the most useful of which are the Degree of Saturation (DOS) and the intersection delay (worst movement) for priority controlled intersections. These performance measures can be interpreted using the following explanations:

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

**Intersection Delay (worst movement)** – The intersection delay for priority controlled intersections is measured by the worst case movement associated with the intersection and the subsequent time required to wait. The actual delay of the majority of movements at the intersection will be less than the worst case movement. Notwithstanding, the worst case scenario is used to measure the intersection delay time when gauging the performance of a priority controlled intersection.



A summary of the modelled results are provided below. Reference should also be made to the SIDRA outputs provided in **Appendix C** which provide detailed results for individual lanes and approaches.

**Table 4: Intersection Performance: Weekday AM and PM Peak Periods**

Intersection Description	Control Type	Model	Period	Degree of Saturation	Intersection Delay	LOS
Dee Why Bowling Club / Fisher Road North	Priority (giveaway)	Without Development	AM	0.185	8.2	A
			PM	0.235	7.3	A
		With Development	AM	0.185	8.2	A
			PM	0.240	7.4	A

It can be seen from Table 4 that the access for the proposed development will cause no discernible increase delays, with all approaches achieving a Level of Service of A. Furthermore, the maximum 95<sup>th</sup> percentile back of queue distance for any scenario is 2.1m which equates to less than one vehicle. Accordingly, the proposed access is expected to operate satisfactorily.

With respect for external impacts, the net increase in traffic volumes equate to no more than an additional vehicle being generated every two minutes during the regular weekday network peak. This is expected to have minimal impacts on the surrounding road network, notwithstanding that many trips are anticipated to be linked trips associated with patrons arriving after finishing work.



## 7. Access & Internal Design Aspects

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### 7.1 Site Access

The proposed development requires a Category 2 driveway under AS2890.1 (2004), being a combined entry-exit driveway of width 6.0m to 9.0m. In response, the proposed Fisher Road North access will have a width of 6.5m, thereby complying with the standard.

The access has been tested for the largest vehicle expected to enter the site, being a 6.4m SRV. The results of a swept path analysis are presented in **Appendix D**, and demonstrate satisfactory operation.

### 7.2 Internal Design

The internal car park complies with the requirements of AS2890.1 (2004) and AS2890.2 (2002), with the following noteworthy characteristics:

#### 7.2.1 Parking Modules

- ② All perpendicular club and visitor parking spaces (including for seniors living development) have been designed in accordance with a Class 2 user and are provided with a minimum space length of 5.4m a minimum width of 2.5m and a minimum aisle width of 5.8m.
- ② All parallel parking spaces have been designed in accordance with Figure 2.5 of AS2890, with space widths being a minimum of 2.1m, regular space lengths of 5.9m and obstructed space lengths of 6.2m.
- ② Reference should be made to the accessibility consultant's report regarding the design of all accessible parking spaces.
- ② All spaces located adjacent to obstructions of greater than 150mm in height are provided with an additional width of 300mm.
- ② Dead-end aisles are provided with the required 1.0m aisle extension in accordance with Figure 2.3 of AS2890.1.





### 7.2.2 Ramps

- All ramps accessing the club car park have a maximum gradient of 20% (1 in 5) with transitions of 10% (1 in 10).
- Ramps associated with the seniors living basement car park have a maximum gradient of 25% (1 in 4) with transitions of 12.5% (1 in 8).

### 7.2.3 Clear Head heights

- A minimum clear head height of 2.2m is to be provided for all areas as required by AS2890.1. A clear head height of 2.5m is provided above all accessible spaces as required by AS2890.6.

### 7.2.4 Other Considerations

- All columns are required to be located outside of the parking space design envelope shown in Figure 5.2 of AS 2890.1 (2004).
- Appropriate visual splays are to be provided in accordance with the requirements of Figure 3.3 of AS2890.1 at all accesses.
- The internal design complies with the Section 3.4 of AS2890.1 with appropriate queuing areas provided. Furthermore the max gradient of 1:10 for not less than 80% of the queuing length has also been achieved.
- A swept path analysis of all critical movements has been undertaken to confirm geometry and compliance with the relevant standards. The swept path assessment is included in **Appendix D**.

### 7.2.5 Service Area Design

- The internal design of the service area has been undertaken in accordance with the requirements of AS2890.2 for the maximum length vehicle permissible on-site being a 6.4m SRV
- A minimum clear head height of 4.5m is to be provided in all areas traversed by the service vehicle. This height is only to comply with the standard, and could be reduced should the actual intended design vehicle have a lower clearance.
- Any ramps traversed by the SRV should comply with AS2890.2 with a maximum grade not in excess of 1:6.5 (15.4%) and maximum rate of change of 1:12 (8.3%).
- A minimum bay width of 3.5m is to be available when the SRV is parked.



- ② A swept path analysis has been undertaken as permissible under AS2890.2 and confirms the internal design. The swept path assessment is included in **Appendix D**.

In summary the internal configuration of the basement car park and loading areas have been designed in accordance with both AS2890.1 (2004) and AS2890.2 (2002). It is however envisaged that a condition of consent would be imposed requiring compliance with these standards and as such any minor amendments considered necessary (if any) can be dealt with prior to the release of a Construction Certificate.



## 8. Conclusions

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In summary:

- ➊ Approval is sought to reconstruct the Dee Why Bowling Club and construct a separate Seniors Living Development at 221-223 Fisher Road North in Cromer. The club is to contain 1,020m<sup>2</sup> gross floor area of space with two bowling greens, while the seniors living development will contain 25 independent living units.
- ➋ Parking surveys have been undertaken of the existing Dee Why Bowling Club development whereby a typical mean parking demand of 6.39 parking spaces per 100m<sup>2</sup> gross floor area has been established. In accordance with the *Warringah Development Control Plan 2011*, which requires a comparison of a similar development, the proposed club would thereby generate a parking demand for 65 parking spaces. In response, provision for 68 parking spaces has been made for this use, and therefore it is expected that all ordinary parking demands will be accommodated on-site.
- ➌ Application of the parking rate under *State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004* results in the proposed seniors living development requiring a minimum of 23 parking spaces. In response, provision for 30 parking spaces has been made, which therefore complies with this policy and will ensure resident and visitor demands will be accommodated on-site.
- ➍ The proposed development has been assessed to generate an additional 10 vehicle trips per hour over existing conditions during the AM peak period and 28 vehicle trips per hour during the PM peak period. These volumes equate to no more than an additional vehicle trip being generated every two minutes and are expected to have minimal impacts on the surrounding road network. SIDRA Intersection modelling has also been undertaken of the site access, which demonstrates that delays will be negligible and no incidence of queueing.

It is therefore concluded that the proposed development is supportable on traffic planning grounds and will operate safely and efficiently.



## Appendix A

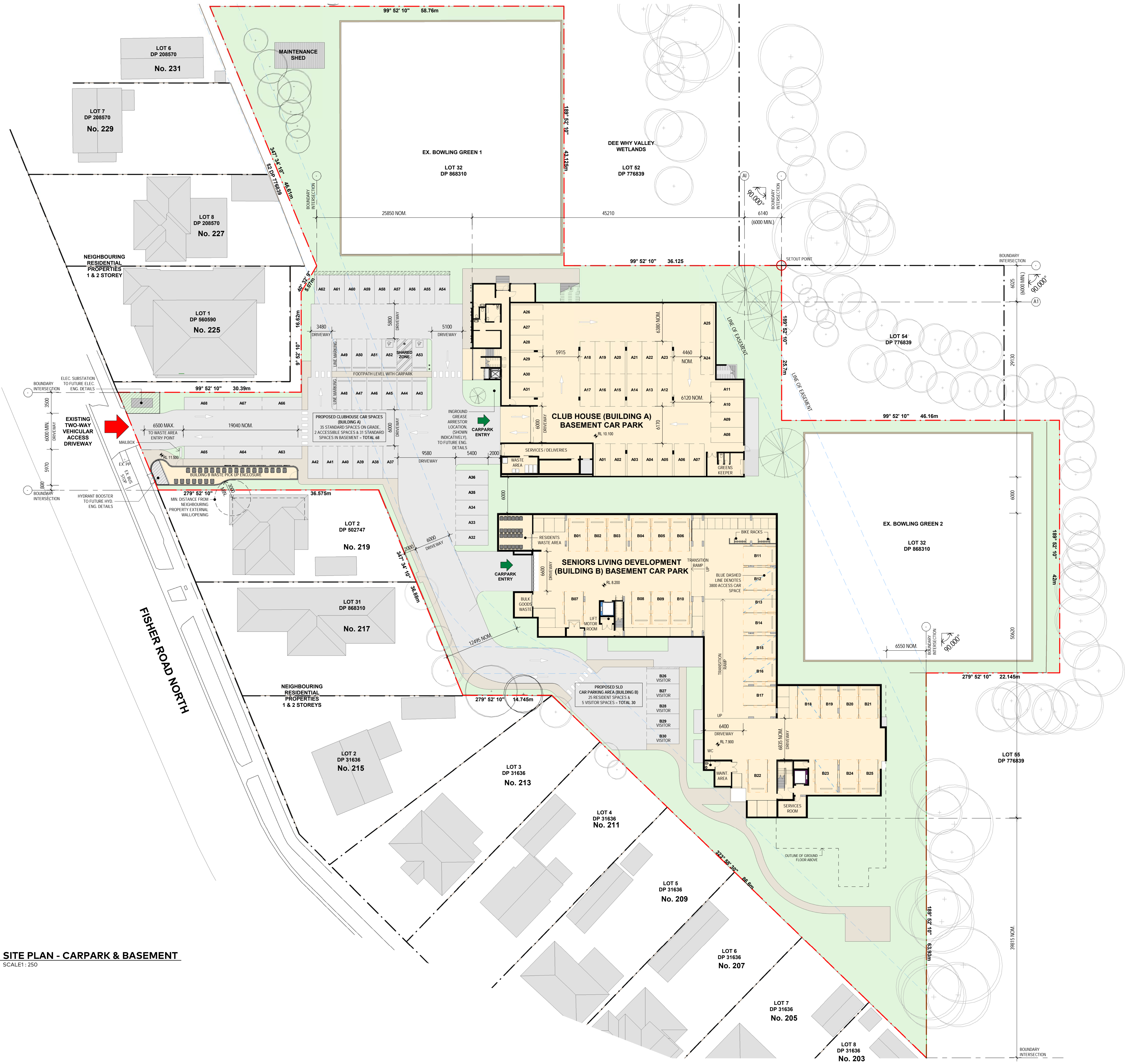
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### Reduced Plans



1 SITE PLAN - CARPARK & BASEMENT

SCALE 1: 250



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Figured dimensions to be used in preference to scaling from drawings. All dimensions to be verified on site before proceeding with work. All boundary dimensions & bearings to be verified by licensed surveyor prior to proceeding with work.

Date	DESCRIPTION	Rev
13/01/17	FOR CONSULTANTS COORDINATION	5
20/01/17	COORDINATION ISSUE	6
08/02/17	COORDINATION ISSUE	7
21/02/17	COORDINATION/CLIENT REVIEW	8
14/03/17	ISSUED FOR QS	9
30/03/17	ISSUE FOR REVIEW AND COMMENT	10
20/04/17	ISSUE FOR REVIEW	11
27/06/17	ISSUE FOR CONSULTANT COORDINATION	12
15/08/17	DRIVEWAY AMENDED, ISSUE FOR COORDINATION	13
21/08/17	ISSUE FOR DA	14

- LEGEND:**
- BOUNDARY LINE
  - EASEMENT LINE
  - DENOTES AREA OF PROPOSED BUILDING WORKS
  - DENOTES AREA OF PROPOSED CARPARK & DRIVEWAY
  - DENOTES AREA OF FOOTPATH WORKS
  - DENOTES AREA OF PROPOSED LANDSCAPING. REFER TO LANDSCAPE PLAN DWG. 18-01 FOR DETAILS
  - EXISTING TREES TO REMAIN
  - EXISTING TREES TO REMAIN ON NEIGHBOURING PROPERTIES (SHOWN GREY)
  - DENOTES PROPOSED TREES. REFER TO LANDSCAPE PLAN DWG. 18-01 FOR DETAILS
  - BUILDING SETOUT POINT
  - CLUB HOUSE (BUILDING A) CAR SPACES. NEW CAR PARKING SPACES TO BE CLEARLY LINE MARKED (100mm WIDE WHITE PAVEMENT PAINT FINISH)
  - SENIORS LIVING DEVELOPMENT (BUILDING B) CAR SPACES. NEW CAR PARKING SPACES TO BE CLEARLY LINE MARKED (100mm WIDE WHITE PAVEMENT PAINT FINISH)
  - CENTRE LINE, CENTRE LINE SETOUT MARKER
  - PAINTED ACCESSIBLE CAR SPACE SYMBOL (COLOURS & SIZE AS REQUIRED BY ALL RELEVANT AUSTRALIA STANDARDS. BUILDER/CONTRACTOR TO PROVIDE CERTIFICATE OF COMPLIANCE AS PART OF OCCUPATION CERTIFICATE APPLICATION)
  - BOLL. BOLLARD AS PER AS 2890.1: PROVIDE FOOTINGS / FIXINGS AS RECD. PAINT FINISH WARNING YELLOW COLOUR
  - WH.S. WHEELSTOP TO COMPLY WITH AS 2890.1
  - RL 38.160 EX. FINISHED FLOOR LEVEL (REFER TO SURVEY & CIVIL DRAWINGS FOR DETAILS)
  - RL 38.160 PROPOSED FINISHED FLOOR LEVEL

Client  
**DEE WHY BOWLING CLUB**  
221-223 FISHER ROAD NORTH  
CROMER NSW 2099



Project  
**CLUB HOUSE & SENIORS LIVING DEVELOPMENT**  
221-223 FISHER ROAD NORTH  
CROMER NSW 2099

Scale @ B1 As Indicated	Scale @ A3 1 : 625
Drawn By: JH, LH	Approved By: MN
Nominated Resp Architect MARC NICHOLAS	NSW Reg. No. 7409

Drawing Title  
**SITE PLAN - BASEMENT & CAR PARKING**

Project No.	Status	Drawing No.	Revision
NA.16-10059	DA	00-01	14

**GROUPN**  
Architecture,  
Interior,  
Landscape.



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C:\Users\jld\Documents\NA\_16-10059\_AFC-Club\_House\_Landscape\_18-01.dwg  
File Path:





## Appendix B

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### Survey Results



# R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Fax 88196849, Mob.0418-239019

Client : Traffix

Job No/Name : 5707 DEE WHY Bowling Club

Day/Date : Wednesday / 29th July 2015

All Vehicles	NORTH <i>Fisher Rd Nth</i>		EAST <i>Bowling Access</i>		SOUTH <i>Fisher Rd Nth</i>		
Time Per	<u>I</u>	<u>L</u>	<u>R</u>	<u>L</u>	<u>R</u>	<u>I</u>	TOTAL
0700 - 0715	53	0	0	0	0	51	104
0715 - 0730	72	0	0	0	0	55	127
0730 - 0745	76	0	1	0	1	56	134
0745 - 0800	87	0	0	0	0	58	145
0800 - 0815	75	0	0	0	0	76	151
0815 - 0830	105	0	0	0	0	82	187
0830 - 0845	71	0	0	0	0	88	159
0845 - 0900	90	0	0	1	0	71	162
Period End	629	0	1	1	1	537	1169

Cap: 54

Start: 14

Accum
14
14
14
14
14
14
14
14
13

End: 13

All Vehicles	NORTH <i>Fisher Rd Nth</i>		EAST <i>Bowling Access</i>		SOUTH <i>Fisher Rd Nth</i>		
Time Per	<u>I</u>	<u>L</u>	<u>R</u>	<u>L</u>	<u>R</u>	<u>I</u>	TOTAL
1600 - 1615	77	1	3	2	1	87	171
1615 - 1630	69	3	3	5	0	90	170
1630 - 1645	74	2	7	7	1	89	180
1645 - 1700	81	1	12	7	0	109	210
1700 - 1715	88	1	10	1	3	86	189
1715 - 1730	85	0	8	5	2	116	216
1730 - 1745	91	2	2	0	0	103	198
1745 - 1800	75	0	0	0	1	85	161
Period End	640	10	45	27	8	765	1495

Cap: 54

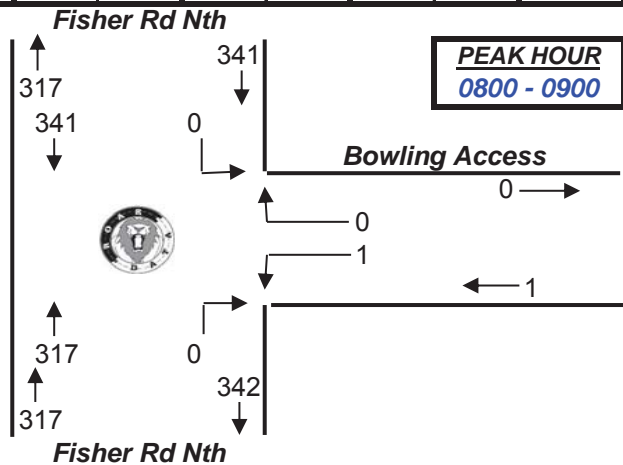
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Accum
73
68
57
39
32
21
21
22

End: 22

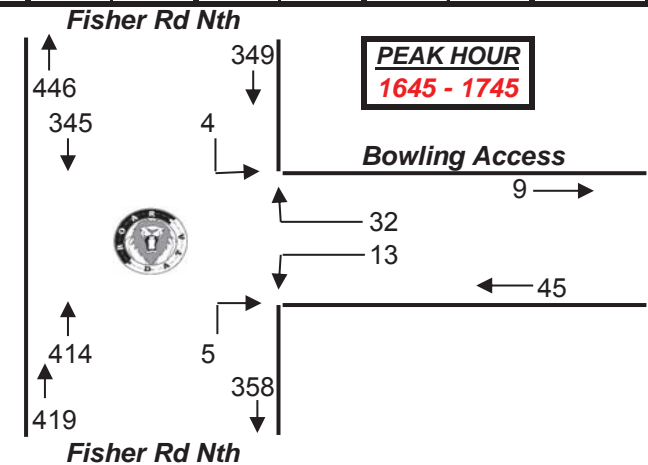
	NORTH <i>Fisher Rd Nth</i>		EAST <i>Bowling Access</i>		SOUTH <i>Fisher Rd Nth</i>		
Peak Per	<u>I</u>	<u>L</u>	<u>R</u>	<u>L</u>	<u>R</u>	<u>I</u>	TOTAL
0700 - 0800	288	0	1	0	1	220	510
0715 - 0815	310	0	1	0	1	245	557
0730 - 0830	343	0	1	0	1	272	617
0745 - 0845	338	0	0	0	0	304	642
0800 - 0900	341	0	0	1	0	317	659

PEAK HR	341	0	0	1	0	317	659
---------	-----	---	---	---	---	-----	-----



	NORTH <i>Fisher Rd Nth</i>		EAST <i>Bowling Access</i>		SOUTH <i>Fisher Rd Nth</i>		
Peak Per	<u>I</u>	<u>L</u>	<u>R</u>	<u>L</u>	<u>R</u>	<u>I</u>	TOTAL
1600 - 1700	301	7	25	21	2	375	731
1615 - 1715	312	7	32	20	4	374	749
1630 - 1730	328	4	37	20	6	400	795
1645 - 1745	345	4	32	13	5	414	813
1700 - 1800	339	3	20	6	6	390	764

PEAK HR	345	4	32	13	5	414	813
---------	-----	---	----	----	---	-----	-----





# R.O.A.R DATA

*Reliable, Original & Authentic Results*

Ph.88196847, Fax 88196849, Mob.0418-239019

Client : Traffix

Job No/Name : 5707 DEE WHY Bowling Club

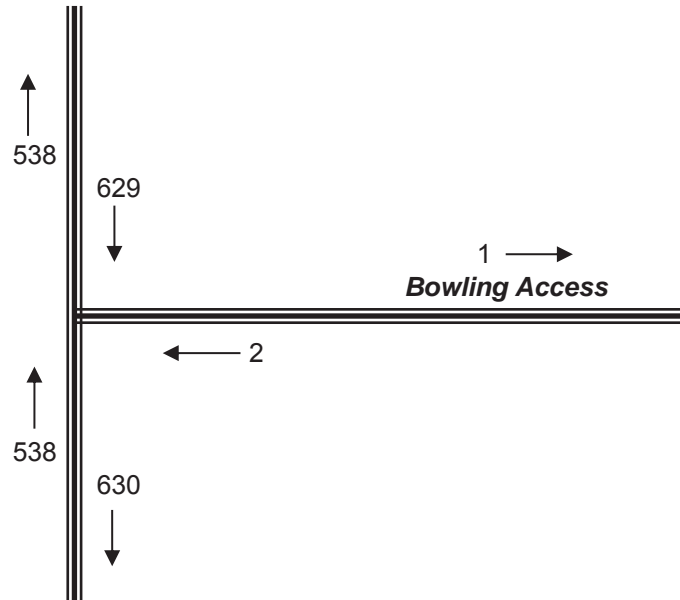
Day/Date : Wednesday / 29th July 2015

AM

PM

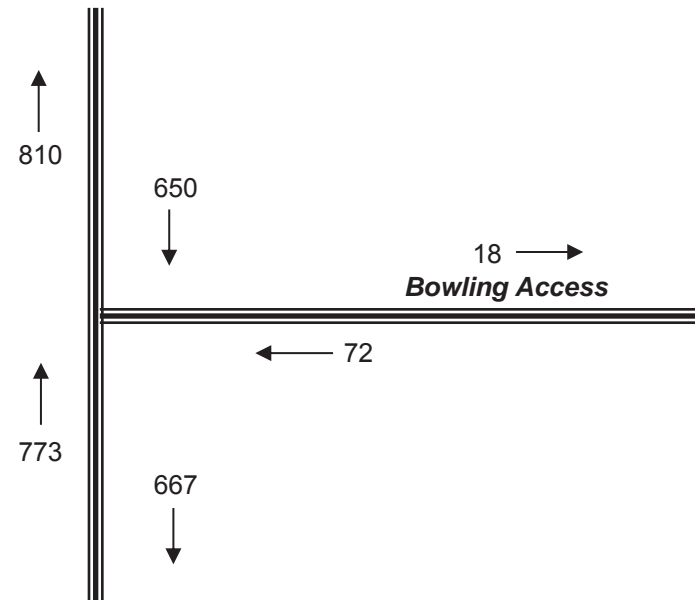
TOTAL VOLUMES  
FOR COUNT  
PERIODS

*Fisher Rd Nth*



*Fisher Rd Nth*

*Fisher Rd Nth*



*Fisher Rd Nth*



# R.O.A.R DATA

Reliable, Original & Authentic Results

Ph.88196847, Fax 88196849, Mob.0418-239019

Client : Traffix

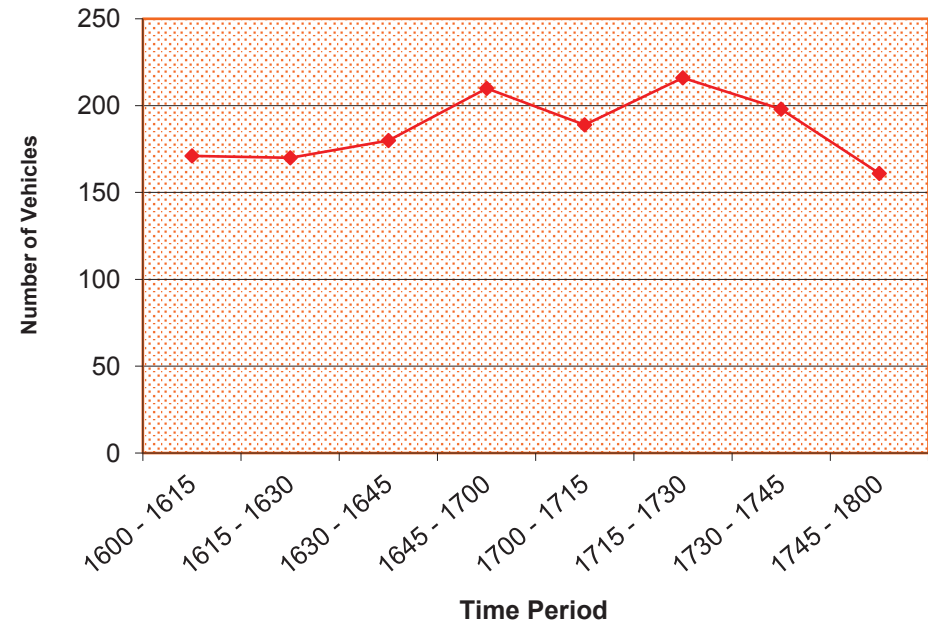
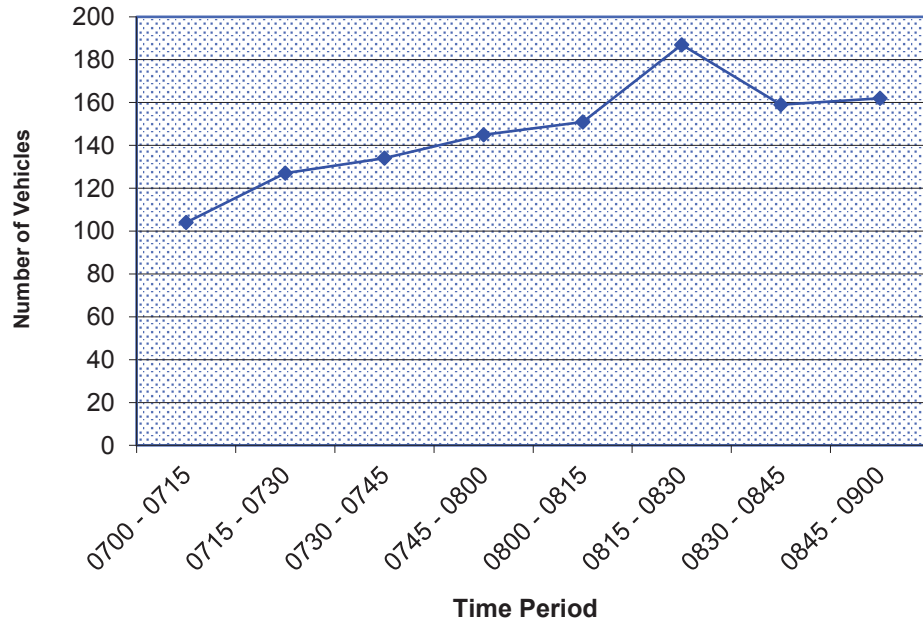
Job No/Name : 5707 DEE WHY Bowling Club

Day/Date : Wednesday / 29th July 2015

AM

Fisher Rd Nth / Bowling Access

PM





# R.O.A.R. DATA

**Reliable, Original & Authentic Results**

Ph.88196847, Fax 88196849, Mob.0418-239019

Client : Traffic  
Job No/Name : 5707 DEE WHY Bowling Club  
Day/Date : Wednesday / 29th July 2015

## Intersection Layout

Obtained via satellite

May be incorrect

**AM PEAK HOUR**  
**0800 - 0900**



**Fisher Rd North**

T	L	
341	0	AM
345	4	PM

R	32	0	
	PM	AM	
L	13	1	

414	5	PM
317	0	AM
T	R	

**Bowling Club Access**

**PM PEAK HOUR**  
**1645 - 1745**

Weather >>>



**Fisher Rd North**





## Appendix C

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### Sidra Intersection Analysis



## Appendix C1

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SIDRA - Existing

# MOVEMENT SUMMARY

## Site: Fisher Rd North x Dee Why Bowling Club\_Existing\_AM Peak

Intersection: Fisher Road North x Dee Why Bowling Club Access

Period: AM Peak

Scenario: Existing

Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Fisher Road North											
2	T1	334	5.0	0.178	0.0	LOS A	0.0	0.1	0.00	0.00	50.0
3	R2	1	5.0	0.178	8.2	LOS A	0.0	0.1	0.00	0.00	41.6
Approach		335	5.0	0.178	0.0	NA	0.0	0.1	0.00	0.00	50.0
East: Dee Why Bowling Club											
4	L2	1	0.0	0.003	1.1	LOS A	0.0	0.1	0.43	0.26	35.7
6	R2	1	0.0	0.003	3.2	LOS A	0.0	0.1	0.43	0.26	35.4
Approach		2	0.0	0.003	2.1	LOS A	0.0	0.1	0.43	0.26	35.6
North: Fisher Road North											
7	L2	1	0.0	0.185	8.2	LOS A	0.0	0.0	0.00	0.00	25.0
8	T1	359	0.0	0.185	0.0	LOS A	0.0	0.0	0.00	0.00	50.0
Approach		360	0.0	0.185	0.0	NA	0.0	0.0	0.00	0.00	49.9
All Vehicles		697	2.4	0.185	0.0	NA	0.0	0.1	0.00	0.00	49.9

Level of Service (LOS) Method: Delay (RTA NSW).

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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: Fisher Rd North x Dee Why Bowling Club\_Existing\_PM Peak

Intersection: Fisher Road North x Dee Why Bowling Club Access

Period: PM Peak

Scenario: Existing

Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Fisher Road North											
2	T1	436	5.0	0.235	0.0	LOS A	0.1	0.4	0.02	0.01	59.9
3	R2	5	5.0	0.235	7.3	LOS A	0.1	0.4	0.02	0.01	56.1
Approach		441	5.0	0.235	0.1	NA	0.1	0.4	0.02	0.01	59.8
East: Dee Why Bowling Club											
4	L2	14	0.0	0.072	4.2	LOS A	0.2	1.7	0.50	0.73	48.0
6	R2	34	0.0	0.072	7.3	LOS A	0.2	1.7	0.50	0.73	47.1
Approach		47	0.0	0.072	6.4	LOS A	0.2	1.7	0.50	0.73	47.4
North: Fisher Road North											
7	L2	4	0.0	0.189	5.5	LOS A	0.0	0.0	0.00	0.01	30.2
8	T1	363	0.0	0.189	0.0	LOS A	0.0	0.0	0.00	0.01	59.9
Approach		367	0.0	0.189	0.1	NA	0.0	0.0	0.00	0.01	59.5
All Vehicles		856	2.6	0.235	0.4	NA	0.2	1.7	0.04	0.05	59.2

Level of Service (LOS) Method: Delay (RTA NSW).

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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.





## Appendix C2

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SIDRA – Existing + Development

# MOVEMENT SUMMARY

Site: Fisher Rd North x Dee Why Bowling Club\_Future\_AM Peak

Intersection: Fisher Road North x Dee Why Bowling Club Access  
Period: AM Peak  
Scenario: Existing + Development  
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Fisher Road North											
2	T1	334	5.0	0.178	0.0	LOS A	0.0	0.1	0.00	0.00	50.0
3	R2	1	5.0	0.178	8.2	LOS A	0.0	0.1	0.00	0.00	41.6
Approach		335	5.0	0.178	0.0	NA	0.0	0.1	0.00	0.00	50.0
East: Dee Why Bowling Club											
4	L2	6	0.0	0.012	1.2	LOS A	0.0	0.3	0.43	0.28	35.7
6	R2	4	0.0	0.012	3.3	LOS A	0.0	0.3	0.43	0.28	35.4
Approach		11	0.0	0.012	2.0	LOS A	0.0	0.3	0.43	0.28	35.6
North: Fisher Road North											
7	L2	1	0.0	0.185	8.2	LOS A	0.0	0.0	0.00	0.00	25.0
8	T1	359	0.0	0.185	0.0	LOS A	0.0	0.0	0.00	0.00	50.0
Approach		360	0.0	0.185	0.0	NA	0.0	0.0	0.00	0.00	49.9
All Vehicles		705	2.4	0.185	0.1	NA	0.0	0.3	0.01	0.01	49.8

Level of Service (LOS) Method: Delay (RTA NSW).  
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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.  
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.  
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: Fisher Rd North x Dee Why Bowling Club\_Future\_PM Peak

Intersection: Fisher Road North x Dee Why Bowling Club Access

Period: PM Peak

Scenario: Existing + Development

Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Fisher Road North											
2	T1	436	5.0	0.234	0.0	LOS A	0.0	0.3	0.01	0.01	59.9
3	R2	4	5.0	0.234	7.3	LOS A	0.0	0.3	0.01	0.01	56.1
Approach		440	5.0	0.234	0.1	NA	0.0	0.3	0.01	0.01	59.9
East: Dee Why Bowling Club											
4	L2	12	0.0	0.061	4.2	LOS A	0.2	1.4	0.50	0.72	48.1
6	R2	28	0.0	0.061	7.2	LOS A	0.2	1.4	0.50	0.72	47.2
Approach		40	0.0	0.061	6.3	LOS A	0.2	1.4	0.50	0.72	47.4
North: Fisher Road North											
7	L2	3	0.0	0.188	5.5	LOS A	0.0	0.0	0.00	0.01	30.2
8	T1	363	0.0	0.188	0.0	LOS A	0.0	0.0	0.00	0.01	59.9
Approach		366	0.0	0.188	0.1	NA	0.0	0.0	0.00	0.01	59.6
All Vehicles		846	2.6	0.234	0.4	NA	0.2	1.4	0.03	0.04	59.4

Level of Service (LOS) Method: Delay (RTA NSW).

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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

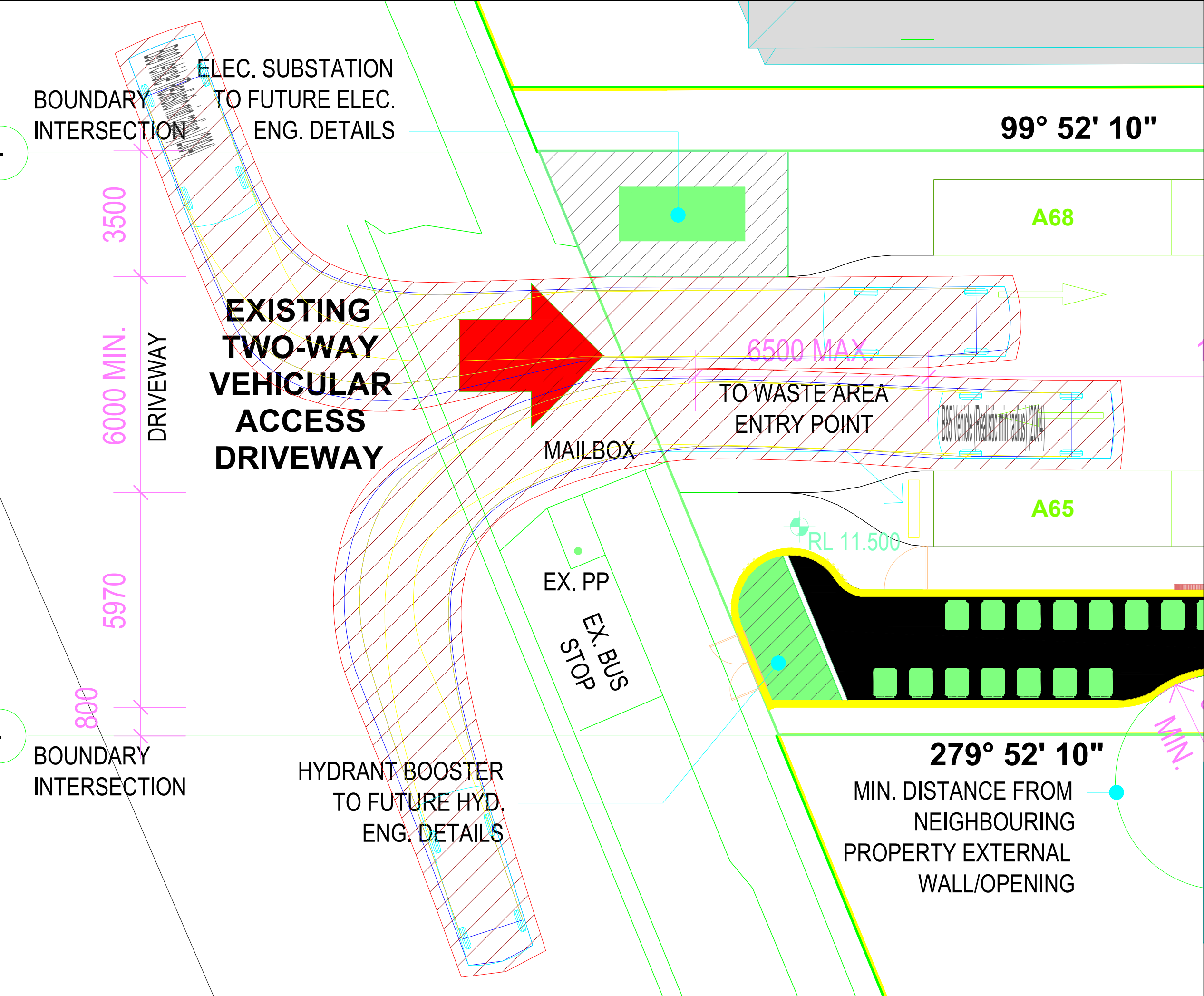
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.



## Appendix D

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### Swept Path Analysis



**Notes**

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

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

Vehicle swept path diagrams prepared using computer generated turning path software and associated CAD drawing platforms. Vehicle data based upon relevant Australian Standards (AS/NZS 2890.1-2004 *Parking facilities - Off-street car parking*, and/or AS 2890.2-2002 *Parking facilities - Off-street commercial vehicle facilities*). These standards embody a degree of tolerance, however the vehicle characteristics in these standards represent a suitable design vehicle and do not account for all variations in vehicle dimensions / specifications and/or driver ability or behaviour.

no.	revision	note	by	date
-----	----------	------	----	------

**architect**

**GROUPN**  
L6/ 111 - 117 Devonshire Street  
Surry Hills NSW 2010

**client**

Dee Why Bowling & Recreation Club Ltd  
PO Box 128 Dee Why 2099

**scale**

1:100 @ A3


0m 1 2 3 4

**project**

Dee Why Bowling Club

**drawing prepared by**

**TRAFFIX**  
traffic and transport planners  
Suite 2 08, 50 Holt Street  
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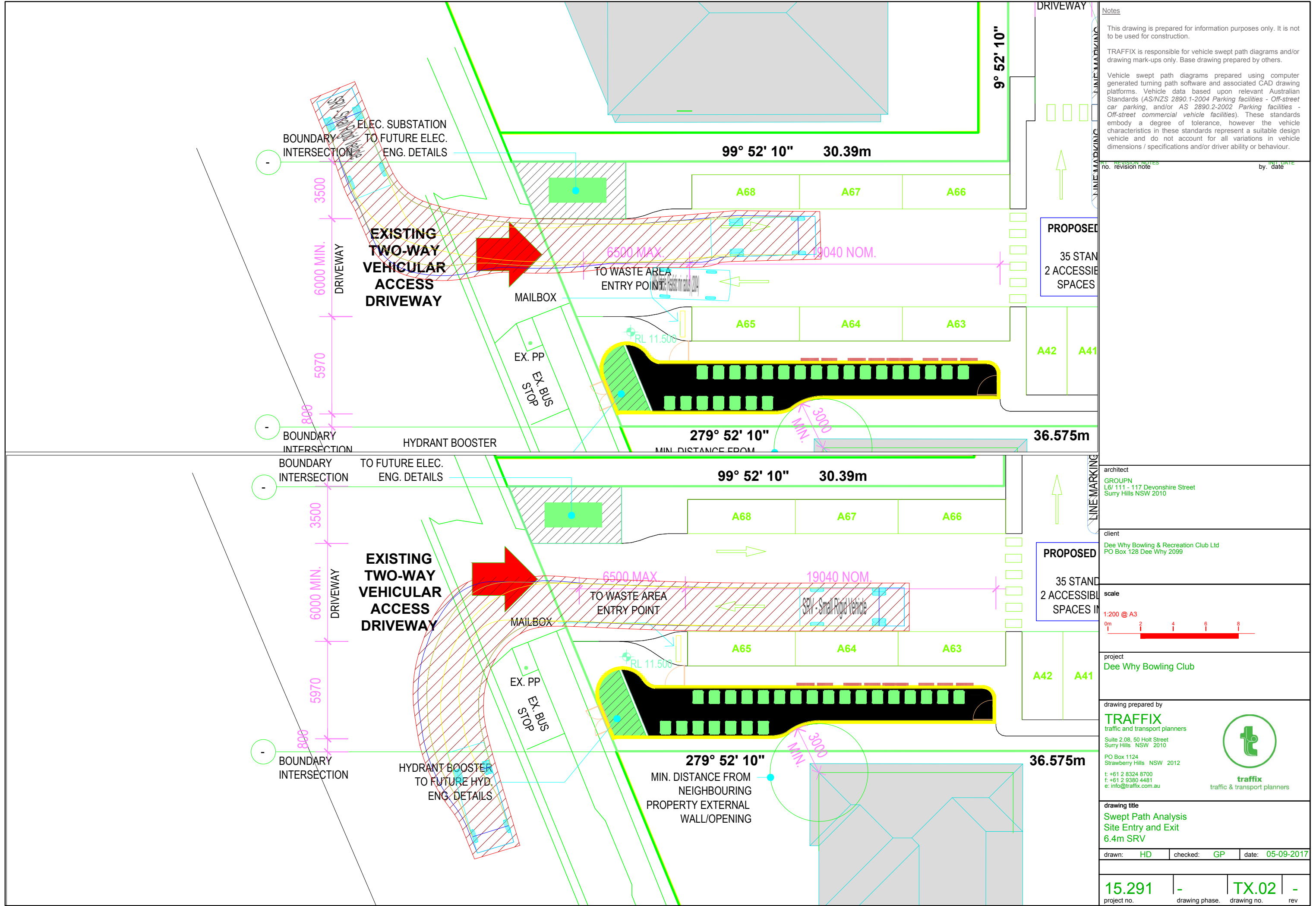
  
traffix  
traffic & transport planners

**drawing title**

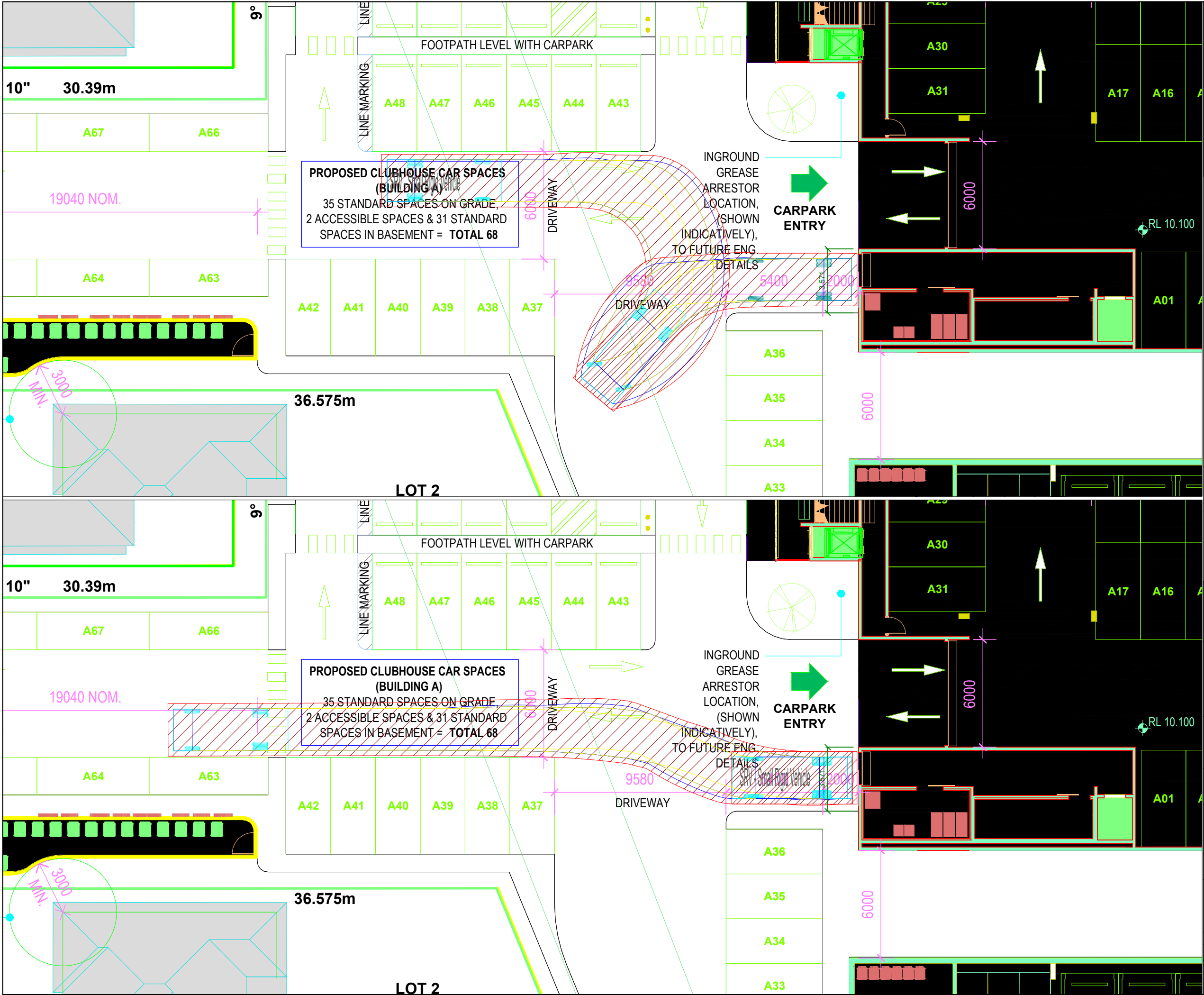
Swept Path Analysis  
Site Entry and Exit  
B99 and B85 Vehicles


drawn:	checked:	date:
HD	GP	05-09-2017

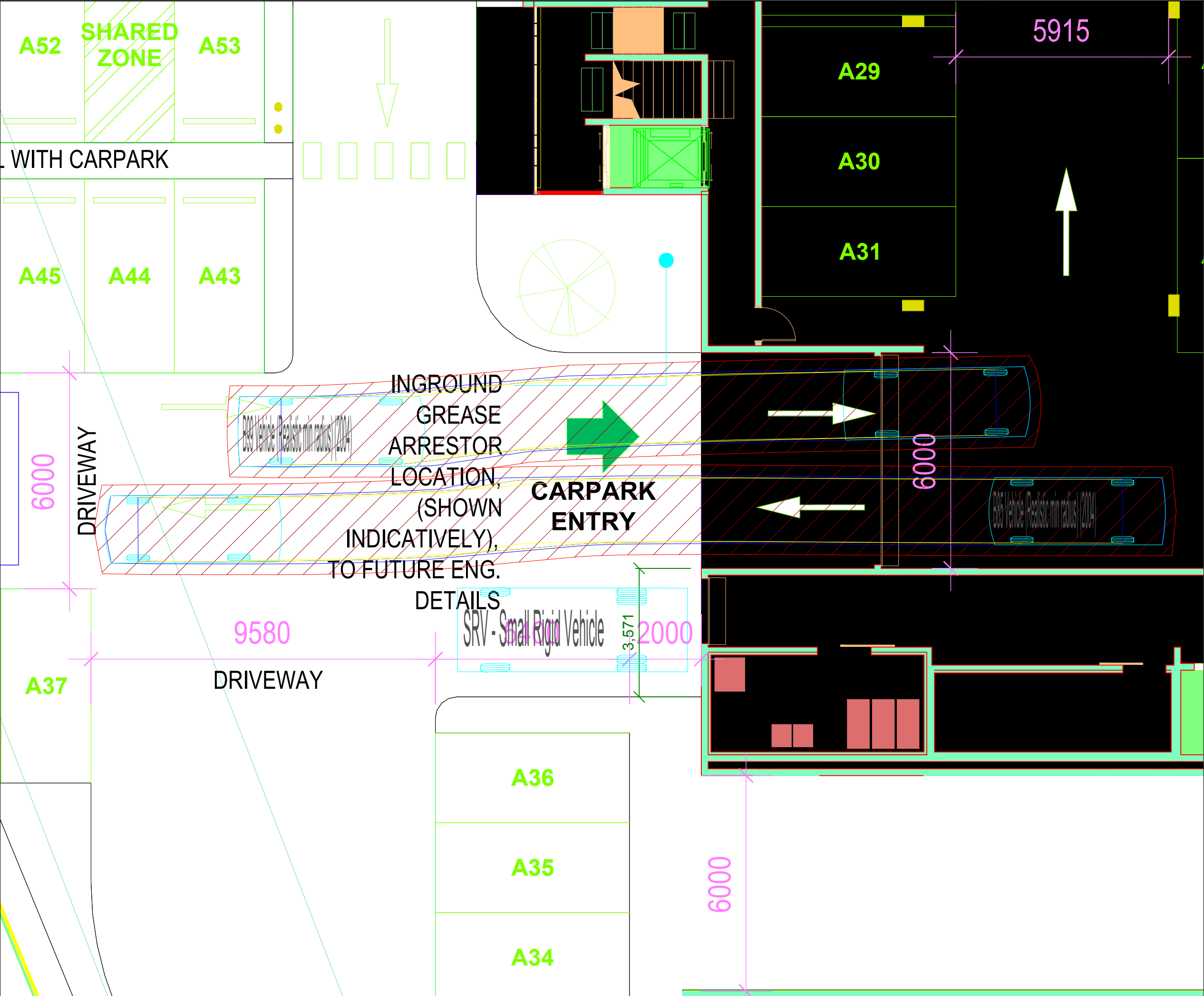
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15.291	-	TX.01	-







<p>Notes</p> <p>This drawing is prepared for information purposes only. It is not to be used for construction.</p> <p>TRAFFIX is responsible for vehicle swept path diagrams and/or drawing mark-ups only. Base drawing prepared by others.</p> <p>Vehicle swept path diagrams prepared using computer generated turning path software and associated CAD drawing platforms. Vehicle data based upon relevant Australian Standards (AS/NZS 2890.1-2004 <i>Parking facilities - Off-street car parking</i>, and/or AS 2890.2-2002 <i>Parking facilities - Off-street commercial vehicle facilities</i>). These standards embody a degree of tolerance, however the vehicle characteristics in these standards represent a suitable design vehicle and do not account for all variations in vehicle dimensions / specifications and/or driver ability or behaviour.</p>			
no.	revision notes	by.	date
<p>architect</p> <p>GROUPN L6/ 111 - 117 Devonshire Street Surry Hills NSW 2010</p>			
<p>client</p> <p>Dee Why Bowling &amp; Recreation Club Ltd PO Box 128 Dee Why 2099</p>			
<p>scale</p> <p>1:200 @ A3</p> <p>0m 2 4 6 8</p>			
<p>project</p> <p>Dee Why Bowling Club</p>			
<p>drawing prepared by</p> <p><b>TRAFFIX</b> traffic and transport planners Suite 2 08, 50 Holt Street Surry Hills NSW 2010 PO Box 1124 Strawberry Hills NSW 2012 t: +61 2 8324 8700 f: +61 2 9380 4481 e: info@traffix.com.au</p>  <p>traffix traffic &amp; transport planners</p>			
<p>drawing title</p> <p>Swept Path Analysis Loading Bay Entry and Exit 6.4m SRV</p>			
drawn:	HD	checked:	GP
		date:	05-09-2017
15.291	-	TX.03	-
project no.	drawing phase.	drawing no.	rev



Notes

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Vehicle swept path diagrams prepared using computer generated turning path software and associated CAD drawing platforms. Vehicle data based upon relevant Australian Standards (AS/NZS 2890.1-2004 *Parking facilities - Off-street car parking*, and/or AS 2890.2-2002 *Parking facilities - Off-street commercial vehicle facilities*). These standards embody a degree of tolerance, however the vehicle characteristics in these standards represent a suitable design vehicle and do not account for all variations in vehicle dimensions / specifications and/or driver ability or behaviour.

RT, REVISION NOTES

no.

revision note

by.

date

architect

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L6/ 111 - 117 Devonshire Street  
Surry Hills NSW 2010

client

Dee Why Bowling & Recreation Club Ltd  
PO Box 128 Dee Why 2099

scale

1:100 @ A3  
0m 1 2 3 4

project

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traffix  
traffic & transport planners

drawing title

Swept Path Analysis  
Loading Bay  
B99 and B85 Vehicles passing 6.4m SRV

drawn:

HD

checked:

GP

date:

05-09-2017

15.291

-

TX.04

-

project no.

drawing phase.

drawing no.

rev