

# TRAFFIC AND PARKING IMPACT ASSESSMENT

Proposed Affordable Housing

*5-9 Alexander Street, Fairy Meadow*

Prepared for: SARM Architects

N244190 (Version 1a)

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## 1. INTRODUCTION

Motion Traffic Engineers was commissioned by SARM Architects to undertake a traffic and parking impact assessment of proposed affordable housing at 5-9 Alexander Street in Fairy Meadow.

Currently, the site is a vacant lot with no permanent structures.

The carparking area for the proposed affordable housing will be provided on the ground level with vehicle access and egress via Alexander Street.

This traffic report presents an assessment of the anticipated transport implications of the proposed affordable housing, with the following considerations:

- ➡ Background and existing traffic and parking conditions of the proposed affordable housing
- ➡ Assessment of the public transport network within the vicinity of the proposed affordable housing
- ➡ Adequacy of car, bicycle and motorcycle parking provision
- ➡ The projected traffic generation of the proposed affordable housing and;
- ➡ The transport impact of the proposed affordable housing on the surrounding road network.

In the course of preparing this assessment, the proposed affordable housing and its environs have been inspected, plans of the development are examined, all relevant traffic and parking data have been collected and analysed.

## 2. BACKGROUND AND EXISTING CONDITIONS OF THE PROPOSED AFFORDABLE HOUSING

### 2.1. Location and Land Use

The proposed affordable housing is located at 5-9 Alexander Street in Fairy Meadow and is near the perimeter of Fairy Meadow Town Centre. The immediate surroundings of the site are residential dwellings with one or two storeys. Guest Park Soccer Fields, and Fairy Meadow Netball Courts are located to the south of the site.

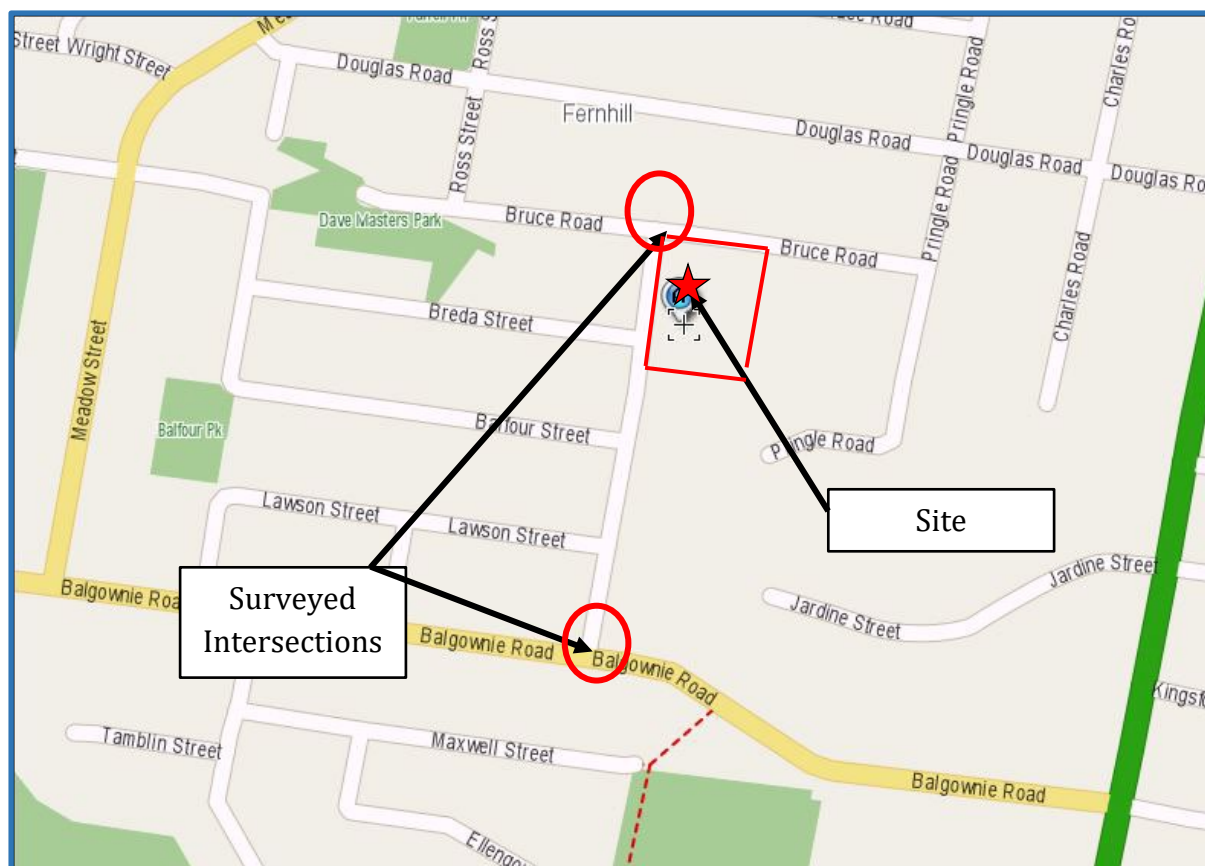
Vehicular access and egress to the proposed affordable housing is via a driveway that runs off Alexander Street.

Figures 1 show the location of the proposed affordable housing from the aerial perspective, and Figure 2 also shows the location of the proposed affordable housing from a street map perspective and the location of the surveyed intersections in relation to the proposed affordable housing. Figure 3 shows the photograph of the proposed affordable housing.



Figure 1: Location of the proposed affordable housing on Aerial





**Figure 2: Location of the proposed affordable housing on Aerial and Surveyed Intersections**



**Figure 3: Photograph of the proposed affordable housing**

## 2.2.Road Network

This section discusses the road network adjacent to the proposed affordable housing.

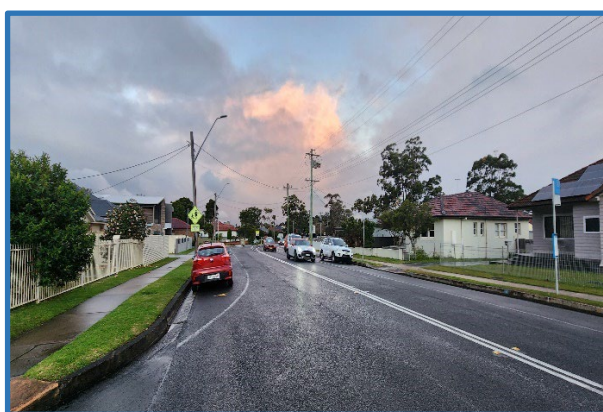
Alexander Street is a local road with one lane each way. Time unrestricted for on-street parking is permitted on both sides of the roads. Figure 4a shows a photograph of Alexander Street. The southern section near Balgownie Road is subject to school zone speed limit of 40 km/hr (8:00am – 9:30am and 2:30 pm-4pm) on weekdays. The speed limit is 50km/hr outside of the school zone.

Balgownie Road is a collector road with one lane each way. Double barrier lines separate two opposing lanes on both sides. Fairy Meadow Demonstration School is located near the street, and sections of Balgownie Road is subject to a school zone speed limit of 40 km/hr (8:00am – 9:30am and 2:30 pm-4pm) on weekdays. The speed limit is 50km/hr outside of the school zone. Time unrestricted for on-street parking is permitted on both sides of the roads. Figure 4b shows a photograph of Balgownie Road.

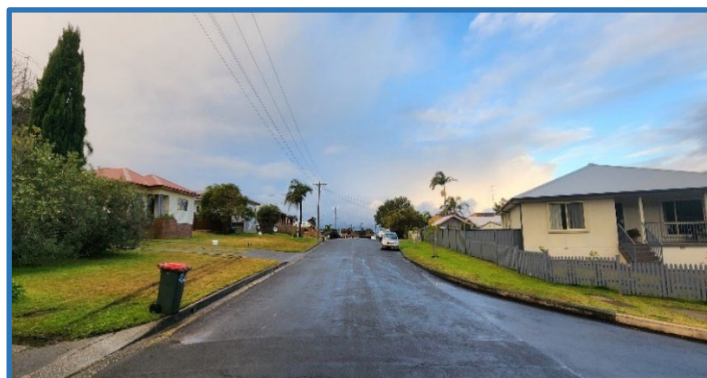
Bruce Road is a local road with one lane each way and a default speed limit of 50km/hr. Bruce Road runs in east-west direction and ends in a cul-de-sac to the west. Time unrestricted on-street parking is permitted on both sides of the road. Figure 4c shows a photograph of Bruce Road.



**Figure 4a: Alexander Street: Looking south near the intersection with Bruce Road**



**Figure 4b: Balgownie Road: Looking east near the intersection with Alexander Street**



**Figure 4c: Bruce Road: Looking east near the intersection with Alexander Street**



## 2.3. Public Transport

### Train

The Fairy Meadow train station and Towradgi Train Station is located within a fifteen walk from the site. The train station provides services such as South Coast Line which includes suburbs such as Kiama, Wollongong, Mortdale and Bondi Junction.

### Bus

The proposed affordable housing is located approximately 300 metres (walking distance) from bus stop located on Balgownie Road before Alexander Street. Bus Route 3 provides loop service once every hour to a range of suburbs including Wollongong, Towradgi and Fairy Meadow. Bus Route 8 provides loop service once every hour from Wollongong to Bellambi via Balgownie. The bus stop only provides service once every hour.

The site has access to public transport.

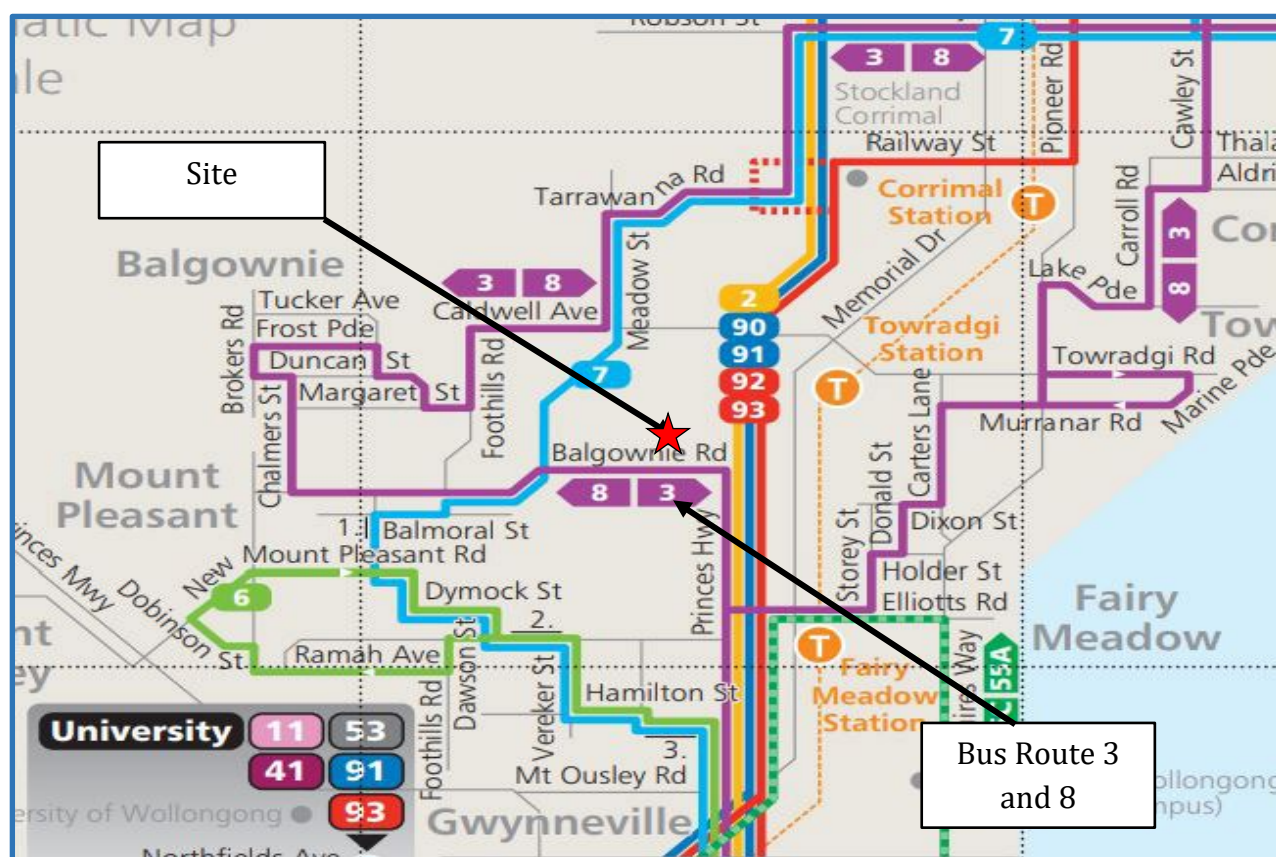


Figure 5: Bus Routes 3 and 8 in relation Bus Route Maps and proposed affordable Housing

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## 2.4. Public Parking

Time unrestricted on-street parking is permitted on Alexander Street with no time restrictions.

Site visits show that there are vacant car space on the Alexander Street with minimal circulation to find a vacant car space.

## 2.5. Intersection Description

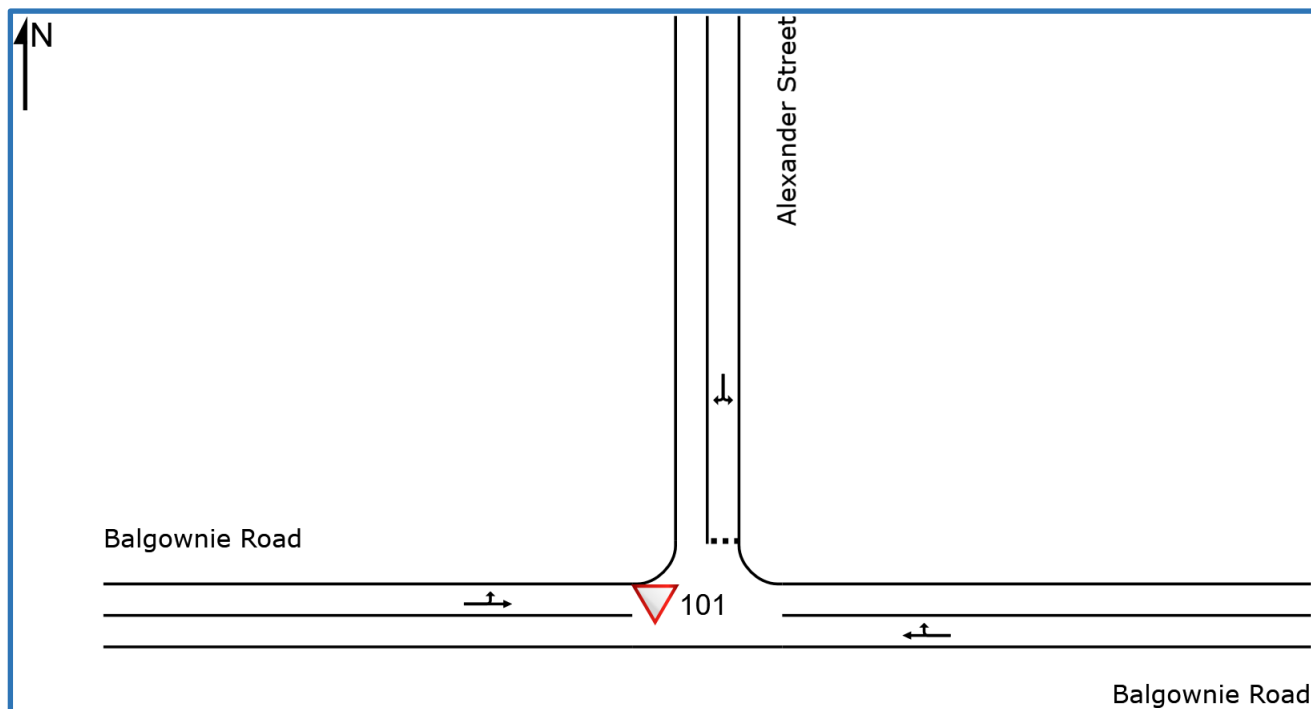
As part of the traffic impact assessment, the performance of the nearby intersection was surveyed and assessed:

- ➡ Priority Intersection of Balgownie Road with Alexander Street
- ➡ Priority Intersection of Bruce Road with Alexander Street

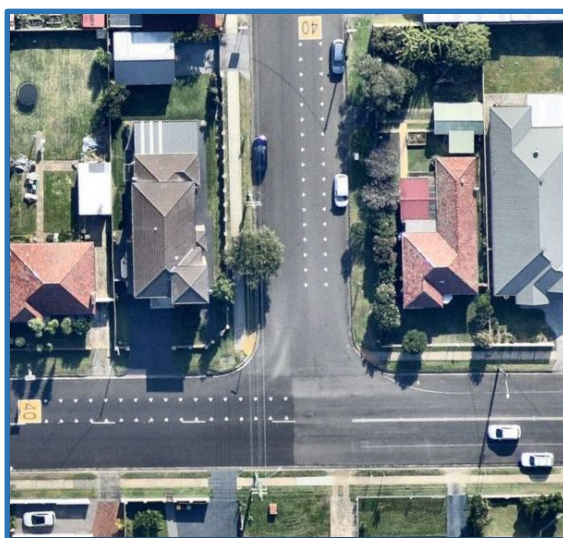
External traffic travelling to and from the development is likely to travel through the intersection mentioned above.

The priority intersection of Balgownie Road with Alexander Street is a three-leg intersection with all turn movements permitted. Drivers travelling on Alexander Street need to give way to traffic on Balgownie Road. Figure 6a shows the layout of the intersection using SIDRA 9.1 – an industry standard intersection software. Figure 6b shows the photograph of intersection in aerial.

The priority intersection of Bruce Road with Alexander Street is a three-leg intersection with all turn movements permitted. Drivers travelling on Alexander Street need to give way to traffic on Bruce Road. Figure 6c shows the layout of the intersection using SIDRA 9.1. Figure 6d shows the photograph of intersection in aerial.



**Figure 6a: Priority Intersection of Balgownie Road with Alexander Street (SIDRA)**



**Figure 6b: Priority Intersection of Balgownie Road with Alexander Street (Aerial)**

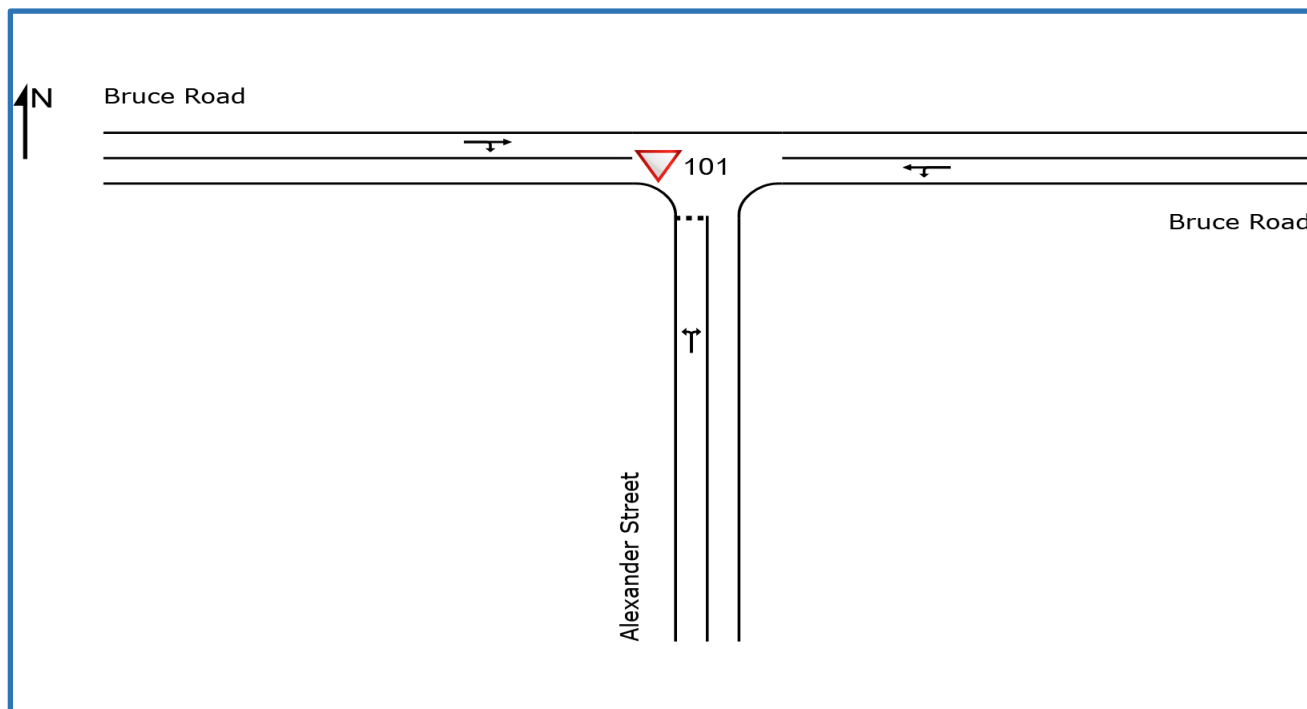


Figure 6c: Priority Intersection of Bruce Road with Alexander Street (SIDRA)



Figure 6d: Priority Intersection of Bruce Road with Alexander Street (Aerial)



## 2.6. Existing Traffic Volume

As part of the traffic assessment, traffic counts have been undertaken at the above-mentioned intersections and the AM and PM peak hours are identified accordingly. The AM peak hour is 8am to 9am and the PM peak hour is 4:30pm to 5:30pm. The following figures present the traffic volumes in vehicles for the weekday peak hours. The bracketed numbers are trucks/buses and the unbracketed are cars.

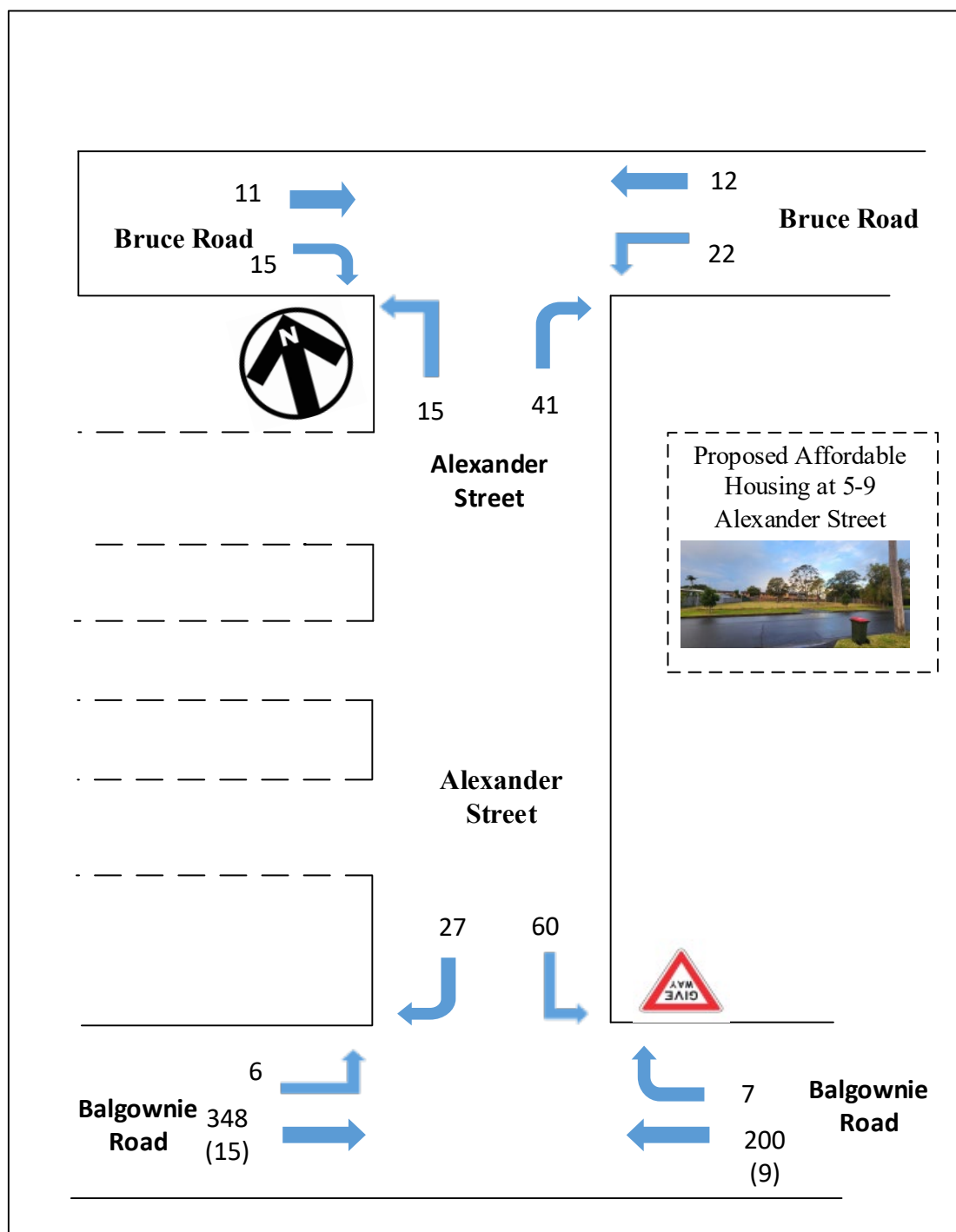


Figure 7: Existing Weekday Traffic Volumes AM Peak Hour

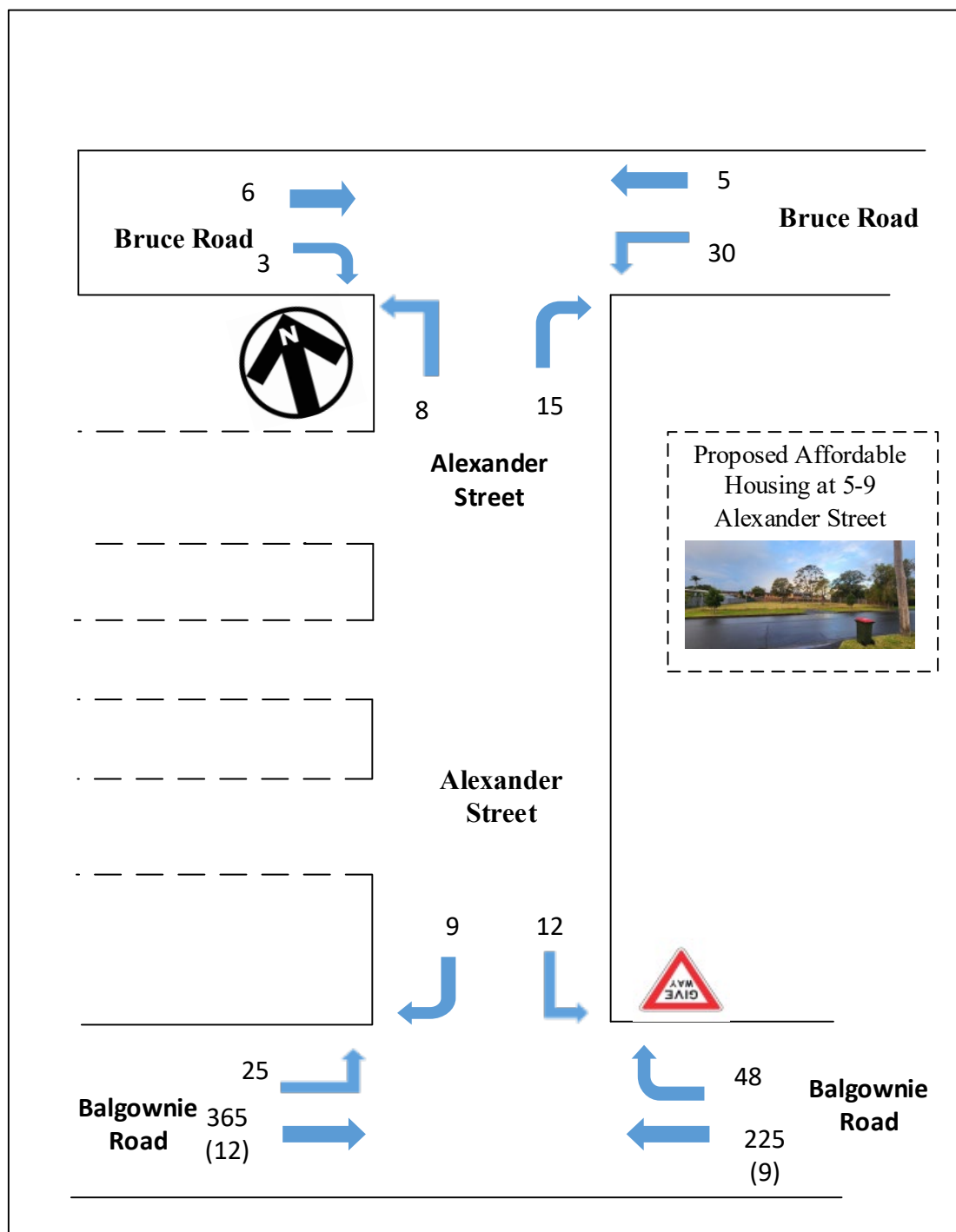


Figure 8: Existing Weekday Traffic Volumes PM Peak Hour

## 2.7. Intersection Assessment with Existing Traffic

An intersection assessment has been undertaken for the:

- ➔ Priority Intersection of Balgownie Road with Alexander Street
- ➔ Priority Intersection of Bruce Road with Alexander Street

The existing intersection operating performance was assessed using the SIDRA software package (version 9.1) to determine the Degree of Saturation (DS), Average Delay (AVD in seconds) and Level of Service (LoS) at each intersection. The SIDRA program provides Level of Service Criteria Tables for various intersection types. The key indicator of intersection performance is Level of Service, where results are placed on a continuum from 'A' to 'F', as shown in Table 1.

LoS	Traffic Signal / Roundabout	Give Way / Stop Sign / T-Junction control
A	Good operation	Good operation
B	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	Satisfactory	Satisfactory, but accident study required
D	Operating near capacity	Near capacity & accident study required
E	At capacity, at signals incidents will cause excessive delays.	At capacity, requires other control mode
F	Unsatisfactory and requires additional capacity, Roundabouts require other control mode	At capacity, requires other control mode

**Table 1: Intersection Level of Service**

The Average Vehicle Delay (AVD) provides a measure of the operational performance of an intersection as indicated below, which relates AVD to LOS. The AVD's should be taken as a guide only as longer delays could be tolerated in some locations (i.e. inner-city conditions) and on some roads (i.e. minor side street intersecting with a major arterial route). For traffic signals, the average delay over all movements should be taken. For roundabouts and priority control intersections (sign control) the critical movement for level of service assessment should be that movement with the highest average delay.

LoS	Average Delay per Vehicles (seconds/vehicle)
A	Less than 14
B	15 to 28
C	29 to 42
D	43 to 56
E	57 to 70
F	>70

**Table 2: Intersection Average Delay (AVD)**

The degree of saturation (DS) is another measure of the operational performance of individual intersections. For intersections controlled by traffic signals both queue length and delay increase rapidly as DS approaches 1. It is usual to attempt to keep DS to less than 0.9. Degrees of Saturation in the order of 0.7 generally represent sat intersection operation. When DS exceed 0.9 queues can be anticipated.

The results of the intersection analysis are as follows:

Intersection/ Performance criteria	AM Peak Hour Existing	PM Peak Hour Existing
<b>Balgownie Road/ Alexander Street</b>		
LoS	N/A (LOS A worst case)	N/A (LOS A worst case)
AVD	0.8	1
DS	0.205	0.22
<b>Bruce Road/Alexander Street</b>		
LoS	N/A (LOS A worst case)	N/A (LOS A worst case)
AVD	3.7	3.8
DS	0.05	0.020

**Table 3: Existing Intersection Performances**

As presented in Table 3, the assessed intersections are currently operating at excellent conditions with spare capacity to accommodate additional traffic both AM and PM peak hours. The full intersection results are presented in Appendix A.

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## **2.8. Conclusions on Existing Conditions**

Vehicle access and egress to the proposed affordable housing carparking area is via a driveway that runs off Alexander Street.

The proposed affordable housing has unrestricted on-street parking available on Alexander Street.

The nearby intersections perform well with sufficient spare capacity to accommodate additional traffic.

The proposed affordable housing has access to public transport.

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## 3. PROPOSED AFFORDABLE HOUSING

### 3.1. Proposed affordable housing

The proposed affordable housing comprises of:

- ➡ Four two bedroom and three one-bedroom units on ground floor
- ➡ Four two bedrooms and three one-bedrooms on first floor
- ➡ Four two bedrooms and three one-bedrooms on second floor
- ➡ A total of twelve two-bedrooms and nine one-bedrooms units

### 3.2. Parking

Car parking is provided on ground floor level with vehicle access and egress via Alexander Street. The details of the carpark area are as follows:

- ➡ Seventeen car spaces including two disabled car spaces

A full scaled plan of the proposed affordable housing is provided as part of the Development Application.



## 4. PARKING REQUIREMENTS

### 4.1. Car Parking

The Wollongong Development Control Plan (DCP) 2009 does not stipulates the car parking requirements for affordable housing.

However, the car parking requirements for proposed development are presented in *State Environmental Planning Policy 2021 (SEPP 21)* in Section 42(1)(f) *Development to which land applies* of the SEPP 21 states as follows:

The proposed affordable housing is not within 800 metres walking distance of Fairy Meadow and Towradgi train stations.

- (f) for development on land that is not in an accessible area—the development will result in the following number of parking spaces —
- (i) for each dwelling containing 1 bedroom—at least 0.5 parking space
  - (ii) for each dwelling containing 2 bedrooms—at least 1 parking space,
  - (iii) for each dwelling containing at least 3 bedrooms—at least 1.5 parking spaces.

The car parking rates derived from the SEPP 21 used for affordable housing are as follows:

- ➡ 0.5 parking spaces for each 1 bedroom apartment
- ➡ 1 parking spaces for each 2 bedroom apartment

Table 4 below presents the minimum car parking requirement for the proposed affordable housing based on the car parking rates listed above.

Landuse	Bedroom	No of Units	Car Parking Rate	Car Spaces Required	Car Spaces Provided
Affordable Housing	One Bedroom	9	0.5	4.5	17
	Two Bedroom	12	1	12	
	Total			16.5	17

**Table 4: Summary of Car Parking Requirements**

. The proposed affordable housing complies with the minimum parking requirement as per *State Environmental Planning Policy 2021 (SEPP 21)*.

Visitor parking is met on the Alexander Street on-street parking.

## 5. TRAFFIC GENERATION AND IMPACT

### 5.1. Proposed Traffic Generation

The NSW RTA Guide to Traffic Generating Development version 2.2 2002 does not stipulate the traffic generation for affordable housing.

However, the proposed affordable housing closely relates to residential developments, the trips generated will be based on the residential flat buildings up to two bedrooms, considering a worst-case scenario as follows:

- ➔ 0.65 per dwelling for both AM/PM peak hour for both one and two bedrooms

Peak Hour	Use	Number of car spaces	Trip Generation Rate	Trip Generated
AM	Residential	21	0.65	14
PM		21	0.65	14

**Table 6: Net Trips generated by the Proposed affordable housing in peak hours**

### 5.2. Trip Distribution

The proposed affordable housing is a low trip generator in both AM and PM peak hours.

The predicted affordable housing trips are distributed as presented in Table 8. The proposed affordable housing is a low trip generator.

The predicted affordable housing generated trips are distributed to the road network assuming 10 percent origin trips 90 percent destination trips for the AM peak hour and 90 percent origin trips 10 percent destination trips for the PM peak hour, which results the following:

Peak Hour	Origin	Destination	Total
AM	13	1	14
PM	1	13	14

**Table 8: Trip Distribution of the proposed affordable housing for the weekday peak hours**

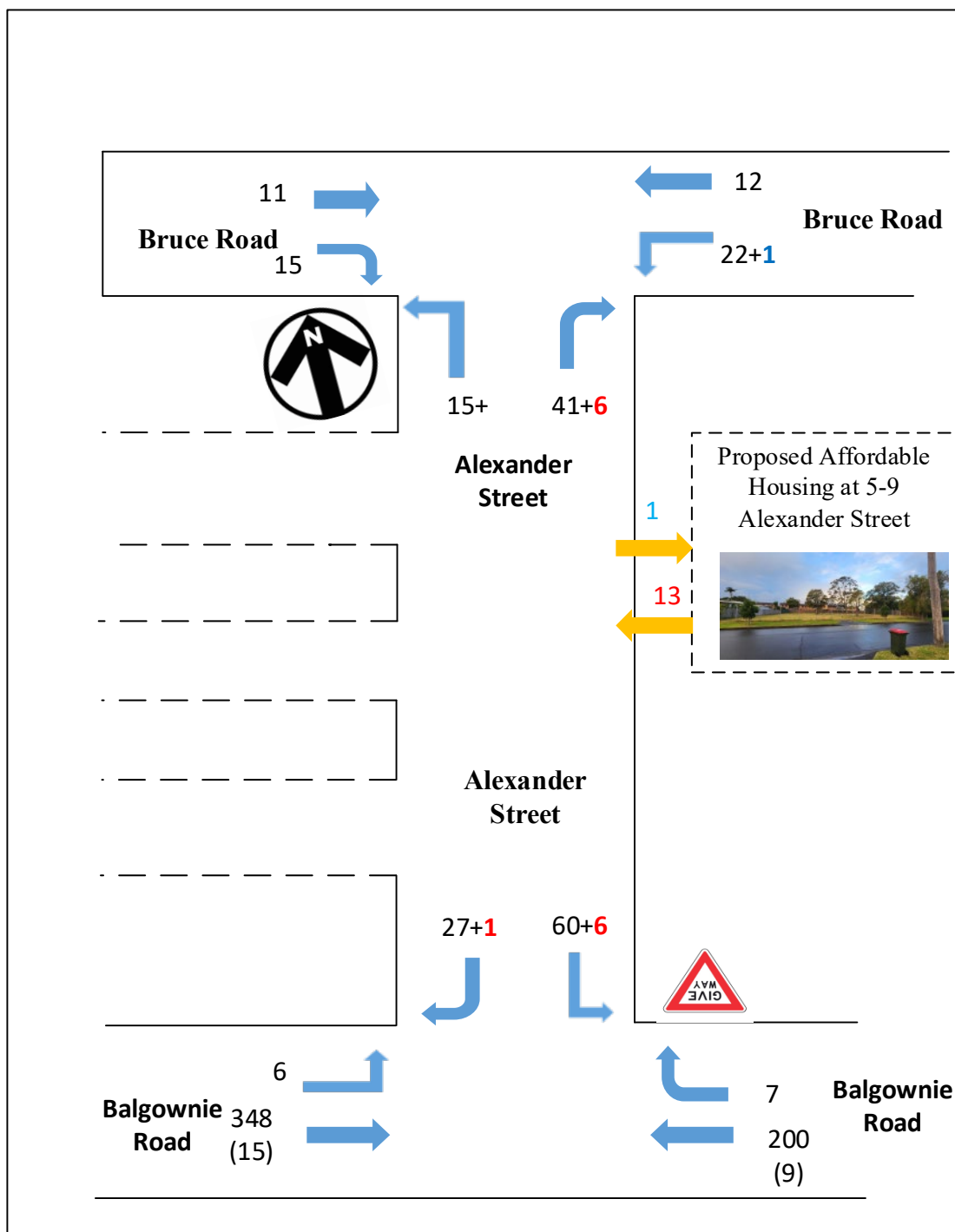
### 5.3. Existing with Affordable housing Traffic

The additional affordable housing trips are assigned onto the local traffic network. The following figures present the additional traffic volume with the affordable housing's trips (in red for origin trips and blue for destination trips) for the weekday AM and PM peak hours.

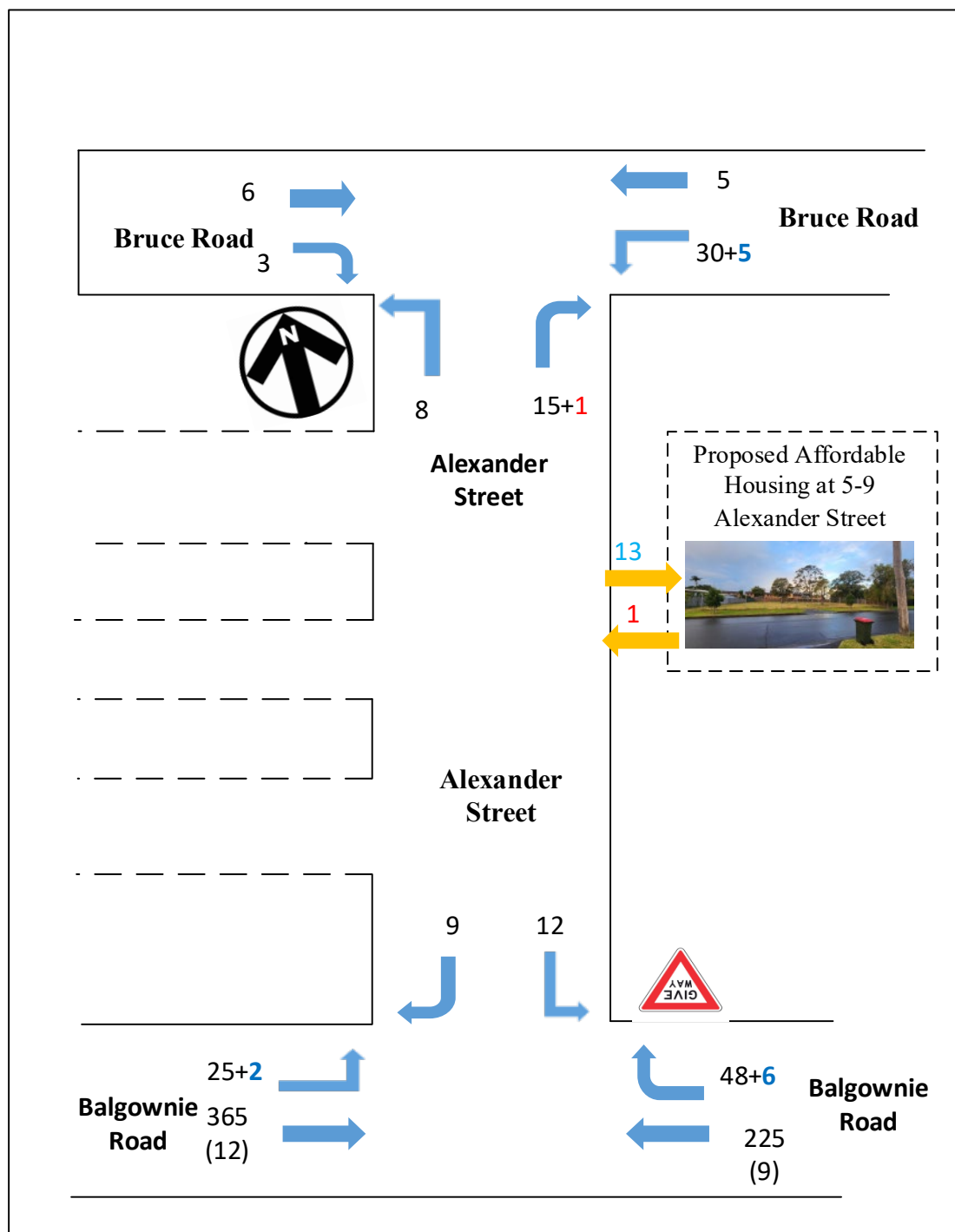
The additional affordable housing trips represent a small proportion of the existing traffic volumes.

**Traffic and Parking Impact Assessment for Proposed Affordable Housing**

**5-9 Alexander Street in Fairy Meadow [N244190A Report 1b]**



**Figure 9a: Existing Weekday Traffic Volumes with Additional Affordable housing traffic AM Peak Hour**



**Figure 9b: Existing Weekday Traffic Volumes with Additional Affordable housing traffic PM Peak Hour**

## 5.4. Traffic Impact

This section assesses the following intersections for the existing traffic with the affordable housing traffic. The results of the intersection assessment are as follows noting that all the intersection for the existing with affordable housing traffic.

Intersection/ Performance criteria	Existing Traffic		Existing and Affordable Housing traffic	
	AM Peak Hour Existing	PM Peak Hour Existing	AM Peak Hour Projected	PM Peak Hour Projected
<b>Balgownie Road/ Alexander Street</b>				
LoS	N/A (LOS A worst case)	N/A (LOS A worst case)	N/A (LOS A worst case)	N/A (LOS A worst case)
AVD	0.8	1	0.9	1.1
DS	0.205	0.22	0.205	0.22
<b>Bruce Road/Alexander Street</b>				
LoS	N/A (LOS A worst case)	N/A (LOS A worst case)	N/A (LOS A worst case)	N/A (LOS A worst case)
AVD	3.7	3.8	3.8	3.8
DS	0.05	0.020	0.05	0.020

**Table 9: Projected intersection performance with traffic**

As presented in Table 9 above, the additional trips generated by the proposed affordable housing have minimum impact on the intersection performances in both AM and PM peak hours. The LoS, AVD and DS of each intersection are not significantly affected by the addition of affordable housing traffic.

The traffic impacts of the proposed affordable housing are therefore considered acceptable.

The full SIDRA results are presented in Appendix B for the proposed conditions with the affordable housing traffic.

## 6. CONCLUSIONS

This traffic impact assessment reports relates to a proposed affordable housing at 5-9 Alexander Street in Fairy Meadow. Based on the analysis and discussions presented in this report, the following conclusions are made:

- ➔ The proposed affordable housing has access to local public transport service.
- ➔ The surrounding intersections currently operates at a good level of services with overall spare capacity available.
- ➔ The proposed affordable housing premises comply with the car parking requirements in the *State Environmental Planning Policy 2021 (SEPP 21)*.
- ➔ The proposed affordable housing is expected to generate a low number of additional trips in both AM and PM peak hours.
- ➔ According to the intersection assessment, the additional trips can be accommodated in the nearby intersections without significantly affecting the performance of any turn movement, approach arm or the overall intersection. The traffic impacts of the proposed affordable housing are therefore considered acceptable.

There are no traffic engineering reasons why a development consent for the proposed affordable housing at 5-9 Alexander Street, Fairy Meadow, should be refused.



## APPENDIX A

### INTERSECTION ASSESSMENT FOR EXISTING TRAFFIC

Vehicle Movement Performance																
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Stop Rate	Eff. Rate	Aver. No. of Cycles	Aver. Speed
			[ Total	HV ]	[ Total	HV ]				[ Veh.	Dist ]					
			veh/h	%	veh/h	%				v/c	sec					
East: Balgownie Road																
5	T1	All MCs	220	4.3	220	4.3	0.122	0.1	LOS A	0.1	0.5	0.04	0.04	0.04	0.04	39.9
6	R2	All MCs	7	0.0	7	0.0	0.122	5.1	LOS A	0.1	0.5	0.04	0.04	0.04	0.04	39.3
Approach			227	4.2	227	4.2	0.122	0.2	NA	0.1	0.5	0.04	0.04	0.04	0.04	39.9
North: Alexander Street																
7	L2	All MCs	63	0.0	63	0.0	0.097	4.8	LOS A	0.4	2.5	0.45	0.62	0.45	0.45	37.3
9	R2	All MCs	28	0.0	28	0.0	0.097	6.7	LOS A	0.4	2.5	0.45	0.62	0.45	0.45	37.2
Approach			92	0.0	92	0.0	0.097	5.4	LOS A	0.4	2.5	0.45	0.62	0.45	0.45	37.3
West: Balgownie Road																
10	L2	All MCs	6	0.0	6	0.0	0.205	3.5	LOS A	0.0	0.0	0.00	0.01	0.00	0.00	39.4
11	T1	All MCs	382	4.1	382	4.1	0.205	0.1	LOS A	0.0	0.0	0.00	0.01	0.00	0.00	39.9
Approach			388	4.1	388	4.1	0.205	0.1	NA	0.0	0.0	0.00	0.01	0.00	0.00	39.9
All Vehicles			707	3.6	707	3.6	0.205	0.8	NA	0.4	2.5	0.07	0.10	0.07	0.07	39.5

**Table A1: Weekday Priority Intersection Performance of Balgownie Road with Alexander Street for the Weekday AM Peak Hour**

Vehicle Movement Performance																
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Stop Rate	Eff. Rate	Aver. No. of Cycles	Aver. Speed
			[ Total	HV ]	[ Total	HV ]				[ Veh.	Dist ]					
			veh/h	%	veh/h	%				v/c	sec					
South: Alexander Street																
1	L2	All MCs	16	0.0	16	0.0	0.045	4.6	LOS A	0.2	1.1	0.08	0.53	0.08	45.8	
3	R2	All MCs	43	0.0	43	0.0	0.045	4.7	LOS A	0.2	1.1	0.08	0.53	0.08	45.6	
Approach			59	0.0	59	0.0	0.045	4.7	LOS A	0.2	1.1	0.08	0.53	0.08	45.6	
East: Bruce Road																
4	L2	All MCs	23	0.0	23	0.0	0.019	4.6	LOS A	0.0	0.0	0.00	0.35	0.00	46.9	
5	T1	All MCs	13	0.0	13	0.0	0.019	0.0	LOS A	0.0	0.0	0.00	0.35	0.00	48.1	
Approach			36	0.0	36	0.0	0.019	3.0	NA	0.0	0.0	0.00	0.35	0.00	47.3	
West: Bruce Road																
11	T1	All MCs	12	0.0	12	0.0	0.015	0.1	LOS A	0.1	0.5	0.10	0.32	0.10	48.0	
12	R2	All MCs	16	0.0	16	0.0	0.015	4.7	LOS A	0.1	0.5	0.10	0.32	0.10	46.7	
Approach			27	0.0	27	0.0	0.015	2.7	NA	0.1	0.5	0.10	0.32	0.10	47.2	
All Vehicles			122	0.0	122	0.0	0.045	3.7	NA	0.2	1.1	0.06	0.43	0.06	46.5	

**Table A2: Weekday Priority Intersection Performance of Bruce Road with Alexander Street for the Weekday AM Peak Hour**

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[ Total	HV ]	[ Total	HV ]				[ Veh.	Dist ]				
			veh/h	%	veh/h	%				v/c	sec				
East: Balgownie Road															
5	T1	All MCs	246	3.8	246	3.8	0.173	0.5	LOS A	0.5	3.3	0.20	0.24	0.20	48.9
6	R2	All MCs	51	0.0	51	0.0	0.173	6.3	LOS A	0.5	3.3	0.20	0.24	0.20	47.5
Approach			297	3.2	297	3.2	0.173	1.5	NA	0.5	3.3	0.20	0.24	0.20	48.7
North: Alexander Street															
7	L2	All MCs	13	0.0	13	0.0	0.026	5.9	LOS A	0.1	0.6	0.47	0.63	0.47	44.7
9	R2	All MCs	9	0.0	9	0.0	0.026	8.1	LOS A	0.1	0.6	0.47	0.63	0.47	44.5
Approach			22	0.0	22	0.0	0.026	6.9	LOS A	0.1	0.6	0.47	0.63	0.47	44.6
West: Balgownie Road															
10	L2	All MCs	26	0.0	26	0.0	0.222	4.6	LOS A	0.0	0.0	0.00	0.03	0.00	48.5
11	T1	All MCs	397	3.2	397	3.2	0.222	0.1	LOS A	0.0	0.0	0.00	0.03	0.00	49.7
Approach			423	3.0	423	3.0	0.222	0.4	NA	0.0	0.0	0.00	0.03	0.00	49.6
All Vehicles			742	3.0	742	3.0	0.222	1.0	NA	0.5	3.3	0.09	0.13	0.09	49.1

**Table A3: Weekday Priority Intersection Performance of Balgownie Road with Alexander Street for the Weekday PM Peak Hour**

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[ Total	HV ]	[ Total	HV ]				[ Veh.	Dist ]				
			veh/h	%	veh/h	%	v/c	sec		veh	m			km/h	
South: Alexander Street															
1	L2	All MCs	8	0.0	8	0.0	0.018	4.6	LOS A	0.1	0.4	0.05	0.53	0.05	45.9
3	R2	All MCs	16	0.0	16	0.0	0.018	4.6	LOS A	0.1	0.4	0.05	0.53	0.05	45.7
Approach			24	0.0	24	0.0	0.018	4.6	LOS A	0.1	0.4	0.05	0.53	0.05	45.7
East: Bruce Road															
4	L2	All MCs	32	0.0	32	0.0	0.020	4.6	LOS A	0.0	0.0	0.00	0.46	0.00	46.3
5	T1	All MCs	5	0.0	5	0.0	0.020	0.0	LOS A	0.0	0.0	0.00	0.46	0.00	47.5
Approach			37	0.0	37	0.0	0.020	3.9	NA	0.0	0.0	0.00	0.46	0.00	46.5
West: Bruce Road															
11	T1	All MCs	6	0.0	6	0.0	0.005	0.0	LOS A	0.0	0.1	0.07	0.19	0.07	48.8
12	R2	All MCs	3	0.0	3	0.0	0.005	4.7	LOS A	0.0	0.1	0.07	0.19	0.07	47.4
Approach			9	0.0	9	0.0	0.005	1.6	NA	0.0	0.1	0.07	0.19	0.07	48.3
All Vehicles			71	0.0	71	0.0	0.020	3.8	NA	0.1	0.4	0.03	0.45	0.03	46.5

**Table A4: Weekday Priority Intersection Performance of Bruce Road with Alexander Street for the Weekday PM Peak Hour**

## APPENDIX B

# INTERSECTION ASSESSMENT FOR EXISTING WITH AFFORDABLE HOUSING TRAFFIC

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[ Total	HV ]	[ Total	HV ]				[ Veh.	Dist ]				
			veh/h	%	veh/h	%				v/c	sec				
East: Balgownie Road															
5	T1	All MCs	220	4.3	220	4.3	0.122	0.1	LOS A	0.1	0.5	0.04	0.04	0.04	39.9
6	R2	All MCs	7	0.0	7	0.0	0.122	5.1	LOS A	0.1	0.5	0.04	0.04	0.04	39.3
Approach			227	4.2	227	4.2	0.122	0.2	NA	0.1	0.5	0.04	0.04	0.04	39.9
North: Alexander Street															
7	L2	All MCs	69	0.0	69	0.0	0.104	4.9	LOS A	0.4	2.7	0.45	0.62	0.45	37.4
9	R2	All MCs	29	0.0	29	0.0	0.104	6.7	LOS A	0.4	2.7	0.45	0.62	0.45	37.2
Approach			99	0.0	99	0.0	0.104	5.4	LOS A	0.4	2.7	0.45	0.62	0.45	37.3
West: Balgownie Road															
10	L2	All MCs	6	0.0	6	0.0	0.205	3.5	LOS A	0.0	0.0	0.00	0.01	0.00	39.4
11	T1	All MCs	382	4.1	382	4.1	0.205	0.1	LOS A	0.0	0.0	0.00	0.01	0.00	39.9
Approach			388	4.1	388	4.1	0.205	0.1	NA	0.0	0.0	0.00	0.01	0.00	39.9
All Vehicles			715	3.5	715	3.5	0.205	0.9	NA	0.4	2.7	0.08	0.10	0.08	39.5

**Table B1: Weekday Priority Intersection Performance of Balgownie Road with Alexander Street for the Weekday AM Peak Hour with affordable housing traffic**

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que Stop	Eff. Rate	Aver. No. of Cycles	Aver. Speed
			[ Total	HV ]	[ Total	HV ]				[ Veh.	Dist ]				
			veh/h	%	veh/h	%				v/c	sec				
South: Alexander Street															
1	L2	All MCs	16	0.0	16	0.0	0.050	4.6	LOS A	0.2	1.2	0.09	0.53	0.09	45.8
3	R2	All MCs	49	0.0	49	0.0	0.050	4.7	LOS A	0.2	1.2	0.09	0.53	0.09	45.6
Approach			65	0.0	65	0.0	0.050	4.7	LOS A	0.2	1.2	0.09	0.53	0.09	45.6
East: Bruce Road															
4	L2	All MCs	24	0.0	24	0.0	0.020	4.6	LOS A	0.0	0.0	0.00	0.35	0.00	46.9
5	T1	All MCs	13	0.0	13	0.0	0.020	0.0	LOS A	0.0	0.0	0.00	0.35	0.00	48.0
Approach			37	0.0	37	0.0	0.020	3.0	NA	0.0	0.0	0.00	0.35	0.00	47.3
West: Bruce Road															
11	T1	All MCs	12	0.0	12	0.0	0.015	0.1	LOS A	0.1	0.5	0.10	0.32	0.10	48.0
12	R2	All MCs	16	0.0	16	0.0	0.015	4.7	LOS A	0.1	0.5	0.10	0.32	0.10	46.7
Approach			27	0.0	27	0.0	0.015	2.7	NA	0.1	0.5	0.10	0.32	0.10	47.2
All Vehicles			129	0.0	129	0.0	0.050	3.8	NA	0.2	1.2	0.07	0.43	0.07	46.4

**Table B2: Weekday Priority Intersection Performance of Bruce Road with Alexander Street for the Weekday AM Peak Hour with affordable housing traffic**

*Traffic and Parking Impact Assessment for Proposed Affordable Housing*

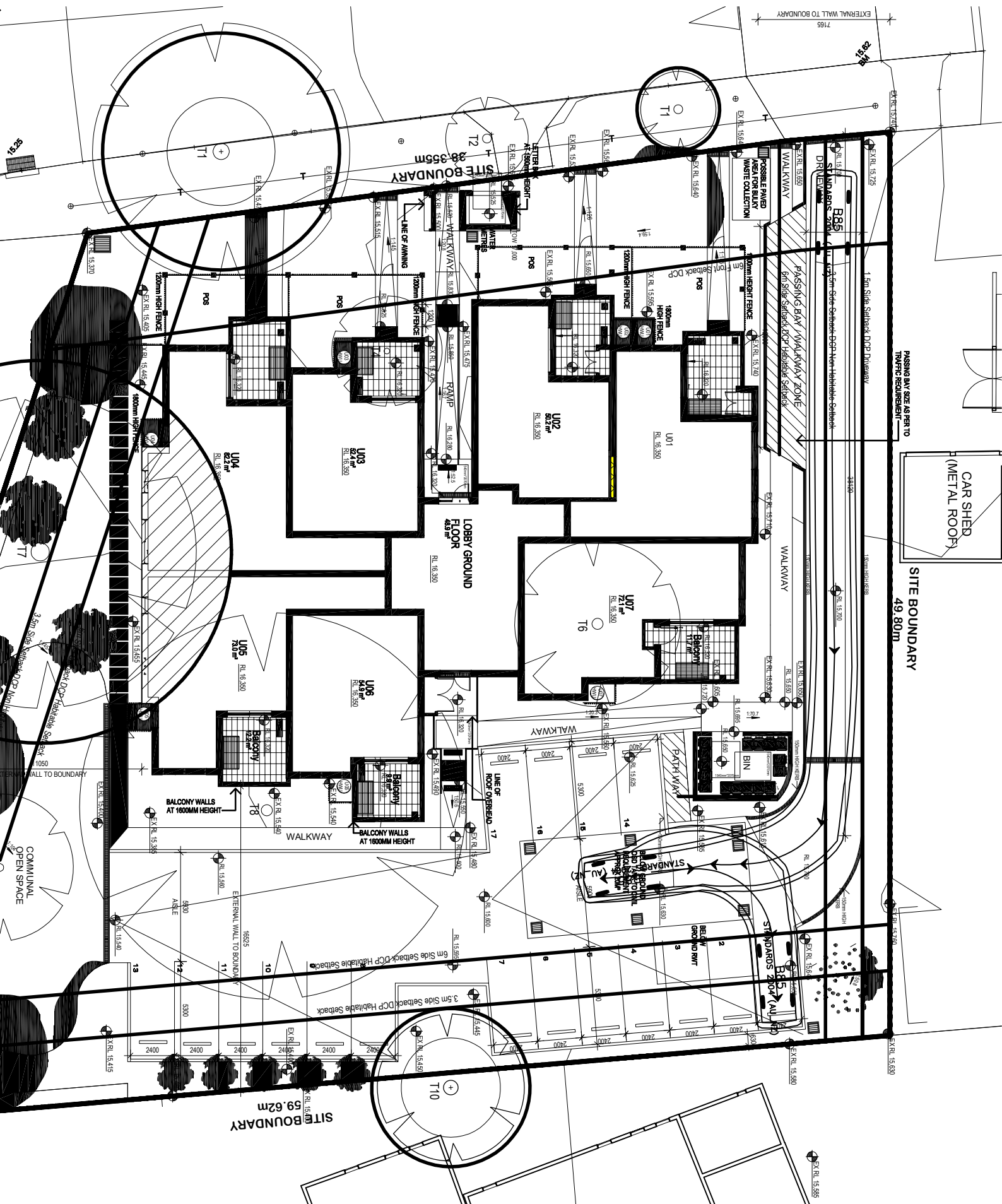
*5-9 Alexander Street in Fairy Meadow [N244190A Report 1b]*

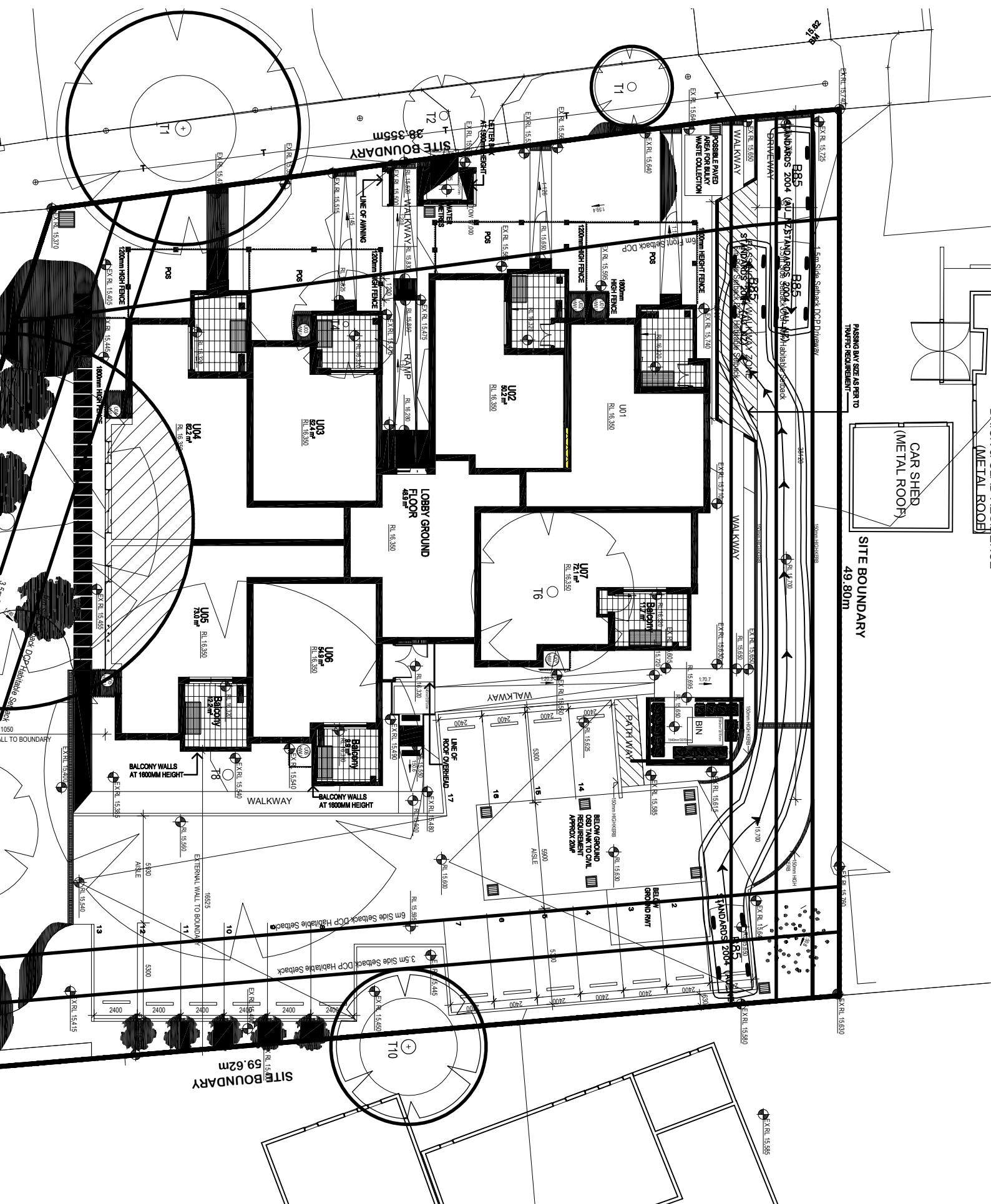
Vehicle Movement Performance																
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Stop Rate	Eff. Rate	Aver. No. of Cycles	Aver. Speed
			[ Total	HV ]	[ Total	HV ]				[ Veh.	Dist ]					
			veh/h	%	veh/h	%				v/c	sec					
East: Balgownie Road																
5	T1	All MCs	246	3.8	246	3.8	0.178	0.6	LOS A	0.5	3.7	0.22	0.26	0.22	0.22	48.8
6	R2	All MCs	57	0.0	57	0.0	0.178	6.4	LOS A	0.5	3.7	0.22	0.26	0.22	0.22	47.4
Approach			303	3.1	303	3.1	0.178	1.7	NA	0.5	3.7	0.22	0.26	0.22	0.22	48.5
North: Alexander Street																
7	L2	All MCs	13	0.0	13	0.0	0.027	5.9	LOS A	0.1	0.6	0.47	0.64	0.47	0.47	44.7
9	R2	All MCs	9	0.0	9	0.0	0.027	8.1	LOS A	0.1	0.6	0.47	0.64	0.47	0.47	44.5
Approach			22	0.0	22	0.0	0.027	6.9	LOS A	0.1	0.6	0.47	0.64	0.47	0.47	44.6
West: Balgownie Road																
10	L2	All MCs	28	0.0	28	0.0	0.223	4.6	LOS A	0.0	0.0	0.00	0.04	0.00	0.00	48.5
11	T1	All MCs	397	3.2	397	3.2	0.223	0.1	LOS A	0.0	0.0	0.00	0.04	0.00	0.00	49.7
Approach			425	3.0	425	3.0	0.223	0.4	NA	0.0	0.0	0.00	0.04	0.00	0.00	49.6
All Vehicles			751	2.9	751	2.9	0.223	1.1	NA	0.5	3.7	0.10	0.14	0.10	0.10	49.0

**Table B3: Weekday Priority Intersection Performance of Balgownie Road with Alexander Street for the Weekday PM Peak Hour with affordable housing traffic**

Vehicle Movement Performance																
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Stop Rate	Eff. Rate	Aver. No. of Cycles	Aver. Speed
			[ Total	HV ]	[ Total	HV ]				[ Veh.	Dist ]					
			veh/h	%	veh/h	%				v/c	sec					
South: Alexander Street																
1	L2	All MCs	8	0.0	8	0.0	0.019	4.6	LOS A	0.1	0.4	0.05	0.53	0.05	0.05	45.8
3	R2	All MCs	17	0.0	17	0.0	0.019	4.6	LOS A	0.1	0.4	0.05	0.53	0.05	0.05	45.7
Approach			25	0.0	25	0.0	0.019	4.6	LOS A	0.1	0.4	0.05	0.53	0.05	0.05	45.7
East: Bruce Road																
4	L2	All MCs	37	0.0	37	0.0	0.023	4.6	LOS A	0.0	0.0	0.00	0.47	0.00	0.00	46.3
5	T1	All MCs	5	0.0	5	0.0	0.023	0.0	LOS A	0.0	0.0	0.00	0.47	0.00	0.00	47.4
Approach			42	0.0	42	0.0	0.023	4.0	NA	0.0	0.0	0.00	0.47	0.00	0.00	46.4
West: Bruce Road																
11	T1	All MCs	6	0.0	6	0.0	0.005	0.1	LOS A	0.0	0.1	0.08	0.19	0.08	0.08	48.8
12	R2	All MCs	3	0.0	3	0.0	0.005	4.7	LOS A	0.0	0.1	0.08	0.19	0.08	0.08	47.4
Approach			9	0.0	9	0.0	0.005	1.6	NA	0.0	0.1	0.08	0.19	0.08	0.08	48.3
All Vehicles			77	0.0	77	0.0	0.023	3.9	NA	0.1	0.4	0.03	0.45	0.03	0.03	46.4

**Table B4: Weekday Priority Intersection Performance of Bruce Road with Alexander Street for the Weekday PM Peak Hour with affordable housing traffic**

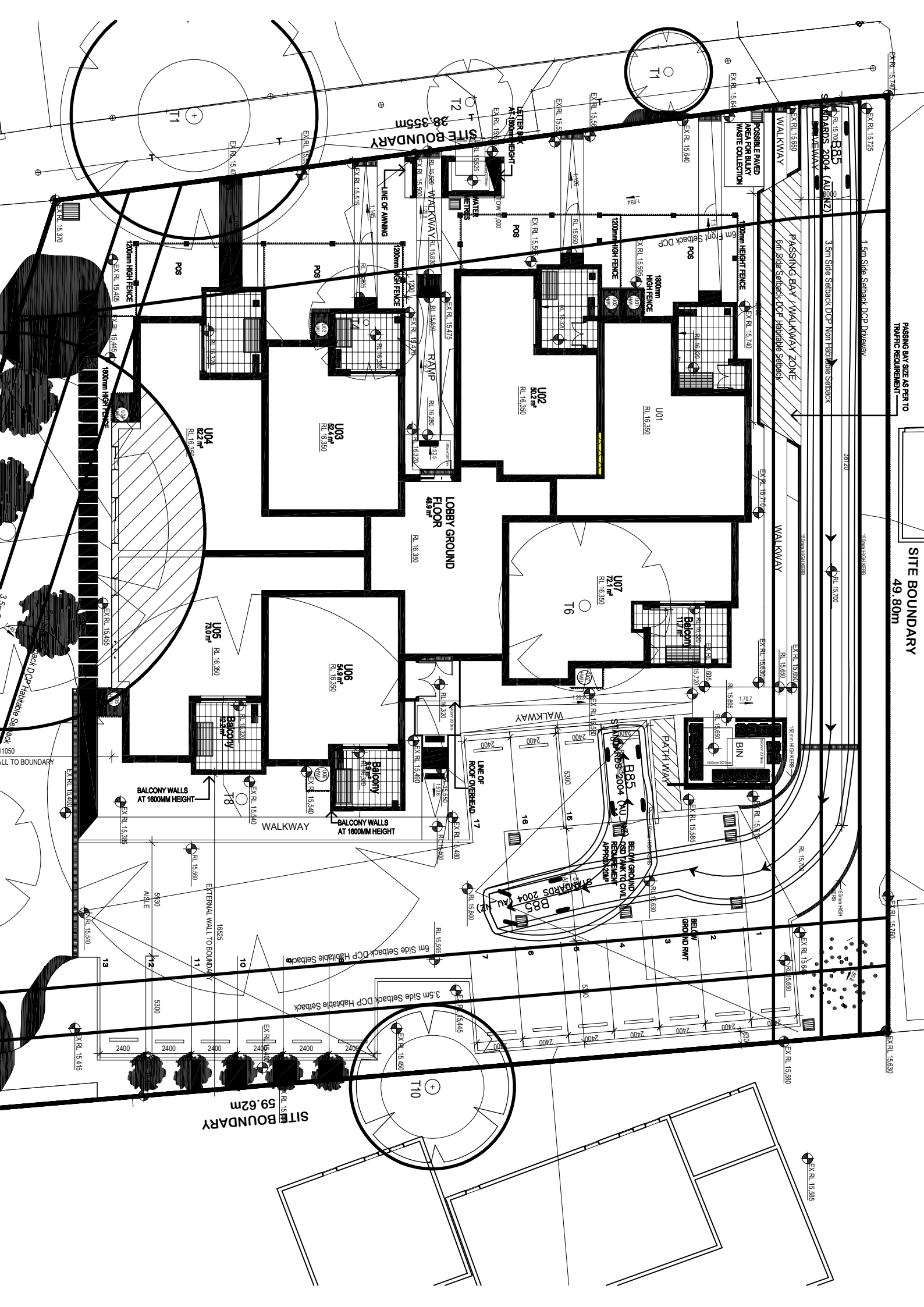


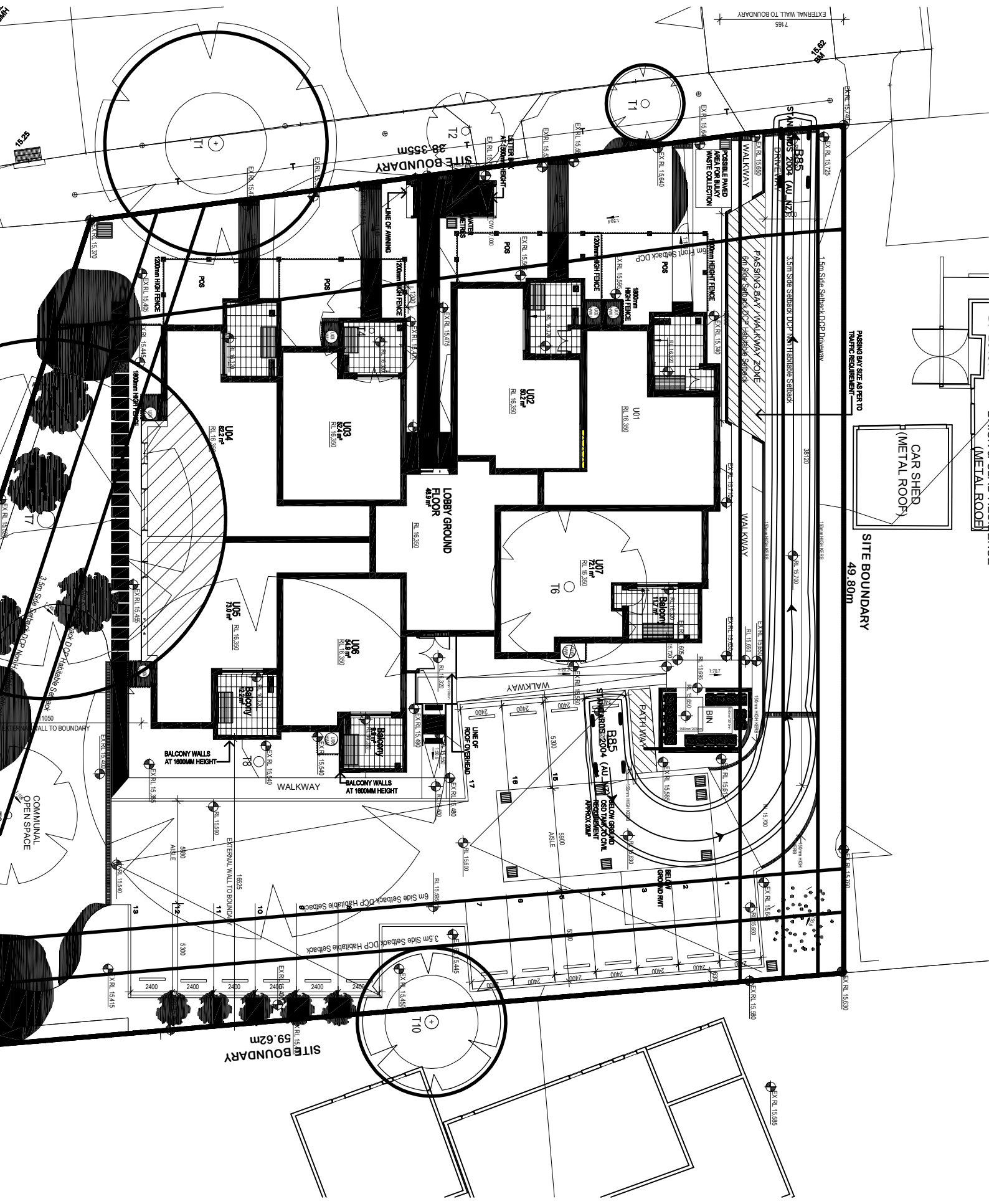




PASSING BAY SIZE AS PER TO  
TRAFFIC REQUIREMENT

SITE BOUNDARY  
49.80m



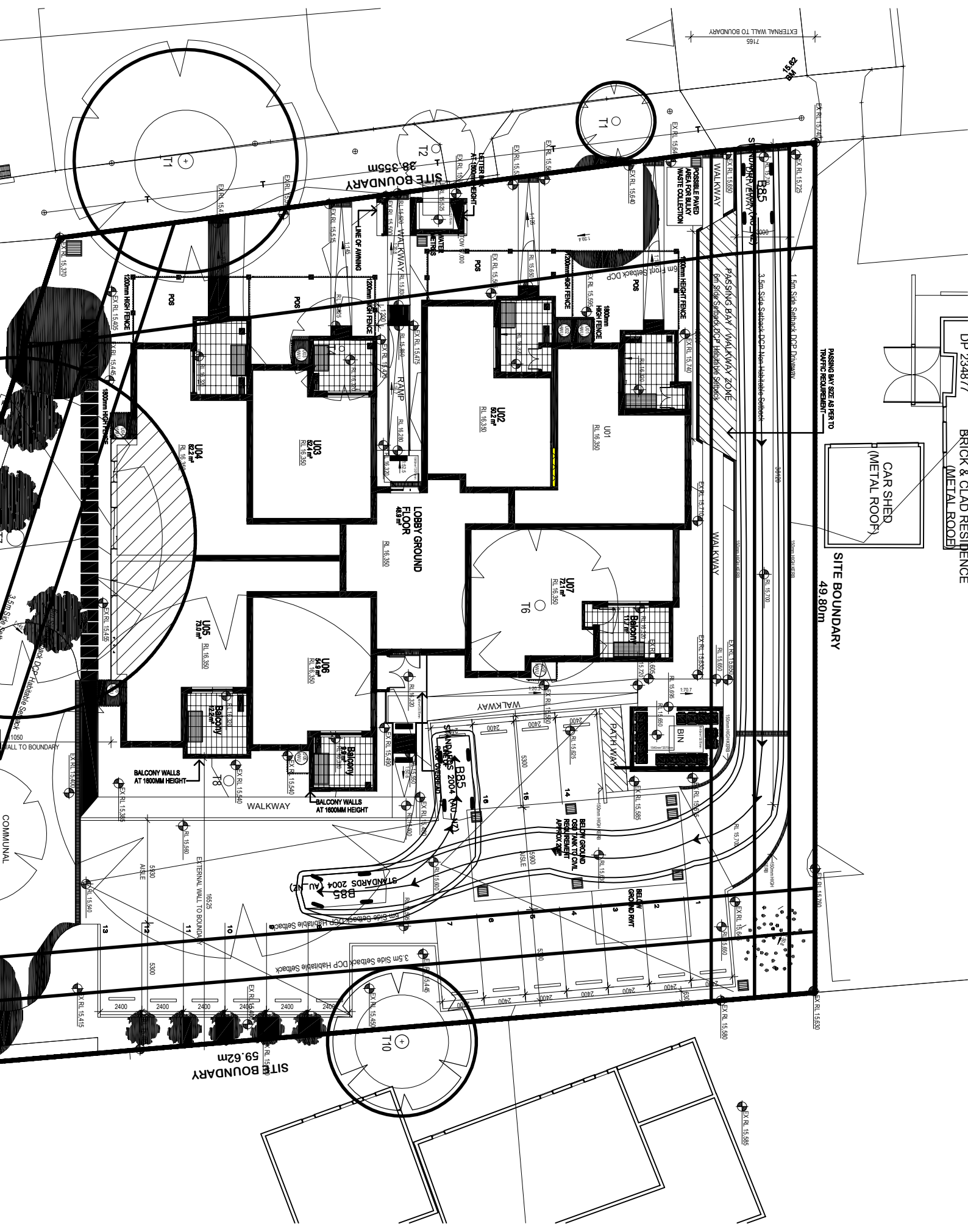


PASSING BAY SIZE AS PER TO  
TRAFFIC REQUIREMENT

SITE BOUNDARY  
49.80m

CAR SHED  
(METAL ROOF)

SITE BOUNDARY  
59.62m



DP 2348/7  
BRICK & CLAD RESIDENCE  
(METAL ROOF)

CAR SHED  
(METAL ROOF)

SITE BOUNDARY  
49.80m

PASSING BAY SIZE AS PER TO  
TYPICAL REQUIREMENT

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EXTERNAL WALL TO BOUNDARY  
7165

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