



**TRAFFIC AND PARKING IMPACT ASSESSMENT OF  
MIXED USE DEVELOPMENT  
AT 90 - 98 GLENMORE RIDGE DRIVE, GLENMORE PARK**



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**Site Address:**               **90 - 98 Glenmore Ridge Drive, Glenmore Park**

**Prepared for:**               **Mintus**

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# **1 INTRODUCTION**

McLaren Traffic Engineering (MTE) was commissioned by Mintus to provide a Traffic and Parking Impact Assessment of the Mixed Use Development at 90 - 98 Glenmore Ridge Drive, Glenmore Park.

## **1.1 Description and Scale of Development**

The proposed mixed-use development (as depicted in **Annexure A**) is to include the following scale relevant to traffic and parking impacts:

- A total of 147 units including:
  - 133 x 1 or 2-Bedroom Units;
  - 14 x 3-Bedroom Units.
- Supermarket with 1,500m<sup>2</sup> Gross Floor Area (GFA);
- Specialty Retail with 3,325m<sup>2</sup> Gross Floor Area (GFA);
- Medical Centre with 750m<sup>2</sup> Gross Floor Area (GFA);
- Gym Premises with 638m<sup>2</sup> Gross Floor Area (GFA);
- Swim school with 350m<sup>2</sup> Gross Floor Area (GFA);
- Offices with 690m<sup>2</sup> Gross Floor Area (GFA);
- Commercial Car Wash and associated Office of 62m<sup>2</sup> Gross Floor Area (GFA);
- Detached Café with 39m<sup>2</sup> Gross Floor Area (GFA);
- Child Care Centre with capacity for 112 children.
- Basement carpark providing 271 car parking spaces, made up of 197 residential spaces and 110 commercial spaces;
  - Proposed vehicular access to residential portion of carpark via a new two-way driveway from Deerubbin Drive;
  - Vehicular access to commercial portion of basement car parking via two-way ramp from ground level carpark.
- Ground level carpark providing 206 car parking spaces, plus 4 drying bays for the car wash facility;
- Proposed vehicular access via two separate two-way driveways, one from Glenmore Ridge Drive and one from Glenholme Drive.
- The construction of the development will be broken up into five (5) separate stages as shown in **Annexure B**. The stages relative to this traffic report can be described as follows:
  - Stage 1: Carwash, Café and stormwater works;
  - Stage 2: Ground Level Retail and Commercial Area;
  - Stage 3: Residential Block A;
  - Stage 4: Residential Block B;

- Stage 5: Residential Block C.

## 1.2 State Environmental Planning Policy (Infrastructure) 2007

The proposed development is of relevant size and capacity under Clause 104 of the SEPP (Infrastructure) 2007 to be referred to the Roads and Maritime Services (RMS) as it has a parking capacity of over 200 or more motor vehicles. It is expected that Penrith City Council will consult the RMS as part of the Development Application process.

## 1.3 Site Description

The subject site is currently land zoned “B2 – Local Centre” under the Penrith Council LEP 2010. The existing site is an empty lot with a proposed mixed-use development to be constructed.

The site is generally surrounded by low to medium density residential dwellings with Fernhill School to the North.

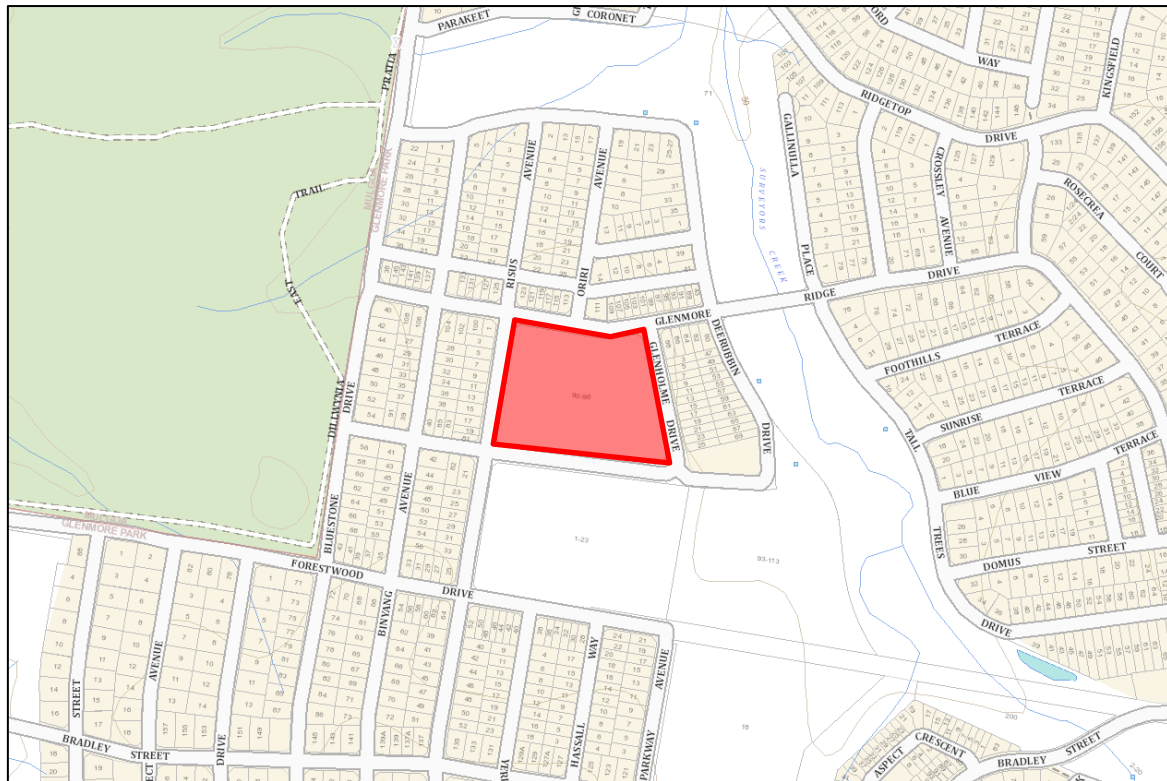
## 1.4 Site Context

The site location is shown on aerial imagery and a map in **Figure 1 & Figure 2** respectively. A zoning map is shown in **Figure 3**.



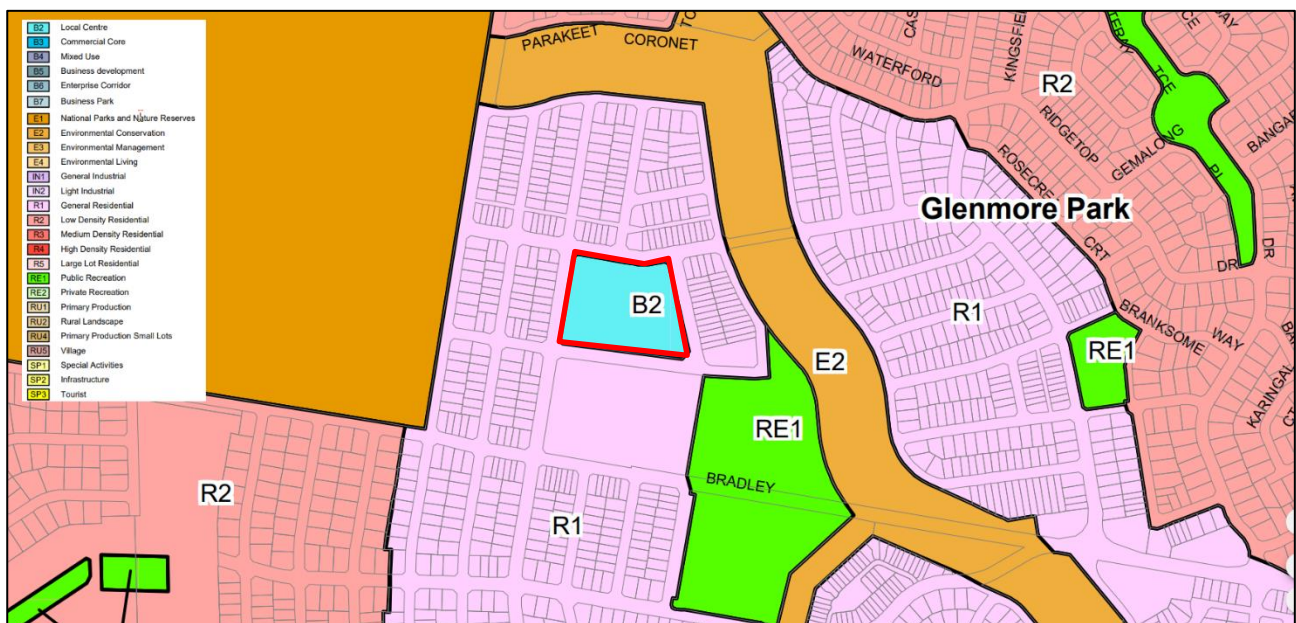
 Site Location

**FIGURE 1: SITE CONTEXT – AERIAL PHOTO**



**Site Location**

**FIGURE 2: SITE CONTEXT – STREET MAP**



**Site Location**

**FIGURE 3: SITE CONTEXT – ZONING MAP**

## **2 EXISTING TRAFFIC AND PARKING CONDITIONS**

### **2.1 *Road Hierarchy***

The road network servicing the site has the following characteristics.

#### **2.1.1 Glenmore Ridge Drive**

- Unclassified LOCAL road;
- Approximately 12m in width facilitating one traffic flow lane in each direction and kerbside parking on both sides of the road;
- No speed limit signposted, a 50km/hr speed limit applies;
- Unrestricted kerbside parking along both sides of the road.

#### **2.1.2 Glenholme Drive**

- Unclassified LOCAL road;
- Approximately 11m in width facilitating one traffic flow lane in both directions and kerbside parking on both sides of the road;
- No speed limit signposted, a 50km/hr speed limit applies;
- Unrestricted kerbside parking along both sides of the road.

#### **2.1.3 Deerubbin Drive**

- Unclassified LOCAL road;
- Approximately 10m in width facilitating one traffic flow lane in both directions and kerbside parking along both sides of the road;
- No speed limit signposted, a 50km/hr speed limit applies;
- Unrestricted kerbside parking along both sides of the road.

#### **2.1.4 Darug Avenue**

- Unclassified LOCAL road;
- Approximately 12m in width facilitating one traffic flow lane in each direction and kerbside parking on both sides of the road;
- No speed limit signposted, a 50km/hr speed limit applies;
- Unrestricted kerbside parking along both sides of the road.

#### **2.1.5 Existing Traffic Management**

- Give way intersection of Glenmore Ridge Drive/Glenholme Drive;
- Give way intersection of Glenmore Ridge Drive/Darug Avenue;
- Give way intersection of Deerubbin Drive/Darug Avenue;
- Give way intersection of Deerubbin Drive/Glenholme Drive.

## 2.2 Existing Traffic and Parking Environment

Turning movement count surveys were completed at the intersections of Glenmore Ridge Drive/Darug Avenue, Glenmore Ridge Drive/Oriri Avenue and Glenmore Ridge Drive/Glenholme Drive on Monday the 3<sup>rd</sup> of December 2018, between 2:30 pm to 6:30 pm representing a typical weekday afternoon.

Supplementary traffic surveys were completed on Tuesday 27 August 2019 at the intersections of Bradley Street/The Northern Road, Darug Avenue/Bradley Street and Deerubbin Drive/Darug Avenue between 7:00 AM to 9:30 AM and 2:30 PM to 6:30 PM, representing a typical weekday afternoon.

The results of these surveys are presented in **Annexure C** for reference.

### 2.2.1 Intersection Performances

Existing intersection performances have been assessed using SIDRA Intersection 8.0. The results of the analysis are summarised in **Table 1**.

**TABLE 1: EXISTING INTERSECTION PERFORMANCES  
SIDRA INTERSECTION 8.0**

Intersection	Peak Hour	Degree of Saturation <sup>(1)</sup>	Average Delay <sup>(2)</sup> (sec/veh)	Level of Service <sup>(3)</sup>	Control Type	Worst Movement	95th Percentile Queue
<b>EXISTING PERFORMANCE</b>							
Glenholme Drive / Glenmore Ridge Drive	PM	0.06	0.3 (Worst: 6)	<b>NA</b> (Worst: A)	Give Way	RT from Glenholme Drive	0 veh (0.2m) Glenholme Drive
Glenmore Ridge Drive / Glenmore Ridge Drive	PM	0.03	0.2 (Worst: 6.6)	<b>NA</b> (Worst: A)	Give Way	RT from Oriri Ave	0 veh (0.2m) Glenmore Ridge Drive
Darug Avenue / Glenmore Ridge Drive	PM	0.07	2 (Worst: 6.5)	<b>NA</b> (Worst: A)	Give Way	RT from Darug Avenue	0.2 veh (1.7m) Glenmore Ridge Drive
Darug Avenue / Deerubbin Drive	PM	0.03	1.2 (Worst: 5.1)	<b>NA</b> (Worst: A)	Give Way	RT from Deerubbin Drive	0.1 veh (0.4m) Darug Avenue
The Northern Road / Bradley Street	PM	0.75	18	<b>B</b>	Give Way	RT from Bradley Street	19.1 veh (143.2m) The Northern Road
Darug Avenue / Bradley Street	PM	0.08	2.2 (Worst: 5.7)	<b>NA</b> (Worst: A)	Give Way	RT from Darug Avenue	0.3 veh (1.8m) Bradley Street

**NOTES:**

(1) The Degree of Saturation is the ratio of demand to capacity for the most disadvantaged movement.

(2) The average delay is the delay experienced on average by all vehicles. The value in brackets represents the delay to the most disadvantaged movement.

(3) The Level of Service is a qualitative measure of performance describing operational conditions. There are six levels of service, designated from A to F, with A representing the best operational condition and level of service F the worst. The LoS of the intersection is shown in bold, and the LoS of the most disadvantaged movement is shown in brackets.

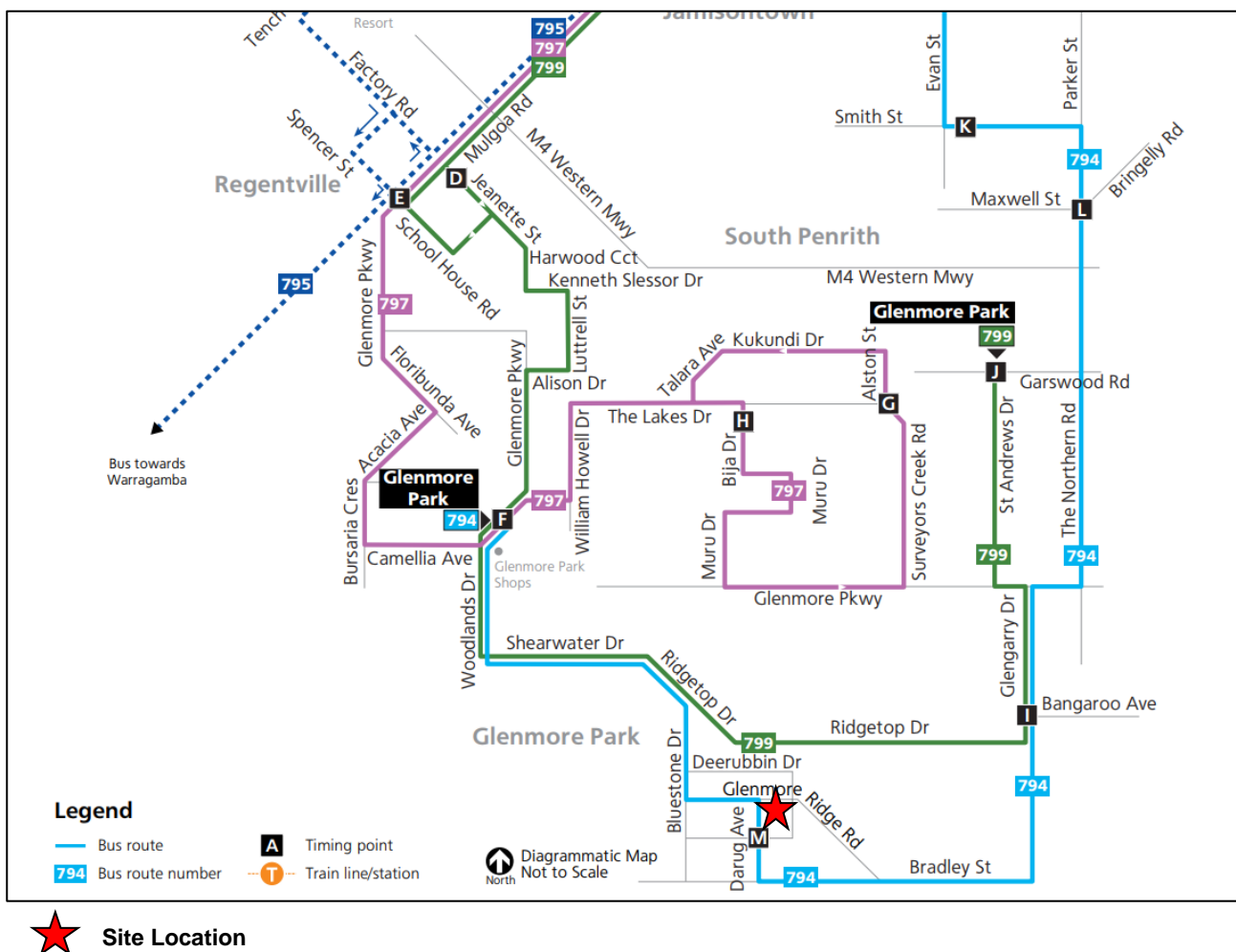
(4) No overall Level of Service is provided for Give Way and Stop controlled intersections as the low delays associated with the dominant movements skew the average delay of the intersection. The Level of Service of the worst approach is an indicator of the operation of the intersection, with a worse Level of Service corresponding to long delays and reduced safety outcomes for that approach.

As shown above, the surrounding intersections worst turning movements are operating satisfactorily at Level of Service (LoS) “A” during the afternoon peak period. This represents minimal delays and additional spare capacity.

### 2.3 Public Transport

The subject site has access to existing bus routes 794 provided by Busabout which runs along Glenmore Ridge Road, with the nearest bus stops located within approximately 150m walking distance from the site. The bus route provides access between Penrith and Glenmore Park via The Northern Road.

**Figure 4** below shows the location of the site relative to the surrounding public transport.



**FIGURE 4: PUBLIC TRANSPORT**

### 2.4 Future Road and Infrastructure Upgrades

From Penrith City Council’s Development Application tracker and website, it appears that there is no future planned road or public transport changes that will affect traffic conditions within the immediate vicinity of the subject site.

### **3 PARKING ASSESSMENT**

The peak parking demands of the proposed development have been assessed within the subsections below.

#### ***3.1 Council DCP Car Parking Requirement***

The Penrith Council Development Control Plan 2014 provides car parking requirements for the site as noted below:

##### **Residential Flat Buildings**

*On-site resident parking for each dwelling:*

*1 space per 1 or 2 bedrooms*

*2 spaces per 3 or more bedrooms*

*1 space per 40 units for service vehicles*

*In addition, visitor parking is to be provided for developments that have 5 or more dwellings: 1 space per every 5 dwellings, or part thereof.*

*1 space for car washing for every 50 units, up to a maximum of 4 spaces per building.*

##### **Business Premises**

*1 space per 40m<sup>2</sup> GFA*

##### **Child Care Centres/Pre Schools**

*1 space per 10 children plus 1 per employee plus provision for any Dwelling*

##### **Fitness Centre including Gym**

*7 spaces per 100m<sup>2</sup> GFA*

##### **Health Consulting Rooms/Medical Centres**

*3 spaces per health care professional practising at any one time plus 1 space per receptionist/support staff, plus 1 space per associated dwelling*

##### **Retail Premises Shop**

*Supermarkets – 1 space per 10m<sup>2</sup> of floor area that is to be used for retailing activities*

*Other neighbourhood and specialty shops – 1 space per 30m<sup>2</sup> GFA*

The parking requirements of the development based on the Penrith Council Development Control Plan is summarised in **Table 2**. It should be noted that the Penrith Council DCP does not include any parking requirement for car wash facilities or swim schools. In any case, the car wash and swim school facilities are considered to be ancillary to the site from a parking demand perspective.

As shown, the proposal requires a total of 611 parking spaces based on a strict application of the Penrith City Council Development Control Plan.

**TABLE 2: PARKING REQUIREMENTS: PENRITH COUNCIL DEVELOPMENT CONTROL PLAN**

Land Use	Scale	Rate	Parking Requirement (spaces)	Parking Provision
<b>Residential</b>				
1 or 2 Bedroom Unit	133	1 Space per Dwelling	133	161
3+ Bedroom Unit	14	2 Spaces per Dwelling	28	
Visitor Parking	147	1 Space per 5 Dwellings	30	30
Service Vehicle Parking		1 Space per 40 Dwellings		3
Car Wash Spaces		1 Space per 50 Dwellings	3	3
<b>Residential Sub-Total</b>			<b>198</b>	<b>197</b>
<b>Commercial</b>				
Business Premises	690m <sup>2</sup> GFA	1 per 40m <sup>2</sup> GFA	17	316
Child Care Centre	112 Children	1 space per 10 children	11	
	19 Staff	1 space per staff member	19	
Fitness Centre/Gym	638m <sup>2</sup> GFA	7 spaces per 100m <sup>2</sup> GFA	45	
Medical Centre	750m <sup>2</sup> GFA	3 Spaces per health care professional plus 1 space per support staff	60 <sup>(2)</sup>	
Supermarket	1,500m <sup>2</sup> GFA	1 space per 10m <sup>2</sup> GFA	150	
Retail	3,325m <sup>2</sup> GFA	1 space per 30m <sup>2</sup> GFA	111	
<b>Commercial Sub-Total</b>			<b>413</b>	<b>316</b>
<b>Total</b>			<b>611</b>	<b>513</b>

Notes:

- (1) Based on three staff per restaurant tenancy.
- (2) Based on an analysis of the surveys undertaken by the RMS of Medical Centres, large medical centres have approximately 2.3 medical professionals per 100m<sup>2</sup> GFA and 1.18 support staff per 100m<sup>2</sup> GFA.
- (3) Where applicable, GLFA has been calculated as 75% of GFA

### 3.2 Actual Parking Demand

The parking demands of mixed-use developments are markedly different to those of isolated premises. The parking demands of each of the relevant land uses is examined in the subsections below.

### 3.2.1 Similar Development in Penrith LGA

Recent small-scale shopping centre developments in the Penrith LGA have been examined to provide a context for the generally accepted rates of car parking demand. Whilst each site is inherently different in its environmental context, it is reasonable to assume that shopping centres are broadly similar within an LGA and should be assessed similarly. The three traffic reports reviewed were:

- Jordan Springs Town Centre (Colston Budd Hunt and Kafes)
- Caddens Precinct Centre (Colston Budd Rogers and Kafes)
- Cranebrook Village Shopping Centre Redevelopment (Transport and Traffic Planning Associates)

For each of the above sites, the RMS car parking rates were utilised to calculate the parking demands. The two reports by Colston Budd et al used the rates provided in the 2002 RMS Guide to Traffic Generating Developments, whereas the TTPA report used the aggregated rate provided in the latest 2011 study commissioned by the RMS.

Notwithstanding that it was accepted by Council, it should be noted that McLaren Traffic Engineering does not agree with the approach used by TTPA considering that:

- Aggregated rates should be used only for the purposes of planning, where finer detail of uses is not available;
- Application of the 2002 RMS Guide rates would result in a parking demand of 280 spaces, 36 spaces more than that calculated using the aggregated approach.

In summary, it is clear that the use of the rates provided in the RMS Guide are generally accepted within the Penrith City Council LGA for shopping centre developments and that it is reasonable to apply these rates to the subject site.

### 3.2.2 Shopping Centres

The Roads and Maritime Services *Guide to Traffic Generating Developments* provides the following with regards to the peak parking demands of Shopping Centre Developments:

#### Shopping Centres

$$\text{Peak Parking} = 24A(S) + 40 A(F) + 42 A(SM) + 45 A(SS) + 9 A(OM)$$

Where:

*A(S): Slow Trade GLFA, includes major Department stores such as David Jones and Grace Brothers, furniture, electrical and utility goods stores.*

*A(F): Faster Trade GLFA, includes discount department stores such as K-Mart and Target, together with larger specialist stores such as Fosseys.*

*A(SM): Supermarket GLFA, includes stores such as Franklins and large fruit markets.*

*A(SS): Speciality Shops and Secondary retail GLFA, includes speciality shops and take-away stores such as McDonalds. These stores are grouped since they tend not be primary attractors to the centre.*

*A(OM): Offices, medical GLFA.*

For the purposes of calculating the park parking demand of the land uses associated with the “Shopping Centre” parking demand, the relevant land-uses proposed have been summarised into the relevant categories above in **Table 3**.

**TABLE 3: LAND-USES AND AREAS – SHOPPING CENTRE**

Land Use	Equivalent Category	GLFA
Business Premises	A(OM)	518m <sup>2</sup>
Supermarket	A(SM)	1,125m <sup>2</sup>
Specialty Retail <sup>(1)</sup>	A(SS)	2.494m <sup>2</sup>
Medical	A(OM)	562m <sup>2</sup>
<b>Total</b>		<b>4,691m<sup>2</sup></b>

Notes: (1) Specialty retail GFA includes the Kiosks, Chemist and Liquor Store.

### 3.2.3 Gymnasiums

The Roads and Maritime Services *Guide to Traffic Generating Developments* states the following with regards to the peak parking demands of gymnasiums.

#### Gymnasiums

*Metropolitan regional (Central Business District) Centres*

*3 spaces per 100m<sup>2</sup> GFA*

*Metropolitan sub-regional areas*

*Minimum provision – 4.5 spaces per 100m<sup>2</sup> GFA*

*Desirable provision – 7.5 spaces per 100m<sup>2</sup> GFA*

These parking rates are based on surveys undertaken in 1993 and whilst surveys were completed in 2013 indicating that parking demands of gymnasiums have reduced in the intervening years, the more recent surveys were limited in their scope and cannot be applied to the subject site. Therefore, the RMS rates provided above have been applied.

### 3.2.4 Child Care Centres

The Roads and Maritime Services *Guide to Traffic Generating Developments* states that child care centres should provide parking at a rate of 1 space per 4 children. The surveys used to inform this parking requirement were completed in 1992, since which time the child care industry has changed significantly, with a trend towards larger centres.

Traffic and parking surveys of child care centres were undertaken in 2013 to determine the contemporary traffic generation and parking demands of child care centres. The results of the surveys indicate the following:

- *Centres with 20 to 35 children – 1 space per 4 children*
- *Centres with 40 to 65 children – 1 space per 5 children*
- *Centres with 70 to 100 children – 1 space per 6 children*

As indicated, there is a marked difference between the parking demands of small centres and that of large centres. The proposed centre will include a total of 112 children and on this basis, the peak parking demands of the centre will be calculated as 1 per 6 children, or 19 spaces.

### 3.2.5 Car Wash Facilities

The RMS Guide to Traffic Generating Developments does not include suggested rates of provision of parking for car wash facilities and the number of parking spaces has been based on the operational capacity of the car wash. The parking demands during hours of operation is likely to be 9 spaces, comprised of 5 spaces for staff and 4 for the drying of cars. It should be noted that the car wash will operate only during business hours on weekdays and weekends and there will be no demand for parking due to the car wash outside of these times.

### 3.2.6 Swim School

The RMS Guide to Traffic Generating Developments does not provide a suggested rate of parking demand for swim school premises. Based on an examination of the operating hours of typical swim school facilities, it is not expected that the swim school will be operating during the peak times of the development. On this basis, it is expected that there will be ample car parking available during the peak times of the swim school, which are typically between the hours of 3:00 PM to 5:00 PM on weekdays and from 8:00 AM to 12:00 PM on weekends. Further, it is expected that some patrons of the swim centre would also be visiting the child care centre and the shopping centre. On this basis it is considered that the swim school is ancillary in terms of its traffic and parking demands.

### 3.2.7 Detached Café Premises

The proposed café adjacent to the car wash facility is of a small scale and is likely to predominantly serve take-away coffee to patrons of the shopping centre or surrounding residents. Further, the café is unlikely to operate past 3pm each day and it is therefore considered that the café will be ancillary to the site in terms of parking demand.

### 3.2.8 Peak Parking Demands

The resulting car parking requirements are summarised in **Table 4** below.

**TABLE 4: CAR PARKING REQUIREMENTS**

Land Use	Scale	RMS Parking Rate	Parking Requirement
<b>Commercial Parking Area</b>			
Medical Centre	562m <sup>2</sup>	0.9 per 100m <sup>2</sup> GLFA	5
Business Premises	518m <sup>2</sup>	0.9 per 100m <sup>2</sup> GLFA	5
Specialty Retail	2,082m <sup>2</sup>	4.5 per 100m <sup>2</sup> GLFA	94
Kiosk Retail	45m <sup>2</sup>	4.5 per 100m <sup>2</sup> GLFA	2
Chemist	235m <sup>2</sup>	4.5 per 100m <sup>2</sup> GLFA	11
Liquor	132m <sup>2</sup>	4.5 per 100m <sup>2</sup> GLFA	6
Supermarket	1,125m <sup>2</sup>	4.2 per 100m <sup>2</sup> GLFA	47
Fitness Centre/Gym	638m <sup>2</sup>	4.5 per 100m <sup>2</sup> GFA	29
Child Care Centre	112 Children	1 per 6 children	19
Residential Visitor	147 Units	1 per 5 units	30
Car Wash	5 Staff + 4 Bays	1 space per staff + 1 space per bay	9
<b>Commercial Total</b>			<b>257</b>

Notes:

- (1) Where applicable, GLFA has been calculated as 75% of GFA

As shown, the parking demand for the commercial parking area has been estimated at 266 spaces; a total of 316 car spaces are proposed for the commercial uses, exceeding the likely parking demand by some 50 car parking spaces.

It is noted that ten (10) car parking spaces have been allocated specifically to the Child Care Centre and will not be available to general users of the shopping centre. This effectively reduces the general parking pool to some 306 spaces, which significantly exceeds the estimated parking demand of the uses excluding the child care centre of 247 car parking spaces.

Considering the above, the proposed development provides ample car parking for the proposed uses and is acceptable.

### 3.2.9 Consideration of Medical Centre and Child Care Centre Demand

Penrith Council officers have requested that the parking demands of the Child Care Centre and Medical Centre be assessed using the Council DCP rather than the RMS Guide Rates. The results of this analysis (which mixes the DCP rates and the RMS and other rates) is presented in **Table 5**.

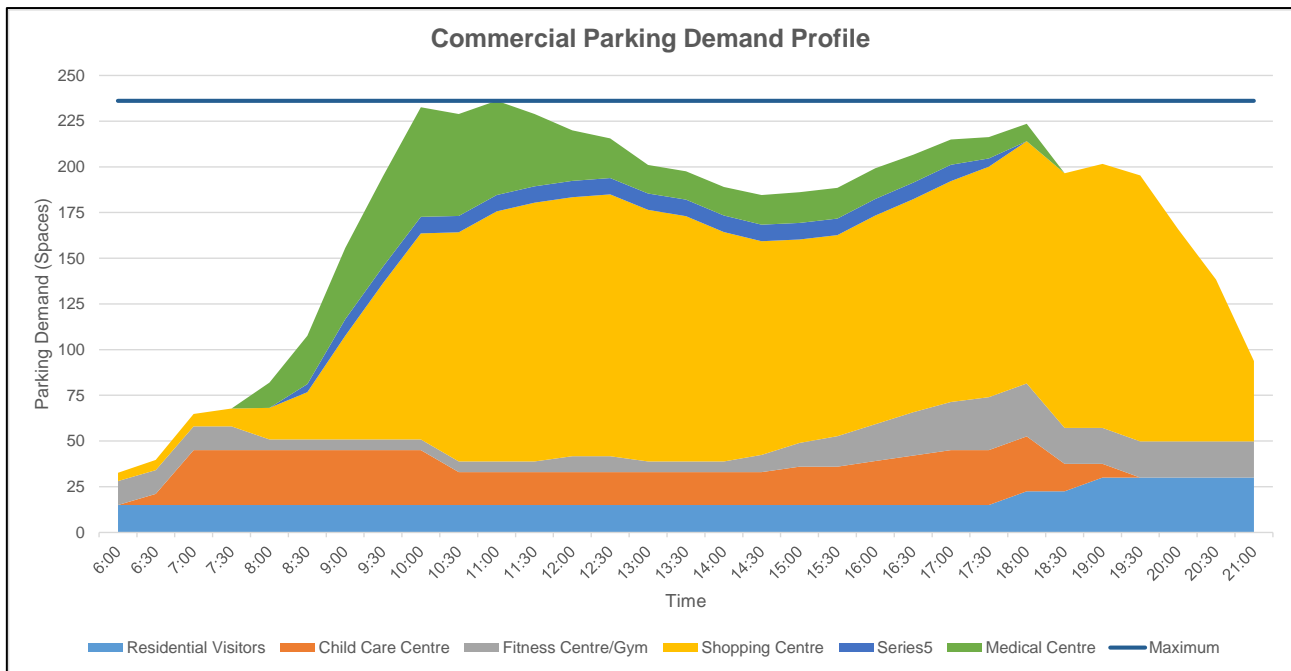
**TABLE 5: CAR PARKING REQUIREMENTS – MIXED RATES**

Land Use	Scale	RMS Parking Rate	Parking Requirement
<b>Commercial Parking Area</b>			
Medical Centre	750m <sup>2</sup> GFA	3 Spaces per health care professional plus 1 space per support staff	60 <sup>(1)</sup>
Business Premises	518m <sup>2</sup>	0.9 per 100m <sup>2</sup> GLFA	5
Specialty Retail	2,082m <sup>2</sup>	4.5 per 100m <sup>2</sup> GLFA	94
Kiosk Retail	45m <sup>2</sup>	4.5 per 100m <sup>2</sup> GLFA	2
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Child Care Centre	112 Children	1 space per 10 children	11
	19 Staff	1 space per staff member	19
Residential Visitor	147 Units	1 per 5 units	30
Car Wash	5 Staff + 4 Bays	1 space per staff + 1 space per bay	9
<b>Commercial Total</b>			<b>323</b>

Notes:

- (1) Based on an analysis of the surveys undertaken by the RMS of Medical Centres, large medical centres have approximately 2.3 medical professionals per 100m<sup>2</sup> GFA and 1.18 support staff per 100m<sup>2</sup> GFA.

Based on the application of these rates of car parking demand, the development requires a total of 323 car parking spaces, however, there has been no consideration of the different peak times of the different land-uses proposed. The peak times of each component of the development have been considered and a parking utilisation matrix has been formed and applied to the parking demands of each relevant component of the development. The utilisation matrix is provided in **Table 6**, the resulting parking demand is provided in **Table 7** and an illustration of the peak demands is provided in **Figure 5**. The peak times for the nearby Glenwest Medical Centre have been extracted from the Google “Popular Times” facility to inform the analysis. The peak time profile of the Glenwest Centre is provided in **Annexure D** for reference.



**FIGURE 5: PARKING DEMAND FOR COMMERCIAL USES**

When applied to the peak parking demand of each land-use, it is evident that the peak demand of the commercial uses will be approximately **236** car parking spaces. A total of 316 car spaces are proposed to serve the commercial uses of the site, significantly exceeding the predicted demand by some 80 spaces.

**TABLE 6: UTILISATION MATRIX – COMMERCIAL PARKING AREA**

Time	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00
<b>Residential Visitors<sup>(1)</sup></b>	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	75%	100%	100%
<b>Child Care Centre<sup>(2)</sup></b>	0%	100%	100%	100%	100%	60%	60%	60%	60%	70%	80%	100%	100%	25%	0%
<b>Fitness Centre/Gym<sup>(3)</sup></b>	45%	45%	20%	20%	20%	20%	30%	20%	20%	45%	70%	91%	100%	68%	68%
<b>Shopping Centre<sup>(4)</sup></b>	3%	5%	12%	39%	77%	94%	97%	94%	86%	76%	78%	83%	91%	99%	80%
<b>Car Wash</b>	0%	0%	0%	100%	100%	100%	100%	100%	100%	100%	100%	100%	0%	0%	0%
<b>Medical Centre<sup>(5)</sup></b>	0%	0%	23%	65%	100%	86%	46%	26%	26%	28%	28%	23%	16%	0%	0%

Notes:

- (1) – RMS surveys of residential development indicate that the peak demands for residential visitor parking occur on weekday evenings (particularly Fridays) and Weekends.
- (2) – Peak parking demand for childcare centres typically peaks at 6 pm and decreases sharply thereafter.
- (3) – RMS surveys of gyms indicate that peak parking demands occur in the early evening.
- (4) – Shopping centre parking utilisation extracted from RMS survey data.
- (5) – Medical centre peak times taken from the Google “Popular Times” feature for the nearby Glenwest Medical Centre.

**TABLE 7: WEIGHTED PARKING DEMAND – COMMERCIAL PARKING AREA**

Time	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00
Residential Visitors	15	15	15	15	15	15	15	15	15	15	15	15	23	30	30
Child Care Centre	0	30	30	30	30	18	18	18	18	21	24	30	30	8	0
Fitness Centre/Gym	13	13	6	6	6	6	9	6	6	13	20	26	29	20	20
Shopping Centre	5	7	17	57	113	137	142	138	126	111	114	121	132	144	116
Car Wash	0	0	0	9	9	9	9	9	9	9	9	9	0	0	0
Medical Centre	0	0	14	39	60	52	28	16	16	17	17	14	10	0	0
<b>Total Commercial Demand</b>	<b>33</b>	<b>65</b>	<b>82</b>	<b>156</b>	<b>233</b>	<b>236</b>	<b>220</b>	<b>201</b>	<b>189</b>	<b>186</b>	<b>199</b>	<b>215</b>	<b>224</b>	<b>202</b>	<b>166</b>

### 3.2.10 Parking for Residents

As noted previously in **Table 2**, the Penrith City Council Development Control Plan requires a total of 161 car parking spaces for residents. A total of 161 car parking spaces are proposed on a single basement level, meeting this requirement. On this basis, the proposed car parking supply for residents is acceptable.

### 3.3 **Staged Construction Parking Demand**

The five (5) stages will each have a different parking requirement based on the different sections of the development that are open. The five (5) stages have been analysed for their respective parking requirements, with the results summarised in **Table 8**. The commercial parking demands presented in **Table 8** are based on the weighted parking demands set out in **Table 7**, with the detailed analysis provided in **Annexure E**.

For the purposes of the staged assessment, the café has been assessed as a restaurant using the recommended rate of parking provision provided by the RMS Guide, resulting in a demand of 6 spaces. Once the shopping centre is constructed, it is expected that the parking demands of the café, if any, will occur outside of the shopping centre peak times.

**TABLE 8: STAGED PARKING REQUIREMENT**

Stage	Type	Parking Demand
1	Residential	0
	Commercial / Visitor	15
2	Residential	0
	Commercial / Visitor	196
3	Block A Residential	65
	Commercial / Visitor	205
4	Block A & B Residential	109
	Commercial / Visitor	211
5	Block A, B & C Residential	161
	Commercial / Visitor	219

### **3.4 Bicycle & Motorcycle Parking Requirements**

#### **3.4.1 Bicycle Parking Requirements**

Penrith Council provides the following recommendations in terms of the provision of bicycle parking for any retail development.

*Bicycle parking in accordance with the suggested bicycle parking provision rates for different land use types in the document 'Planning Guidelines for Walking and Cycling' (NSW Government 2004). Bicycle parking spaces should comply with AS2890.3:1993 Bicycle Parking Facilities.*

The *Planning Guidelines for Walking and Cycling* document provides bicycle parking rates as follows:

#### **Residential housing and casual accommodation**

##### *1-bedroom units/ flats and bedsitters*

*Resident- 20-30% of Units*

*Visitors- 5-10% of Units*

##### *2- or more bedroom units/flats*

*Resident- 20-30% of Units*

*Visitor- 5-10% of Units*

#### **Office, commercial and industry**

*Commercial offices, Retail shops, Major shopping centres and markets*

*Staff- 3-5% of Staff*

*Visitors- 5-10% of Staff*

The resulting bicycle storage requirements based on the NSW Government parking recommendations are summarised in **Table 9** below.

As shown, the development requires the minimum provision of 48 bicycle storage spaces, allocated as indicated in **Table 9**. There are ample areas on-site on the ground floor to accommodate the required bicycle provision and as such the provision of bicycle storage can be required via consent condition.

**TABLE 9: BICYCLE PARKING PROVISION RECOMMENDATION**

Bicycle Storage Controls				
Type	Resident/Staff		Customer/Visitor	
	Minimum	Maximum	Minimum	Maximum
Residential Units	1/5 Units	1/3.33 Units	1/20 Units	1/10 Units
Commercial Uses	1/33.3 Staff Members	1/20 Staff Members	1/20 Staff Members	1/10 Staff Members
Scale of Development				
Residential Units	147		Units	
Commercial Uses	7,243 (145 Staff) <sup>(1)</sup>		sqm	
Applicable Minimum and Maximum Requirements				
Type	Resident/Staff		Customer/Visitor	
	Minimum	Maximum	Minimum	Maximum
Residential Units	29.4 (29)	44.1 (44)	7.4 (7)	14.7 (15)
Commercial Uses	4.4 (5)	7.25 (7)	7.3 (7)	14.5 (15)
Total	3	51	14	30

Notes (1) A staff rate of one per 50m<sup>2</sup> has been assumed.

### 3.4.2 Motorcycle Parking Requirements

Penrith City Council does not provide a motorcycle parking rate for shopping centres and as such does not require this facility. Nonetheless, three (3) motorcycle parking spaces have been provided in the at-grade car park.

### 3.5 Servicing & Loading

The Penrith City Council's DCP requires a total of 4 service vehicle parking spaces for the residential units, of which three (3) have been provided in the basement. The DCP does not specify a size for these service vehicle spaces and it has been assumed that these spaces are to accommodate vans and similar car-sized vehicles. Further, as deliveries are usually undertaken outside of the residential visitor peak parking demand period, one (1) delivery van can utilise vacant visitor car parking spaces. As such, adequate service vehicle parking is provided onsite.

The Penrith City Council DCP does not provide specific requirements for the provision of service vehicle parking for shopping centre or mixed-use development. The servicing and loading area provided has been designed to meet the requirements of the development, as advised by the client. The loading and servicing area has the capacity to accommodate the forward entry and exit of a 15.5m long articulated vehicle (AV) and can provide for the loading of up to three vehicles (two MRVs and one 15.5m long AV) simultaneously.

Waste collection for all components of the development will be completed from the loading and servicing area provided on-site by both the Council Heavy Rigid Vehicle for residential waste and private waste contractors for the commercial waste.

Swept path testing has been undertaken demonstrating the function of the loading and servicing area and is reproduced in **Annexure F** for reference.

### **3.6 Local Pedestrian Access**

The inclusion of pedestrian crossings should be implemented to aid in pedestrian movements to/from the surrounding local streets. Pedestrian refuges are proposed on three of the four road frontages and are shown on the plans reproduced in **Annexure A**. The pedestrian refuges proposed on Glenmore Ridge Drive and Darug Drive will be placed to align with the existing pram ramps. The pedestrian refuge proposed on Deerubbin Drive will align with the southern pedestrian entrance to the site and will also provide for sufficient width for future conversion to a pedestrian crossing. The provision of a pedestrian crossing shall be assessed against the relevant warrants outlines in *RMS Australian Standard Supplement – Manual of Uniform Traffic Control Devices 1742 – Part 10 – Pedestrian Control and Protection*.

### **3.7 Car Park Design Compliance**

The proposed car parking, loading and servicing and access facilities have been assessed as compliant with the relevant requirements of AS2890.1, AS2890.2 and AS2890.6. Swept path testing of the car park has been undertaken and the results provided in **Annexure F** for reference. The design features:

- Car parking aisle and space widths appropriate to the relevant user classes;
- Correctly designed car parking spaces for use by disabled persons;
- Ramps with gradients not exceeding 25% and appropriate transitions;
- Appropriately located and designed driveways;
- Loading and servicing facilities sufficient for use by a 15.5m long Articulated Vehicle (AV).

Whilst the car parking design has been assessed to be compliant with the relevant standards, it is usual and expected that a design certificate be required prior to the issue of a Construction Certificate to account for any design changes during the DA process.

## 4 TRAFFIC ASSESSMENT

### 4.1 *Traffic Generation*

The RMS provides estimated traffic generation levels for various types of development in their *Guide to Traffic Generating Developments* document and more recent supplements. The relevant extracts are provided below.

#### High Density Residential Dwellings

*PM Peak Vehicle Trips per Unit*                      0.06 – 0.41

#### Gymnasiums

*Metropolitan Sub Regional Areas.*

*Evening Peak Hour Vehicle Trips = 9 trips per 100m<sup>2</sup> GFA*

#### Shopping Centres

*Thursday:*

$V(P) = 20 A(S) + 51 A(F) + 155 A(SM) + 46 A(SS) + 22 A(OM)$  (vehicle trips per 1000m<sup>2</sup>).

*Saturday:*

$PVT = 38 A(S) + 13 A(F) + 147 A(SM) + 107 A(SS)$  (vehicle trips per 1000m<sup>2</sup>). where:

$A(S)$ : Slow Trade GLFA

$A(F)$ : Faster Trade GLFA

$A(SM)$ : Supermarket GLFA

$A(SS)$ : Speciality shops, secondary retail GLFA

$A(OM)$ : Office, medical GLFA

Applying these site-specific traffic generation rates to the subject site results in the estimated traffic generation as summarised in **Table 7** and **Table 11** below.

As shown below, the proposed development is expected to generate 609 (322 in, 287 out) vehicle trips during the Thursday PM peak hour period and 622 (311 in, 311 out) vehicle trips during the weekend peak hour period.

It should be noted that a higher than normal proportion of patrons are expected to walk to and from the centre, as the centre is surrounded on all sides by low-density residential development. The traffic generation estimates are therefore conservative and a worst-case scenario.

**TABLE 10: ESTIMATED PEAK HOUR TRAFFIC GENERATION – THURSDAY PM**

Land Use	Scale	Rate	Trips	Weekday PM Peak Generation	
				IN	OUT
<b>High Density Residential Dwellings</b>	147 Dwellings	0.41 trips per unit <sup>(1)</sup>	60 <sup>(2)</sup>	48	12
<b>Business Premises</b>	518m <sup>2</sup> GLFA	22 trips per 1000m <sup>2</sup> GLFA	11 <sup>(3)</sup>	2	9
<b>Child Care Centre</b>	112 Children	0.7 trips per child	78 <sup>(4)</sup>	39	39
<b>Fitness Centre/Gym</b>	638m <sup>2</sup> GFA	9 trips per 100m <sup>2</sup> GFA	58 <sup>(5)</sup>	29	29
<b>Medical Centre</b>	562m <sup>2</sup> GLFA	22 trips per 1000m <sup>2</sup> GLFA	12 <sup>(6)</sup>	6	6
<b>Supermarket</b>	1,125m <sup>2</sup> GLFA	155 trips per 1000m <sup>2</sup> GLFA	174 <sup>(7)</sup>	87	87
<b>Retail</b>	2,494m <sup>2</sup> GLFA	46 trips per 1000m <sup>2</sup> GLFA	115 <sup>(8)</sup>	58	57
<b>Total</b>			<b>508</b>	<b>269</b>	<b>239</b>

**NOTES:**

- (1) The RMS Technical Direction 13-04a notes a range of 0.09-0.41 trips per high-density dwelling in the weekday PM peak hour. Considering the location of the site, 0.41 trips per dwelling has been used for conservatism.
- (2) Residential trip generation assumed to be 80% in, 20% out for PM peak period.
- (3) Business trip generation assumed to be 20% in, 80% out for PM peak period.
- (4) Child care centre trip generation assumed to be 50% in, 50% out for PM peak period.
- (5) Fitness Centre/ Gym trip generation assumed to be 50% in, 50% out for PM peak period.
- (6) Medical Centre trip generation assumed to be 50% in, 50% out for PM peak period.
- (7) Supermarket trip generation assumed to be 50% in, 50% out for PM peak period.
- (8) Retail trip generation assumed to be 50% in, 50% out for PM peak period.

**TABLE 11: ESTIMATED PEAK HOUR TRAFFIC GENERATION – SATURDAY MIDDAY**

Land Use	Scale	Rate	Trips	Weekend Peak Generation	
				IN	OUT
High-Density Residential Dwellings	147 Dwellings	25% of Weekday Peak	15 <sup>(1)</sup>	8	7
Business Premises	518m <sup>2</sup> GLFA	Nil	0	0	0
Child Care Centre	112 Children	Nil	0	0	0
Fitness Centre/Gym	638m <sup>2</sup> GFA	9 trips per 100m <sup>2</sup> GFA	58 <sup>(2)</sup>	29	29
Medical Centre	562m <sup>2</sup> GLFA	22 trips per 1000m <sup>2</sup> GLFA <sup>(3)</sup>	12 <sup>(4)</sup>	6	6
Supermarket	1,125m <sup>2</sup> GLFA	147 trips per 1000m <sup>2</sup> GLFA	165 <sup>(5)</sup>	82	83
Retail	2,494m <sup>2</sup> GLFA	107 trips per 1000m <sup>2</sup> GLFA	267 <sup>(6)</sup>	148	149
<b>Total</b>			<b>517</b>	<b>258</b>	<b>259</b>

NOTES:

- (1) Residential trip generation assumed to be 50% in, 50% out for weekend peak period.
- (2) Fitness Centre/ Gym trip generation assumed to be 50% in, 50% out for weekend peak period.
- (3) Assumed to be operating on weekends with the same peak traffic generation as on a weekday afternoon.
- (4) Medical Centre trip generation assumed to be 50% in, 50% out for weekend peak period.
- (5) Supermarket trip generation assumed to be 50% in, 50% out for weekend peak period.
- (6) Retail trip generation assumed to be 50% in, 50% out for weekend peak period.

## 4.2 Trip Assignment

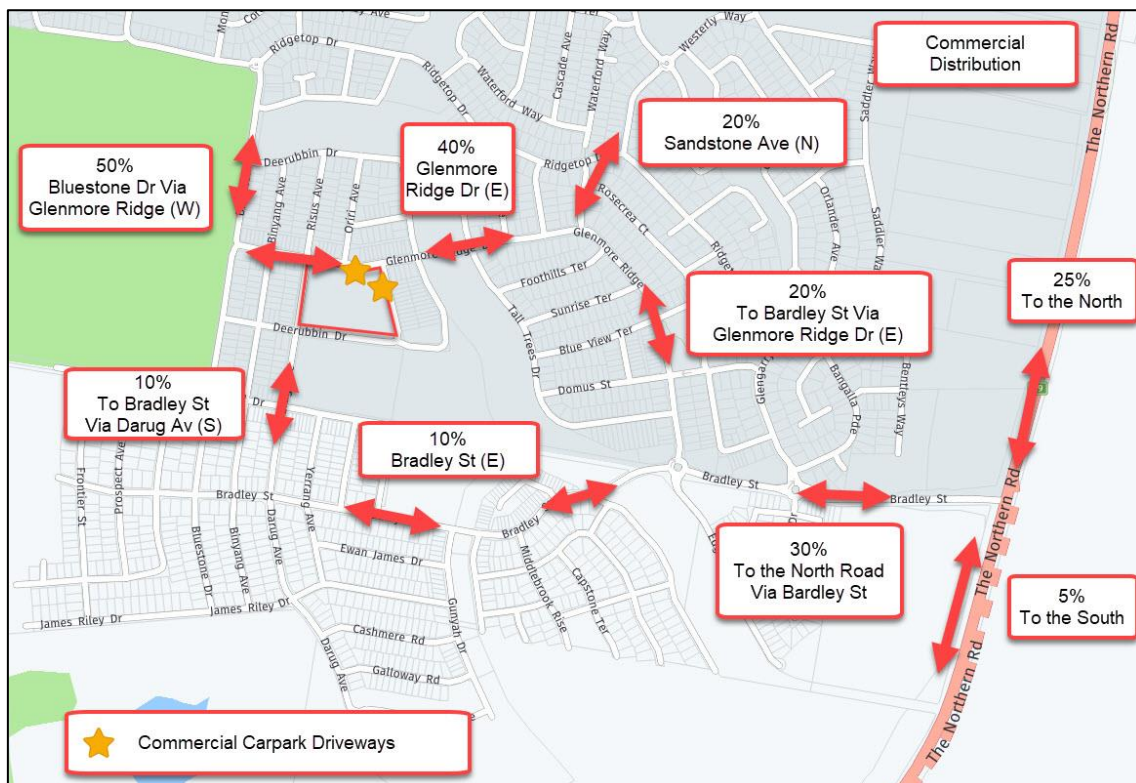
Given the surrounding road network and available routes to/from the site the traffic generated from the subject site is assumed to be distributed as per **Figure 6** and **Figure 7**.

## 4.3 Traffic Impact

The traffic generation of the site as estimated in **Section 4.1** has been distributed through the traffic network based upon the traffic assignment provided in **Section 4.2**. The intersections have been modelled under the future traffic case in SIDRA INTERSECTION 8.0. The purpose of this assessment is to compare the existing intersection operations to the future scenario under the increased traffic load. The results of this assessment are shown in **Table 12**.



**FIGURE 6: RESIDENTIAL TRAFFIC DISTRIBUTION**



**FIGURE 7: COMMERCIAL TRAFFIC DISTRIBUTION**

**TABLE 12: INTERSECTION PERFORMANCES - FUTURE  
SIDRA INTERSECTION 8.0**

Intersection	Peak Hour	Degree of Saturation(1)	Average Delay(2) (sec/veh)	Level of Service(3)	Control Type	Worst Movement	95th Percentile Queue
<b>EXISTING PERFORMANCE</b>							
Glenholme Drive / Glenmore Ridge Drive	PM	0.06	0.3 (Worst: 6)	<b>NA</b> (Worst: A)	Give Way	RT from Glenholme Drive	0 veh (0.2m) Glenholme Drive
Glenmore Ridge Drive / Glenmore Ridge Drive	PM	0.03	0.2 (Worst: 6.6)	<b>NA</b> (Worst: A)	Give Way	RT from Oriri Ave	0 veh (0.2m) Glenmore Ridge Drive
Darug Avenue / Glenmore Ridge Drive	PM	0.07	2 (Worst: 6.5)	<b>NA</b> (Worst: A)	Give Way	RT from Darug Avenue	0.2 veh (1.7m) Glenmore Ridge Drive
Darug Avenue / Deerubbin Drive	PM	0.03	1.2 (Worst: 5.1)	<b>NA</b> (Worst: A)	Give Way	RT from Deerubbin Drive	0.1 veh (0.4m) Darug Avenue
The Northern Road / Bradley Street	PM	0.75	18	<b>B</b>	Signals	RT from Bradley Street	19.1 veh (143.2m) The Northern Road (S)
Darug Avenue / Bradley Street	PM	0.08	2.2 (Worst: 5.7)	<b>NA</b> (Worst: A)	Give Way	RT from Darug Avenue	0.3 veh (1.8m) Bradley Street
<b>FUTURE PERFORMANCE</b>							
Glenholme Drive / Glenmore Ridge Drive	PM	0.11	1.5 (Worst: 5.7)	<b>NA</b> (Worst: A)	Give Way	RT from Glenholme Drive	0.2 veh (1.1m) Glenholme Drive
Glenmore Ridge Drive / Glenmore Ridge Drive	PM	0.06	0.1 (Worst: 7.5)	<b>NA</b> (Worst: A)	Give Way	RT from Oriri Ave	0 veh (0.2m) Glenmore Ridge Drive
Darug Avenue / Glenmore Ridge Drive	PM	0.14	1.5 (Worst: 7.2)	<b>NA</b> (Worst: A)	Give Way	RT from Darug Avenue	0.4 veh (3m) Glenmore Ridge Drive
Darug Avenue / Deerubbin Drive	PM	0.06	1.4 (Worst: 5.4)	<b>NA</b> (Worst: A)	Give Way	RT from Deerubbin Drive	0.1 veh (0.8m) Darug Avenue
The Northern Road / Bradley Street	PM	0.70	23.3	<b>B</b>	Signals	RT from Bradley Street	25.4 veh (189.9m) The Northern Road
Darug Avenue / Bradley Street	PM	0.11	2.8 (Worst: 6.1)	<b>NA</b> (Worst: A)	Give Way	RT from Darug Avenue	0.5 veh (3.2m) Bradley Street

**NOTES:**

(1) The Degree of Saturation is the ratio of demand to capacity for the most disadvantaged movement.

(2) The average delay is the delay experienced on average by all vehicles. The value in brackets represents the delay to the most disadvantaged movement.

(3) The Level of Service is a qualitative measure of performance describing operational conditions. There are six levels of service, designated from A to F, with A representing the best operational condition and level of service F the worst. The LoS of the intersection is shown in bold, and the LoS of the most disadvantaged movement is shown in brackets.

(4) No overall Level of Service is provided for Give Way and Stop controlled intersections as the low delays associated with the dominant movements skew the average delay of the intersection. The Level of Service of the worst approach is an indicator of the operation of the intersection, with a worse Level of Service corresponding to long delays and reduced safety outcomes for that approach.

As shown in **Table 12**, the traffic generated by the development will have no noticeable effect on the road network in terms of traffic flow and road safety considerations. The existing LoS has been maintained, with minor increases to the average delays and capacity maintained.

Considering the primarily residential land uses surrounding the site, it is expected that the weekend traffic peak would be equal to or lower than the weekday PM peak. Considering that the estimated traffic generation of the site is approximately equal for both the weekday PM and weekend peak periods, it is reasonable to assume that there would be no unacceptable impact on the road network during the weekend peak hour as a result of the proposed development.

Similarly, the development will generate significantly less traffic during the AM peak hour than during the PM peak hour. Based on the traffic surveys undertaken, the AM and PM peak hours are not significantly different in terms of existing traffic flows and, considering that the PM peak hour has been modelled, there is no need to undertake modelling for the AM peak.

## 5 **CONCLUSIONS**

The traffic and parking impacts of the proposed mixed-use development at 90 - 98 Glenmore Ridge Drive, Glenmore Park, as shown on reduced plans provided in **Annexure A**, have been assessed.

The parking demands of the proposed development have been assessed using a combination of the guidelines provided by the Roads and Maritime Services, the Penrith City Council DCP and the most recent parking demand studies. The residential units proposed require a total of 198 car parking spaces and 197 parking spaces are proposed for use by residents on a single basement level. The shortfall of car parking is due to the reduction of one (1) service bay whereby, service/delivery vehicles can use vacant visitor parking outside of residential visitor peaks.

The peak commercial parking demands of the development have been estimated as 236 car parking spaces, 316 are provided in an at-grade parking area and basement level parking area. On this basis, the proposed development is provided with sufficient car parking to cater for the demands of both the residential and commercial components of the development.

The design of the car parking areas, access facilities and loading and servicing facilities have been assessed to comply with the relevant Australian Standards, with each parking area being designed for the appropriate user class. The loading and servicing areas are designed to accommodate vehicles of up to 15.5m in length and will facilitate waste collection for all components of the development.

The traffic generation of the site has been estimated as some 508 (269 in, 239 out) vehicle trips during the Thursday PM peak hour period and 517 (258 in, 259 out) vehicle trips during the weekend peak hour period. SIDRA Intersection 8.0 has been used to assess the impact of the additional traffic on the intersections surrounding the site, with the results reflecting that there be no change in level of service or otherwise noticeable change in the function of the surrounding intersections as a result of the proposed development.

In view of the foregoing, the subject development is fully supported in terms of its traffic and parking impacts.



## **ANNEXURE A: REDUCED PLANS**

STAGE 2 SCHEDULES

COMMERCIAL + RETAIL SCHEDULE

UNIT NUMBER	ROOM TYPE	NET AREA
BASEMENT LEVEL		
AR12	RETAIL	15 m²
AR00	RETAIL	27 m²
GROUND LEVEL		
MAJOR SUPERMARKET	IGA	1500 m²
AC02	COM	100 m²
MC01	MEDICAL CENTRE	750 m²
AR01	RETAIL	102 m²
AR02	RETAIL	93 m²
AR03	RETAIL	103 m²
AR04	RETAIL	129 m²
AR05	RETAIL	130 m²
AR10	LIQUOR	176 m²
G01	SWIM SCHOOL	350 m²
AC01	COM	100 m²
G02	GYM	638 m²
CR04	RETAIL	86 m²
CR05	RETAIL	108 m²
CRO3	DISCOUNTER	472 m²
CR06	RETAIL	85 m²
CC01	CHILD CARE	136 m²
CR07	RETAIL	111 m²
CR01	RETAIL	55 m²
AR06	RETAIL	72 m²
BR03	RETAIL	39 m²
BR01	CHEMIST	313 m²
AR07	RETAIL	68 m²
BR02	RETAIL	132 m²
KR01	KIOSK	20 m²
BR05	RETAIL	101 m²
BR06	RETAIL	117 m²
AR09	RETAIL	77 m²
AR08	RETAIL	81 m²
KR02	KIOSK	20 m²
KR03	KIOSK	20 m²
CO2	COM	39 m²
CO1	COM	62 m²
BR04	RETAIL	31 m²
CR02	RETAIL	64 m²
AR11	RETAIL	478 m²
MEZZANINE LEVEL		
AC03	COM	490 m²
Grand total: 39		7488 m²

CHILD CARE CENTRE STAFF CALCULATION

KIDS AGE GROUP	NO. OF KIDS	STAFF RATIO	NOS. OF STAFF REQUIRED
0-2	32	1/4	8
2-3	30	1/5	6
3-5	50	1/10	5
TOTAL			
	112		19

CHILD CARE CENTRE SPATIAL REQUIREMENT

INDOOR SPACE REQUIREMENT				
KIDS AGE GROUP	NO. OF KIDS	AREA/ CHILD	REQUIRED (m²)	PROPOSED (m²)
0-2	32	3.25	104	105
2-3	30	3.25	97.5	98
3-5	50	3.25	162.5	170

OUTDOOR SPACE REQUIREMENT			
TOTAL KIDS	AREA/ CHILD	REQUIRED (m²)	PROPOSED (m²)
112	7	784	855

TOTAL PROPOSED CHILD CARE FLOOR AREA: 660m²

SUPERMARKET GENERAL WASTE CALCULATION

	AREA	GARBAGE RATE	GARBAGE PER WEEK
GENERAL WASTE	m²	L/100m²/DAY	L/ WEEK
SUPERMARKET	2193	660	101316.6
COLLECTION FREQUENCY			4 PER WEEK

SUPERMARKET RECYCLE WASTE CALCULATION

	AREA	GARBAGE RATE	GARBAGE PER WEEK
GENERAL WASTE	m²	L/100m²/DAY	L/ WEEK
SUPERMARKET	2193	240	36842.4
COLLECTION FREQUENCY			4 PER WEEK

\* PLEASE REFER TO WASTE MANAGEMENT PLAN. DETAILS OF BINS, WASTE EQUIPMENT + WASTE ROOMS TO BE DETERMINED BY TENANT

COMMERCIAL/ RETAIL GENERAL WASTE CALCULATION

GENERAL WASTE	AREA	GARBAGE RATE	GARBAGE PER WEEK
	m²	L/100m²/DAY	L/ WEEK
RESTAURANT	509	660	23516
SPECIALTY RETAIL	1439	50	5037
FOOD RETAIL	238	150	2499
KIOSK RETAIL	60	50	210
LIQUOR RETAIL	260	50	910
CHEMIST	313	50	1096
MEDICAL CENTRE	750	50	2625
GYM	638	10	446.6
COMMERCIAL OFFICES	147	10	103
CHILD CARE	660	80	3696
CAR WASH STATION	62	10	65.1
CAFE	38	300	798
SWIM SCHOOL	291	10	203.7

TOTAL WASTE PER WEEK	41204.1L
BIN SIZE	1100L
TOTAL BINS PER WEEK	38
COLLECTION FREQUENCY	4 PER WEEK
NO. OF BINS REQUIRED	10

COMMERCIAL/ RETAIL RECYCLE CALCULATION

GENERAL WASTE	AREA	GARBAGE RATE	GARBAGE PER WEEK
	m²	L/100m²/DAY	L/ WEEK
RESTAURANT	509	200	7126
SPECIALTY RETAIL	1439	50	5037
FOOD RETAIL	238	150	2499
KIOSK RETAIL	60	50	210
LIQUOR RETAIL	260	50	910
CHEMIST	313	50	1096
MEDICAL CENTRE	750	50	2625
GYMS	890	10	446.6
COMMERCIAL OFFICES	147	10	103
CHILD CARE	660	80	3696
CAR WASH STATION	62	15	65.1
CAFE	38	300	532
SWIM SCHOOL	38	300	1018.5

TOTAL WASTE PER WEEK	25363.1L
BIN SIZE	1100L
TOTAL BINS PER WEEK	24
COLLECTION FREQUENCY	4 PER WEEK
NO. OF BINS REQUIRED	6

GENERAL WASTE BIN RECYCLE BIN

STAGE 1 SCHEDULES

STAGE 1- COMMERCIAL SHOWROOM + CAFE SCHEDULE

UNIT NUMBER	ROOM TYPE	NET AREA
GROUND LEVEL		
CO2 (CAFE)	COM	39 m²
CO1 (SHOWROOM)	COM	62 m²
Grand total: 2		100 m²

SHOWROOM + CAFE CAR PARKING SCHEDULE

PROGRAMS	AREA (m²)	NLA (75%)	RATE	REQUIRED PARKING	PROPOSED PARKING
SHOWROOM + CAFE	62	NA	3 SPACES	3	3 ON STREET PARKING
SHOWROOM + CAFE	38	NA	15 / 100m²	6	6 ON STREET PARKING
TOTAL					10 ON STREET PARKING

COMMERCIAL BICYLCE PARKING SCHEDULE

by Planning Guidelines for Walking + Cycling (NSW Government 2004)

SHOWROOM/ CAFE (100m²)	MIN RATE	MAX RATE	MIN REQUIRED	MAX REQUIRED	PROPOSED SPACE
2x STAFF	1 SPACE / 33.3 STAFF	1 SPACE / 20 STAFF	0.1	0.1	NIL
CUSTOMERS	1 SPACE / 20 STAFF	1 SPACE / 10 STAFF	0.1	0.2	1
* STAFF (1 STAFF/50m²)= 100/50= 2 STAFF (BASED ON RMS SURVEY)					

COMMERCIAL / RETAIL CAR PARKING SCHEDULE

by RMS GUIDE TO TRAFFIC GENERATING DEVELOPMENT

PROGRAMS	AREA (m²)	NLA (75%)	RATE	REQUIRED PARKING	PROPOSED AT-GRADE PARKING
SUPERMARKET	2193	1645	0.042	69	
SPECIALTY RETAIL (21)	2658	1994	0.045	90	
KIOSK RETAIL (3)	60	45	0.045	2	
CHEMIST	313	245	0.045	11	
LIQOUR	260	195	0.045	9	
MEDICAL CENTRE	750	562	0.009	5	
GYMS (1)	638	NIL	0.045	29	
OFFICES (2)	147	110	0.009	1.0	
CHILD CARE	112 KIDS		1 PER 6 CHILD	19	
CAR WASH	5 STAFFS + 4 BAYS	NIL	1/ STAFF + 1/ BAY	9	
* RESIDENTIAL VISITORS	147 UNITS	BASED ON DCP	1 SPACE/ 5 UNITS	30	
TOTAL				274	223

COMMERCIAL BICYLCE PARKING SCHEDULE

by Planning Guidelines for Walking + Cycling (NSW Government 2004)

COM/ RETAIL (7410m²)	MIN RATE	MAX RATE	MIN REQUIRED	MAX REQUIRED	PROPOSED SPACE
STAFF *	1 SPACE / 33.3 STAFF	1 SPACE / 20 STAFF	4.4	7.4	8
CUSTOMERS	1 SPACE / 20 STAFF	1 SPACE / 10 STAFF	7.4	14.8	15
* STAFF (1 STAFF/50m²)= 7410/50= 148 STAFF (BASED ON RMS SURVEY)					

ESTIMATION OF EXISTING POTENTIAL ON STREET PARKING

STREET	APPROX. NO. OF PARKING
GLENMORE RIDGE DRIVE	16
DARUG DRIVE	11
DEERUBBIN DRIVE	24
GLENHOLME DRIVE	26
TOTAL	77

SHOWROOM + CAFE GENERAL WASTE CALCULATION

GENERAL WASTE	AREA	GARBAGE RATE	GARBAGE PER WEEK
	m²	L/100m²/DAY	L/ WEEK
CAFE	38	300	798
SHOWROOM	62	15	65.1

TOTAL WASTE PER WEEK	863.1L
BIN SIZE	240L
TOTAL BINS PER WEEK	4
COLLECTION FREQUENCY	4 PER WEEK
NO. OF BINS REQUIRED	1

SHOWROOM + CAFE RECYCLE WASTE CALCULATION

GENERAL WASTE	AREA	GARBAGE RATE	GARBAGE PER WEEK
	m²	L/100m²/DAY	L/ WEEK
CAFE	38	200	532
SHOWROOM	62	15	65.1

TOTAL WASTE PER WEEK	597.1L
BIN SIZE	240L
TOTAL BINS PER WEEK	3
COLLECTION FREQUENCY	4 PER WEEK
NO. OF BINS REQUIRED	1

GENERAL WASTE BIN RECYCLE BIN

REFERENCES

DRAWINGS TO BE READ IN CONJUNCTION WITH BUT NOT LIMITED TO ALL STRUCTURAL ENGINEERS, STORMWATER ENGINEERS, LANDSCAPE ARCHITECTS, AND OTHER ASSOCIATED PLANS & REPORTS

REFER TO THE BASIX REPORT FOR ADDITIONAL REQUIREMENTS.

NOTES

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FIGURED DIMENSIONS TO BE USED AT ALL TIME.  
DO NOT SCALE MEASUREMENTS OFF DRAWINGS.

B 02.06.2020 GENERAL AMENDMENTS

A 17.05.2019 DA SUBMISSION

Rev.	Date	Description
------	------	-------------

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Nominated Architect: Jacob Yammine 8395, ABN 24 243 205 327

Project

PROPOSED MIXED USE DEVELOPMENT

90-98 GLENMORE RIDGE DRIVE,  
GLENMORE PARK

Drawing Title

COMMERCIAL/ RETAIL + CHILD CARE  
SCHEDULES

Job no. Drawing no. Rev.

J18429D DA 1002 B

Drawn by	Checked by	Approved by	Date
Author	Checker	Approver	MAY 2018

DARUG DRIVE

GLENMORE RIDGE DRIVE

DEEP SOIL ZONE 1786m<sup>2</sup>

DEERUBBIN DRIVE

### RESIDENTIAL CAR PARKING SCHEDULE

by Penrith DCP 2014

UNITS (147)	RATE	REQUIRED	PROPOSED
RESIDENTIAL NON-ADAPTABLE (132 UNITS)			
1 BED (9)	1 SPACE / 1 UNIT	9	9
2 BED (124)	1 SPACE / 1 UNIT	124	124
3 BED (14)	2 SPACE / 1 UNIT	28	28
VISITORS	1 SPACE / 5 UNITS	29.4	30 <sup>*</sup>
CARWASH BAY	1 SPACE / 50 UNITS	2.9	3
SERVICE VEHICLE	1 SPACE / 40 UNITS	3.7	3
TOTAL		197	197
RESIDENTIAL ADAPTABLE (15 UNITS)			
		15	15

\* RESIDENTIAL VISITORS PARKING TO BE LOCATED ON EXTERNAL 'AT-GRADE' PARKING. PLEASE REFER TO TRAFFIC REPORT.

### RESIDENTIAL BICYCLE STORAGE SCHEDULE

by Planning Guidelines for Walking + Cycling (NSW Government 2004)

UNITS (147)	MIN RATE	MAX RATE	MIN REQUIRED	MAX REQUIRED	PROPOSED SPACE
RESIDENTIAL	1 SPACE / 5 UNIT	1 SPACE / 3.33 UNIT	29.4	44.1	58
VISITORS	1 SPACE / 20 UNIT	1 SPACE / 10 UNIT	7.4	14.7	15

### RESIDENTIAL WASTE CALCULATION

	RATE OF WASTE	TOTAL WASTE	BIN SIZE	NO. OF BINS COMPLIANCE REQUIRED	NO. OF BINS PROPOSED
BLOCK A RESIDENTIAL (60 UNITS)					
WASTE	1100L/18week	3720L/WEEK	1100L	4	5
RECYCLE	1100L/18week	3720L/WEEK	1100L	4	5
PROPOSED TOTAL					8
BLOCK B RESIDENTIAL (39 UNITS)					
WASTE	1100L/18week	2418L/WEEK	1100L	3	4
RECYCLE	1100L/18week	2418L/WEEK	1100L	3	4
PROPOSED TOTAL					8
BLOCK C RESIDENTIAL (48 UNITS)					
WASTE	1100L/18week	2976L/WEEK	1100L	3	4
RECYCLE	1100L/18week	2976L/WEEK	1100L	3	4
PROPOSED TOTAL					8

GENERAL WASTE BIN RECYCLE BIN

### LEGEND

FHR FIRE HOSE REEL

REFERENCES  
DRAWINGS TO BE READ IN CONJUNCTION WITH BUT NOT LIMITED TO ALL STRUCTURAL, ENGINEERING, STORMWATER ENGINEERING, LANDSCAPE ARCHITECTS, AND OTHER ASSOCIATED PLANS & REPORTS  
REFER TO THE BASIS REPORT FOR ADDITIONAL REQUIREMENTS  
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### PARKING LEGEND

BICYCLE PARKING 600x1200  
CAR WASH PARKING 3400x5400  
COMMERCIAL ACCESSIBLE PARKING 2600x5400  
COMMERCIAL PARKING 2600x5400  
MOTORCYCLE PARKING 1200x2500  
RESIDENTIAL ACCESSIBLE PARKING 2400x5400  
RESIDENTIAL PARKING 2400x5400, U.N.O.  
SERVICES / CARRIER PARKING 2600x7500

C	02.06.2020	GENERAL AMENDMENTS
B	24.09.2019	CARPARK LAYOUT AMENDMENT
A	17.05.2019	DA SUBMISSION
Rev.	Date	Description
Scale	1:200 at A1	1:400 at A2

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Notified Architect: Jacob Yarmine 8395, ABN: 24 243 205 327

Project:  
PROPOSED MIXED USE DEVELOPMENT  
50-58 GLENMORE RIDGE DRIVE, GLENMORE PARK  
Drawing Title:  
BASEMENT PLAN

Job no.	Drawing no.	Rev.
J18429D	1101	C
Drawn by	Checked by	Date
AL	Checker	MAY 2018

### 1 BASEMENT FLOOR PLAN

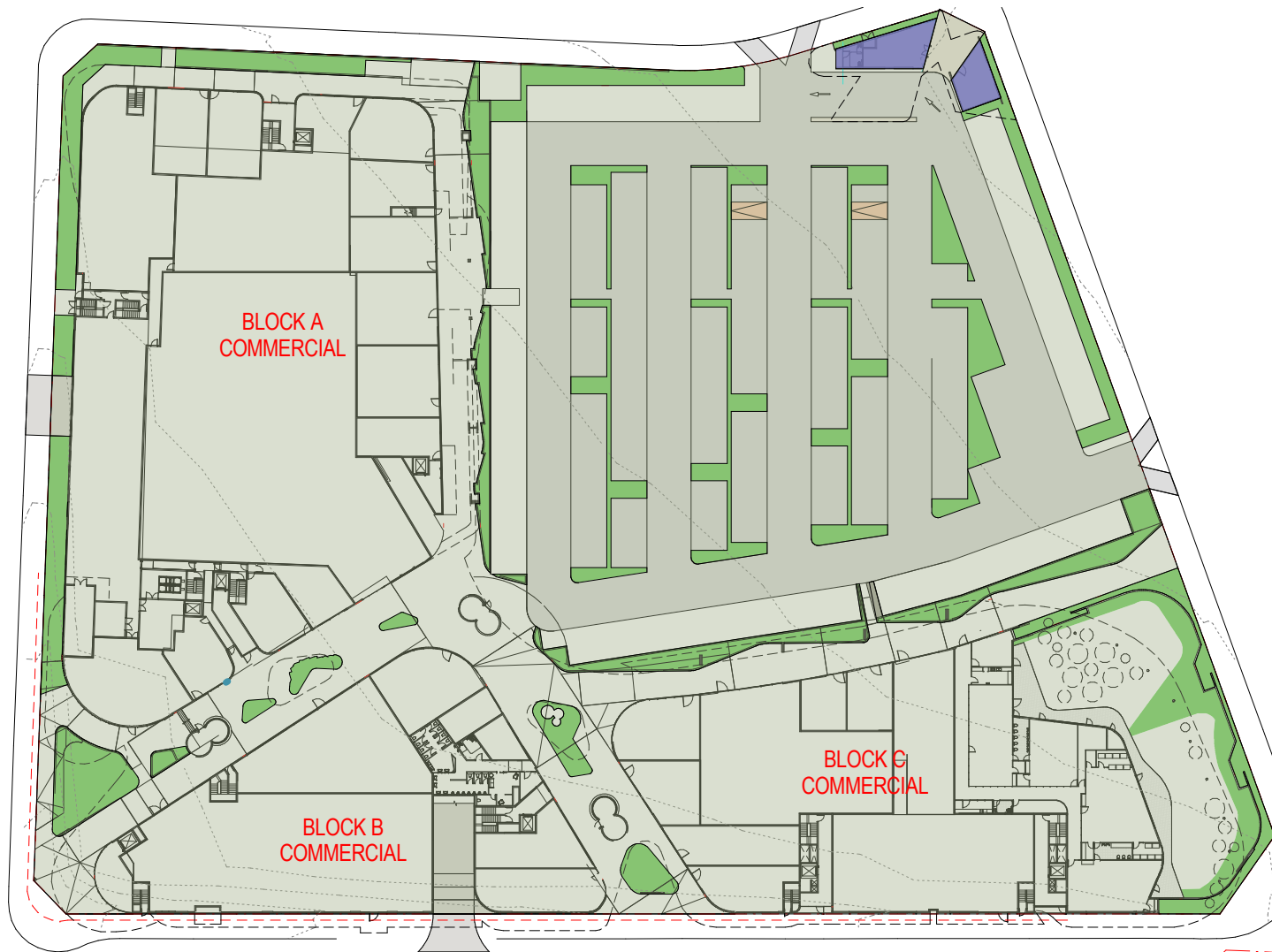
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Document Set ID: 9176045  
Version: 1, Version Date: 15/06/2020






## **ANNEXURE B: STAGING PLAN**



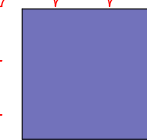
**1 GROUND FLOOR STAGE 1-2**

-  **STAGE 2 CONSTRUCTION - LEVEL 1**
  - FIRST FLOOR SLAB
  - ALL ASSOCIATED RETAIL AWNINGS
  - ALL COMMERCIAL SIGNAGES
  - ALL ASSOCIATED PLANTERS

-  **STAGE 3 CONSTRUCTION - LEVEL 1 + 2 + 3**
  - BLOCK A RESIDENTIAL APARTMENTS

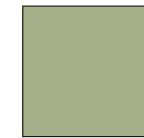
-  **STAGE 4 CONSTRUCTION - LEVEL 1 + 2 + 3**
  - BLOCK B RESIDENTIAL APARTMENTS

-  **STAGE 5 CONSTRUCTION - LEVEL 1 + 2 + 3**
  - BLOCK C RESIDENTIAL APARTMENTS



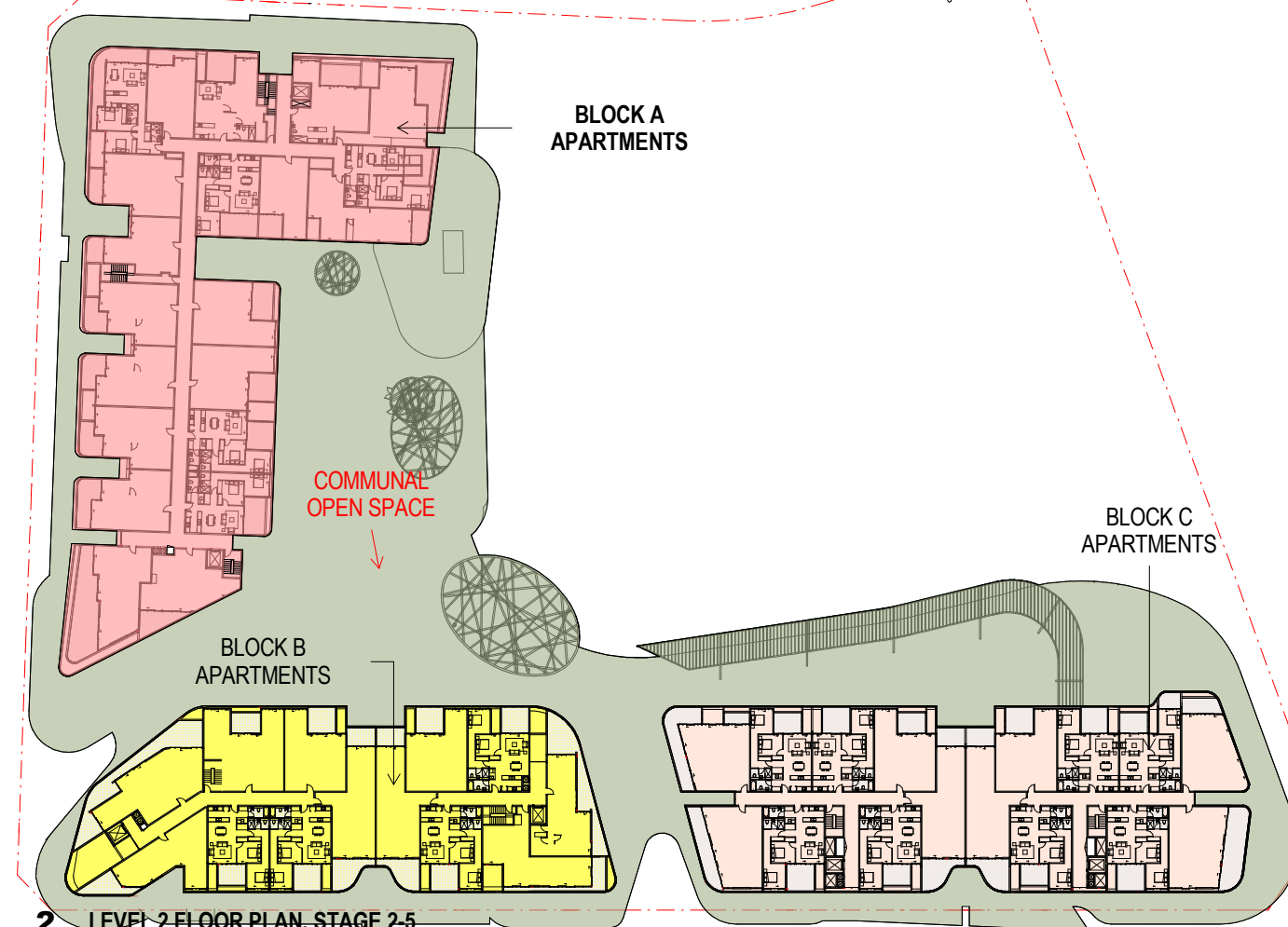
## STAGE 1 CONSTRUCTION - GROUND LV

- CARWASH + CAFE
- ASSOCIATED LANDSCAPING + STORMWATER



## STAGE 2 CONSTRUCTION - GROUND LV


- BLOCK A, BLOCK B + BLOCK C GROUND LEVEL COMMERCIAL
- GROUND LEVEL LANDSCAPING
- GROUND LEVEL 'AT GRADE' PARKING
- GROUND LEVEL PROMENADES + PUBLIC DOMAINS
- ALL BLOCK A, B + C BASEMENT
- COMMERCIAL DISPLAY SUITE CONVERTED TO CAR WASH STATION + RETAIN CAFE



**2 LEVEL 2 FLOOR PLAN, STAGE 2-5**

**REFERENCES**  
DRAWINGS TO BE READ IN CONJUNCTION WITH BUT NOT LIMITED TO ALL STRUCTURAL ENGINEERS, STORMWATER ENGINEERS, LANDSCAPE ARCHITECTS, AND OTHER ASSOCIATED PLANS & REPORTS  
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B	02.06.2020	GENERAL AMENDMENTS
A	17.05.2019	DA SUBMISSION
Rev.	Date	Description
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Scale		
m		

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Nominated Architect: Jacob Yammine 8395, ABN 24 243 205 327

Project  
**PROPOSED MIXED USE DEVELOPMENT**

90-98 GLENMORE RIDGE DRIVE,  
GLENMORE PARK  
Drawing Title  
**STAGING PLAN**

Job no.	Drawing no.	Rev.	
J18429D	DA 1008	B	
Drawn by	Checked by	Approved by	Date
Author	Checker	Approver	MAY 2018

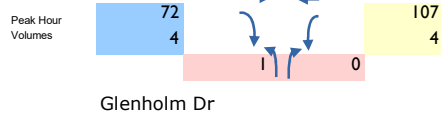


## **ANNEXURE C: TRAFFIC SURVEY RESULTS**

# Curtis Traffic Surveys

## Turning movement count

Job: 181201mcl  
 Day, date: 3/12/18  
 Location: Glenmore Ridge Dr & Glenholm Dr  
 Weather: Fine  
 Client: McLaren Traffic Engineering



Glenmore Ridge

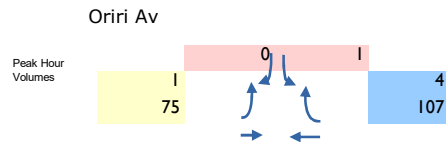
Time Period	From Glenmore Ridge Dr west					From Glenmore Ridge Dr east					Total vehicles	Peak
	through	right	left	right	left	through	right	left	right	left		
14:30 to 14:45	16	0	0	0	0	1	0	0	0	0	12	29
14:45 to 15:00	23	0	1	0	0	0	0	0	0	0	17	41
15:00 to 15:15	20	1	0	0	4	3	0	0	0	0	5	33
15:15 to 15:30	17	1	2	0	0	1	0	0	0	0	21	42
15:30 to 15:45	18	0	1	0	0	1	0	0	0	0	21	41
15:45 to 16:00	15	0	0	0	1	0	0	0	0	0	10	26
16:00 to 16:15	13	1	0	0	3	1	0	0	0	0	20	38
16:15 to 16:30	16	0	0	0	0	1	0	0	0	0	24	41
16:30 to 16:45	15	0	1	0	0	1	0	0	0	0	16	33
16:45 to 17:00	18	0	0	0	1	1	0	0	0	0	23	43
17:00 to 17:15	15	0	0	0	0	1	0	0	0	0	28	44
17:15 to 17:30	15	1	1	0	0	1	0	0	0	0	24	42
17:30 to 17:45	21	2	0	0	0	2	0	0	0	0	31	56 peak
17:45 to 18:00	21	1	0	0	0	0	0	0	0	0	24	46
18:00 to 18:15	15	0	1	1	1	0	0	0	0	0	25	42
18:15 to 18:30	20	0	0	1	1	6	0	0	0	0	14	41
Total	278	7	7	11	20	315						

### Hourly summary

14:30 to 15:30	76	2	3	4	5	55	145
14:45 to 15:45	78	2	4	4	5	64	157
15:00 to 16:00	70	2	3	5	5	57	142
15:15 to 16:15	63	2	3	4	3	72	147
15:30 to 16:30	62	1	1	4	3	75	146
15:45 to 16:45	59	1	1	4	3	70	138
16:00 to 17:00	62	1	1	4	4	83	155
16:15 to 17:15	64	0	1	1	4	91	161
16:30 to 17:30	63	1	2	1	4	91	162
16:45 to 17:45	69	3	1	1	5	106	185
17:00 to 18:00	72	4	1	0	4	107	188 peak hour
17:15 to 18:15	72	4	2	1	3	104	186
17:30 to 18:30	77	3	1	2	8	94	185

# Curtis Traffic Surveys

**Turning movement count**  
 181201mcl  
 3/12/18  
 Glenmore Ridge Dr & Oriri Av  
 Fine  
 McLaren Traffic Engineering



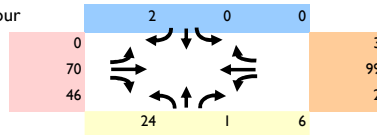
N  
 Glenmore Ridge

Time Period	From Glenmore Ridge Dr east			From Oriri Av			From Glenmore Ridge Dr west			Total vehicles	Peak
	through	right	left	right	left	through	through	right	left		
14:30 to 14:45	13	0	0	1	0	16	30				
14:45 to 15:00	16	1	1	0	0	22	40				
15:00 to 15:15	8	0	2	0	0	19	29				
15:15 to 15:30	19	3	0	0	1	18	41				
15:30 to 15:45	22	0	0	0	1	18	41				
15:45 to 16:00	10	0	0	0	0	15	25				
16:00 to 16:15	20	1	1	0	1	13	36				
16:15 to 16:30	24	1	0	0	0	16	41				
16:30 to 16:45	15	2	0	0	0	15	32				
16:45 to 17:00	23	1	3	1	1	15	44				
17:00 to 17:15	27	2	0	0	0	15	44				
17:15 to 17:30	24	1	0	0	1	16	42				
17:30 to 17:45	32	1	1	0	0	22	56 peak				
17:45 to 18:00	24	0	0	0	0	22	46				
18:00 to 18:15	23	2	0	0	0	15	40				
18:15 to 18:30	19	1	0	0	0	20	40				
Total	319	16	8	2	5	277					
Hourly summary											
14:30 to 15:30	56	4	3	1	1	75	140				
14:45 to 15:45	65	4	3	0	2	77	151				
15:00 to 16:00	59	3	2	0	2	70	136				
15:15 to 16:15	71	4	1	0	3	64	143				
15:30 to 16:30	76	2	1	0	2	62	143				
15:45 to 16:45	69	4	1	0	1	59	134				
16:00 to 17:00	82	5	4	1	2	59	153				
16:15 to 17:15	89	6	3	1	1	61	161				
16:30 to 17:30	89	6	3	1	2	61	162				
16:45 to 17:45	106	5	4	1	2	68	186				
17:00 to 18:00	107	4	1	0	1	75	188 peak hour				
17:15 to 18:15	103	4	1	0	1	75	184				
17:30 to 18:30	98	4	1	0	0	79	182				

# Curtis Traffic Surveys

**Job:** 181201mcl  
**Day, date:** 3/12/18  
**Location:** Glenmore Ridge Dr, Risus Av & Darug Av  
**Weather:** Fine  
**Client:** McLaren Traffic Engineering  
 All motor vehicles

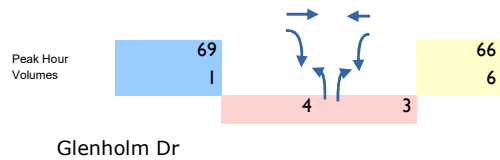
Peak Hour



Time Period	From Risus Av			From Glenmore Ridge Dr west			From Darug Av			From Glenmore Ridge Dr east			Total vehicle movements
	left	through	right	left	through	right	left	through	right	left	through	right	
14:30 to 14:45	0	0	0	1	15	4	5	0	1	2	10	1	39
14:45 to 15:00	1	1	1	1	21	3	6	0	0	3	13	1	51
15:00 to 15:15	2	0	0	0	16	10	3	0	1	1	9	0	42
15:15 to 15:30	0	0	0	1	18	13	2	0	1	4	15	0	54
15:30 to 15:45	1	0	0	2	18	7	3	0	0	3	18	1	53
15:45 to 16:00	0	0	0	0	13	3	3	0	2	0	10	0	31
16:00 to 16:15	1	0	0	0	12	7	3	0	1	1	19	1	45
16:15 to 16:30	0	0	0	2	13	11	5	1	3	1	22	1	59
16:30 to 16:45	2	0	0	0	13	6	9	1	0	0	14	1	46
16:45 to 17:00	0	0	0	0	15	7	3	1	1	2	24	0	53
17:00 to 17:15	0	0	0	0	15	10	2	0	0	0	27	0	54
17:15 to 17:30	0	0	0	0	17	13	7	0	0	0	24	0	61
17:30 to 17:45	0	0	2	0	20	11	6	1	2	1	32	0	75 Peak
17:45 to 18:00	0	0	0	0	20	11	5	0	2	1	22	1	62
18:00 to 18:15	0	0	0	0	13	11	6	0	2	0	21	2	55
18:15 to 18:30	0	0	0	0	17	11	9	1	3	2	14	3	60
Totals	7	1	3	7	256	138	77	5	19	21	294	12	
14:30 to 15:30	3	1	1	3	70	30	16	0	3	10	47	2	186
14:45 to 15:45	4	1	1	4	73	33	14	0	2	11	55	2	200
15:00 to 16:00	3	0	0	3	65	33	11	0	4	8	52	1	180
15:15 to 16:15	2	0	0	3	61	30	11	0	4	8	62	2	183
15:30 to 16:30	2	0	0	4	56	28	14	1	6	5	69	3	188
15:45 to 16:45	3	0	0	2	51	27	20	2	6	2	65	3	181
16:00 to 17:00	3	0	0	2	53	31	20	3	5	4	79	3	203
16:15 to 17:15	2	0	0	2	56	34	19	3	4	3	87	2	212
16:30 to 17:30	2	0	0	0	60	36	21	2	1	2	89	1	214
16:45 to 17:45	0	0	2	0	67	41	18	2	3	3	107	0	243
17:00 to 18:00	0	0	2	0	72	45	20	1	4	2	105	1	252
17:15 to 18:15	0	0	2	0	70	46	24	1	6	2	99	3	253 Peak Hour
17:30 to 18:30	0	0	2	0	70	44	26	2	9	4	89	6	252

# Curtis Traffic Surveys

**Turning movement count**  
 181201mcl  
 Day, date 3/12/18  
 Location: Glenmore Ridge Dr & Glenholm Dr  
 Weather: Fine  
 Client: McLaren Traffic Engineering



Glenmore I

Time Period	From Glenmore Ridge Dr west		From Glenholm Dr		From Glenmore Ridge Dr east		Total vehicles	Peak
	through	right	left	right	left	through		
07:00 to 07:15	20	0	1	1	0	16	38	
07:15 to 07:30	20	0	0	1	1	19	41	
07:30 to 07:45	20	0	0	2	0	19	41	
07:45 to 08:00	8	0	1	1	0	5	15	
08:00 to 08:15	23	0	1	1	1	20	46	peak
08:15 to 08:30	17	0	0	0	2	19	38	
08:30 to 08:45	13	0	2	0	1	9	25	
08:45 to 09:00	16	1	1	2	2	18	40	
09:00 to 09:15	14	0	0	0	1	15	30	
09:15 to 09:30	9	0	0	0	1	8	18	
<b>Total</b>	<b>160</b>	<b>1</b>	<b>6</b>	<b>8</b>	<b>9</b>	<b>148</b>		

## Hourly summary

07:00 to 08:00	68	0	2	5	1	59	135	
07:15 to 08:15	71	0	2	5	2	63	143	
07:30 to 08:30	68	0	2	4	3	63	140	
07:45 to 08:45	61	0	4	2	4	53	124	
08:00 to 09:00	69	1	4	3	6	66	149	peak hour
08:15 to 09:15	60	1	3	2	6	61	133	
08:30 to 09:30	52	1	3	2	5	50	113	

# Curtis Traffic Surveys

Job:

Day, date:

Location:

Weather:

Client:

## Turning movement count

181201mcl

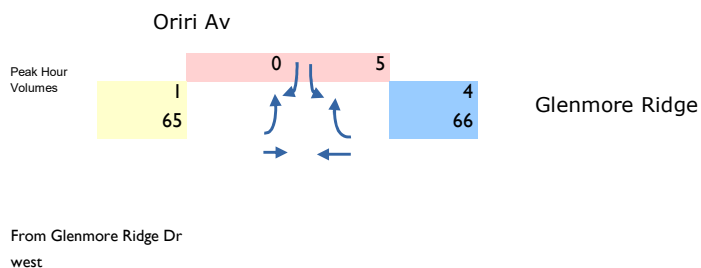
3/12/18

Glenmore Ridge Dr & Oriri Av

Fine

McLaren Traffic Engineering

N

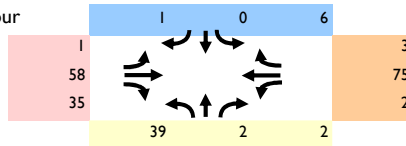


Time Period	through	right	left	right	left	through	Total vehicles	Peak
07:00 to 07:15	17	0	3	0	0	17	37	
07:15 to 07:30	19	0	1	0	0	19	39	
07:30 to 07:45	19	0	2	0	1	18	40	
07:45 to 08:00	6	0	3	0	1	5	15	
08:00 to 08:15	21	0	2	0	0	21	44	peak
08:15 to 08:30	16	3	1	0	0	16	36	
08:30 to 08:45	11	0	2	0	0	11	24	
08:45 to 09:00	18	1	0	0	1	17	37	
09:00 to 09:15	14	1	1	0	1	13	30	
09:15 to 09:30	8	0	0	1	0	9	18	
Total	149	5	15	1	4	146		
Hourly summary								
07:00 to 08:00	61	0	9	0	2	59	131	
07:15 to 08:15	65	0	8	0	2	63	138	
07:30 to 08:30	62	3	8	0	2	60	135	
07:45 to 08:45	54	3	8	0	1	53	119	
08:00 to 09:00	66	4	5	0	1	65	141	peak hour
08:15 to 09:15	59	5	4	0	2	57	127	
08:30 to 09:30	51	2	3	1	2	50	109	

# Curtis Traffic Surveys

Job: 181201mcl  
 Day, date: 3/12/18  
 Location: Glenmore Ridge Dr, Risus Av & Darug Av  
 Weather: Fine  
 Client: McLaren Traffic Engineering  
 All motor vehicles

Peak Hour



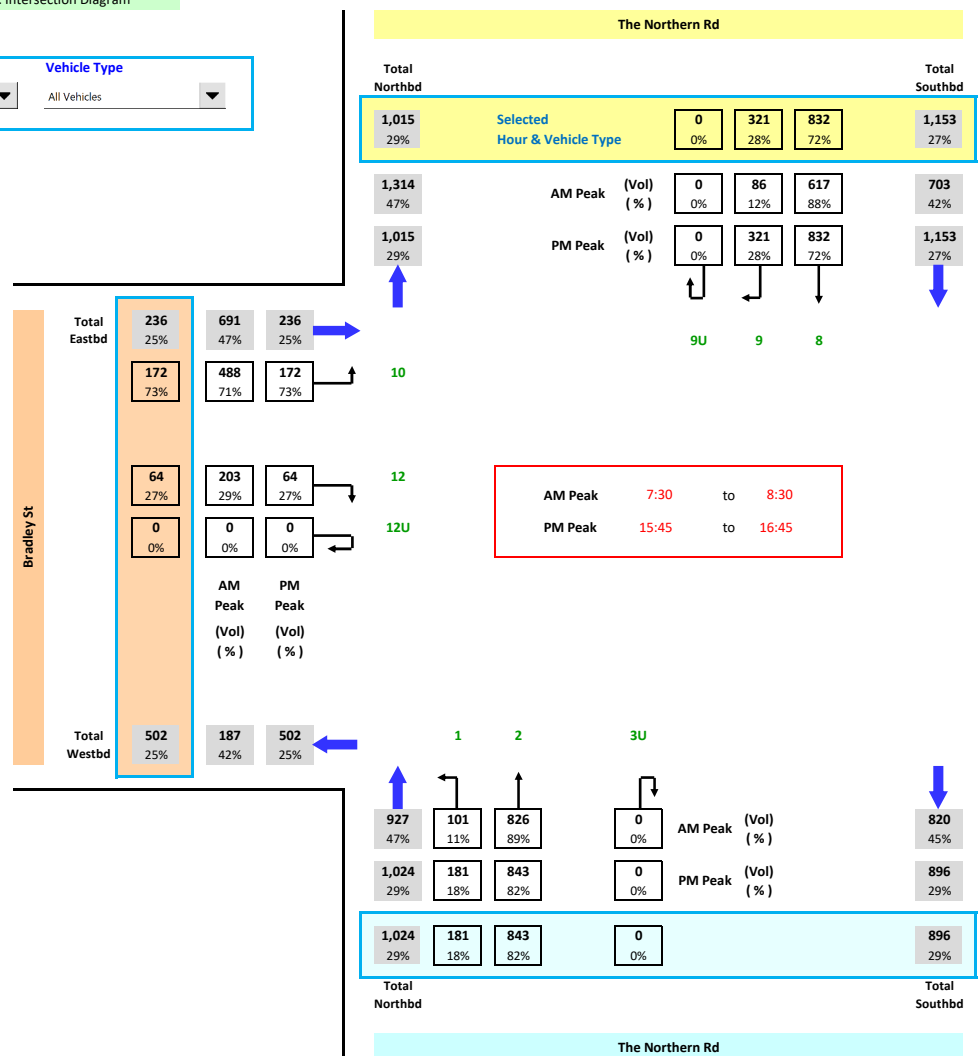
Time Period	From Risus Av			From Glenmore Ridge Dr west			From Darug Av			From Glenmore Ridge Dr east			Total vehicle movements
	left	through	right	left	through	right	left	through	right	left	through	right	
07:00 to 07:15	1	0	0	0	16	2	1	0	0	1	12	0	33
07:15 to 07:30	0	0	0	0	19	4	4	0	0	0	8	0	35
07:30 to 07:45	1	0	0	0	18	3	5	0	0	0	10	0	37
07:45 to 08:00	0	0	0	0	6	5	12	1	0	2	5	0	31
08:00 to 08:15	3	0	0	0	17	9	11	0	1	1	20	2	64 Peak
08:15 to 08:30	2	0	0	0	14	11	12	1	0	0	22	1	63
08:30 to 08:45	0	0	1	0	11	6	6	0	0	0	15	0	39
08:45 to 09:00	1	0	0	1	16	9	10	1	1	1	18	0	58
09:00 to 09:15	2	0	0	0	11	10	1	0	1	1	9	0	35
09:15 to 09:30	0	1	0	0	7	5	4	0	2	2	6	0	27
Totals	10	1	1	1	135	64	66	3	5	8	125	3	
07:00 to 08:00	2	0	0	0	59	14	22	1	0	3	35	0	136
07:15 to 08:15	4	0	0	0	60	21	32	1	1	3	43	2	167
07:30 to 08:30	6	0	0	0	55	28	40	2	1	3	57	3	195
07:45 to 08:45	5	0	1	0	48	31	41	2	1	3	62	3	197
08:00 to 09:00	6	0	1	1	58	35	39	2	2	2	75	3	224 Peak Hour
08:45 to 09:00	5	0	1	1	52	36	29	2	2	2	64	1	195
09:00 to 09:30	3	1	1	1	45	30	21	1	4	4	48	0	159

Job No. : N5254  
 Client : SLR Consulting  
 Suburb : Glenmore Park  
 Location : 1. Bradley St / The Northern Rd

Day/Date : Tue, 27th August 2019  
 Weather : Fine  
 Description : Classified Intersection Count  
 : Intersection Diagram



Hour Starting: 15:45  
 Vehicle Type: All Vehicles

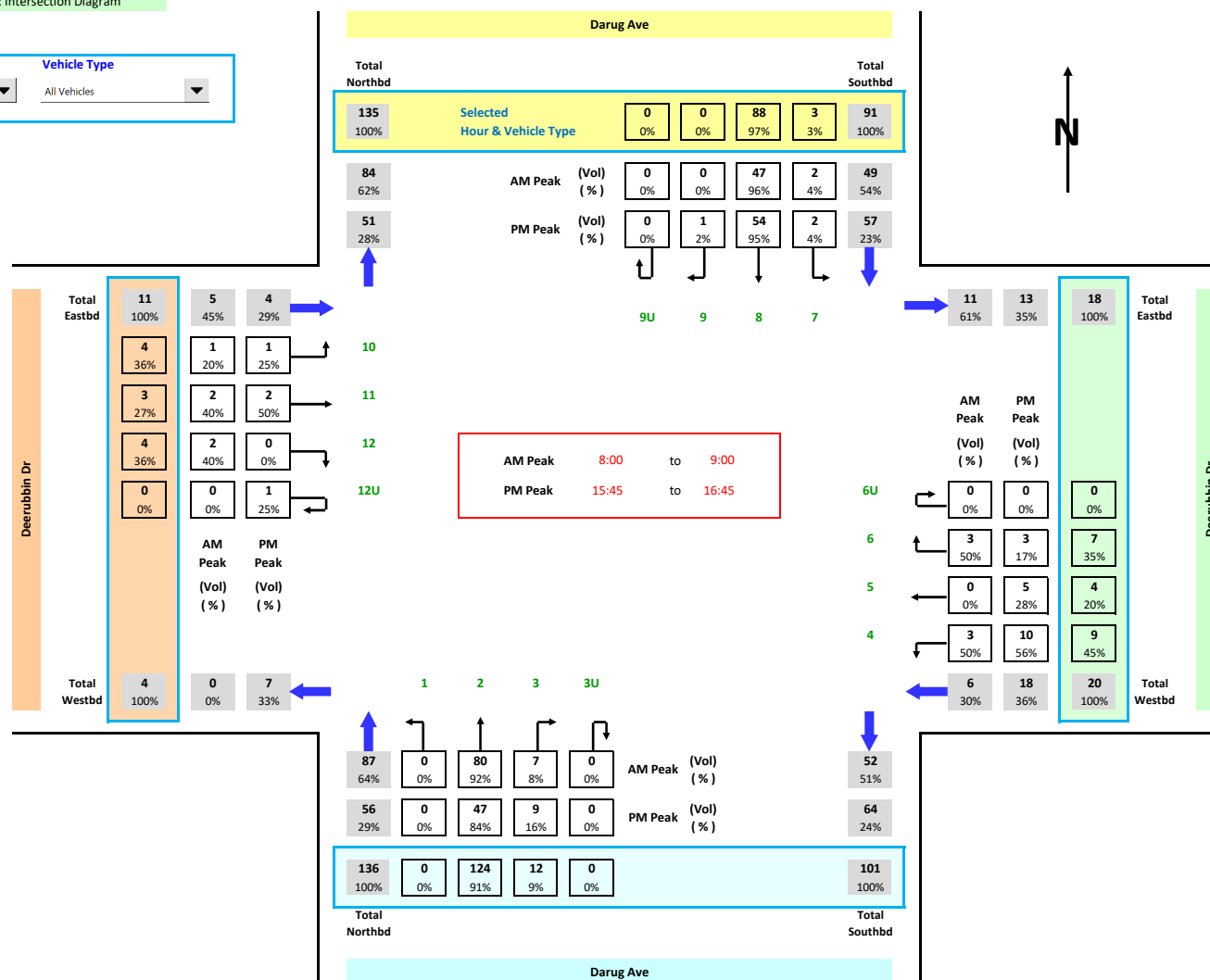


AM Peak 7:30 to 8:30  
 PM Peak 15:45 to 16:45

**Day/Date** : Tue, 27th August 2019  
**Weather** : Fine  
**Description** : Classified Intersection Count  
 : Intersection Diagram

Hour Starting      Vehicle Type

AM Totals      All Vehicles

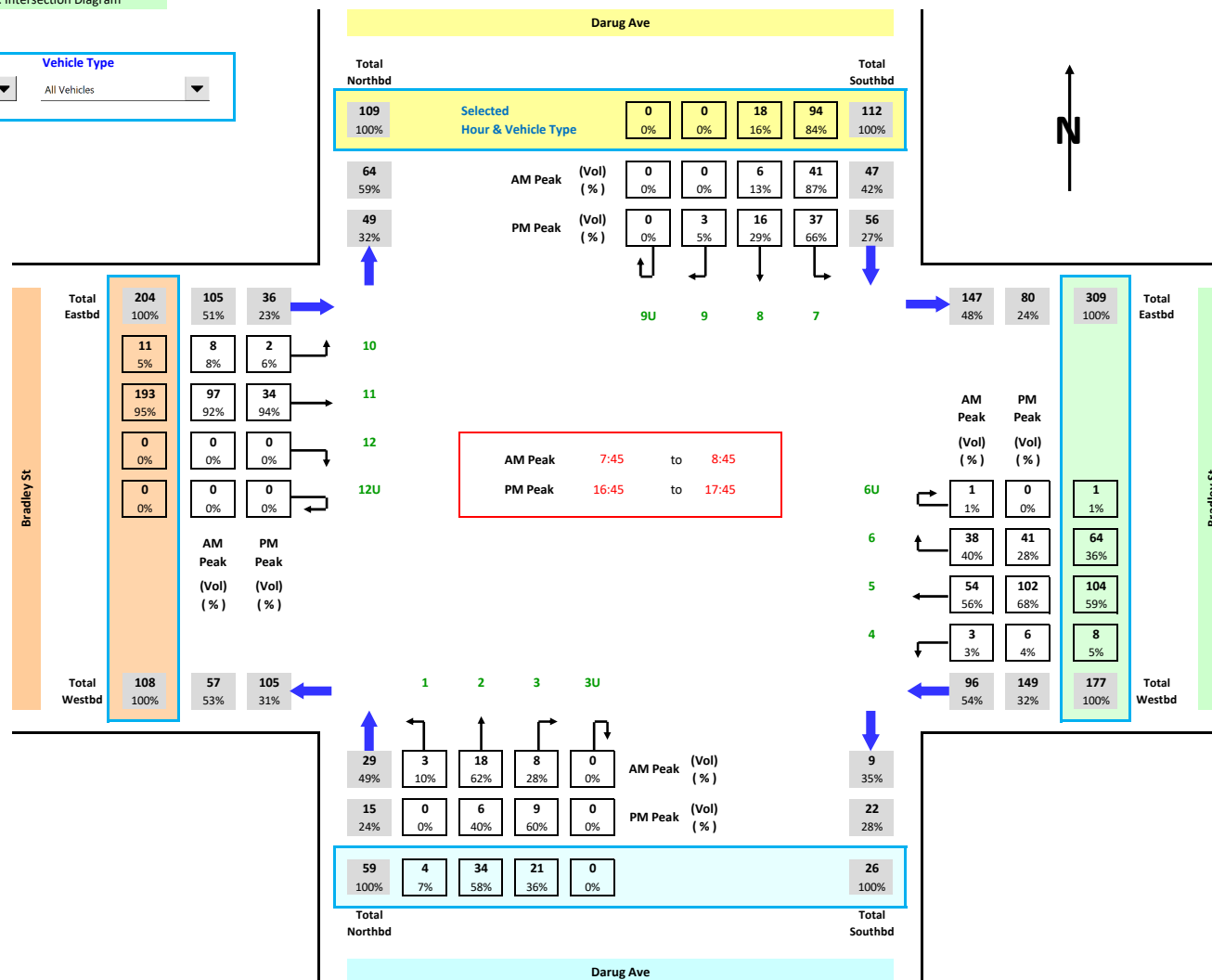


Job No. : N5254  
 Client : SLR Consulting  
 Suburb : Glenmore Park  
 Location : 3. Darug Ave / Bradley St

Day/Date : Tue, 27th August 2019  
 Weather : Fine  
 Description : Classified Intersection Count  
 : Intersection Diagram



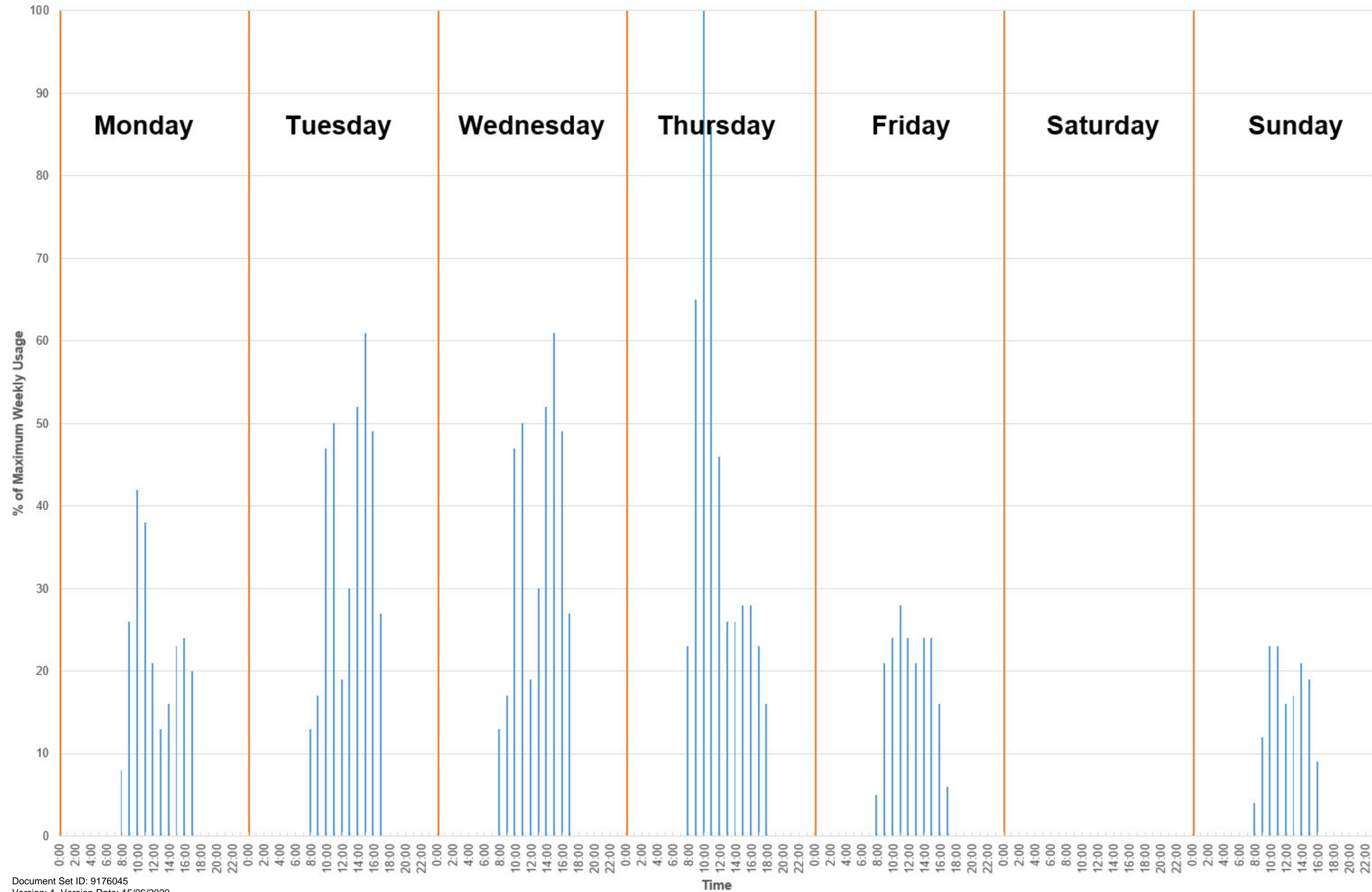
Hour Starting: AM Totals  
 Vehicle Type: All Vehicles





**ANNEXURE D: PEAK TIMES OF NEARBY GLENWEST  
MEDICAL CENTRE (SOURCED FROM GOOGLE)**

Usage Over Entire Week - Glenwest Medical Centre





## **ANNEXURE E: STAGED PARKING REQUIREMENTS**

Land Use	Scale	Parking Rate	Parking Requirement
<b>Stage 1 – Display Suite and Cafe</b>			
Car Wash	5 Staff + 4 Bays	1 space per staff + 1 space per bay	9
Cafe	38m <sup>2</sup> GFA	15 spaces per 100m <sup>2</sup> (RMS)	6
<b>Sub total</b>	-	-	<b>15</b>
<b>Stage 2 – Commercial and Retail Areas</b>			
Car wash	5 Staff + 4 Bays	1 space per staff + 1 space per bay	9
Cafe	38m <sup>2</sup> GFA	12 spaces per 100m <sup>2</sup>	5
Medical Centre	562m <sup>2</sup>	0.9 per 100m <sup>2</sup> GLFA	5
Business Premises	518m <sup>2</sup>	0.9 per 100m <sup>2</sup> GLFA	5
Specialty Retail	2,082m <sup>2</sup>	4.5 per 100m <sup>2</sup> GLFA	94
Supermarket	1,125m <sup>2</sup>	4.2 per 100m <sup>2</sup> GLFA	47
Fitness Centre/Gym	638m <sup>2</sup>	4.5 per 100m <sup>2</sup>	29
Child Care Centre	112 Children	1 per 6 children	19
<b>Sub total</b>	-	-	<b>213</b>
<b>Stage 3 – Residential A Block</b>			
Car wash	5 Staff + 4 Bays	1 space per staff + 1 space per bay	9
Cafe	38m <sup>2</sup> GFA	12 spaces per 100m <sup>2</sup>	5
Medical Centre	562m <sup>2</sup>	0.9 per 100m <sup>2</sup> GLFA	5
Business Premises	518m <sup>2</sup>	0.9 per 100m <sup>2</sup> GLFA	5
Specialty Retail	2,082m <sup>2</sup>	4.5 per 100m <sup>2</sup> GLFA	94
Supermarket	1,125m <sup>2</sup>	4.2 per 100m <sup>2</sup> GLFA	47
Fitness Centre/Gym	638m <sup>2</sup>	4.5 per 100m <sup>2</sup>	29
Child Care Centre	112 Children	1 per 6 children	19
Residential Visitors	60 units	1 space per 5 dwellings	12
1- or 2-bedroom unit	55 units	1 space per dwelling	55
3+ bedroom Unit	5 units	2 spaces per dwelling	10
Service Vehicle Parking	60 units	1 space per 40 dwellings	2
<b>Sub total</b>	-	-	<b>292</b>

Stage 4– Residential B Block			
Car wash	5 Staff + 4 Bays	1 space per staff + 1 space per bay	9
Cafe	38m <sup>2</sup> GFA	12 spaces per 100m <sup>2</sup>	5
Medical Centre	562m <sup>2</sup>	0.9 per 100m <sup>2</sup> GLFA	5
Business Premises	518m <sup>2</sup>	0.9 per 100m <sup>2</sup> GLFA	5
Specialty Retail	2,082m <sup>2</sup>	4.5 per 100m <sup>2</sup> GLFA	94
Supermarket	1,125m <sup>2</sup>	4.2 per 100m <sup>2</sup> GLFA	47
Fitness Centre/Gym	638m <sup>2</sup>	4.5 per 100m <sup>2</sup>	29
Child Care Centre	112 Children	1 per 6 children	19
Residential Visitors	99 units	1 space per 5 dwellings	20
1- or 2-bedroom unit	89 units	1 space per dwelling	89
3+ bedroom Unit	10 units	2 spaces per dwelling	20
Service Vehicle Parking	60 units	1 space per 40 dwellings	3
<b>Sub Total</b>	-	-	<b>345</b>
Stage 5 – Residential C Block			
Car wash	5 Staff + 4 Bays	1 space per staff + 1 space per bay	9
Cafe	38m <sup>2</sup> GFA	12 spaces per 100m <sup>2</sup>	5
Medical Centre	562m <sup>2</sup>	0.9 per 100m <sup>2</sup> GLFA	5
Business Premises	518m <sup>2</sup>	0.9 per 100m <sup>2</sup> GLFA	5
Specialty Retail	2,082m <sup>2</sup>	4.5 per 100m <sup>2</sup> GLFA	94
Supermarket	1,125m <sup>2</sup>	4.2 per 100m <sup>2</sup> GLFA	47
Fitness Centre/Gym	638m <sup>2</sup>	4.5 per 100m <sup>2</sup>	29
Child Care Centre	112 Children	1 per 6 children	19
Residential Visitors	147 units	1 space per 5 dwellings	30
1- or 2-bedroom unit	133 units	1 space per dwelling	133
3+ bedroom Unit	14 units	2 spaces per dwelling	28
Service Vehicle Parking	60 units	1 space per 40 dwellings	4
<b>Sub Total</b>	-	-	<b>408</b>

Land Use	Scale	Parking Rate	Parking Requirement
<b>Stage 1 – Display Suite and Cafe</b>			
Car Wash	5 Staff + 4 Bays	1 space per staff + 1 space per bay	9
Cafe	38m <sup>2</sup> GFA	12 spaces per 100m <sup>2</sup> (RMS)	6
<b>Sub total</b>	-	-	<b>15</b>
<b>Stage 2 – Commercial and Retail Areas</b>			
Car wash	5 Staff + 4 Bays	Based upon utilisation matrix in <b>Table 5.</b>	196
Cafe	38m <sup>2</sup> GFA		
Medical Centre	562m <sup>2</sup>		
Business Premises	518m <sup>2</sup>		
Specialty Retail	2,082m <sup>2</sup>		
Supermarket	1,125m <sup>2</sup>		
Fitness Centre/Gym	638m <sup>2</sup>		
Child Care Centre	112 Children		
<b>Sub total</b>	-	-	<b>196</b>
<b>Stage 3 – Residential A Block</b>			
Car wash	5 Staff + 4 Bays	Based upon utilisation matrix in <b>Table 5</b>	205
Cafe	38m <sup>2</sup> GFA		
Medical Centre	562m <sup>2</sup>		
Business Premises	518m <sup>2</sup>		
Specialty Retail	2,082m <sup>2</sup>		
Supermarket	1,125m <sup>2</sup>		
Fitness Centre/Gym	638m <sup>2</sup>		
Child Care Centre	112 Children		
Residential Visitors	60 units		
1- or 2-bedroom unit	55 units	1 space per dwelling	55
3+ bedroom Unit	5 units	2 spaces per dwelling	10
Service Vehicle Parking	60 units	1 space per 40 dwellings	2
<b>Sub total</b>	-	-	<b>272</b>

Stage 4– Residential B Block			
Car wash	5 Staff + 4 Bays	Based upon utilisation matrix in <b>Table 5</b>	211
Cafe	38m² GFA		
Medical Centre	562m²		
Business Premises	518m²		
Specialty Retail	2,082m²		
Supermarket	1,125m²		
Fitness Centre/Gym	638m²		
Child Care Centre	112 Children		
Residential Visitors	99 units		
1- or 2-bedroom unit	89 units	1 space per dwelling	89
3+ bedroom Unit	10 units	2 spaces per dwelling	20
Service Vehicle Parking	60 units	1 space per 40 dwellings	3
<b>Sub Total</b>	-	-	<b>323</b>
Stage 5 – Residential C Block			
Car wash	5 Staff + 4 Bays	Based upon utilisation matrix in <b>Table 5.</b>	219
Cafe	38m² GFA		
Medical Centre	562m²		
Business Premises	518m²		
Specialty Retail	2,082m²		
Supermarket	1,125m²		
Fitness Centre/Gym	638m²		
Child Care Centre	112 Children		
Residential Visitors	147 units		
1- or 2-bedroom unit	133 units	1 space per dwelling	133
3+ bedroom Unit	14 units	2 spaces per dwelling	28
Service Vehicle Parking	60 units	1 space per 40 dwellings	4
<b>Sub Total</b>	-	-	<b>384</b>



## **ANNEXURE F: SWEPT PATH TESTING**



MCLAREN TRAFFIC ENGINEERING  
A division of RAMTRANS Australia Pty. Ltd.  
Shop 7, 716-720 Old Princes Hwy, Sutherland NSW 2232  
Email: admin@mcclarentraffic.com.au  
Phone : (02) 8355 2440  
Document Set ID: 176045  
Version: 1, Version Date: 15/06/2020

**CLIENT / Project:**  
Mintus

**Project Address:**  
90-98 Glenmore Ridge Drive, Glenmore Park

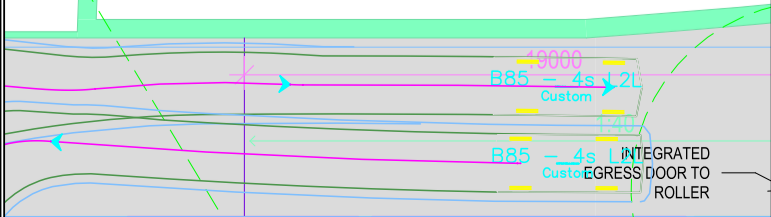
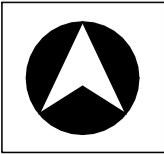
**Project No:** 2019/0510

**Dwg Name:** Commercial Basement Circulation  
**Dwg No:** 2019-0510-01A

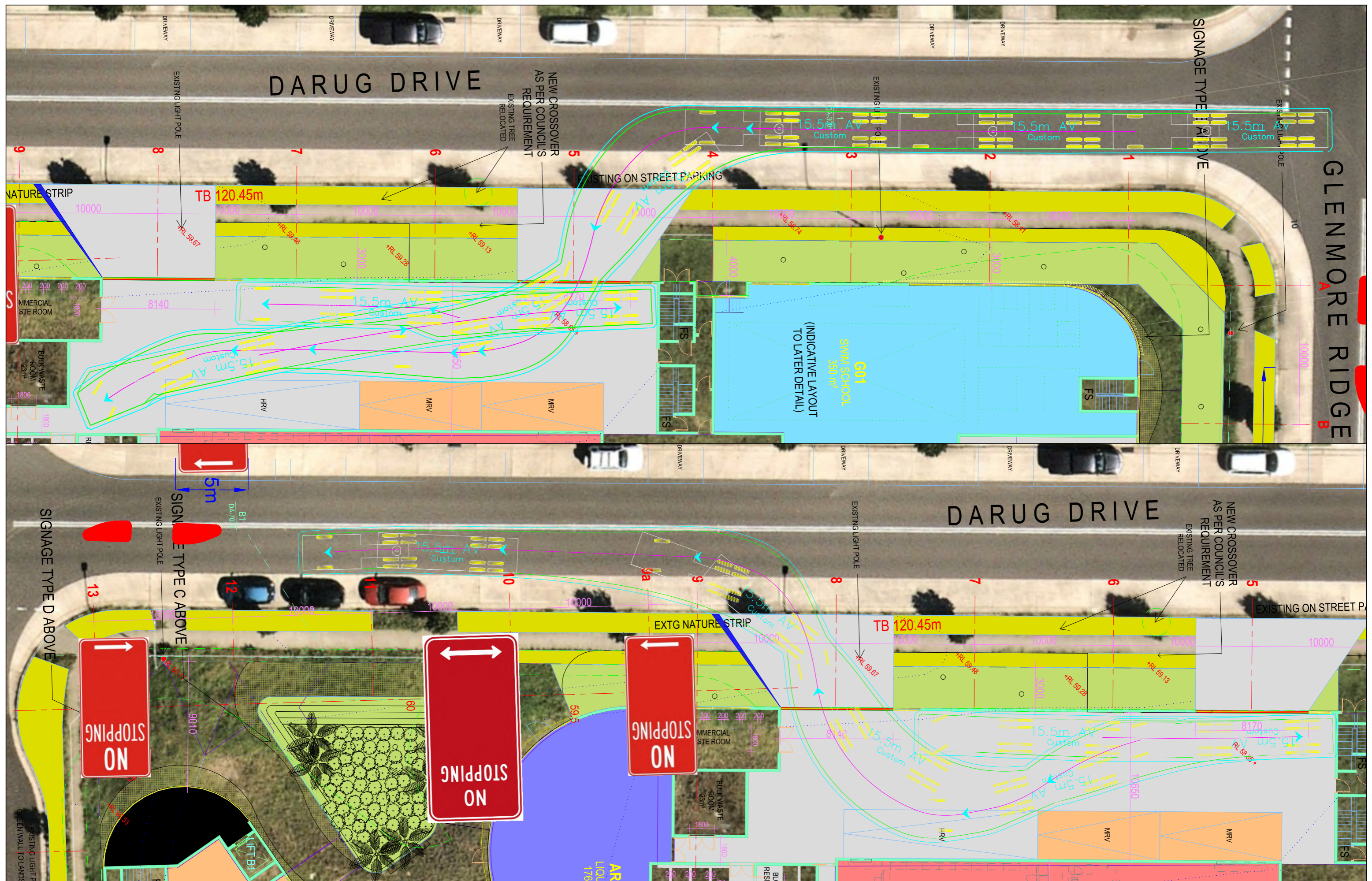
Revision	Date	Details
A	11/06/2020	


**Notes:**  
CONCEPT PLAN ONLY.  
NOT FOR CONSTRUCTION.

**Tested Using:**  
\*AutoTURN 10  
\*ZWCAD 2019









Document Set ID: 9176045  
Version: 1, Version Date: 15/06/2020

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**CLIENT / Project:**  
Mintus

**Project Address:**  
90-98 Glenmore Ridge Drive, Glenmore Park


**Notes:**  
CONCEPT PLAN ONLY.  
NOT FOR CONSTRUCTION.

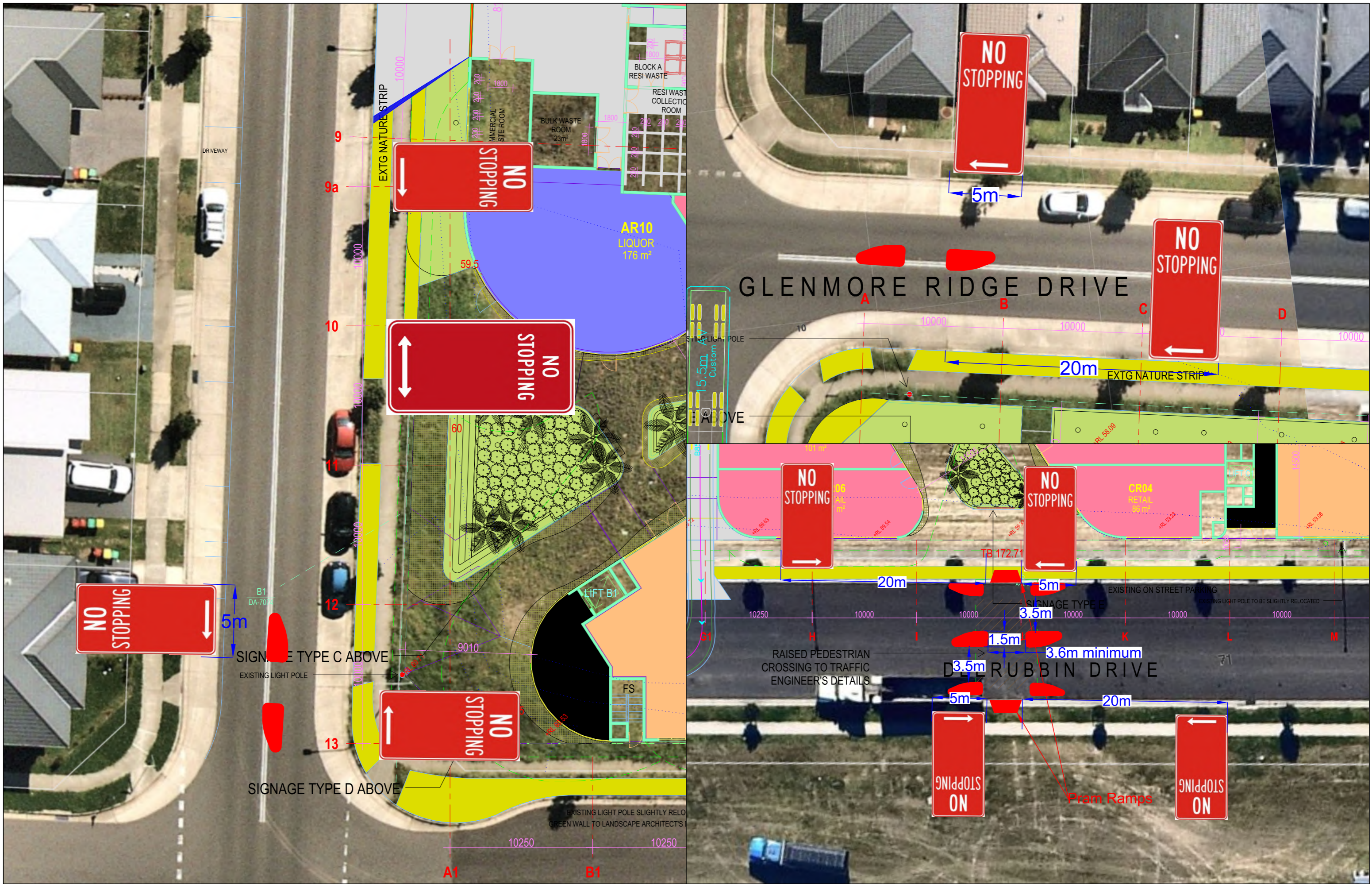
**Tested Using:**  
\*AutoTURN 10  
\*ZWCAD 2019

**Drawing Title:**  
MTE Site Access Plan

Revision	Date	Details
A	11/06/2020	

Project No:	Drawing No:
2019/0510	2019-0510-03A





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**CLIENT / Project:**  
Mintus  
**Project Address:**  
90-98 Glenmore Ridge Drive, Glenmore Park

**Notes:**  
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**Tested Using:**  
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\*ZWCAD 2019

**Drawing Title:**  
Pedestrian Refuge Concept  
**Project No:**  
2019/0510  
**Drawing No:**  
2019-0510-03A

Revision	Date	Details
A	11/06/2020	



