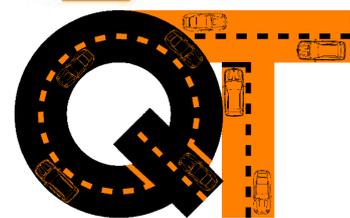


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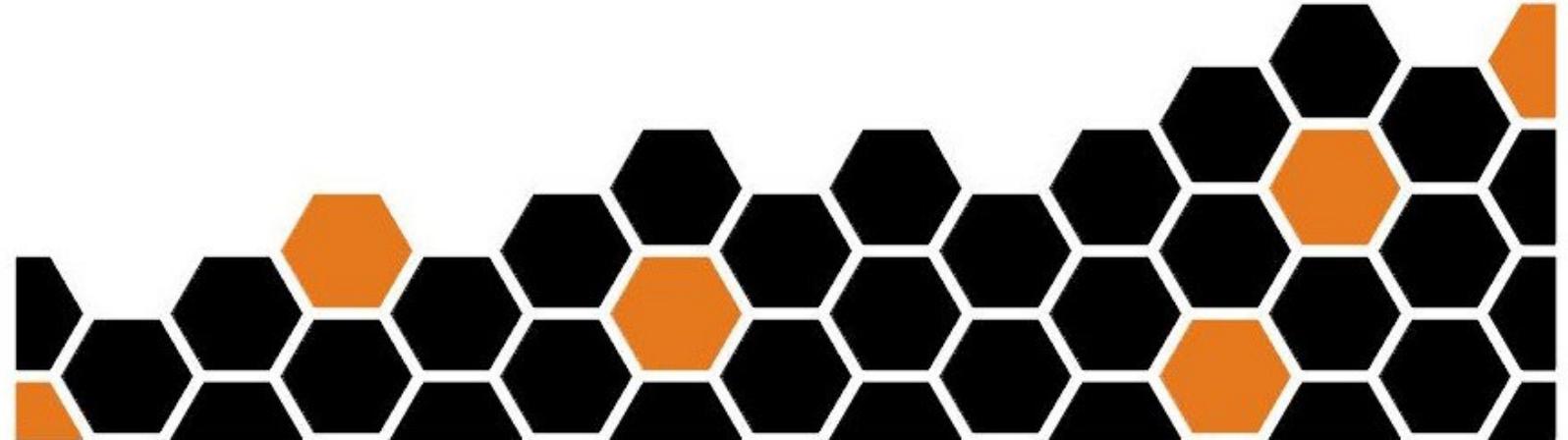
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Traffic Impact Assessment Report

501-521 Police Road, Mulgrave

Proposed Residential Development

28/02/2023





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Proposed Residential Development

Document Control

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Executive Summary

This report assesses the Proposed Residential Development at 501-521 Police Road, Mulgrave. The following provides an executive summary of the report.

Car Parking

The statutory car parking requirement as specified under Clause 52.06-5 of the Monash Planning Scheme is 59 car spaces (54 resident spaces and 5 visitor spaces).

The provision of 88 car spaces (54 resident spaces and 34 visitor spaces) satisfies the statutory car parking requirements.

The design of the garages, visitor space and vehicle access accords with the Design Standards of Clause 52.06-9 and AS2890.1:2004 where relevant.

Bicycle Parking

There is no statutory bicycle parking requirement under Clause 52.34 as the development is less than 4 storeys.

Long term resident bicycle parking can be accommodated informally within private dwelling garage/storage areas, with visitor bicycle parking accommodated by six (6) bicycle parking spaces around the site.

Traffic Impacts

The proposed development is expected to generate 216 vehicles/day, inclusive of 22 movements in the peak hours.

The peak hour traffic volumes can be comfortably accommodated by the existing unsignalised intersection at Police Road / Gladstone as demonstrated by SIDRA capacity analysis.

Daily traffic volumes on Katoomba Drive are expected to increase from approximately 200 vehicles/day to 416 vehicles/day. Given that local access streets can typically accommodate up to 2,000-3,000 vehicles/day, Katoomba Drive will continue to operate with volumes well within the typical range for a local access road.

Service Vehicles

Waste collection can occur on-site by private contractor, with the specified vehicle able to exit the site in a forwards direction, which is satisfactory from a traffic engineering perspective. Swept paths demonstrate that 8.8m vehicle can perform a three point turn manoeuvre on-site.

No loading bay is required for a residential development.

Summary of Opinions

Having undertaken all tasks necessary to adequately assess the traffic engineering impacts of the Proposed Residential Development at 501-521 Police Road, Mulgrave, we are satisfied that the proposed development is satisfactory.

There are no reasons why a permit for the proposed development should not be issued from a traffic engineering perspective, subject to appropriate conditions.



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1 Introduction

The following Traffic Impact Assessment Report, reviews the critical matters pertaining to traffic engineering associated with the Proposed Residential Development at 501-521 Police Road, Mulgrave.

This report reviews the proposed layout (Version 4) with vehicle access via Katoomba Drive.

2 Proposal

The proposal is for a medium density residential development comprising 27 dwellings.

Table 1 outlines the key attributes of the development from a traffic engineering perspective.

Table 1: Proposed Development Numbers

Attribute	Proposed
Land Use	
Three-Bedroom Dwellings	2 dwellings
Four-Bedroom Dwellings	19 dwelling
Five-Bedroom Dwellings	6 dwelling
TOTAL	27 dwelling
Car Parking Provision	
Resident Spaces	54 spaces
Visitor Spaces	27 tandem driveway spaces 7 spaces within common property
TOTAL	88 spaces
Car Parking Allocation	
Resident	2 spaces per townhouse (54 spaces)
Visitor	1.26 spaces per townhouse (34 spaces)
Car Parking Location/Type	
Resident	27 x Double garages
Visitor	27 x Tandem driveway spaces On-street – 7 indented spaces on the internal access road.

Vehicle access is proposed via Katoomba Drive on the northern boundary of the site. The internal access road is proposed with a typical width of 6.0m wide, with a localised reduction to 3.57m adjacent to an existing tree to be retained.

Pedestrian access is also provided via footpaths to the existing network on Katoomba Drive.

Waste collection is proposed to occur internally via private contractor.

Development plans prepared by Millar Merrigan (Version 4 dated 31/01/2023) are attached at Appendix A.



3 Existing Conditions

3.1 Subject Site

The subject site is located at 501-521 Police Road, Mulgrave on the north side of Police Road between Blanton Drive and Eastlink (Melway Reference 81 C6).

Table 2 outlines the key existing features of the site.

Table 2: Existing Features of Subject Site

Site Feature	Detail
Municipality & Referral Authorities	
Municipality	Monash City Council
Existing Use	
501-515 Police Road	Single dwelling
517-521 Police Road	3 x residential dwellings
Zoning & Overlays	
Zoning	Neighbourhood Residential Zone - Schedule 4 (NRZ4)
Overlays	-
Critical Dimensions	
Site Area	Approximately 13,300m ²
Site Frontage	501-515 Police Road – 126m
	517-521 Police Road – 45m
On-Street Car Parking	
Street Frontage	Police Road – No Stopping
Nearby Land Use	
Within 100m	Typically residential, with the Mulgrave Private Hospital to the east.

A photograph of the subject site’s frontage and location map are provided at Figure 1 to Figure 3, respectively.



Figure 1: Site Photograph – View North-West from Gladstone Road



Figure 2: Aerial Photograph (source: Nearthmap)

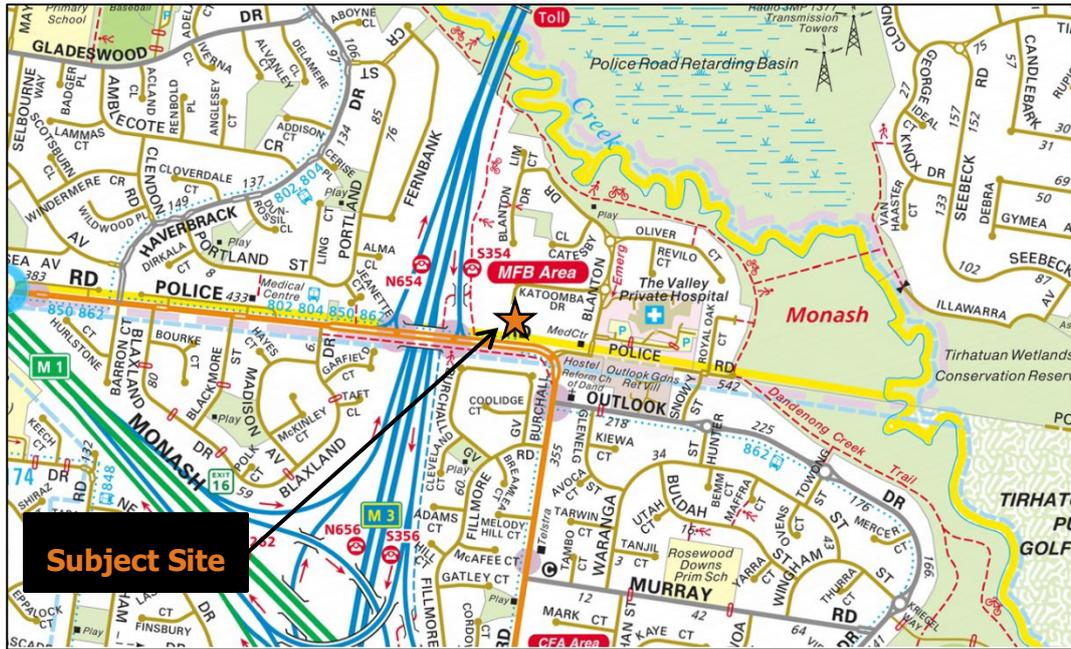


Figure 3: Location Map (Source: www.melway.com.au)

3.2 Road Network

Police Road

Police Road extends east-west between Princes Highway/Springvale Road in the west (where it continues as Centre Road) and east of Blanton Road in the east.

Police Road is a declared arterial road to the west of Eastlink and a Council managed road to the east of Eastlink (adjacent to the subject site).

In the vicinity of the site, Police Road has the following carriageway elements:

- Eastlink to Gladstone Road – Divided carriageway with a single lane of traffic in each direction.
- Gladstone Road to End – Single carriageway approximately 6m wide, providing a single lane of traffic in each direction.

In the vicinity of the subject site kerbside parking is generally not permitted (No Stopping restrictions).

A sign posted speed limit of 60km/h applies to the section west of Gladstone Road, whilst the default urban speed limit of 50km/h applies to the section east of Gladstone Road.

Photographs of the surrounding road network are provided from Figure 4 to Figure 7 respectively.



Figure 4: Police Road – West of Gladstone Road (view west)



Figure 5: Police Road – West of Gladstone Road (view east)



Figure 6: Police Road – East of Gladstone Road (view east)



Figure 7: Police Road – East of Gladstone Road (view east)

Katoomba Drive

Katoomba Drive is classified as a local access road managed by Monash City Council. Katoomba Drive extends west from Blanton Drive, terminating as a 'dead-end' at the northern property boundary of the subject site.

Katoomba Drive generally provides for a 10.2m wide carriageway in the east-west section, reducing to approximately 5.5m wide in the north-south section. On-Street parking is generally permitted on both sides of the road.

Footpaths are generally provided on both sides of the road.

Katoomba Drive is subject to the default urban speed zoning of 50km/h.

Photographs of Katoomba Drive are provided in Figure 8 and Figure 11 below.



Figure 8: Katoomba Drive – East-West Section (view east)



Figure 9: Katoomba Drive – East-West Section (view west)



Figure 10: Katoomba Drive – North-South Section (view north)



Figure 11: Katoomba Drive – North-South Section (view south)



3.3 Public Transport Infrastructure

The site has access to public transport infrastructure, including bus services operating along Police Road / Gladstone Road (past the site).

A summary of the available bus routes within comfortable walking distance of the subject site is provided below.

Table 3: Public Transport Infrastructure

Service	Between	Via
Bus Routes		
Route 802 / 804 / 862	Dandenong and Chadstone	Route 802 operates via Wellington Road and Brady Road. Route 804 operates via Wheelers Hill Shopping Centre. Route 862 operates via Waverley Gardens SC.
Route 850	Dandenong and Glen Waverley	Mulgrave and Brandon Park.

Figure 12 outline the nearby public transport services.

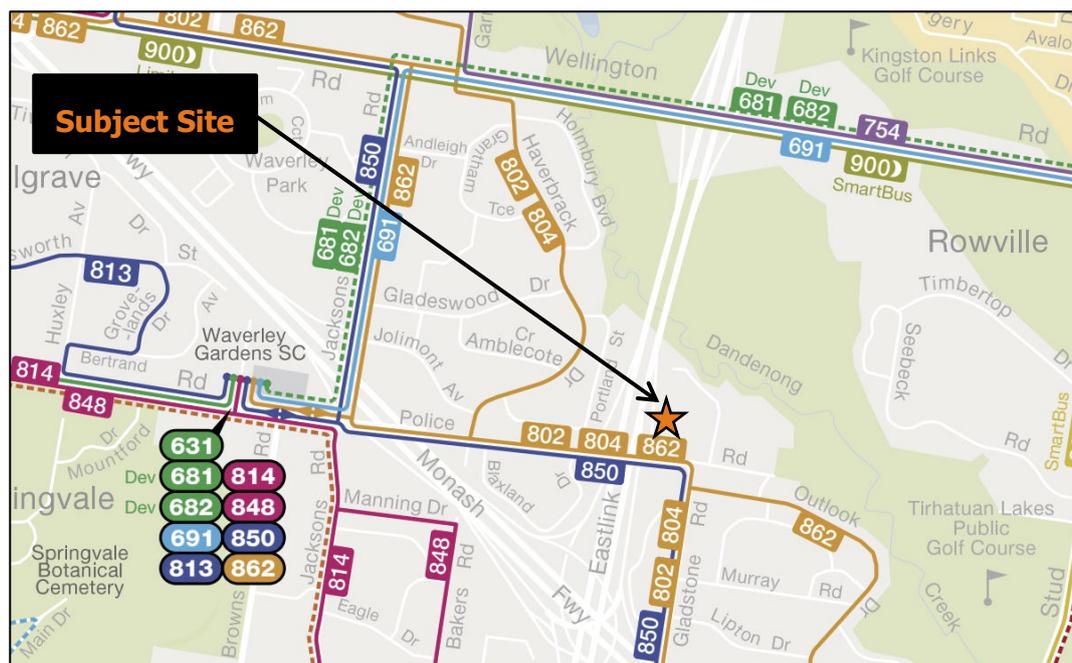


Figure 12: Public Transport Local Area Map (Source: www.ptv.com.au)

We note that the site is located outside the Principle Public Transport Network area.

3.4 Traffic Surveys

AM and PM peak hour traffic surveys were undertaken at the intersection of Police Road / Gladstone Road.

The surveys were undertaken at the following times:

- Tuesday, 20th May, 2020 - 8am-9am.



- Wednesday, 21st May, 2020 - 5pm-6pm.

This data was collected during 'normal' conditions outside of formal COVID-19 lockdown periods. To establish a current 2022 data set, the traffic volumes have been factored by 2.5% per annum (linear).

The 2022 data set for the Police Road / Gladstone Road intersection are provided in Figure 13 below.

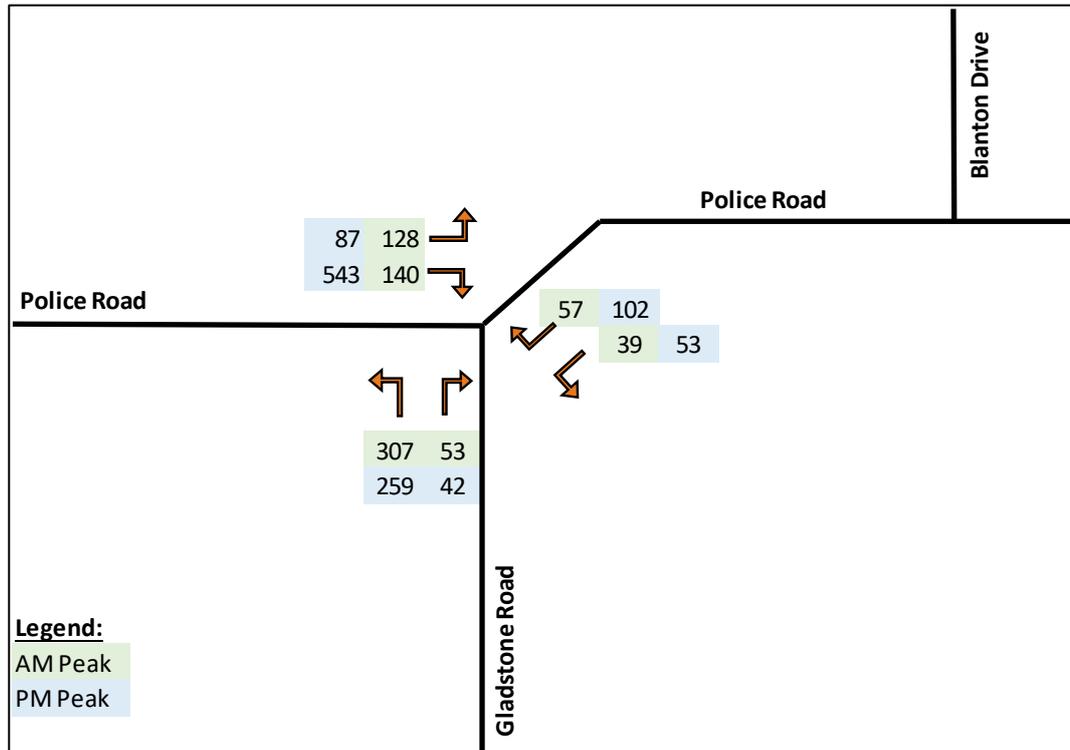


Figure 13: 2022 Peak Hour Volumes – Police Road / Gladstone Road

4 Car Parking Assessment

4.1 Statutory Car Parking

Clause 52.06-5 prescribes the number of car spaces to be provided for the proposed development.

Under Clause 74 the proposed land use category is included under 'dwelling'.

The site is located outside of the Principal Public Transport Network Map as defined under Clause 52.06 of the Planning Scheme and VC148 *Principal Public Transport Network Area Maps (State Government of Victoria 2018)*. On this basis, Column A parking rates apply.

Table 4 outlines an assessment of the car parking provision against the statutory requirement prescribed under Clause 52.06-5 of the Monash Planning Scheme, adopting the Column A rates, as prescribed.



Table 4: Statutory Car Parking Assessment

Use	No.	Statutory Car Parking Rate	Requirement (1)	Provision
Resident				
Three + Bedroom Dwellings	27	2 spaces per dwelling	54	54
Visitor				
Visitor	27	1 space per 5 dwellings (2)	5	34
TOTAL			59	88

Note 1: Non-whole numbers rounded down to the nearest whole number as specified by Clause 52.06-5

Note 2: For developments of 5 or more dwellings.

Accordingly, the statutory car parking requirement for the proposed development is 59 spaces (54 resident spaces and 5 visitor spaces).

The provision of 88 spaces (54 resident spaces & 34 visitor spaces) results in the proposed development exceeding the statutory car parking requirement of Clause 52.06 of the Planning Scheme.

4.2 Car Park Design

A total of 88 car spaces are provided on-site as follows:

- 54 resident spaces provided as double garages.
- 27 individual visitor parking spaces provided as tandem driveway spaces (in front of double garages).
- 7 shared visitor spaces on-street along the internal accessway (indented 90 degree).

The following table reviews the proposal against the design standards as specified under Clause 52.06-9 of the Monash Planning Scheme.



Table 5: Review of Car Park Design Against Clause 52.06-9

Design Standard	Compliant	Comments
Design Standard 1 - Accessways		
<i>Be at least 3 metres wide</i>	Compliant	<p>The main internal accessway is generally proposed at 6.0m wide, which can comfortably accommodate simultaneous two-way traffic flow.</p> <p>A localised reduction to 3.57m is proposed adjacent to an existing tree to be retained. This will result in single lane operation past the localised reduction. Given that 9 dwellings are located past the localised reduction in width, we are satisfied that peak hour traffic volumes will be well within the 30 veh/hour threshold for single lane operation.</p> <p>A secondary accessway is proposed to service 4 properties in the vicinity of the western boundary. This minor accessway is proposed at 3.5m wide, allowing for single lane operation. Again, the expected peak hour volumes will be well below the thresholds for single lane operation.</p>
<i>Have an internal radius of at least 4 metres at changes of direction or intersection or be at least 4.2 metres wide.</i>	Compliant	<p>The internal accessway includes generous radii at the changes of direction.</p> <p>Swept path diagrams provided at Appendix B, demonstrate that the internal layout is suitable to accommodate an 8.8m MRV (waste collection / emergency services).</p>
<i>Allow vehicles parked in the last space of a dead-end accessway in public car parks to exit in a forward direction with one manoeuvre</i>	Not Applicable	The car parking areas are private.
<i>Provide at least 2.1 metres headroom beneath overhead obstructions, calculated for a vehicle with a wheel base of 2.8 metres</i>	Compliant	The shared accessway has no overhead obstructions and the internal headroom within the garages (with the door in the open position) has a minimum headroom clearance of 2.1m.
<i>If the accessway serves four or more car spaces or connects to a road in a Transport Zone 2 or Transport Zone 3, the accessway must be designed so that cars can exit the site in a forward direction</i>	Compliant	All cars can enter and exit the site in a forward direction.
<i>Provide a passing area at the entrance at least 6.1 metres wide and 7 metres long if the accessway serves ten or</i>	Compliant	The internal accessway at the property entrance is shown at approximately 6m,



Design Standard	Compliant	Comments
<i>more car parking spaces and is either more than 50 metres long or connects to a road in a Transport Zone 2 or Transport Zone 3.</i>		matching into the existing Katoomba Drive carriageway. Given that no obstructions will be located within the vicinity of the carriageway, the road can comfortably accommodate two-way flow.
<i>Have a corner splay or area at least 50 per cent clear of visual obstructions extending at least 2 metres along the frontage road from the edge of an exit lane and 2.5 metres along the exit lane from the frontage, to provide a clear view of pedestrians on the footpath of the frontage road.</i>	Compliant	Whilst the plans do not show specific pedestrian sight line triangles at the property boundary, the configuration is unique whereby there is no footpath across the accessway (as the proposed access is a continuation of the existing Katoomba Drive carriageway).
<i>If an accessway to four or more car parking spaces is from land in a Transport Zone 2 or Transport Zone 3, the access to the car spaces must be at least 6 metres from the road carriageway</i>	Compliant	All spaces are located more than 6m from the roadway, albeit not a Transport Zone 2 or Transport Zone 3.
<i>If entry to the car space is from a road, the width of the accessway may include the road</i>	Not Applicable	All spaces are accessed via the internal accessway.
Design Standard 2 – Car Parking Spaces		
<i>Car parking spaces and accessways must have the minimum dimensions as outlined in Table 2.</i>	Compliant	The parking spaces provided on-site are compliant with the requirements of Clause 52.06 Table 2 as follows: <ul style="list-style-type: none"> • Tandem driveway parking spaces – minimum of 5.4m long from the garage to the internal access road (accommodated B99 vehicle). • Indented On-Street Visitor Spaces (90 degrees) – 4.9m long and 2.6m wide, with an 8m access aisle (6m carriageway and 2m offset). These dimensions satisfy the requirements of Table 2 of Clause 52.06-8.
<i>A wall, fence, column, tree, tree guard or any other structure that abuts a car space must not encroach into the area marked 'clearance required' on Diagram 1, other than:</i> <ul style="list-style-type: none"> • <i>A column, tree or tree guard, which may project into a space if it is within the area marked 'tree or column permitted' on Diagram 1.</i> • <i>A structure, which may project into the space if it is at least 2.1 metres above the space.</i> 	Compliant	The proposed driveway spaces do not have any specific obstructions within 300mm of the driveways. In any event, the driveway widths allow for comfortable entry and exit of the vehicles by the driver and the occupants. No obstructions are located adjacent to the indented on-street parking is proposed to be limited to locations that do not impact on driveway accessibility (refer to Appendix B).



Design Standard	Compliant	Comments
<p><i>Car spaces in garages or carports must be at least 6 metres long and 3.5 metres wide for a single space and 5.5 metres wide for a double space measured inside the garage or carport.</i></p>	Compliant	<p>All garages meet these minimum dimensions.</p> <p>The garages are set back from the accessway a minimum of 5.4m resulting in a minimum maneuvering area of 11.4m when including the accessway. This will provide for comfortable maneuvers in / out of the proposed garage spaces.</p>
<p><i>Where parking spaces are provided in tandem (one space behind the other) an additional 500 mm in length must be provided between each space</i></p>	Compliant	<p>As discussed previously, all tandem parking spaces are a minimum of 5.4m long.</p> <p>This accords with the additional 500mm requirement which equates to 5.4m long (4.9m space and additional 0.5m).</p>
<p><i>Where two or more car parking spaces are provided for a dwelling, at least one space must be under cover</i></p>	Compliant	<p>All dwellings are proposed with double garages.</p> <p>Therefore, all dwellings are provided with two spaces that are undercover.</p>
<p><i>Disabled car parking spaces must be designed in accordance with Australian Standard AS2890.6-2009 (disabled) and the Building Code of Australia. Disabled car parking spaces may encroach into an accessway width specified in Table 2 by 500mm</i></p>	Not Applicable	<p>Disabled car parking is not required for this class of building under the BCA (now NCC).</p>



Design Standard 3 – Gradients		
<i>Accessway grades must not be steeper than 1:10 (10 per cent) within 5 metres of the frontage.</i>	Compliant	The first 5m will be provided at a maximum of 1:10.
<i>Ramps (except within 5 metres of the frontage) must have the maximum grades as outlined in Table 3 and be designed for vehicles travelling in a forward direction.</i>	Compliant	Internal grades are proposed to follow the general topography of the site. Indicative grades along the east-west section of the internal accessway would average approximately 7.7% (1 in 13) to 12% (1 in 8).
<i>Where the difference in grade between two sections of ramp or floor is greater than 1:8 (12.5 per cent) for a summit grade change, or greater than 1:6.7 (15 per cent) for a sag grade change, the ramp must include a transition section of at least 2 metres to prevent vehicles scraping or bottoming.</i>	Compliant	The design of the internal road at the detailed design stage should provide the minimum grades achievable with transition sections provided where required to accord with Clause 52.06.
<i>Plans must include an assessment of grade changes of greater than 1:5.6 (18 per cent) or less than 3 metres apart for clearances, to the satisfaction of the responsible authority.</i>	Compliant	
Design Standard 4 – Mechanical Car Parking		
<i>Mechanical parking may be used to meet the car parking requirement...</i>	Not Applicable	No mechanical car parking is proposed within this development
Design Standard 5 – Urban Design		
<i>Ground level car parking, garage doors and accessways must not visually dominate public space.</i>	Compliant	The single accessway is not considered excessive, particularly given the large size of the subject site. The accessway is proposed as an extension of Katoomba Drive, noting that Katoomba Drive was originally designed to allow for a future extension.
<i>Car parking within buildings (including visible portions of partly submerged basements) must be screened or obscured where possible, including through the use of occupied tenancies, landscaping, architectural treatments and artworks.</i>	Compliant	All of the carpark provided 'within buildings' are provided in garages. These garages include doors to screen the car parking from view.
<i>Design of car parks must take into account their use as entry points to the site.</i>	Not Applicable	This is a private car park and the nature of parking for the individual dwellings does not result in a significant 'entry point' for the car parks.
<i>Design of new internal streets in developments must maximise on street parking opportunities.</i>	Not Applicable	As discussed previously, the proposal exceeds the car parking requirements of Clause 52.06 of the Monash Planning Scheme.



Design Standard 6 – Safety		
<i>Car parking must be well lit and clearly signed.</i>	Compliant	Lighting would be expected to be provided along the internal accessway. Signage for the on-site car parking is not required, given the allocation to individual dwellings.
<i>The design of car parks must maximise natural surveillance and pedestrian visibility from adjacent buildings.</i>	Compliant	Good levels of surveillance are provided to the internal accessway from the proposed dwellings.
<i>Pedestrian access to car parking areas from the street must be convenient.</i>	Not Applicable	Each dwelling has an attached garage / driveway carpark.
<i>Pedestrian routes through car parking areas and building entries and other destination points must be clearly marked and separated from traffic in high activity parking areas.</i>	Not Applicable	A footpath is proposed along the north side of the main accessway and both side of the site entry.
Design Standard 7 – Landscaping		
<i>Landscaping and trees must be planted to provide shade and shelter, soften the appearance of ground level car parking and aid in the clear identification of pedestrian paths.</i>	Compliant	Landscaping areas are proposed throughout the layout.

Based on the above, we are satisfied that the proposed internal design is satisfactory and in accordance with Clause 52.06-9 of the Monash Planning Scheme.

There are no reasons why the layout in its current form, should not be approved, based on this traffic engineering assessment.

5 Bicycle Parking

Clause 52.34 prescribes the number of bicycle spaces to be provided for the proposed development.

There is no rate for residential developments less than four storeys. On this basis, there is no statutory requirement for bicycle parking.

Nevertheless, each dwelling will be able to informally cater for bicycle parking demands within private dwelling areas. Additionally, all dwellings have 'end of trip' facilities internally.

The development plans include six (6) visitor bicycle parking spaces throughout the development to cater for short term bicycle parking demands.

Accordingly, we are satisfied that bicycle parking can be adequately accommodated on-site.



6 Vehicle Access & Traffic Assessment

6.1 Vehicle Access

The proposal seek to provide access to Katoomba Drive at the northern boundary of the site, with the internal accessway integrating as an extension of the existing 6m wide carriageway.

6.2 Traffic Generation

Traffic generation rates for residential dwellings in metropolitan Melbourne have been assessed through empirical surveys by other consultants. In particular, surveys in May 2016 for 456 dwellings in Altona Meadows identified the following traffic generation rates:

- Daily Traffic Generation – 7.7 trips/dwelling/day
- AM Peak Hour – 0.63 trips/dwelling/hour
- PM Peak Hour – 0.71 trips/dwelling/hour

The case study area in Altona Meadows had limited access to public transport and no internal non-residential uses, which is likely to result in high car dependence and therefore high traffic generation rates.

For the purposes of this assessment we have conservatively adopted 8 trips/dwelling/day and 0.8 trips/dwelling/hour for analysis.

Table 6 below outlines the daily and peak hour traffic generation of the proposed development.

Table 6: Traffic Generation

Use	No.	Traffic Generation Rate	Daily Volume	Peak hour Volume
Resident				
Townhouses	27	8 vte/day/dwelling 0.8 vte/peak hour/dwelling	216	22
TOTAL			216	22

NOTE1: vte = vehicle trip ends or 'vehicle movements'

Accordingly, the traffic generation of the proposed development is 216 daily vehicle movements, inclusive of 22 vehicle movements occurring in the commuter peak periods (typically 8-9am and 5-6pm).

This equates to an average of 1 vehicle movement every 2-3 minutes in the peak hours.



6.3 Traffic Distribution

The following table outlines the likely distribution of entering and exiting traffic in the AM and PM peak hours. The distribution is based on the following accepted distributions:

- AM Peak hour – 80% of vehicles exiting, 20% of vehicles entering
- PM Peak Hour – 30% of vehicles exiting, 70% of vehicles entering

Table 7: Traffic Distribution (based on 22 vehicle trip ends in peak hours)

Use	No. of Movements	Avg. Time Per Movement
AM Peak Hour		
Entering Movement	4	1 movement every 15 minutes
Exiting Movement	18	1 movement every 3-4 minutes
PM Peak Hour		
Entering Movement	15	1 movement every 4 minutes
Exiting Movement	7	1 movement every 8-9 minutes

Given the 'dead end' nature of Blanton Drive catchment, all vehicle movements associated with the subject site occur to/from the south via Blanton Drive and Police Road.

We have distributed the volumes at the Police Road / Gladstone Street intersection in the same proportions as the existing traffic volumes.

A summary of the expected peak hour traffic volumes associated with the subject site including the existing traffic volumes at the Police Road / Gladstone Street intersection is provided in Figure 14 below.

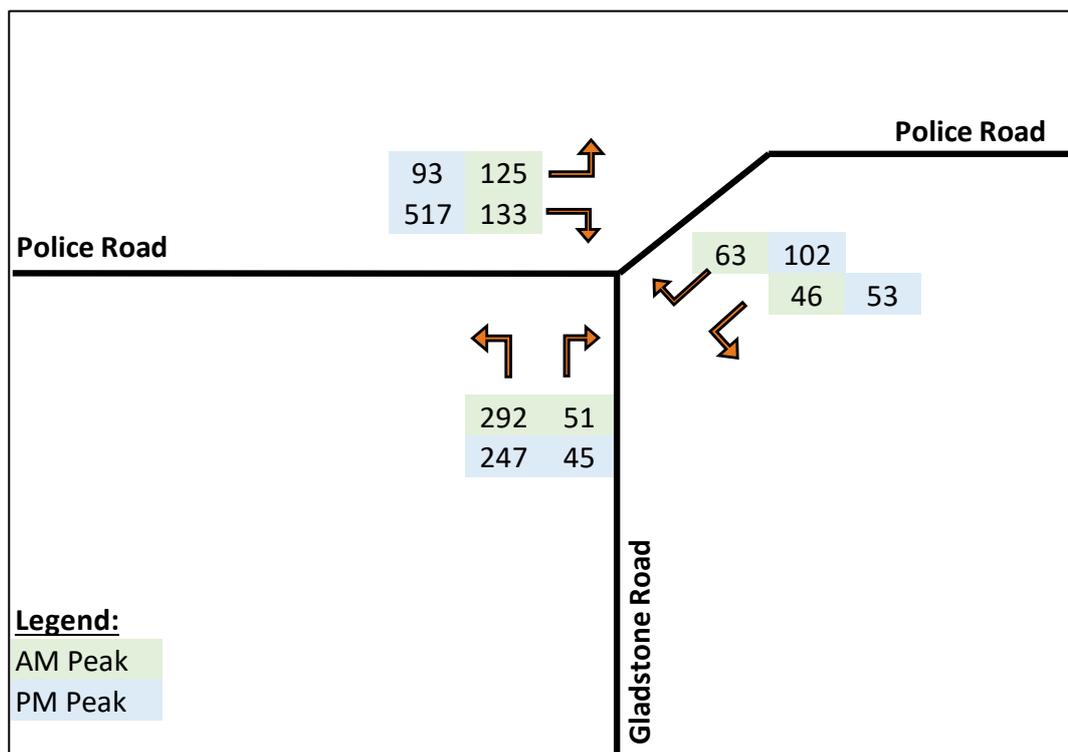


Figure 14: Post Development Peak Hour Traffic Volumes



6.4 Intersection Capacity

We have prepared a SIDRA model to review the capacity impacts of the increased traffic volumes at the vehicle access and the impact on the adjacent intersection at Police Road / Gladstone Road.

SIDRA presents output results based on the following key metrics:

- **Degree of Saturation** – A ratio of demand (volume) on capacity.
- **Average Delay** – The average delay of all vehicles for a particular movement or lane.
- **95th Percentile Queue Length** – The length the 95% of queues are at or below for a particular movement or lane.
- **Level of Service (LOS)** – Measured LOS A through LOS E a 'rating' of the operation based on average delay.

For unsignalised intersections, the threshold for acceptable operation is typically a DOS of less than 0.8 and LOS C or better.

The other following key inputs were also adopted for the SIDRA model:

- **Gap Acceptance:** SIDRA default gap acceptance values.
- **Traffic Volumes:** Post development 2022 volumes as presented previously in Figure 14.

A summary of the SIDRA results for the Police Road / Gladstone Road intersection are provided in Table 8 below.

Table 8: Post Development SIDRA Summary – Police Road / Gladstone Road

Movement		DOS	Average Delay	95 th Percentile Queue Length
AM Peak				
Police Rd (W)	Left	0.15	5s	0m
	Through	0.15	6s	0m
Police Rd (NE)	Left	0.11	6s	3m
	Right	0.11	8s	3m
Gladstone Rd (S)	Through	0.22	6s	3m
	Right	0.22	6s	3m
PM Peak				
Police Rd (W)	Left	0.37	5s	0m
	Through	0.37	6s	0m
Police Rd (NE)	Left	0.30	9s	8m
	Right	0.30	13s	8m
Gladstone Rd (S)	Through	0.20	7s	5m
	Right	0.20	9s	5m

The results of the SIDRA model demonstrate that the proposed additional traffic can be comfortably accommodated by the existing Police Road / Gladstone Road intersection.



Critically, the 95th percentile queue length for the north-east approach is a maximum of 8m in the PM peak (approximately 1 vehicle).

A copy of the full SIDRA outputs is provided in Appendix D.

6.5 Katoomba Drive – Capacity

The proposed development will take access to Katoomba Drive at the northern boundary of the site. Given the existing 'dead end' nature of Katoomba Drive, the proposed access will operate as a continuation of the existing carriageway.

We have estimated the existing daily traffic volume for Katoomba Drive based on the number of dwellings. Under the existing conditions 24 dwellings take access to Katoomba Drive, with 1 vacant block. On this basis, we have adopted 25 dwellings to assess traffic volumes assuming that an additional dwelling will be constructed on the vacant block of land.

A summary of the estimated existing, development and post development traffic volumes are provided in Table 6 below.

Table 9: Katoomba Drive – Daily Traffic Volume Assessment

Use	No.	Traffic Generation Rate	Daily Volume
Existing Volume	25	8 vte/day/dwelling	200
Proposed Development	27	8 vte/day/dwelling	216
Post Development	52	8 vte/day/dwelling	416

In view of the above, the daily traffic volume on Katoomba Drive is expected to increase from approximately 200 vehicles/day to 416 vehicles/day.

Katoomba Drive is classified as a 'Local Access Road' under the Monash Register of Public Roads. Access Roads are described by Council as follows:

"Standard usage local public roads, low speed environment. Provide access to properties. Service roads where Council is the responsible road authority"

Whilst Council doesn't specify a target volume, it is generally accepted that local roads can carry up to 2,000-3,000 vehicles per day. On this basis, Katoomba Drive would continue to operate with volumes well within the typical range for a local access road.

7 Service Vehicles

Waste Collection

The proposed development plan includes locations for bin collection areas along the main accessway.

A Waste Management Plan (WMP) has been prepared by Urban Leaf (dated June, 2022) which formalises waste collection arrangements and nominates collection on-site by private contractor.



Swept paths are attached at Appendix B, which confirm that an 8.8m MRV (large waste collection vehicle) can enter/exit the site in a forwards direction and circulate through the internal layout.

Overall, we are satisfied that waste collection is acceptable for the proposed development.

Loading

This development includes dwellings only, and accordingly there is no requirement to facilitate formal on-site loading.

We are satisfied that any loading activities associated with the proposed development can occur via the internal accessway and will have minimal impact on traffic conditions for residents of the proposed development.

Emergency Services

The swept path diagrams provided at Appendix B show an 8.8m MRV entering the site in a forwards direction, circulating around the internal access road and exiting the site in a forwards direction.

We are satisfied that this demonstrates suitable access for emergency services (i.e. fire trucks).



8 Conclusions

Having visited the site, undertaken traffic surveys and undertaken a detailed traffic engineering assessment the following conclusions are reached in relation to the residential development at 501-521 Police Road, Mulgrave:

1. The statutory car parking requirement as specified under Clause 52.06-5 of the Monash Planning Scheme is 59 car spaces (54 resident spaces and 5 visitor spaces).
2. The provision of 88 car spaces (54 resident spaces and 34 visitor spaces) satisfies the statutory car parking requirements.
3. The design of the garages, visitor space and vehicle access accords with the Design Standards of Clause 52.06-9 and AS2890.1:2004 where relevant.
4. There is no statutory bicycle parking requirement under Clause 52.34 as the development is less than 4 storeys.
5. Long term resident bicycle parking can be accommodated informally within private dwelling garage/storage areas, with visitor bicycle parking accommodated by six (6) bicycle parking spaces around the site.
6. The proposed development is expected to generate 216 vehicles/day, inclusive of 22 movements in the peak hours.
7. The peak hour traffic volumes can be comfortably accommodated by the existing unsignalised intersection at Police Road / Gladstone as demonstrated by SIDRA capacity analysis.
8. Daily traffic volumes on Katoomba Drive are expected to increase from approximately 200 vehicles/day to 416 vehicles/day. Given that local access streets can typically accommodate up to 2,000-3,000 vehicles/day, Katoomba Drive will continue to operate with volumes well within the typical range for a local access road.
9. Waste collection can occur on-site by private contractor, with the specified vehicle able to exit the site in a forwards direction, which is satisfactory from a traffic engineering perspective. Swept paths demonstrate that 8.8m vehicle can perform a three point turn manoeuvre on-site.
10. No loading bay is required for a residential development.

Having undertaken all tasks necessary to adequately assess the traffic engineering impacts of the Proposed Residential Development at 501-521 Police Road, Mulgrave, we are satisfied that the proposed development is satisfactory.

There are no reasons why a permit for the proposed development should not be issued from a traffic engineering perspective, subject to appropriate conditions.



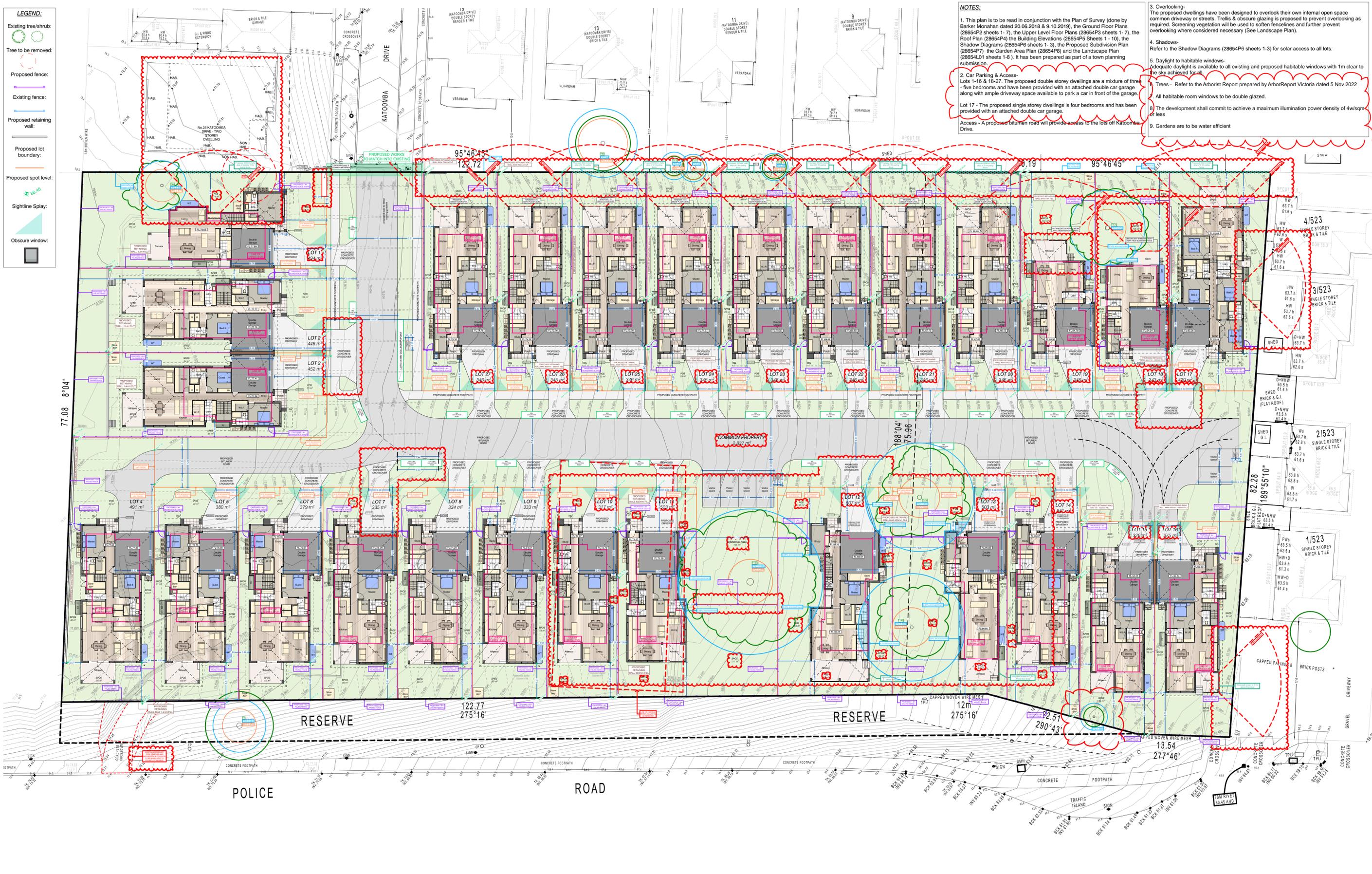


Appendix A

Development Plans

- LEGEND:**
- Existing tree/shrub:
 - Tree to be removed:
 - Proposed fence:
 - Existing fence:
 - Proposed retaining wall:
 - Proposed lot boundary:
 - Proposed spot level:
 - Sightline Splay:
 - Obscure window:

- NOTES:**
- This plan is to be read in conjunction with the Plan of Survey (done by Barker Monahan dated 20.06.2018 & 9.10.2019), the Ground Floor Plans (28654P2 sheets 1-7), the Upper Level Floor Plans (28654P3 sheets 1-7), the Roof Plan (28654P4) the Building Elevations (28654P5 Sheets 1-10), the Shadow Diagrams (28654P6 sheets 1-3), the Proposed Subdivision Plan (28654P7) the Garden Area Plan (28654P8) and the Landscape Plan (28654L01 sheets 1-8). It has been prepared as part of a town planning submission.
 - Car Parking & Access- Lots 1-16 & 18-27. The proposed double storey dwellings are a mixture of three - five bedrooms and have been provided with an attached double car garage along with ample driveway space available to park a car in front of the garage.
 - Lot 17 - The proposed single storey dwellings is four bedrooms and has been provided with an attached double car garage.
 - Access - A proposed bitumen road will provide access to the lots off Katoomba Drive.
 - Overlooking- The proposed dwellings have been designed to overlook their own internal open space common driveway or streets. Trellis & obscure glazing is proposed to prevent overlooking as required. Screening vegetation will be used to soften fences and further prevent overlooking where considered necessary (See Landscape Plan).
 - Shadows- Refer to the Shadow Diagrams (28654P6 sheets 1-3) for solar access to all lots.
 - Daylight to habitable windows- Adequate daylight is available to all existing and proposed habitable windows with 1m clear to the sky achieved for all.
 - Trees - Refer to the Arborist Report prepared by ArborReport Victoria dated 5 Nov 2022.
 - All habitable room windows to be double glazed.
 - The development shall commit to achieve a maximum illumination power density of 4w/sqm or less.
 - Gardens are to be water efficient.



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Version	Description	Drafted	Checked	Issue Date
04	Amendments made as per council's suggestion	TF	BB	31/01/2023
03	Amendments made as per council's RFI dated 2/12/2022	TF	BB	19/12/2022
02	Amendments made as requested by council	TF	BB	17/11/2022
01	Prepared for planning purposes	TF	MH	20/07/2022

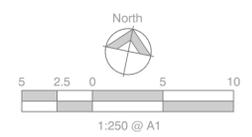
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Civil Engineering
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 Landscape Architecture
 Project Management
 Town Planning
 Urban Design

SAI GLOBAL Quality ISO 9001

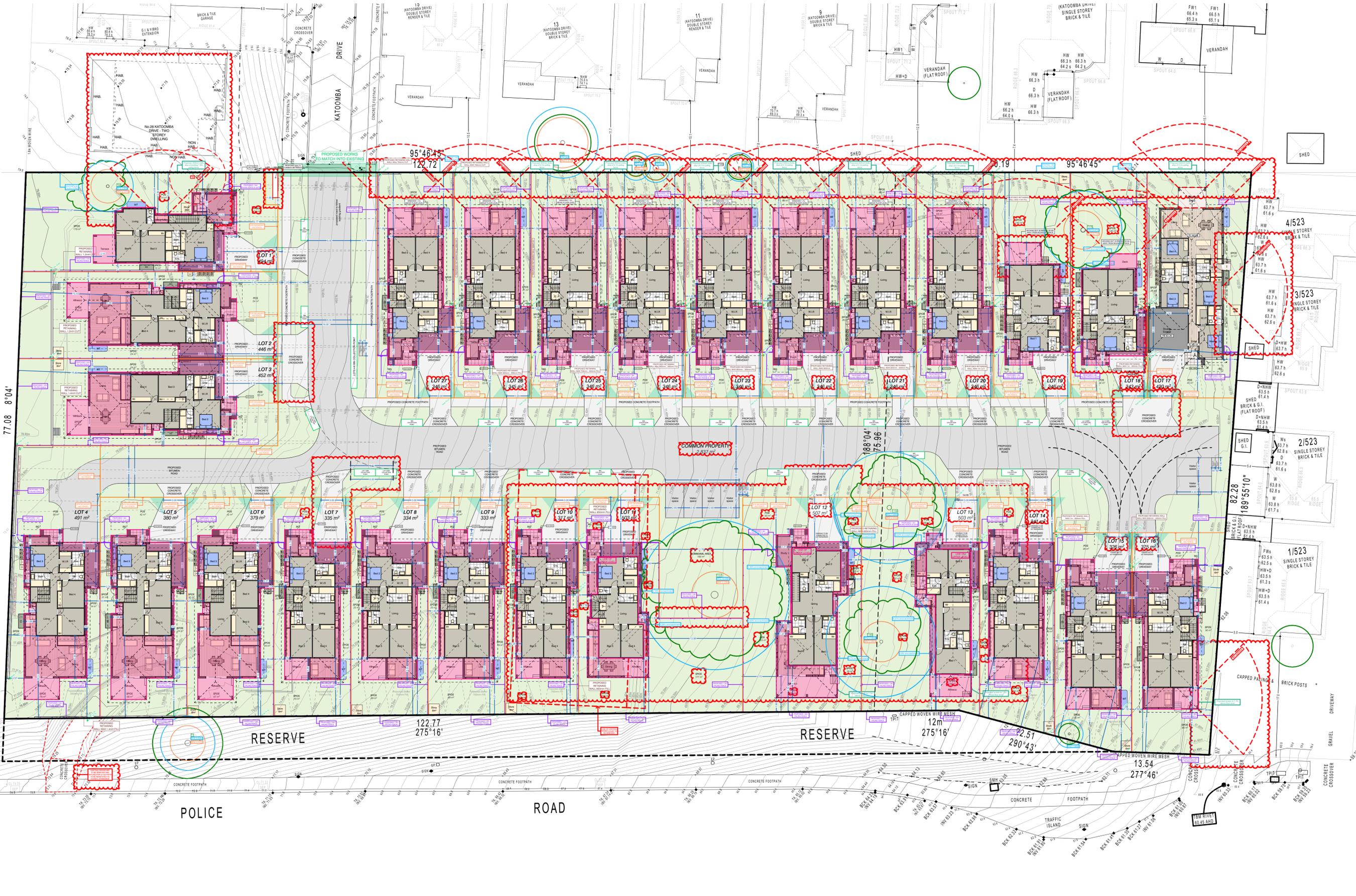
Millar & Merrigan Pty Ltd ACN 005 541 668
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OVERALL SITE LAYOUT PLAN SHEET 1 OF 7
 PROPOSED DEVELOPMENT
 501-515 & 517-521 POLICE ROAD, MULGRAVE
 MONASH CITY COUNCIL

28654 P2
 Version 04

- LEGEND:**
- Existing tree/shrub:
 - Tree to be removed:
 - Proposed fence:
 - Existing fence:
 - Proposed retaining wall:
 - Proposed lot boundary:
 - Proposed spot level:
 - Sightline Splay:
 - Obscure window:



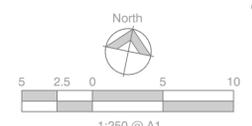
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04	Amendments made as per council's suggestion	TF	BB	31/01/2023
03	Amendments made as per council's RFI dated 21/2/2022	TF	BB	19/12/2022
02	Amendments made as requested by council	TF	BB	17/11/2022
01	Prepared for planning purposes	TF	MH	20/07/2022

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OVERALL UPPER LEVEL PLAN SHEET 1 OF 7
 PROPOSED DEVELOPMENT
 501-515 & 517-521 POLICE ROAD, MULGRAVE
 MONASH CITY COUNCIL

28654 P3
 Version 04

SUBJECT TO APPROVAL

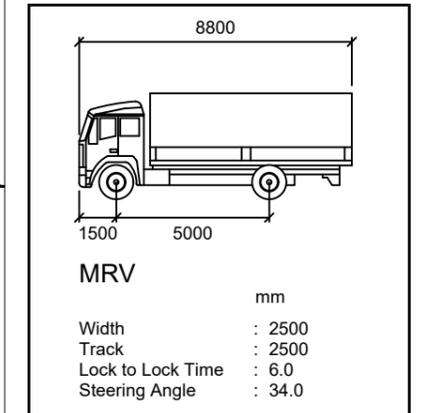


Appendix B

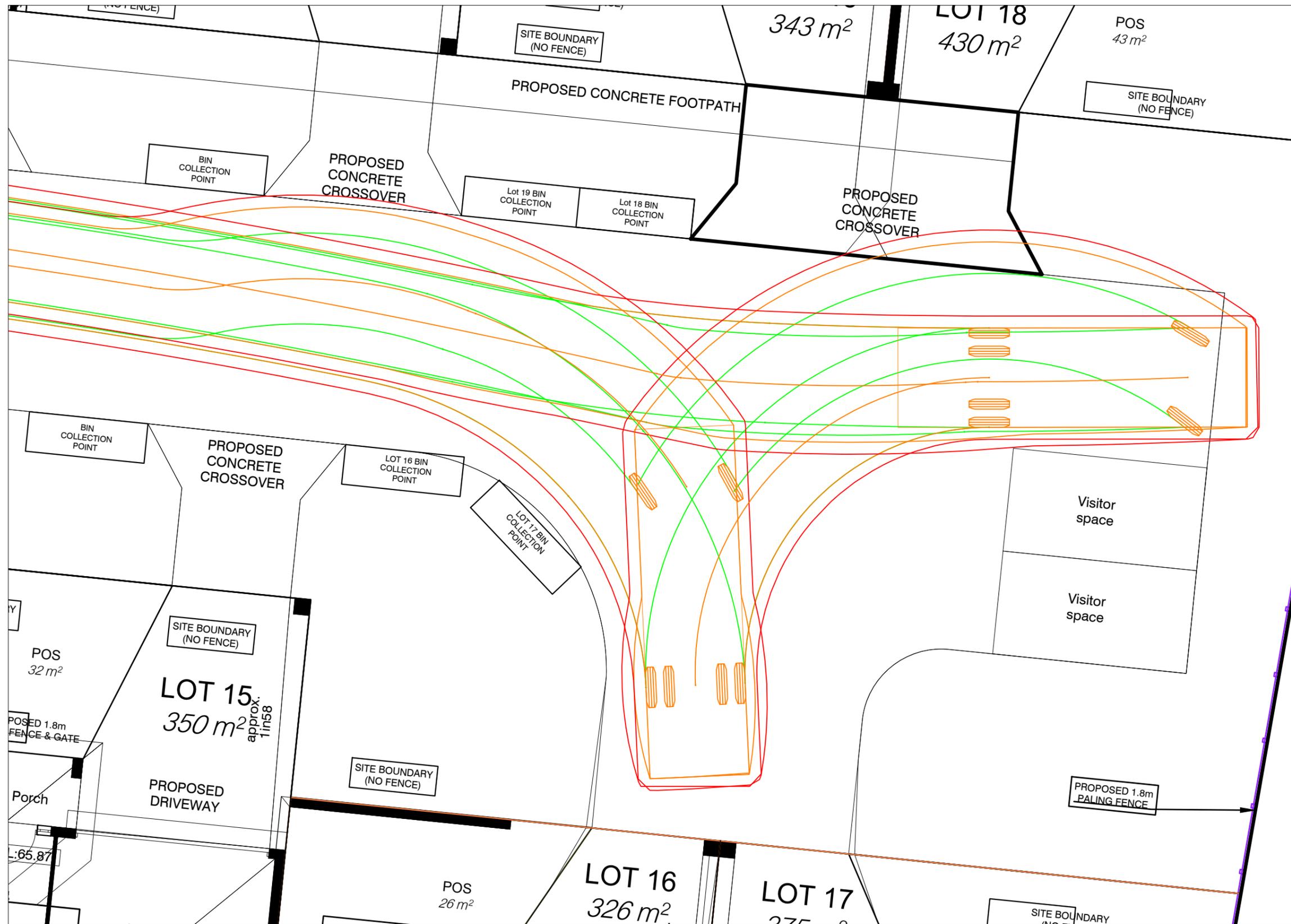
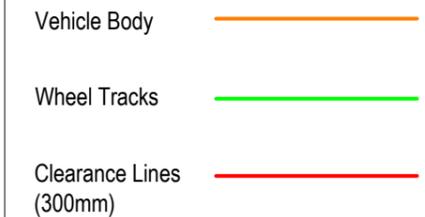
Swept Path Diagram – 8.8m MRV

Waste Vehicle - Accessibility

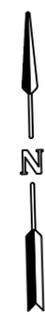
DESIGN VEHICLE USED IN SIMULATION



LEGEND



MELWAY REF: 14 A12



ISSUE	DATE	DESCRIPTION
A	24/10/22	SWEPT PATH DIAGRAMS

DESIGNED	P Chan
CHECKED	D Beaton
DATE	24/10/2022
PROJECT REF	19-0142

Quantum Traffic

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w: www.quantumtraffic.com.au
a: 5 Murray Place RINGWOOD VIC 3134

GENERAL NOTES
1.
2.
3.
4.
5.

PROPOSED RESIDENTIAL DEVELOPMENT
501-521 POLICE ROAD, MULGRAVE
CRITICAL SWEPT PATH DIAGRAMS

DRAWING NO. 19-0142-01

ISSUE A

SCALE 1:100 @ A3

0 1 2



Appendix C

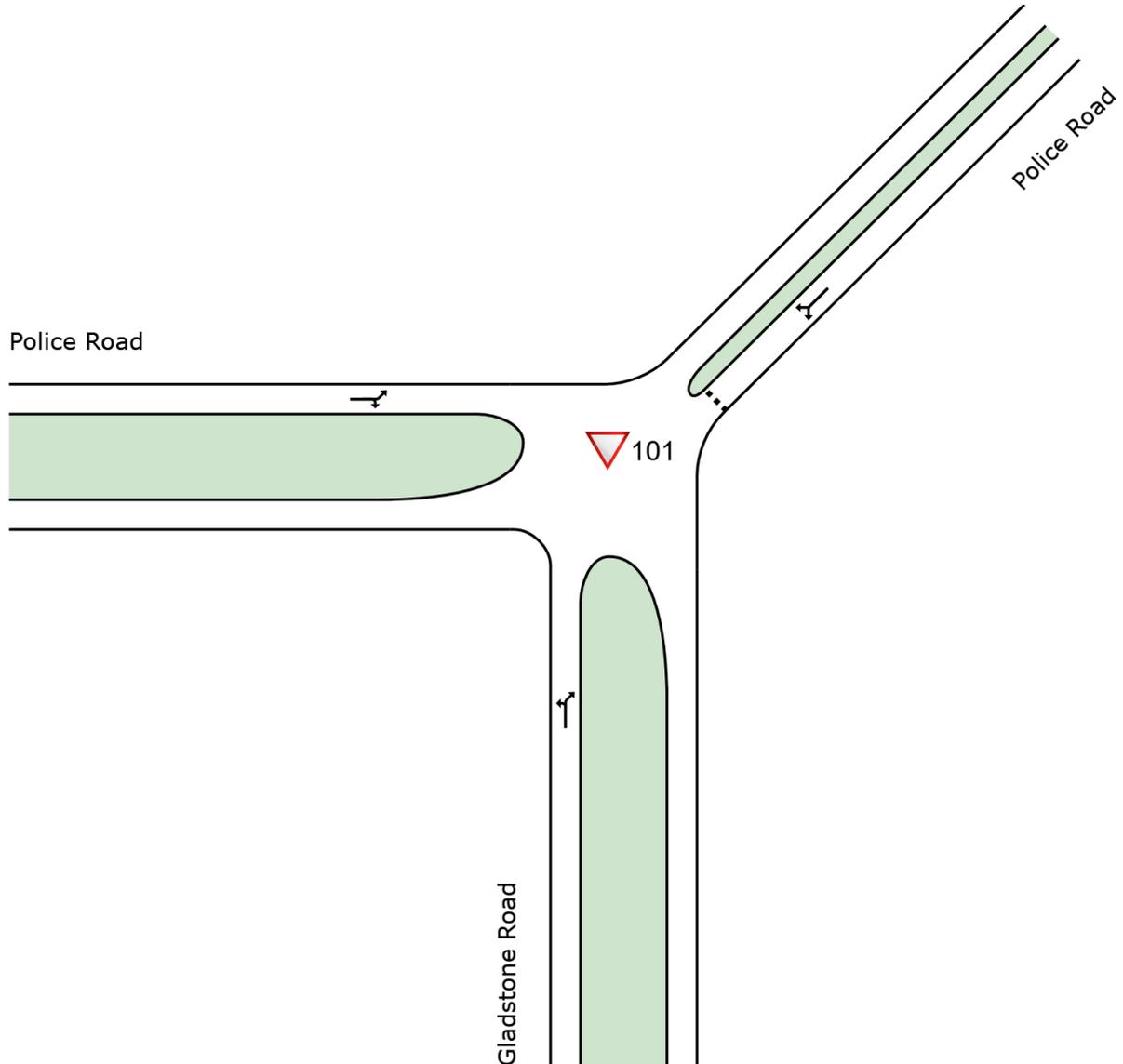
SIDRA Capacity Model Outputs

SITE LAYOUT

▽ Site: 101 [Police-Gladstone AM Peak (Site Folder: General)]

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

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



MOVEMENT SUMMARY

Site: 101 [Police-Gladstone AM Peak (Site Folder: General)]

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh. veh]	[Dist m]				
South: Gladstone Road														
1	L2	307	5.0	323	5.0	0.219	5.9	LOS A	0.5	3.4	0.15	0.51	0.15	53.0
3a	R1	53	0.0	56	0.0	0.219	6.2	LOS A	0.5	3.4	0.15	0.51	0.15	52.9
Approach		360	4.3	379	4.3	0.219	5.9	NA	0.5	3.4	0.15	0.51	0.15	53.0
NorthEast: Police Road														
24a	L1	39	0.0	41	0.0	0.113	5.8	LOS A	0.4	2.8	0.32	0.64	0.32	51.9
26a	R1	57	0.0	60	0.0	0.113	8.0	LOS A	0.4	2.8	0.32	0.64	0.32	52.1
Approach		96	0.0	101	0.0	0.113	7.1	LOS A	0.4	2.8	0.32	0.64	0.32	52.0
West: Police Road														
10a	L1	128	0.0	135	0.0	0.153	5.4	LOS A	0.0	0.0	0.00	0.60	0.00	53.2
12	R2	140	5.0	147	5.0	0.153	5.5	LOS A	0.0	0.0	0.00	0.60	0.00	52.9
Approach		268	2.6	282	2.6	0.153	5.5	NA	0.0	0.0	0.00	0.60	0.00	53.0
All Vehicles		724	3.1	762	3.1	0.219	5.9	NA	0.5	3.4	0.12	0.56	0.12	52.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
 Vehicle movement LOS values are based on average delay per movement.
 Minor Road Approach LOS values are based on average delay for all vehicle movements.
 NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
 Delay Model: SIDRA Standard (Geometric Delay is included).
 Queue Model: SIDRA Standard.
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Police-Gladstone PM Peak (Site Folder: General)]

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

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh. veh]	[Dist m]				
South: Gladstone Road														
1	L2	259	5.0	273	5.0	0.203	6.6	LOS A	0.6	4.5	0.24	0.47	0.24	52.4
3a	R1	42	0.0	44	0.0	0.203	8.9	LOS A	0.6	4.5	0.24	0.47	0.24	52.3
Approach		301	4.3	317	4.3	0.203	6.9	NA	0.6	4.5	0.24	0.47	0.24	52.4
NorthEast: Police Road														
24a	L1	53	0.0	56	0.0	0.304	8.7	LOS A	1.2	8.2	0.67	0.90	0.80	48.9
26a	R1	102	0.0	107	0.0	0.304	12.7	LOS B	1.2	8.2	0.67	0.90	0.80	49.1
Approach		155	0.0	163	0.0	0.304	11.3	LOS B	1.2	8.2	0.67	0.90	0.80	49.0
West: Police Road														
10a	L1	87	0.0	92	0.0	0.367	5.4	LOS A	0.0	0.0	0.00	0.60	0.00	53.0
12	R2	543	5.0	572	5.0	0.367	5.6	LOS A	0.0	0.0	0.00	0.60	0.00	52.8
Approach		630	4.3	663	4.3	0.367	5.6	NA	0.0	0.0	0.00	0.60	0.00	52.8
All Vehicles		1086	3.7	1143	3.7	0.367	6.8	NA	1.2	8.2	0.16	0.61	0.18	52.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
 Vehicle movement LOS values are based on average delay per movement.
 Minor Road Approach LOS values are based on average delay for all vehicle movements.
 NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
 Delay Model: SIDRA Standard (Geometric Delay is included).
 Queue Model: SIDRA Standard.
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.