Traffix Group

# Transport Assessment

## Proposed Retirement Village & Residential Subdivision Development

## 275 Manchester Road, Chirnside Park

Prepared for
Summerset Villages (Number 5) Pty Ltd

May 2022

G30557R-02C

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# Document Control

## Our Reference: G30557R-02B

| Issue No. | Type | Date | Prepared By | Approved By |
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| A | Draft | 20/04/2022 | M. O'Shea / F. Bahn | K. Ballantyne |
| B | Final | 21/04/2022 | M. O'Shea / F. Bahn | K. Ballantyne |
| C | RFI Response | 10/05/2022 | M. O'Shea / F. Bahn | K. Ballantyne |

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# 1. Introduction

Traffix Group has been engaged by Summerset Villages (Number 5) Pty Ltd to undertake a Transport Assessment for a proposed retirement village & residential subdivision development at 275 Manchester Road, Chirnside Park.

**RFI Response**

This report responds to the updated development scheme that has been amended to respond to various matters raised within the Council RFI. Response to relevant traffic engineering matters is included throughout with a summary of our response provided at Section 5.

# 2. Proposal

The proposal is for a retirement village and residential subdivision development on the site.

The consolidated retirement village will include a Residential Aged Care Facility (RACF), Assisted Living Apartments (ALA) in addition to Independent Living Units (ILUs).

The retirement village will be an enclosed site with all internal access roads under private ownership and management. The external roads are proposed to be public roads under the control and management of Council.

A copy of the development plans prepared by Clarke Hopkins Clarke are attached at Appendix A.

**Retirement Village Development Summary**

A development summary that identifies the breakdown of dwelling types for the retirement village component across the development is provided in the following table.

*Table 1: Development Summary – Retirement Village*

| Characteristics | Description | | |
|---|---|---|---|
| **Uses** | **Size/No.** | **Car Parking** | **Notes** |
| ***Retirement Aged Care Building and Assisted Living Apartments*** | | | |
| Aged Care Beds<br>One-bedroom ALA. | 72<br>28 | 43<br>28<br>2 spaces within Porte Cochere<br>1 Loading Emergency Vehicle car space | 0.6 spaces/bed<br>1 space/dwelling |
| Basement car parking includes:<br>• 45 car spaces (including 2 small cars spaces)<br>• 2 DDA car spaces<br>• 2 EV car spaces | | | |

| Characteristics | Description | | |
|---|---|---|---|
| **Uses** | **Size/No.** | **Car Parking** | **Notes** |
| • 1 Loading Emergency Vehicle car space<br>At grade car parking includes:<br>• 9 car spaces outside of basement entry<br>• 13 car spaces outside of RACF building<br>• 2 x porte cochere spaces | | | |
| ***ILUs inc. Fletcher Road Apartments*** | | | |
| Two-bedroom ILU | 142 | 142 res (garage/driveway) 130 visitor (tandem) | 1.91 spaces/dwelling |
| Three-bedroom ILU | 41 | 41 res (garage) 41 res (tandem) | 2 spaces/dwelling |
| Fletcher Road Apt.<br>Two-bedroom ILU.<br>Three-bedroom ILU. | <br>8<br>1 | <br>8 res (basement)<br>1 res (basement) | <br>1 space/dwelling<br>1 space/dwelling |
| Shared Visitor Car Parking (on-street within Retirement Village) | | 18 spaces | 0.29 spaces/dwelling without private visitor parking |
| **Other** | **Notes** | | |
| Vehicle Access | Primary access via two-way crossover to new East-West Link Road.<br>Secondary 'exit only' access via single width crossover to East-West Link Road towards western boundary of Aged Care site.<br>Internal private roads provided at 5.5-6.0m minimum (two-way) and 4.0m wide (one-way) | | |
| Changes to on-street parking | Reduction of approx. 6-7 on-street spaces along Manchester Road as a result of new intersection.<br>Creation of approx. 42-44 on-street spaces along new East-West Link Road between Manchester Road and Hedwig Drive connection (conservatively assumes car parking available along one side only). | | |
| Loading Provision | Loading for the Aged Care building is proposed within dedicated areas of the basement. Access for vehicles up to 6.4m long Small Rigid Vehicle (SRV at AS2890.2) is proposed within this loading area.<br>Circulation throughout the site has been reviewed for an 8.8m long Medium Rigid Vehicle (MRV at AS2890.2). | | |

| Characteristics | Description | | |
|---|---|---|---|
| **Uses** | **Size/No.** | **Car Parking** | **Notes** |
| Waste Collection | Waste collection to be undertaken via private contractor using a 6.4m Hino min waste truck. Collection practices for various components described as follows:<br>• Primary RACF Building – waste collection to occur within basement BOH and associated loading bay<br>• ILUs – waste collection to occur via the internal road network with bins transferred to temporary collection area within individual driveways<br>• Fletcher Road Apartments – bins transferred to temporary collection point along internal road network adjacent to the apartment building | | |

**Residential Subdivision Development Summary**

A development summary that identifies the breakdown of the residential subdivision component of the proposal is provided in the following table.

*Table 2: Development Summary – Residential Subdivision*

| Characteristics | Description | | |
|---|---|---|---|
| Uses | Size/No. | Car Parking | Notes |
| Townhouse Lots (120-135m$^2$)<br>Standard Lots (350m$^2$) | 64<br>20 | 1 space to each 2-bed<br>2 spaces to each 3-bed | Resident parking to be compliant with Clause 52.06.<br>Visitor parking on-street to be compliant with Clause 56.06. |
| Apartment Building 1 | | | |
| One-bedroom<br>Two-bedroom<br>Three-bedroom | 8<br>21<br>9 | 47 | Resident parking to be compliant with Clause 52.06.<br>Visitor parking on-street. |
| Apartment Building 2 | | | |
| One-bedroom<br>Two-bedroom<br>Three-bedroom | 8<br>19<br>14 | 55 | Resident parking to be compliant with Clause 52.06.<br>Visitor parking on-street. |

| Characteristics | Description |
|---|---|
| **Other** | **Notes** |
| Vehicle Access | All vehicle access to individual lots and apartment buildings to occur via the new internal road network. |
| Changes to on-street parking | Creation of approx. 109 on-street spaces across the new internal access roads (allows for on-street car parking along both sides of 7m carriageway and one side only of the primary east-west link).<br>This level of on-street car parking equates to 1 space to each 1.5 residential dwelling/lot within the residential subdivision. |
| Loading Provision | To occur on-street.<br>Circulation throughout new road network has been reviewed for an 8.8m long MRV. |
| Waste Collection | To occur on-street via Council's services. |
| Other Notes | Footpaths have been provided along both sides of the new internal road network.<br>A Connection to Hedwig Drive is proposed to be two-way. Whilst an original scheme included one-way link this has been revised at request of Council Engineering Department who identified in various correspondence a preference for the link to be provided as a two-way link. |

**Carriageway Configuration – Cross-sections**

The residential subdivision will include new local roads that provide a 16m road reserve. This cross-section accommodates a 7m wide carriageway and footpaths (or a shared path) along each side.

A figure that identifies the cross-section for the East-West Link Road is provided below.

Other 16m local roads across the site will include 1.5m footpaths along both sides rather than a 2.5m shared path.

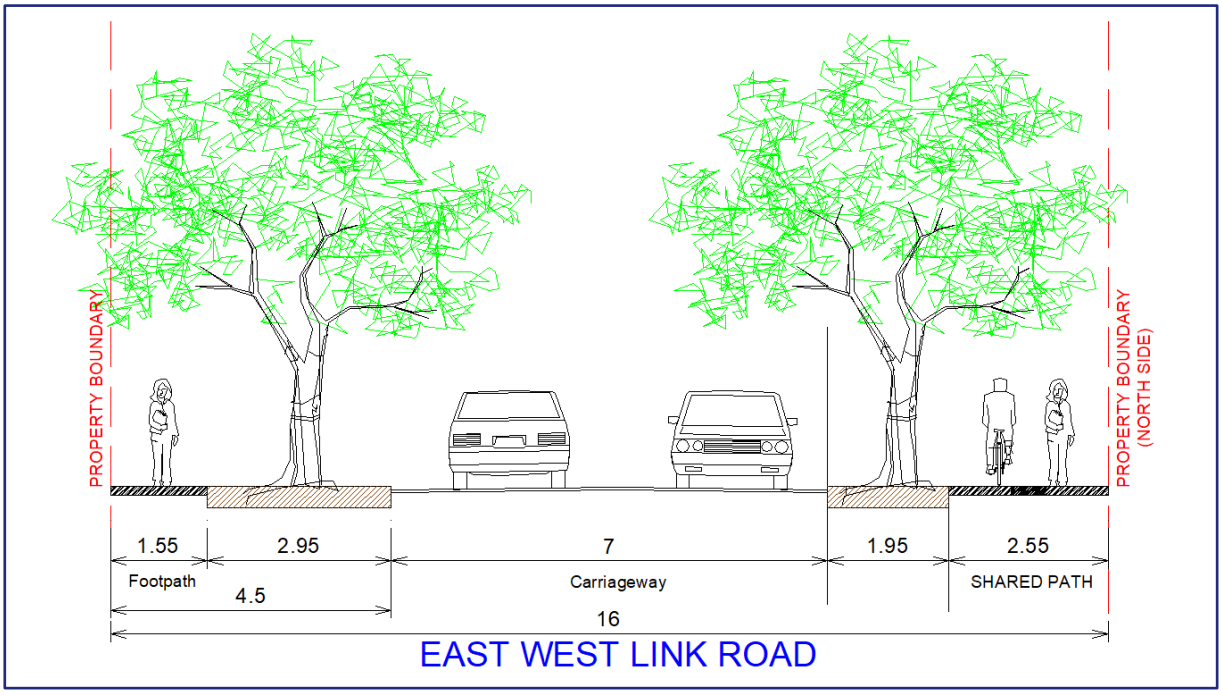



*Figure 1: East-West Link Road – Carriageway Configuration*

**Manchester Road Intersection**

The development will include access to Manchester Road at the existing median opening via the creation of the new internal public road.

As a result of the alignment of the East-West Link Road, various works to the road opening will be required. The works will include:

- Modification to the central median allowing for opening to be centrally located with the new East-West Link Road.
- Extension of the central right-turn deceleration lane on the southern approach to ensure compliance with relevant standards.
- Inclusion of line marking works in order to accommodate left-turn deceleration lane into the new road.

A functional layout plan that identifies the required works is attached to this report at Appendix B.

An assessment of the impacts to vegetation and trees in association with the proposed works is addressed within a report prepared by Galbraith and Associates.

# 3. Existing Conditions

## 3.1. Subject Site

The subject site is located at 275 Manchester Road, Chirnside Park (also known as Lot S4, 266-288 Maroondah Highway, Chirnside Park).

The table below summarises the key characteristics of the subject site.

*Table 3: Subject Site Description*

| Characteristic | Description |
|---|---|
| Address | 275 Manchester Road, Chirnside Park<br>(Lot S4, 266-288 Maroondah Highway, Chirnside Park) |
| Area | 9.3 ha |
| Frontages | ~91m to Fletcher Road<br>~400m to Manchester Road<br>16m to Hedwig Drive<br>16m to East Ridge Drive |
| Zoning | Residential Growth Zone – GRZ3 |
| Activity Centre | N/A |
| Current use of site | Vacant |
| On-street parking along site frontage | Approx. 40 unrestricted car spaces on Manchester Road<br>Approx. 9 unrestricted car spaces on Fletcher Road |

A locality plan, aerial photograph and land use zoning map is provided at Figure 2 to Figure 4, respectively.

Nearby land uses are typically residential east and south of the site, with various commercial uses located to the east. Significant nearby land uses include:

- **Chirnside Park Shopping Centre** located 700m north of the site,
- **Bulky Goods and Retail Commercial Uses** located along Maroondah Highway to the west of the site, and
- **Mooroolbark Activity Centre and Railway Station** located 2.2km south of the site.

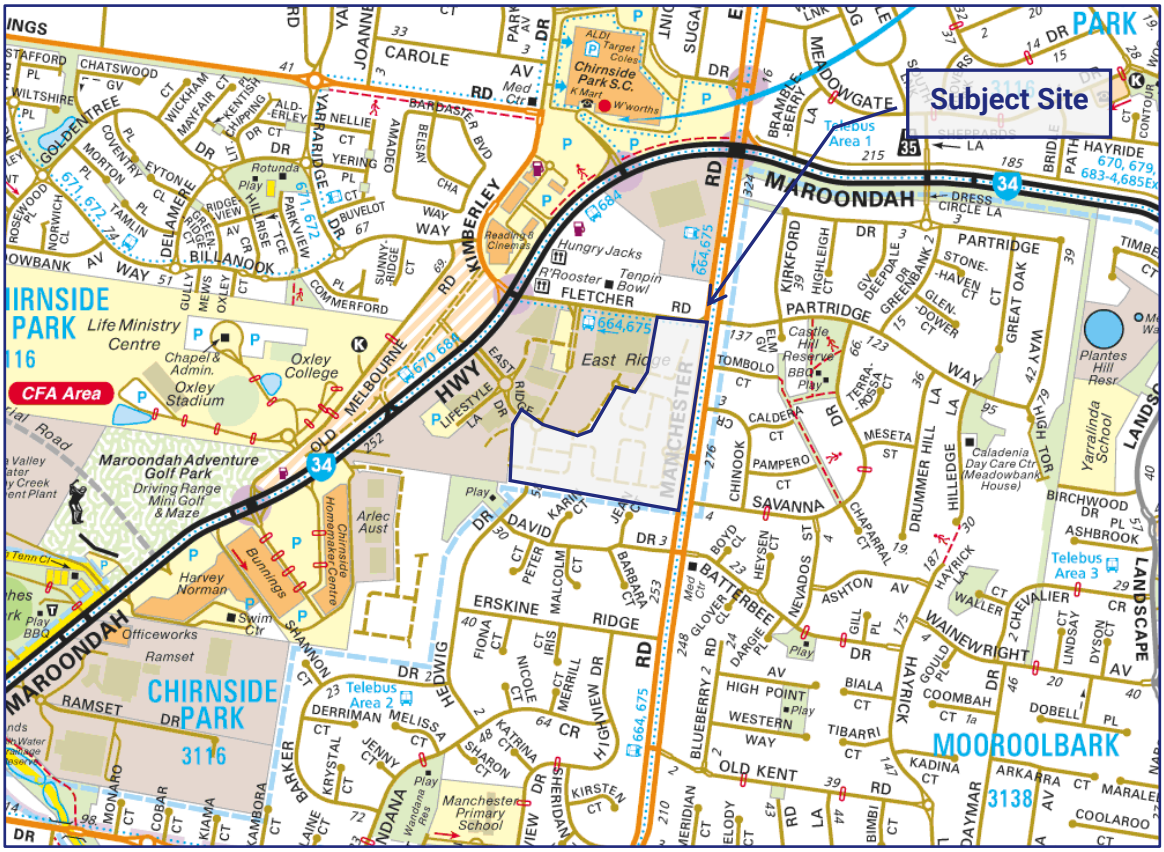



*Figure 2: Locality Plan (source: Melways)*


*Figure 3: Aerial Photograph (source: Nearmap)*

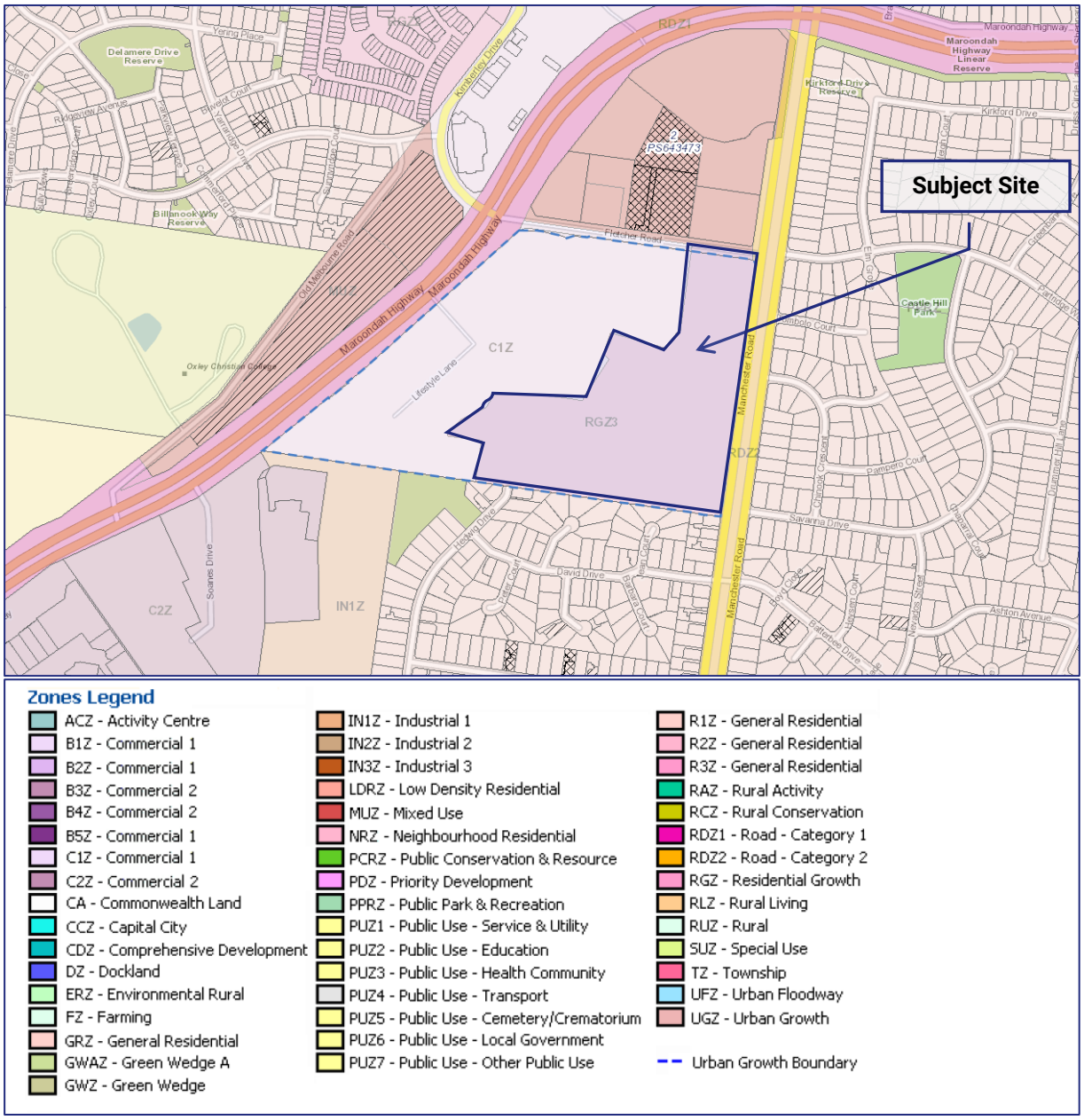



*Figure 4: Land Use Zoning Map (source: Planning Schemes Online)*

## 3.2. Planning Background

### 3.2.1. Current Planning Permit (YR-2018/408) – December 2018

A planning permit was approved by Yarra Ranges Council on 21st December 2018 for the subdivision of 266-268 Maroondah Highway (of which the subject site is Lot S4 in the plan of subdivision).

A number of conditions were attached to the Planning Permit that related to the subject site (Lot S4), which will be addressed in this report, where relevant.

The Current Planning Permit (YR-2018/408) specified a number of conditions relating to the requirement for a road reserve through the subject site that connects East Ridge Drive (and Maroondah Highway) with Manchester Road as follows:

*7.1.1.1 That as an obligation, arising under this agreement, upon the future development of the Subject Land, the Council will require a public road network though parts of the Subject Land and such Municipal Roads will be required to be created through Common Property No 1, and Lot S4 to* ***allow access through the Subject Land to and from Maroondah Highway and Manchester Road****.*

*7.1.1.5 Upon the approval of development of either Lot S5 or Lot S4 the construction of the extension of Eastridge Drive, including as a Municipal Road, must occur, to the boundary of Lot S4,* ***generally in accordance with the Section Plan 16133-C11-A*** *prepared by Davis, Naismith and McGovern (which has been attached to this report at Appendix B).*

Based on the above, the current planning permit notes that a road must be created between East Ridge Drive and Manchester Road and must be in accordance with a previously prepared plan that shows a road reservation of 16m with a 7m carriageway and a 2.5m shared path on one side of the road.

A figure that identifies this cross-section is provided below, noting that the shared path has been implemented along the north side of this road under the existing conditions.

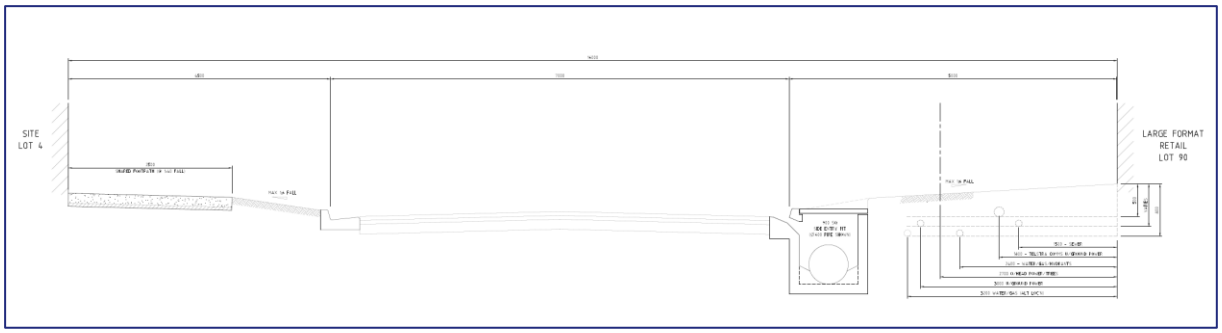



*Figure 5: East Ridge Drive Extension – Cross Section*

### 3.2.2. Approved Commercial Development

The commercial development at Lot 90 PS544666, 266-268 Maroondah Highway, Chirnside Park, has recently been approved and issued a planning permit by Council (Planning Permit YR/2021/22). This development included retail and shop premises, three convenience restaurants, and associated car parking areas.

Conditions within Planning Permit YR/2021/22 relevant to traffic engineering matters included a requirement for a 2.5m shared path along East Ridge Drive (Condition 1(i)). Other conditions are generally related to internal matters.

The conditions included by DoT (Condition 29-36) required various external improvements, including:

- Upgrade to bus stop (including shelters) on Maroondah Highway, and
- Upgrade to bus stop (including shelters) on Fletcher Road.

Significantly, the permit did not include any requirement for improvements to the signalised intersection of Fletcher Road and Maroondah Highway.

The post development traffic conditions were assessed as part of this development and presented within the traffic report (*Traffic Impact Assessment, dated 7 December, 2020, prepared by MGA*). This analysis was accepted by Council and DoT and has been adopted in our assessment of the traffic impacts for the proposal.

## 3.3. Transport Network

### 3.3.1. Road Network

**Manchester Road** is a Council collector road that extends from Maroondah Highway in the north to Hull Road in the south.

In the vicinity of the subject site, Manchester Road provides a divided carriageway with two lanes in each direction. Parking/bicycle lanes are generally provided along either side of Manchester Road.

A central median break is located opposite the site. The medium break provides for U-turn opportunities.

A posted speed limit of 70km/h applies to Manchester Road in the vicinity of the subject site.

**Fletcher Road** is classified as a local road and extends from Maroondah Highway in the west to Manchester Road in the east.

Fletcher Road provides a single traffic lane in each direction and forms a signalised intersection to the west with Maroondah Highway and a 'left in / left out' arrangement with Manchester Road in the east.

Kerbside parking is permitted, however, as a result of the traffic volumes along this road and limited demand, this does not occur frequently.

Fletcher Road is subject to the default urban speed limit of 50km/h.

**East Ridge Drive** is classified as a local road and extends from Maroondah Highway in the west to a dead end.

East Ridge Drive currently has two configurations, including:

- Dual carriageway that accommodates single traffic lane in each direction with no on-street car parking. A 2.5m shared path is provided along the north side that connects to the Maroondah Highway green spine path.
- Single carriageway of 7m that accommodate a traffic lane in each direction. A 2.5m shared path is provided along the north side.

The single carriageway section provides an interface with the subject property.

**Hedwig Drive** is classified as a local road and extends from Wandana Crescent in the south to a dead end at the subject site.

Hedwig Drive provides a 7m carriageway that accommodates a traffic lane in each direction and kerbside car parking along one side (alternately kerbside parking along both sides and single lane for through traffic).

Footpaths are provided along both sides; however, they currently do not extend to provide any interface with the development site.

Photographs of the surrounding road network are shown below.

*Figure 6: Manchester Road (western carriageway) – view north*

*Figure 7: Manchester Road (eastern carriageway) – view south*

*Figure 8: East Ridge Drive – view north-west*

*Figure 9: East Ridge Drive – view south-east*

*Figure 10: Hedwig Drive – view north*

*Figure 11: Hedwig Drive – view south*

## 3.4. Existing Traffic Conditions

### 3.4.1. Traffic Surveys – Manchester Road Median Opening

Traffic surveys of the intersection between Manchester Road and the median opening were undertaken by Trans Traffic Survey on Wednesday 17th November, 2021 between 7:30-9:30am and 4:30-6:30pm.

A review of the traffic volumes along the arterial road network was completed for the nearby intersection of Fletcher Road/Maroondah Highway. Based on this review, we are satisfied that the traffic data is adequate for the purpose of our assessments and does not require any growth factors.

The results of the movements recorded are presented in the following figure.

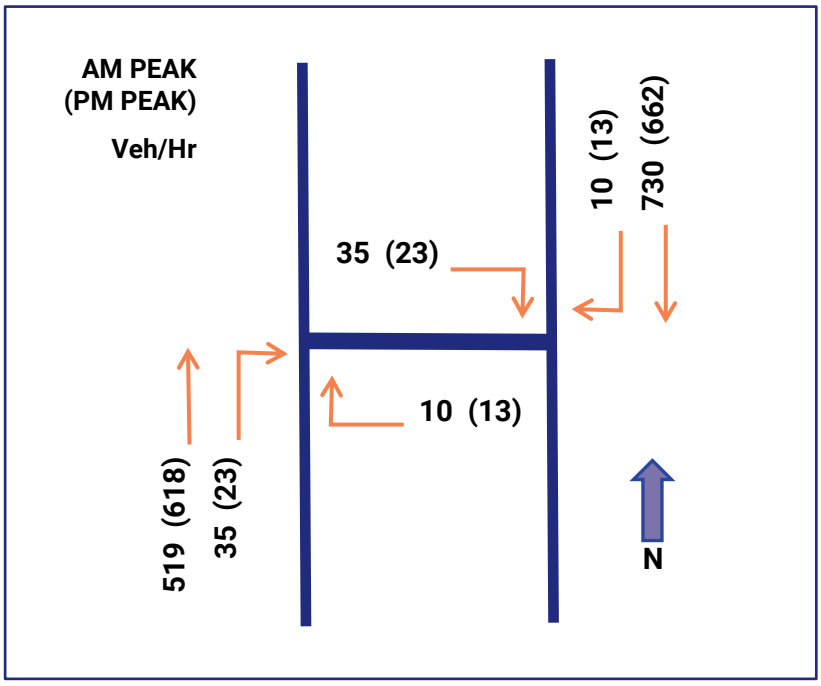



*Figure 12: Existing Traffic Conditions – Manchester Road / Median Opening (Opposite 276 Manchester Road)*

### 3.4.2. Traffic Surveys – Maroondah Highway/Fletcher Road

Traffic surveys of the intersection between Maroondah Highway and Fletcher Road were undertaken by Trans Traffic Survey on Wednesday 17th November, 2021 between 7:30-9:30am and 4:30-6:30pm.

The results of the peak hour traffic volumes are presented in the following figure.

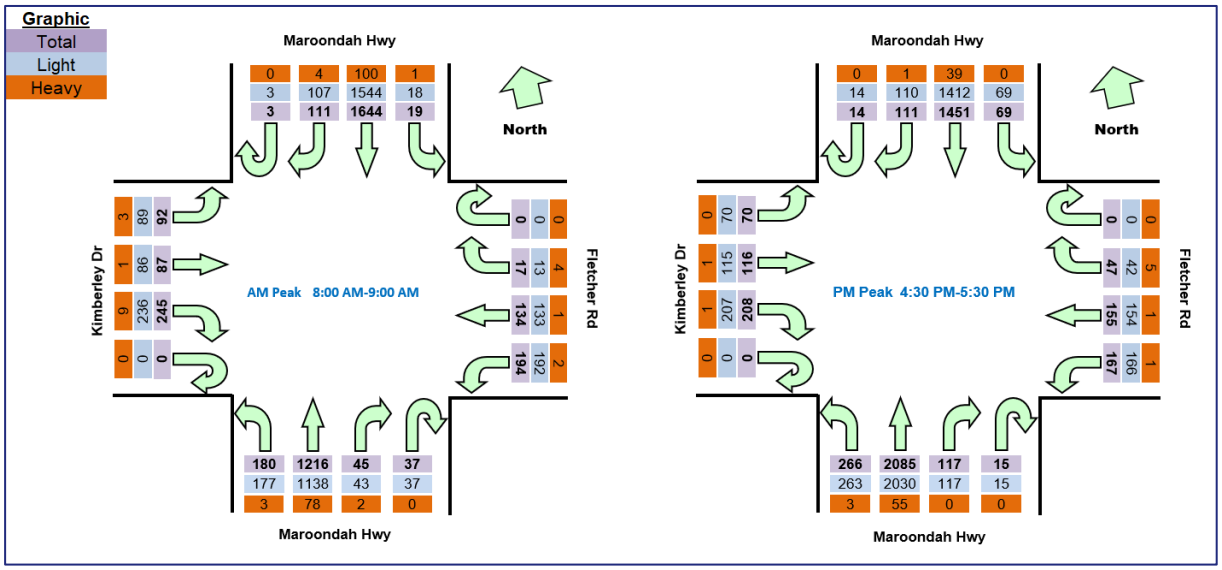



*Figure 13: Existing Traffic Conditions – Maroondah Highway/Fletcher Road Intersection*

### 3.4.3. Base Case Scenario – Maroondah Highway/Fletcher Road Intersection

A detailed traffic engineering assessment was completed in association with the approved commercial development at Lot 90 PS544666, 266-268 Maroondah Highway, Chirnside Park (Planning Permit YR/2021/22).

The post development traffic conditions assessed as part of this development and presented within the traffic report (*Traffic Impact Assessment, dated 7 December, 2020, prepared by MGA*) was accepted by Council and DoT, and have been adopted in our assessments of the traffic impacts from the proposed development.

The critical period that is relevant to the proposed development was the Weekday PM peak hour. Excerpts from this report that identify the existing traffic conditions and post-development traffic conditions during the Friday PM peak hour are provided in the following figures.

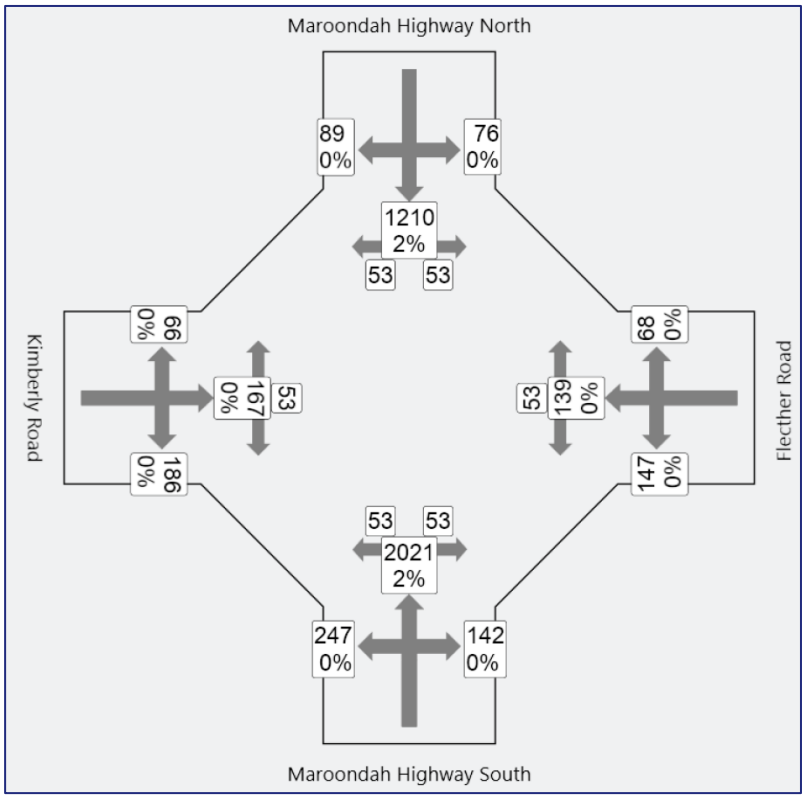



*Figure 14: Existing Traffic Conditions – Maroondah Highway/Fletcher Road Intersection – Weekday PM Peak*

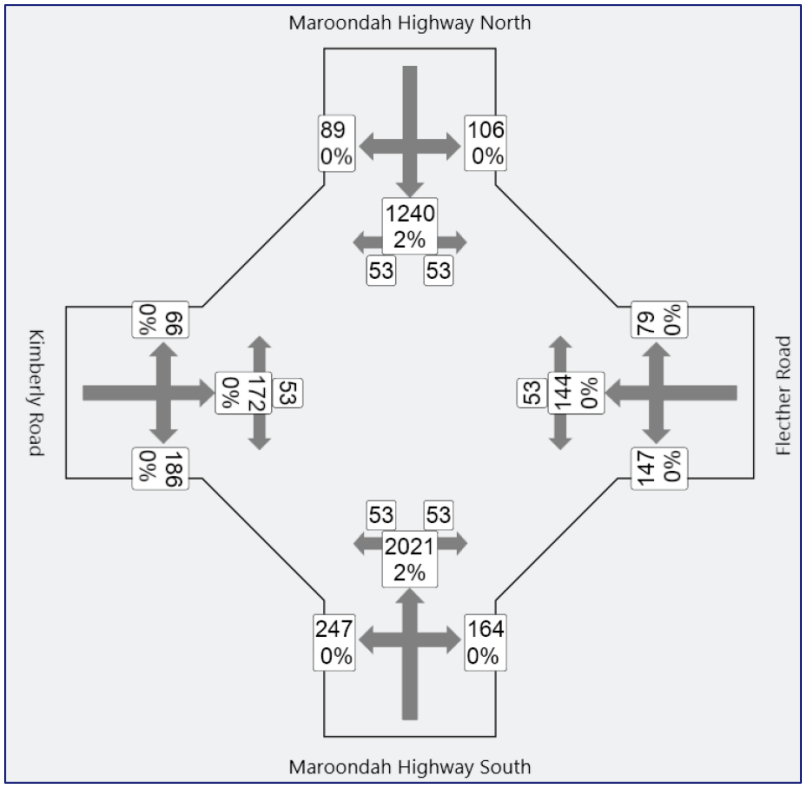



*Figure 15: Post-Development Traffic Conditions – Maroondah Highway/Fletcher Road – Weekday PM Peak*

The key findings of the traffic impact analysis undertaken by MGA and accepted by Council and DoT are reproduced as follows:

> *The full SIDRA results are presented in Appendix A with the results presented in Table 6.3. The results indicate that the network generally operates under satisfactory conditions on all approaches in both peak hours and will continue to do so in the post development scenario.*
>
> *The right turn lane (from south to east) at the signalised intersection of Maroondah Highway and Fletcher Road is expected to contain the post development queue length within the turn lane. In the critical Friday PM period the queue length is expected to be increased by one car length from 75m in existing conditions to 83m in the post development scenario which can be satisfactorily accommodated within the available storage of 85m.*
>
> *Similarly, in the Saturday peak period the queue length is expected to be increased from 50m in existing conditions to 64m in the post development which can be satisfactorily accommodated within the available storage of 85m.*
>
> *The queue length on Maroondah Highway increases given the limited storage available (and road reserve constraints) in the existing left turn lane on the north approach to Fletcher Road. The analysis has assumed a 50:50 assignment for the left turn into Fletcher Road and East Ridge Road for modelling purposes.*
>
> *Notwithstanding, that should the left turn into Fletcher Road have delays then a higher proportion of traffic would be expected to use East Ridge Road.*
>
> *The intersection of East Ridge Drive operates as a left in, left out intersection with a left turn deceleration lane and is configured to support development traffic to/from the site. The internal Site access points to Fletcher Road and East Ridge Drive are also configured to support development traffic to/from the Site. The intersections are expected to operate in a safe and efficient manner. Indeed, the traffic volumes of this application are approximately half (50%) less than the previous application for the Kaufland Development which maintained existing Site Access connections to the site.*

### 3.4.4. Traffic Volume Estimate – Hedwig Drive

Whilst traffic surveys have not been completed an estimate of the existing traffic conditions along Hedwig Drive has been undertaken based on the lots within the residential area to the south distribution of traffic via the various connections to the external road network.

In summary we would anticipate that at any location along Hedwig Drive the daily traffic volumes would be less than 1,000 vehicle movements per day. The short connection to the subject site currently provides access to a limited number of properties and accordingly, the volumes along this leg would be significantly lower (40-50 vehicle movements per day).

The volumes along Hedwig Drive are consistent with is carriageway configuration and classification as an Access Street Level 2 under Clause 56.06. An excerpt from Clause 56.06 that identifies the key design considerations and environmental traffic volume capacities is provided.

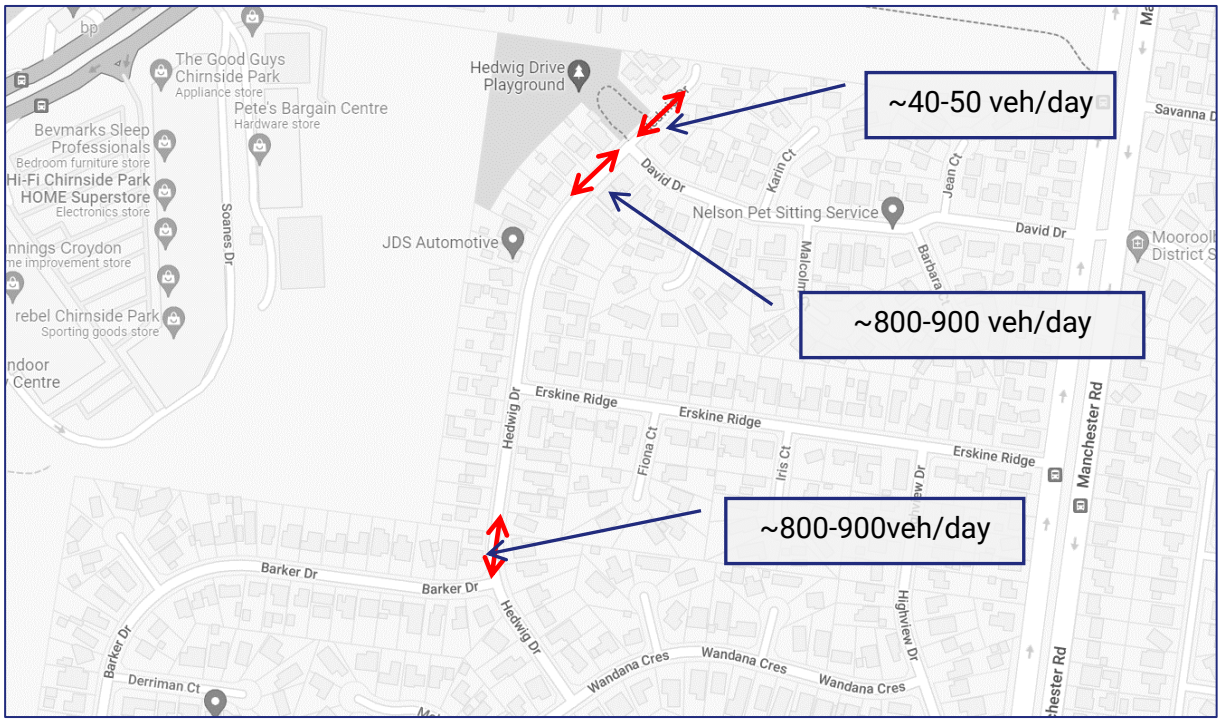



*Figure 16: Traffic Condition Estimate – Hedwig Drive*

**Access Street - Level 2**

A street providing local residential access where traffic is subservient, speed and volume are low and pedestrian and bicycle movements are facilitated.

| | |
|---|---|
| ▪ **Traffic volume**[1] | 2000vpd to 3000vpd |
| ▪ **Target speed**[2] | 40kph |
| ▪ **Carriageway width**[3] **& parking provision within street reservation** | 7m-7.5m wide with parking on both sides of carriageway |
| ▪ **Verge width**[4] | 4.5m minimum each side |
| ▪ **Kerbing**[5] | Semi-mountable rollover or flush and swale or other water sensitive urban design treatment area. |
| ▪ **Footpath provision** | 1.5m wide footpaths on both sides.<br>Footpaths should be widened to 2.0m in vicinity of a school, shop or other activity centre.<br>Be offset a minimum distance of 1m from the kerb. |
| ▪ **Cycle path provision** | Carriageway designed as a shared zone and appropriately signed. |

*Figure 17: Clause 56.06 – Access Street Level 2*

## 3.5. Alternative Transport Modes

### 3.5.1. Public Transport

The site has access to public transport services, including train and bus services. A summary of the bus services operating along the site's frontage to Manchester Road is provided at Table 4. A map of the broader services is provided at Figure 18.

Bus stops for the services along Manchester Road are available as follows:

- North-bound – Flag pole and concrete pad located at site's southern boundary (opposite Savanna Drive).
- South-bound – Flag pole and concrete pad located north of Partridge Drive and Flag pole and concrete pad located south of Batterbee Drive.

*Table 4: Summary of Public Transport Services*

| Service | Between | Via |
|---|---|---|
| Bus Route 664 | Chirnside Park and Knox City | Croydon and Bayswater |
| Bus Route 675 | Chirnside Park and Knox City | Manchester Road and Mooroolbark Station |
| Flexi-ride Mooroolbark | Chirnside Park Shopping centre and Mooroolbark Railway Station | On demand tele ride service (https://www.ptv.vic.gov.au/footer/about-ptv/improvements-and-projects/bus-and-coach/on-demand-bus-service-flexiride-expands-to-lilydale/) |

Multiple additional bus routes are available via the bus interchange that is located at Chirnside Park Shopping Centre. The interchange is located within the at grade carpark on the southern side of the shopping centre buildings.

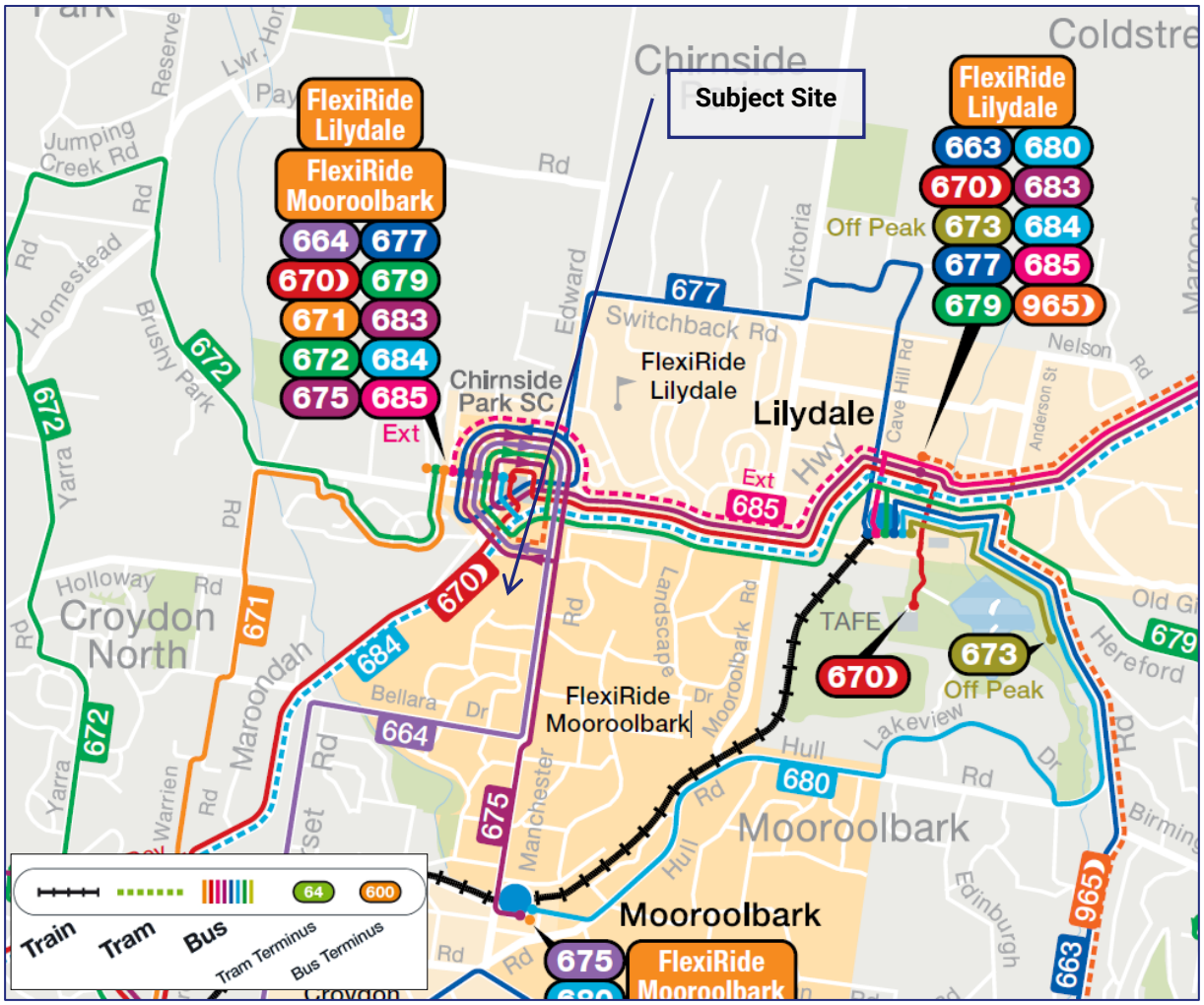



*Figure 18: Public Transport Map (Source: PTV)*

### 3.5.2. Bicycle Infrastructure

The site is relatively well served by bicycle infrastructure with off-road trails and on-road bicycle lanes available in the nearby area.

Manchester Road includes on-road bike lanes along both sides and an off-road shared path is provided as part of the green spine that extends along the south-east side of Maroondah Highway.

A 2.5m shared path that connects to the Maroondah Highway bike path is available along the north side of East Ridge Drive. The proposed development will include an extension to this link from Manchester Road along the proposed east-west road.

### 3.5.3. Walking

The site is walkable, with everyday services located within walking distance of the site. Significantly, Chirnside Park Shopping Centre is located approximate 1km walking distance north-west of the site.

# 4. Traffic Engineering Assessment

## 4.1. Statutory Car Parking Assessment

### 4.1.1. Retirement Village Component

The proposed development falls under the land-use categories of 'residential aged care facility', 'retirement village' and 'dwelling' under Clause 73.03 of the Planning Scheme.

The standard residential lots are assessed under Clause 56 and will include resident parking on-site within attached garages at rates compliant with the Planning Scheme. Visitor parking for these dwellings would be provided on-street as required within the new road network. As such, we have excluded this component from the statutory assessment under Clause 52.06.

The Planning Scheme sets out the parking requirements for new developments under Clause 52.06. The purpose of Clause 52.06 is:

- *To ensure that car parking is provided in accordance with the Municipal Planning Strategy and the Planning Policy Framework.*
- *To ensure the provision of an appropriate number of car parking spaces having regard to the demand likely to be generated, the activities on the land and the nature of the locality.*
- *To support sustainable transport alternatives to the motor car.*
- *To promote the efficient use of car parking spaces through the consolidation of car parking facilities.*
- *To ensure that car parking does not adversely affect the amenity of the locality.*
- *To ensure that the design and location of car parking is of a high standard, creates a safe environment for users and enables easy and efficient use.*

The statutory parking requirements are set out at Clause 52.06-5 of the Planning Scheme. Clause 52.06-5 states:

*Column A applies unless Column B applies.*

*Column B applies if:*

- *any part of the land is identified as being within the Principal Public Transport Network Area as shown on the Principal Public Transport Network Area Maps (State Government of Victoria, 2018); or*
- *a schedule to the Parking Overlay or another provision of the planning scheme specifies that Column B applies.*

Given the site is not located with the PPTN, the Column A rates apply.

The statutory car parking assessment of the development is set out in Table 5 below.

*Table 5: Retirement Village Car Parking Assessment – Clause 52.06-5*

| Use | Size / No. | Statutory Parking Rate (Column A) | Parking Req.(1) | Parking Provision | Shortfall / Surplus |
|---|---|---|---|---|---|
| ***Retirement Village (ILUs) and Fletcher Apartments*** | | | | | |
| Two-bed ILU | 142 | 1 space per one/two-bedroom dwelling | 142 | 142 | 0 |
| Three-bed ILU | 41 | 2 spaces per three or more bedroom dwelling | 82 | 82 | 0 |
| Two-bed Apt. (Fletcher) | 8 | 1 space per one/two-bedroom dwelling | 8 | 8 | 0 |
| Three-bed Apt. (Fletcher) | 1 | 2 spaces per three or more bedroom dwelling | 2 | 1 | -1 |
| Residential visitors | 192 dwellings | 1 space to each 5 dwellings | 38 | 130 private (2)<br>18 shared | +110 |
| ***Residential Aged Care Building*** | | | | | |
| Aged Care Beds | 72 | 0.3 car spaces to each lodging room | 21 | 71<br>(49 in basement and 22 external adjacent to RACF) | +17 |
| One-bedroom ALA | 28 | 1 space per one/two-bedroom dwelling | 28 | | |
| Visitor Parking (ALA only) | 28 | 1 space to each 5 dwellings | 5 | | |

Notes:

1. Clause 52.06-5 specifies that where a car parking calculation results in a requirement that is not a whole number, then number of spaces should be rounded down to the nearest whole number.
2. The tandem car spaces for 130 of the two-bedroom ILUs have been assessed as 'private' visitor car spaces for these dwellings.

As detailed in the above table, 130 of the two-bedroom ILUs will include a private visitor car space located in tandem external to the garages. This space would be available for use as a private visitor parking space for these dwellings and ensure no reliance on the shared visitor parking areas.

When considering those ILU dwellings within the retirement village without a private visitor space (total of 62 dwellings), a visitor car parking requirement of 12 spaces would apply. This requirement is satisfied by the 18 shared visitor spaces that are available within the north-eastern part of the site across the private internal road network.

Overall, the proposed retirement village development will include car parking for residents, staff and visitors that accord with the requirements of Clause 52.06-5.

An exception to the above, is one three-bedroom apartment provided within the Fletcher Road building that will include 1 resident car space. An assessment of the car parking reduction required in association with this dwelling is provided in the following section.

**Car Parking Reduction – Three-Bedroom Apartment**

Clause 52.06-7 allows for the statutory car parking requirement to be reduced (including to zero). An application to reduce (including reduce to zero) the number of car spaces required under Clause 52.06-5 or in a schedule to the Parking Overlay must be accompanied by a Car Parking Demand Assessment.

Clause 52.06-7 sets out that a Car Parking Demand Assessment must have regard to the following key factors:

- *The likelihood of multi-purpose trips within the locality which are likely to be combined with a trip to the land in connection with the proposed use.*
- *The variation of car parking demand likely to be generated by the proposed use over time.*
- *The short-stay and long-stay car parking demand likely to be generated by the proposed use.*
- *The availability of public transport in the locality of the land.*
- *The convenience of pedestrian and cyclist access to the land.*
- *The provision of bicycle parking and end of trip facilities for cyclists in the locality of the land.*
- *The anticipated car ownership rates of likely or proposed visitors to or proposed occupants (residents or employees) of the land.*
- *Any empirical assessment or case study.*

For the three-bedroom apartment, we are satisfied that the provision of a single resident space is acceptable noting that the dwelling forms part of the retirement village and residents would be aware of the car parking allocation prior to taking residence in the site.

Residents within retirement village environments commonly have a reduced car parking demand compared to standard residential dwellings.

On the basis of the above, we are satisfied that the provision of a single resident space is acceptable and supported under Clause 52.06-7 for a single three-bedroom apartment.

**Disabled Parking**

Clause 52.06-9 states that:

> *The car parking requirement specified in Table 1 includes disabled car parking spaces. The proportion of spaces to be allocated as disabled spaces must be in accordance with Australian Standard AS2890.6-2009 (disabled) and the Building Code of Australia.*

Two DDA compliant car spaces are provided within the basement car parking areas associated with the aged care building.

The provision of car parking complies with the requirements of Clause 52.06-5, with exception to the reduction of 1 car space for a single three-bedroom dwelling. Based on the above, we conclude that the provision of car parking for the retirement village component satisfies the purpose of Clause 52.06 of the Planning Scheme.

### 4.1.2. Residential Subdivision Component

Parking for dwellings within the residential subdivision would be provided on individual lots in accordance with the requirements of Clause 52.06. Similarly, the apartment buildings will be assessed against the parking requirements of Clause 52.06-7.

The level of resident car parking for all dwellings within the residential subdivision (lots and apartments) accord with the statutory requirements.

On-street parking for visitors will be provided via on-street car parking along the proposed local access roads.

The 7m wide carriageway for a typical 16m wide Local Street will be sufficient for parking to readily occur on both sides of the road whilst maintaining a through lane for traffic. Alternatively, simultaneous two-way traffic would be possible if parking occurred on only one side of these roads. We have conservatively assumed that car parking would occur along one-side only of the primary East-west Link Road.

The level of on-street car parking will equate to approximately 109 spaces for the 163 dwellings provided within the new residential subdivision areas. This level of parking equates to 1 visitor car spaces to each 1.5 lots/dwellings. This level of car parking is adequate and accords with the objectives of Clause 56.06

The proposed provision of on-street parking within the subdivision areas is consistent with current best practice and is considered acceptable.

## 4.2. Bicycle Parking

Clause 52.34 of the Planning Scheme specifies bicycle parking requirements for new developments. The purpose of Clause 52.34 is to:

- *To encourage cycling as a mode of transport.*
- *To provide secure, accessible and convenient bicycle parking spaces and associated shower and change facilities.*

Based on the size of the buildings, bicycle parking requirements apply to the Fletcher Road apartments only. The statutory bike parking requirements for dwellings under Clause 52.34:

- Resident - 1 space to each 5 dwellings
- Visitor - 1 space to each 10 dwellings

Based on the above, the bicycle parking requirements for the various apartment buildings is as follows:

- Fletcher Apartments (9 dwellings)
  - 2 resident spaces
  - 1 visitor space
- Subdivision Apartment 1 (38 dwellings)
  - 8 resident spaces
  - 4 visitor spaces
- Subdivision Apartment 2 (41 dwellings)
  - 8 resident spaces
  - 4 visitor spaces

At this stage, development plans for the apartment buildings do not identify the separate provision of bicycle parking. It is suggested that a condition of permit is included that specifies bicycle parking be provided in accordance with the minimum requirements of the Planning Scheme.

Subject to the above, we are satisfied that the provision of bicycle parking will accord with the requirements of Clause 52.34.

## 4.3. Review of Carparking Layout

Traffix Group provided design advice to the project architect to achieve a satisfactory carpark layout. The proposed parking layout has been assessed under the following guidelines:

- Clause 52.06-9 of the Planning Scheme (Design Standards for car parking),
- AS2890.1-2004 – Part 1: Off-Street Car Parking (where relevant), and
- AS2890.6-2009 – Part 6: Off-Street Car Parking for People with Disabilities.

We are satisfied that the various car parking layouts comply with the relevant design standards of the Planning Scheme and Australian Standards (where relevant).

## 4.4. Subdivision Road Configuration

### Local Access Streets

The majority of streets in the subdivision are to be Local Access Streets with a 16m wide road reserve.

These roads are to be provided in accordance with the relevant cross-sections set out at Figure 19 and Figure 20 below.

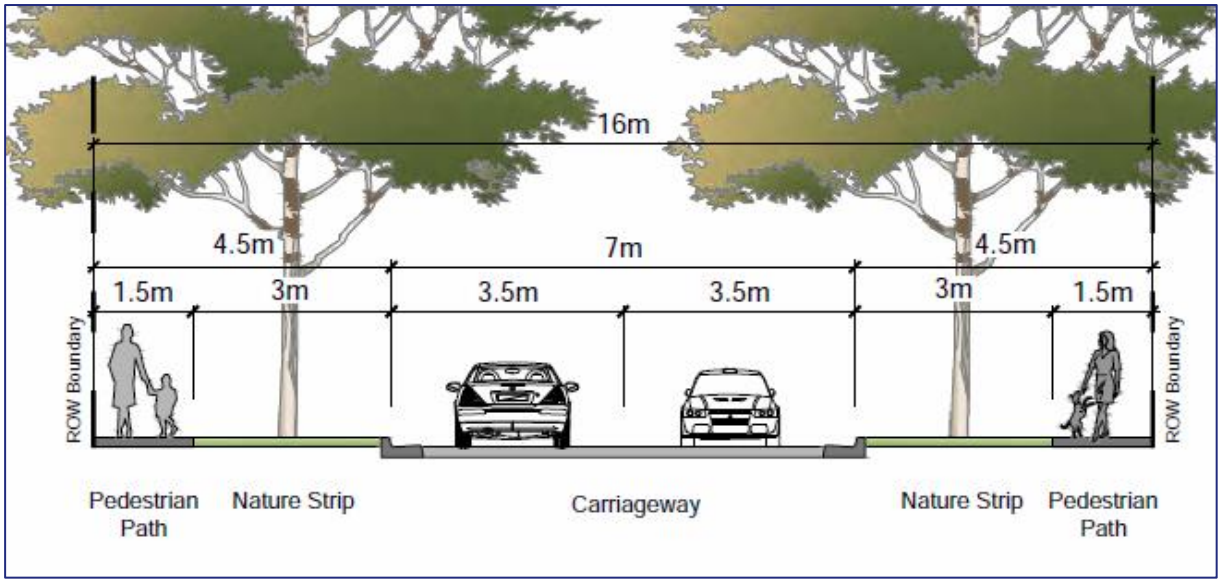



*Figure 19: Cross-Section of typical Local Street*

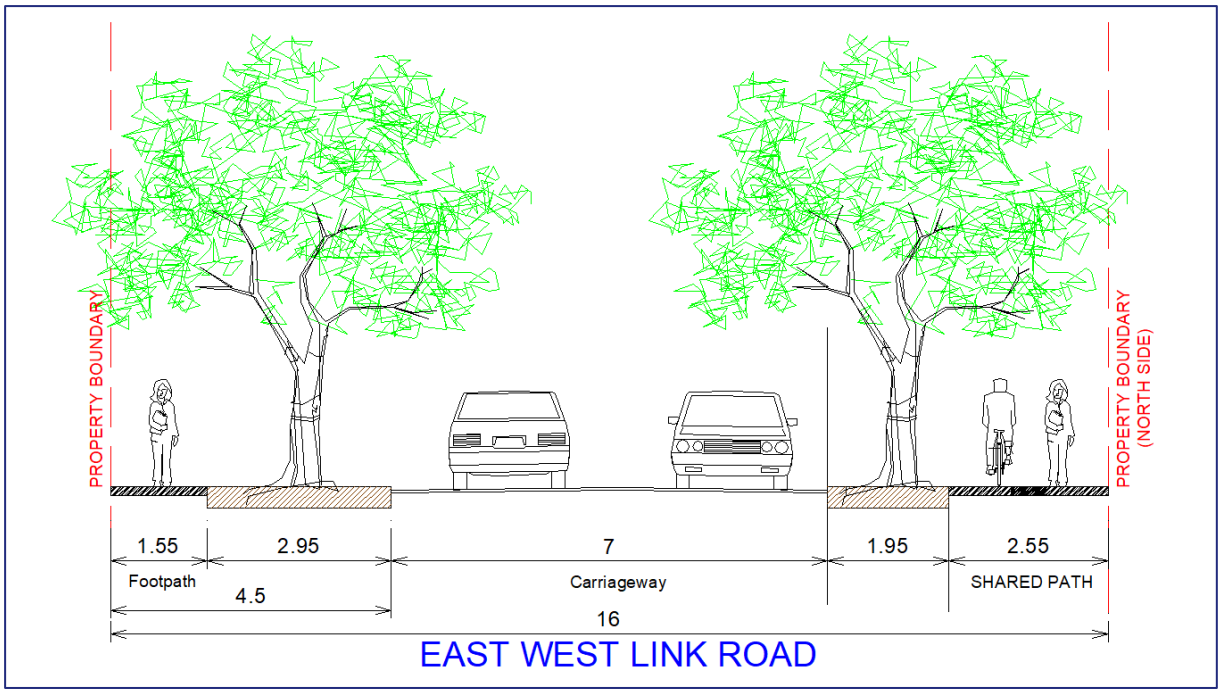



*Figure 20: East West Link Road – Carriageway Configuration*

**Court Bowl**

A court bowl with a diameter of 22m is provided at the end of the southern access road. The dimensions of this are adequate to accommodate the turnaround of service vehicles.

**Laneways**

The access lanes that access the rear car parking areas of the ROW/Townhouse Lots will provide a minimum width of 6m within an 8m (minimum) road reserve. This provision exceeds the requirements of Clause 56.

**Access for Service and Emergency Vehicles**

The 7.0m wide carriageway for the 16m wide Local Street will adequately facilitate movements by the relevant service and emergency vehicles and are consistent with the typical FRV and CFA requirements.

Access through the Access Lane network by suitable emergency vehicles will also be facilitated.

**Pedestrian and Cycling Access**

Footpaths, shared paths, and bicycle lanes are to be provided in accordance with the requirements of Clause 56.06.

A 2.5m shared path will be provided along the northern side of the East West Link Road, consistent with the existing configuration of East Ridge Drive.

## 4.5. External Access Arrangements

### 4.5.1. Hedwig Drive

Access to Hedwig Drive is proposed as a continuation of the existing carriageway. This connection will ultimately form part of the public road network.

The connection to Hedwig Drive is provided as two-way. Whilst an original scheme included a one-way link only (northbound) this has been revised at request of Council Engineering Department who identified in various correspondence a preference for the link to be provided as a two-way link.

The link will enable for through access by emergency and service vehicles and provide some benefit to the existing residential areas located to the south of the site as a result of a new link to access Maroondah Highway via East Ridge Drive.

It is not expected that a significant volume of the proposed development traffic would rely on or use this link given more convenient connections to the arterial network are available.

### 4.5.2. East Ridge Drive

The connection to East Ridge Drive will be configured with a carriageway consistent to the existing conditions (7m carriageway within 16m road reserve).

The link will provide for two-way access and on-street car parking, where appropriate. A connection to the 2.5m wide shared path located along the north side will be provided.

No variations to the intersection between East Ridge Drive and Maroondah Highway, currently configured as left-in/left-out with a left-turn deceleration lane, are proposed or warranted as a result of the proposed development.

### 4.5.3. Manchester Road

The development access to Manchester Road at the existing median opening.

As a result of the alignment of the East-West Link Road, various works to the road opening will be required. The works will include:

- Modification to the central median allowing for opening to be centrally located with the new East-West Link Road.
- Extension of the central right-turn deceleration lane on the southern approach to ensure compliance with relevant standards.
- Inclusion of line marking works in order to accommodate left-turn deceleration lane into the new road.

A functional layout plan that identifies the required works is attached to this report at Appendix B. The design of this intersection will be subject to the approval of Council and DoT.

### 4.5.4. Manchester Road – Austroads Consideration

Guidance regarding the selection of various intersection types is provided within *Austroads Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings*. An excerpt from this guideline provides the following general guidance.

> *Traffic control and road classification*
>
> *Table 2.6 provides a broad guide to the suitability of the type of traffic control in relation to the functional classification of roads. It is based on a general appreciation of the need to provide a satisfactory level of safety and mobility on arterial roads. In some cases the suitability is obvious whilst in other cases traffic analysis and examination of other factors is required to determine the most appropriate form of control at a site. Needs of all road users should be taken into account when selecting traffic control. For example, as noted in Section 3.4.2 and 3.4.3, while roundabouts are generally safer than other types of at-grade intersection for motor vehicle occupants, they do not offer the same extent of benefits for cyclists and motorcyclists (Austroads 2015d).*

**Table 2.6: Suitability of types of traffic control to different road types based on operational and Safe System objectives**

| Road type | Primary arterial | Secondary arterial | Collector and local crossing road | Local street |
|---|---|---|---|---|
| **Roundabouts** | | | | |
| Primary arterial | A | A | X | X |
| Secondary arterial | A | A | A | X |
| Collector & local crossing road | X | A | A | O |
| Local street | X | X | O | O |
| **Traffic signals** | | | | |
| Primary arterial | O | O | O | X |
| Secondary arterial | O | O | O | X |
| Collector & local crossing road | O | O | X | X |
| Local street | X | X | X | X |
| ***Stop* signs or *give way* signs** | | | | |
| Primary arterial urban/(rural) | X/(X) | X/(O) | A | A |
| Secondary arterial urban/(rural) | X/(O) | X/(O) | A | A |
| Collector & local crossing road | A | A | A | A |
| Local street | A | A | A | A |

*A = Most likely to be an appropriate treatment*
*O = May be an appropriate treatment*
*X = Usually an inappropriate treatment.*

In regard to the classification of the new East-West Link Road, we are of the opinion that the most appropriate classification would be as a Local Road on the basis that:

- Daily traffic volumes at any location are likely to be less than 1,000 vehicle per day under the current development yield and assessments.
- Carriageway configuration at 7m with footpath or shared path on either side is consistent with other Local Roads in the nearby area (some of which also include a direct connection to Manchester Road).

As detailed above, under a simple assessment the use of an unsignalised intersection represents the *'most likely to be an appropriate treatment'* under Table 2.6.

### 4.5.5. Manchester Road – Sight Distance Assessment

For the proposed intersection, movements occur as staged for the critical right-in and right-out movements. For movements crossing the northbound carriageway of Manchester Road, ample sight distance is available and is unhindered by the vertical or horizontal alignment of the road.

For the second stage of the right-out movement into the southbound carriageway, a crest exists to the north that has some impact on the available sight distance. During our site inspection, a sight distance of approximately 115m was recorded from the existing central median towards the north (i.e. towards the southbound traffic stream).

In regard to the site distance, it is acknowledged that the requirement (141m) for the Safe Intersection Sight Distance (SISD) would not be met, however, the Minimum Gap Sight Distance (MGSD) requirements of 97m is satisfied based on the posted speed limit of 70km/h.

The MGSD is defined as *'Minimum gap sight distance (MGSD) is based on distances corresponding to the critical acceptance gap that drivers are prepared to accept when undertaking a crossing or turning manoeuvre at intersections'*.

We are satisfied that the available sight distance is acceptable on the basis that the central median is located in a similar location to existing conditions, and that suitable gaps can be observed by drivers to enable safe access from the median into the southbound traffic stream.

Furthermore, as the turning movements will be readily accommodated with minimal queuing/delays, we are satisfied that drivers would not feel pressured to take gaps that are less than those nominated under the relevant guidelines.

Overall, we are satisfied that suitable sight distance will be available for the proposed intersection with Manchester Road.

## 4.6. Land Adjacent to a Road Zone

Clause 52.29 applies to land adjacent to a Road Zone, Category 1, or a Public Acquisition Overlay for a Category 1 Road.

The purpose of this clause is to:

- *To ensure appropriate access to identified roads.*
- *To ensure appropriate subdivision of land adjacent to identified roads.*

A permit is required to:

- *Create or alter access to:*
  - *A road in a Road Zone, Category 1.*
  - *Land in a Public Acquisition Overlay if the purpose of acquisition is for a Category 1 road.*
- *Subdivide land adjacent to:*
  - *A road in a Road Zone, Category 1.*
  - *Land in a Public Acquisition Overlay if the purpose of acquisition is for a Category 1 road.*

Manchester Road is a road in a Road Zone Category 2, and as such is not subject to the requirements under Clause 52.29. Notwithstanding, an assessment against the requirements of Clause 52.29 has been undertaken.

#### 4.6.1. Decision Guidelines

Before deciding on an application, in addition to the decision guidelines in Clause 65, the responsible authority must consider:

- *The Municipal Planning Strategy and the Planning Policy Framework.*
- *The views of the relevant road authority.*
- *The effect of the proposal on the operation of the road and on public safety.*
- *Any policy made by the relevant road authority pursuant to Schedule 2, Clause 3 of the Road Management Act 2004 regarding access between a controlled access road and adjacent land.*

#### 4.6.2. Assessment

The creation of vehicle access to Manchester Road is consistent with the anticipated vehicle access arrangements for the development of the site.

The proposal will include suitable works to the intersection to ensure safe and efficient vehicle access to the site from Manchester Road. These include modifications to the central median and extensions to turn lanes, as required.

Traffic impacts from the proposed development can be readily accommodated at this location with minimal impacts on the operation of Manchester Road and low levels of queuing and delays.

We are satisfied that the vehicle access arrangements achieve the objectives of Clause 52.29.

### 4.7. Loading and Waste Collection Arrangements

Clause 65.01 of the Planning Scheme states that the Responsible Authority must consider a number of matters as appropriate including:

- *The adequacy of loading and unloading facilities and any associated amenity, traffic flow and road safety impacts.*

#### 4.7.1. Retirement Village

**Loading**

An on-site loading area is included within the Aged Care building. The loading bay will include 3.5m headroom clearance suitable for SRV vehicles (as presented under AS2890.2-2018). This loading bay will accommodate loading for the Aged Care building in addition to waste collection for the overall retirement village site.

Some loading demands may occur in association with the individual ILUs (i.e. furniture from move-in/move-out activities). These demands would be undertaken on-street within the development with local traffic management occurring as required when these activities occur.

**Waste Collection**

A waste management plan has been prepared in association with the overall retirement village.

All waste collection will occur on-site, with the transfer of bins to and from collection areas being undertaken by site management or ILU residents. Collection for the ILUs and the Fletcher Road apartments will occur via the private internal road network for the aged care development. Bins would be places directly adjacent to the dwellings for collection. This arrangement is acceptable from a traffic engineering perspective.

A review of the ability for the nominate waste collection vehicle to negotiate the site has been undertaken with swept paths attached.

### 4.7.2. Subdivision Dwellings

**Loading**

Loading for the dwellings and apartments within the residential subdivision will occur on-street within the new street network. This arrangement is acceptable and consistent with standard practice for separate residential lots and apartment buildings.

**Waste Collection**

Waste collection for the residential lots would occur on-street via Council services.

Waste collection for the Apartment buildings is expected to be undertaken by private contractor within the basement car parking areas using a 6.4m Hino mini waste truck.

This arrangement is acceptable from a traffic engineering perspective. Waste Management Plans for the individual apartment buildings could be prepared as a condition of permit, if required.

## 4.8. Traffic Impact Assessment

### 4.8.1. Traffic Distribution

Traffic is generally expected to be distributed as per the following figure. This considers the traffic from the retirement village component is more likely to be to and from local activity centres rather than employment generators.

- 35% from areas towards the south-west – via East Ridge Drive (Maroondah Highway)
- 35% towards areas towards the south-west – via East Ridge Drive (Maroondah Highway)
- 25% to/from, areas towards the south-east – via Manchester Road
- 35% to/from areas towards the north and north-east – via Manchester Road and East Ridge Drive (Maroondah Highway)
- 5% to/from local road network to the south – via Hedwig Drive

Figure 21 identifies the distribution splits from the proposed development for the entry and exit movements.

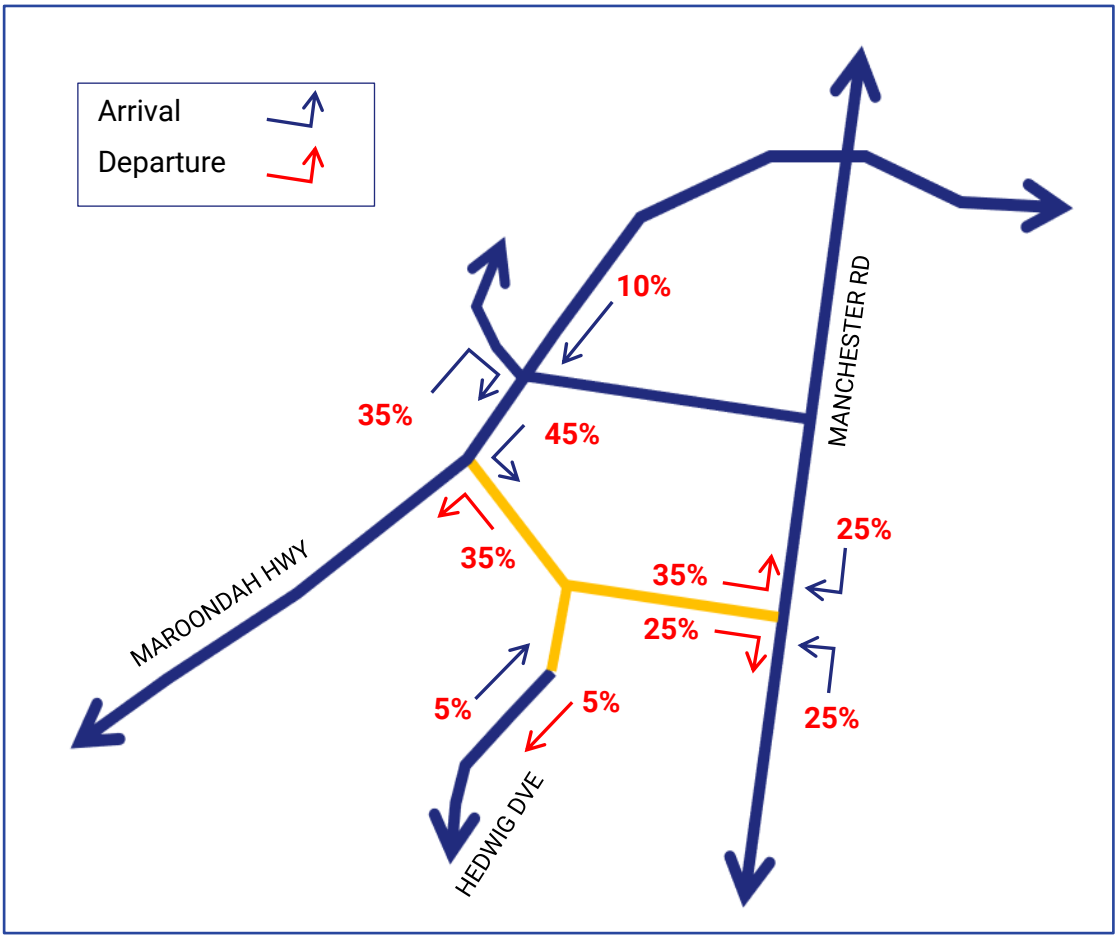



*Figure 21: Adopted Traffic Distribution*

### 4.8.2. Traffic Generation Rates

Various case study data recorded at existing retirement village developments has been used to identify traffic generation rates for ILUs and aged care beds within this component. The rate for standard residential lots is based on our experience with similar developments within the metropolitan area.

The traffic generation rates for the proposed development are summarised in the table below, including the adopted directional splits (in/out) during the AM and PM commuter peak periods.

*Table 6: Adopted Traffic Generation Rates*

| Use | Network Peak | | Daily Traffic Generation |
|---|---|---|---|
| | AM Peak Hour | PM Peak Hour | |
| ***Residential Lots*** | | | |
| Residential Lots | 0.8 vte/lot/hour (20% in / 80% out) | 0.8 vte/lot/hour (70% in / 30% out) | 8 vte/lot/day (50% in / 50% out) |
| Townhouse Lots | 0.6 vte/lot/hour (20% in / 80% out) | 0.6 vte/lot/hour (70% in / 30% out) | 6 vte/lot/day (50% in / 50% out) |
| Apartments | 0.4 vte/lot/hour (20% in / 80% out) | 0.4 vte/lot/hour (70% in / 30% out) | 4 vte/lot/day (50% in / 50% out) |
| ***Retirement Village*** | | | |
| Aged Care Beds | 0.15 vte/bed/hour (85% in / 15% out) | 0.24 vte/bed/hour (35% in / 65% out) | 2.8 vte/bed/day (50% in / 50% out) |
| ILU Apartments/ Townhouses/Assisted Living Suites | 0.22 vte/dwelling/hour (40% in / 60% out) | 0.22 vte/dwelling/hour (50% in / 50% out) | 3.4 vte/dwelling/day (50% in / 50% out) |

### 4.8.3. Peak Hour Impacts

Adopting the previously presented distribution and rates, the AM and PM peak hour traffic generation and impacts from the proposed development are presented in the following tables and figures.

*Table 7: AM Peak Hour Traffic Impacts*

| Use | No. / Size | AM Peak Traffic Generation | AM Peak Hour (veh/hour) | |
|---|---|---|---|---|
| | | | IN | OUT |
| ***Residential Lots / Apartments*** | | | | |
| House Lots | 20 | 0.8 vte/lot/hour (20% in / 80% out) | 3 | 13 |
| Townhouse Lots | 64 | 0.6 vte/lot/hour (20% in / 80% out) | 7 | 31 |
| Apartments | 79 | 0.4 vte/lot/hour (20% in / 80% out) | 6 | 26 |
| **Residential Lots / Apartment Subtotal** | | | **16** | **70** |
| ***Retirement Village Site*** | | | | |
| Aged Care Beds | 72 | 0.15 vte/bed/hour (85% in / 15% out) | 9 | 2 |
| Assisted Living Suites | 28 | 0.22 vte/dwelling/hour (40% in / 60% out) | 2 | 4 |
| ILU Townhouses / Apartments | 192 | | 17 | 25 |
| **Retirement Village Subtotal** | | | **28** | **31** |
| **Total** | | | **44 veh/hour** | **101 veh/hour** |

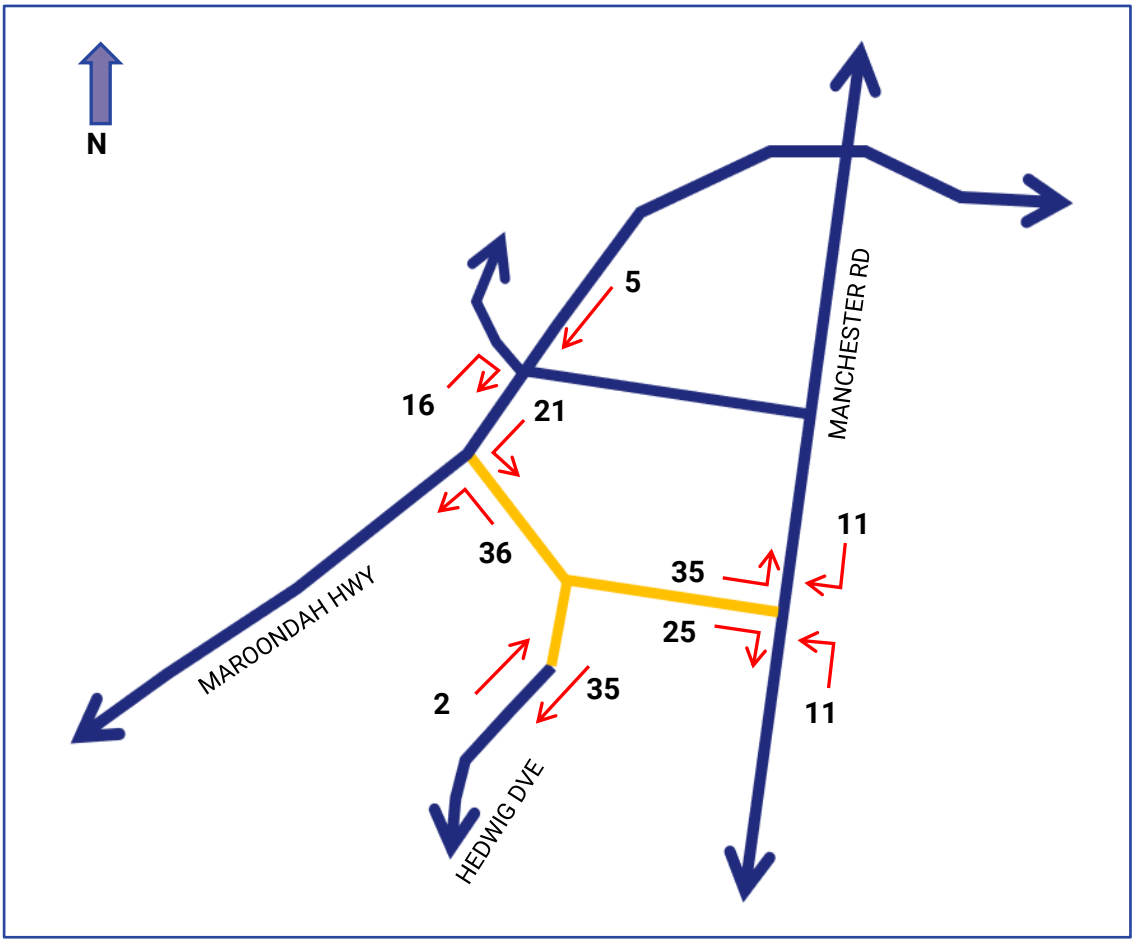



*Figure 22: AM Peak Hour Traffic Impacts (veh/hour)*

*Table 8: PM Peak Hour Traffic Impacts*

| Use | No. / Size | AM Peak Traffic Generation | AM Peak Hour (veh/hour) | |
|---|---|---|---|---|
| | | | IN | OUT |
| ***Residential Lots / Apartments*** | | | | |
| House Lots | 20 | 0.8 vte/lot/hour (70% in / 30% out) | 11 | 5 |
| Townhouse Lots | 64 | 0.6 vte/lot/hour (70% in / 30% out) | 27 | 11 |
| Apartments | 79 | 0.4 vte/lot/hour (70% in / 30% out) | 22 | 10 |
| **Residential Lots / Apartment Subtotal** | | | **60** | **26** |
| ***Retirement Village Site*** | | | | |
| Aged Care Beds | 72 | 0.24 vte/bed/hour (35% in / 65% out) | 6 | 11 |
| Assisted Living Suites | 28 | 0.22 vte/bed/hour (50% in / 50% out) | 3 | 3 |
| ILU Townhouses / Apartments | 192 | | 21 | 21 |
| **Retirement Village Subtotal** | | | **30** | **35** |
| **Total** | | | **90 veh/hour** | **61 veh/hour** |

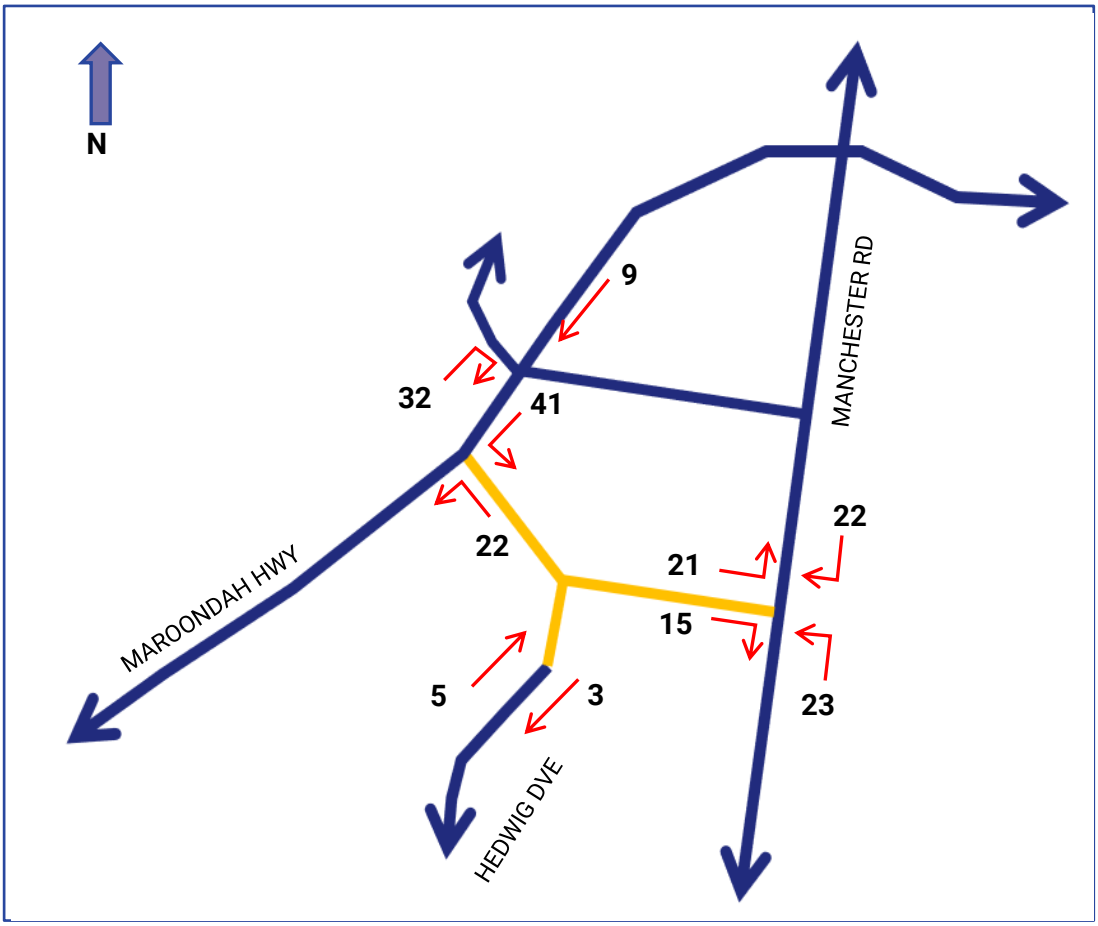



*Figure 23: PM Peak Hour Traffic Impacts (veh/hour)*

### 4.8.4. External Traffic Impacts

The future traffic link between East Ridge Drive and Manchester Road is expected to result in some level of increase between movements from external sources.

In regard to the bulky goods and take away food uses along Maroondah Highway, the majority of traffic for these uses would be attracted from the adjacent arterial road network. We cannot see any reason as to why a significant level of traffic would be diverted via the new East-West Link Road.

Notwithstanding, we have included an allowance for 50 additional vehicle movements during the PM peak hour associated with 25 left-in movements and 25 right-out movements at the new intersection with Manchester Road. Left-out and right-in movements are not anticipated given the access direct from Maroondah Highway and Fletcher Road. Impact during the AM peak hour would be negligible for the bulky good site and uses.

### 4.8.5. Post Development Traffic Conditions

Based on the impacts and assumptions presented above and allowing for the new intersection leg, the post development traffic conditions are presented in the following figure.

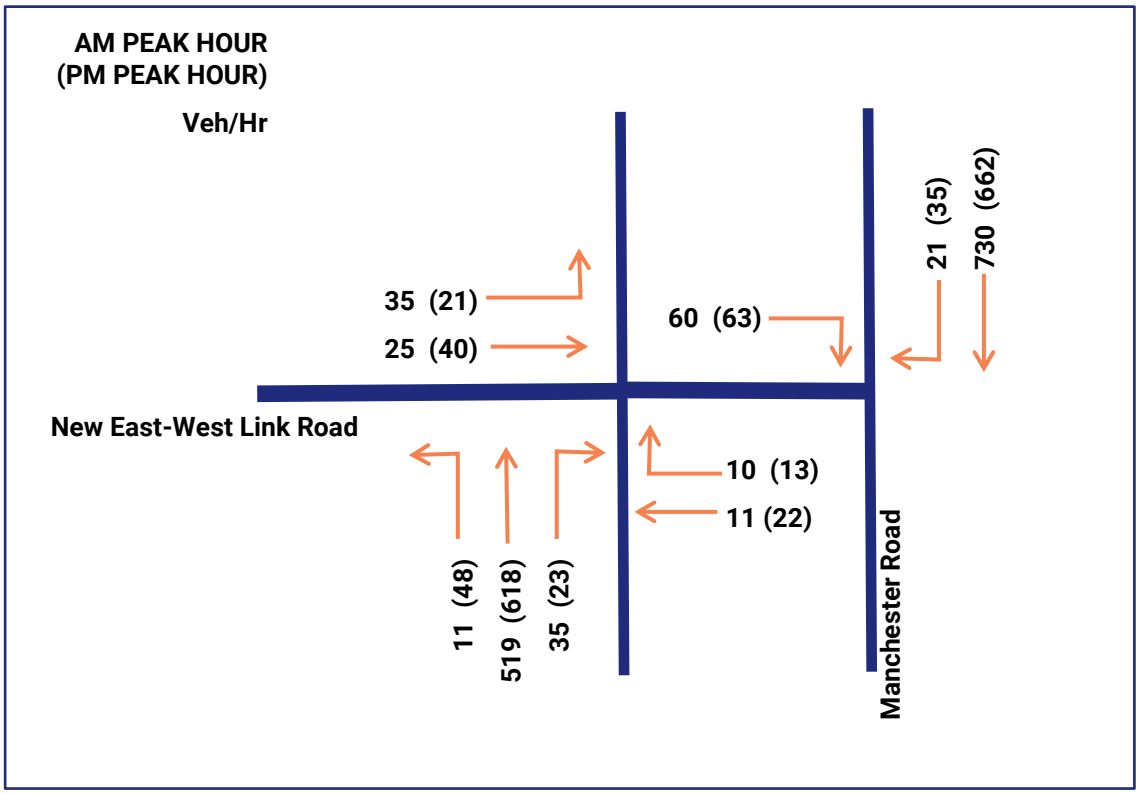



*Figure 24: Post-Development Traffic Conditions – Manchester Road/Median Opening*

### 4.8.6. Sidra Assessment – Manchester Road

We have assessed the post-development intersection conditions using SIDRA 8.0, adopting the traffic volumes set out at Figure 24.

The intersection was modelled as a network to allow for staged right-turn movements from the central median. Figure 25 identifies the intersection layout adopted as part of our assessment. The central median was considered to accommodate 2 queued vehicles within the median.

The SIDRA results are attached at Appendix D and demonstrate that negligible queuing and delays will occur for all turning movements (95$^{th}$ percentile queue of 1 vehicle or less).

The results confirm that the proposed development will not result in any adverse traffic impacts at the new proposed intersection, and that this intersection will operate under excellent conditions post-development.

On the basis of the above, signalisation of the intersection would not be required on the basis of traffic capacity, noting that movements can be readily accommodated within the existing traffic stream along Manchester Road.

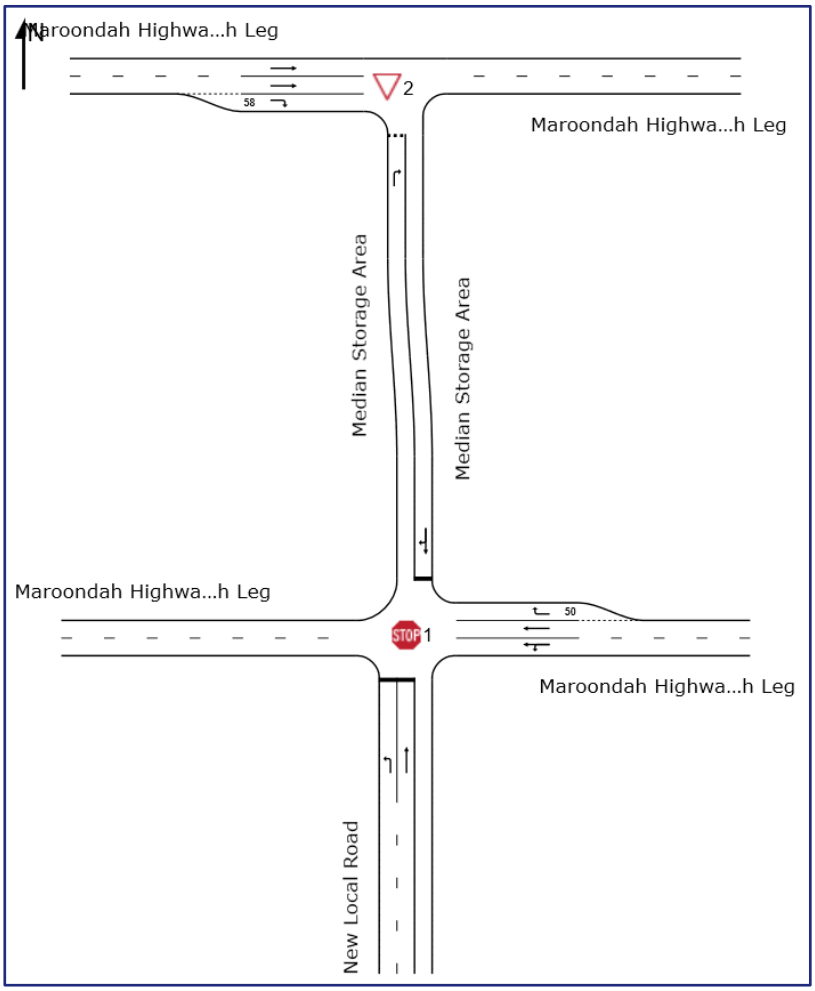



*Figure 25: Adopted SIDRA Intersection Layout – Staged Right Turns*

### 4.8.7. Traffic Impacts Maroondah Highway - Fletcher Road

The peak hour traffic impacts associated with the proposed development at Maroondah Highway and Fletcher Road will be minimal. Specifically, when considering the increase in traffic movements at this location:

- AM Peak Hour
  - Increase in 16 veh/hour within the right-turn lane (associated with U-turn) this level of traffic represents a 19.5% increase and equate to 1 additional movement every 225 seconds on average (based on the 2021 AM Peak hour traffic surveys).

    This level of traffic represents less than 1 vehicle each signal cycle period (allowing for 120-150 seconds cycle time) and can be accommodated with negligible impacts to the operating conditions of the intersection.
  - Increase in southbound through movements will be 5 veh/hour only which is negligible in context to the existing through movements at this location.
- PM Peak Hour
  - Increase in 32 veh/hour within the right-turn lane (associated with U-turn) this level of traffic represents a 19.5% increase and equate to 1 additional movement every 112 seconds on average (based on the 2019 Surveys and Post-Development Base Case).

    This level of traffic represents 1-2 vehicles each signal cycle period (allowing for 120-150 seconds cycle time) and can be accommodated with minimal impacts to the operating conditions of the intersection.
  - Increase in southbound through movements will be 9 veh/hour only which is negligible in context to the existing through movements at this location.

Overall, we are satisfied that the traffic impacts associated with the proposed development represent minor increase in traffic at the intersection between Maroondah Highway and Fletcher Road.

### 4.8.8. Daily Traffic Generation

Adopting the previously presented distribution and rates, the daily traffic generation and impact from the proposed development are presented in the following table and figure.

We are satisfied that the volumes along the internal road network are in line with the accepted volumes for Local Access Streets.

In regard to the impacts on Hedwig Drive the proposed development is expected to result in the order of 90 additional vehicle movements per day. The closed end section of Hedwig Drive would also experience some level of increase as residents from within the residential catchment using this link to travel to and from the Maroondah Highway. These impacts are in line with Council preference for an interconnected road network and as such further analysis of the variation in traffic has not been undertaken.

*Table 9: Daily Traffic Impacts*

| Use | No. / Size | Daily Traffic Generation | Daily Traffic Generation (veh/day) | |
|---|---|---|---|---|
| | | | IN | OUT |
| ***Residential Lots / Apartments*** | | | | |
| House Lots | 20 | 8 vte/lot/day (50% in / 50% out) | 80 | 80 |
| Townhouse Lots | 64 | 6 vte/lot/day (50% in / 50% out) | 192 | 192 |
| Apartments | 79 | 4 vte/lot/day (50% in / 50% out) | 158 | 158 |
| **Residential Lots / Apartment Subtotal** | | | 430 | 430 |
| ***Retirement Village Site*** | | | | |
| Aged Care Beds | 72 | 2.8 vte/bed/day (50% in / 50% out) | 101 | 100 |
| Assisted Living Suites | 28 | 3.4 vte/dwelling/day (50% in / 50% out) | 47 | 48 |
| ILU Townhouses / Apartments | 192 | | 327 | 326 |
| **Retirement Village Subtotal** | | | 469 | 467 |
| **Total** | | | **905 veh/day** | **904 veh/day** |

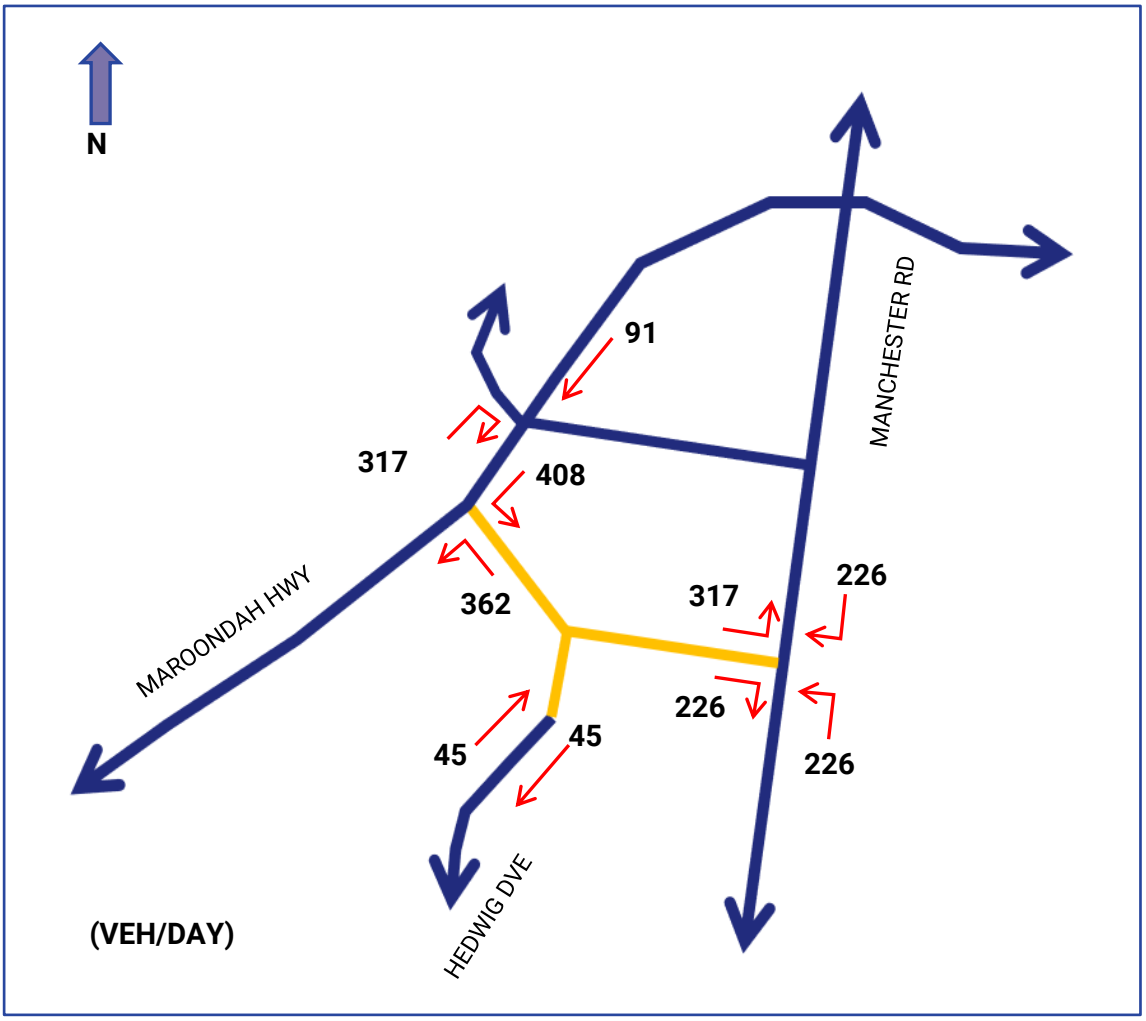



*Figure 26: Daily Traffic Impacts*

# 5. Section 173 Agreement

The Section 173 agreement that applies to the site includes the following requirements:

> *4.2 Traffic Impact Assessment Report*
>
> *4.2.1 The owner covenants and agrees that:*
>
> *(a) prior to the Future Development of the Subdivided Land, a Traffic Impact Assessment Report must be prepared at the cost of the Owner and to the satisfaction of VicRoads; and*
>
> *(b) the Owner must undertake any works or traffic management measures recommended in the Traffic Impact Assessment report approved by VicRoads:*
>
> > *(i) at the cost of the Owner;*
> >
> > *(ii) within the timeframe recommended in the Traffic Impact Assessment Report approved by VicRoads or further approvals required;*
> >
> > *(iii) subject to any conditions required by VicRoads or further approvals required;*
> >
> > *(iv) in relation to any works, in accordance with plans approved by VicRoads; and*
> >
> > *(v) to the satisfaction of VicRoads.*

The original traffic report was submitted to DoT for consideration in regards to the above matters. DoT provided a response (dated 16th February, 2022) that identified no objection to the development and confirming DoT was satisfied that no remedial works were required along Maroondah Highway as a result of the proposed development.

On the basis of the above, the proposed development adequately responds to the requirements of Clause 4.2 under the Section 173 agreement.

# 6. Summary Response to RFI

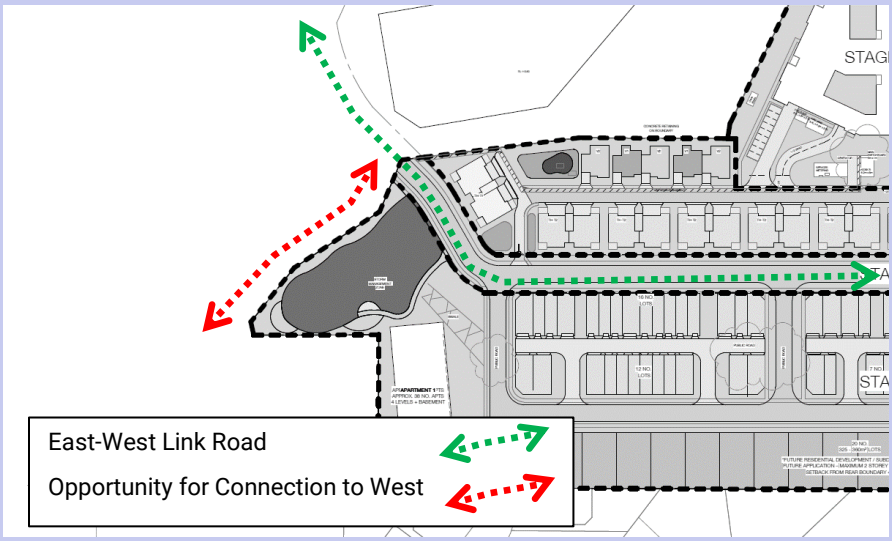
A summary of the RFI items related to traffic engineering and a discussion/response is provided in the following table.

*Table 10: Council RFI and Response*

| Council RFI / Comments | Discussion |
|---|---|
| *1. Amended Plans that address the following:*<br>*f. Swept path diagrams for vehicles accessing the basement in Apartment 1 and 2.* | Swept path diagrams have been prepared in association with:<br>• two-way access to the Apartments buildings, and<br>• vehicle access to typical car parking spaces. |

| Council RFI / Comments | Discussion |
|---|---|
| 23. *An amended waste management plan addressing the issues raised by Council's Waste Management officers (see below).* | Waste management plan has been amended noting collection for all dwellings within the retirement village development to occur via a private contractor using a 6.4m Mini-Hino style collection vehicle.<br>Swept paths demonstrating access for the nominated vehicle are attached to this report. |
| 24. *The traffic impact report to address the matters required by S173 agreement AS907500V part 4.2, details of any works to Maroondah Highway and the application amended to include these works.* | Section 4.2 of the S173 requires a Traffic Impact Assessment to be prepared and approved by DoT.<br>As detailed within this report, the detailed analysis of the traffic impacts identifies that no remedial works are warranted along Maroondah Highway as a result of the proposed development.<br>DoT has provided confirmation that they are satisfied with this position and the proposed development (16 February 2022). |
| 25. *Details of how the matters required by S173 agreement AS706540D part 6 are proposed to be addressed (see issue raised below)* | Summerset has engaged with Council regarding the proposed transfer of the existing section of East Ridge Drive from a private to public road.<br>Council has undertaken a preliminary assessment of the road to determine what upgrade are required for the road to be to Council's standards with an itemised inventory to follow.<br>Engagement with Council is continuing to occur. The upgrade of the existing portion of East Ridge Drive to a public carriageway does not limit the ability for Council to determine the current application. |
| 36. *Details of existing and proposed traffic volumes in Hedwig Drive and an assessment as to whether the proposed additional traffic will be through traffic (i.e. rat running) or from traffic servicing the immediate residential area.* | Whilst traffic surveys have not been completed an estimate of the daily traffic volumes along Hedwig Drive as presented at Section 3.4.4. This review identifies that daily volumes along Hedwig Drive are likely to be no greater than 1,000 vehicle movements per day.<br>The link to Hedwig Drive is provided as two-way in line with Council's nominated preferences.<br>We estimate that based impacts from the proposed development would be approximately 90 vehicle movements per day.<br>It is acknowledged that the provision of this link will likely result in some redistribution of traffic from the residential subdivision areas to the south. However, in practice it is difficult to ascertain the exact impacts from these movements noting that a detailed O/D survey for the entire subdivision would be required. Notwithstanding, we would |

| Council RFI / Comments | Discussion |
|---|---|
| | estimate that no more than 600-800 vehicles per day from the residential catchment may use this link noting that the through link provides access to Maroondah Highway (southbound) only. Connections to Maroondah Highway are also available via Bellara Drive to the south.<br>We do not expect any level of rat running noting that the link is convoluted and alternate and more direct access between Manchester Road and Maroondah Highway is available via Fletcher Road. |
| **Traffic Engineering Department Comments**<br>Separate comments were provided by Council Engineers as detailed within email provided to the applicant on 11 April 2022. | |
| *East Ridge Drive must converted from Common Property and be extended through the subject land to provide a Council Connecter road between Maroondah Highway and Manchester Road.* | Noted. East Ridge Drive would be provided as a public road post development.<br>The configuration of the link will be in accordance with the Section Plan 16133-C11-A prepared by Davis, Naismith and McGovern and will include a 7m carriageway and 2.5m shared path along the north side.<br>Based on the anticipated volumes along the east-west link this type of carriageway is appropriate. |
| *A roundabout must constructed at the intersection at Hedwig Drive extension / East Ridge Drive with a fourth western leg Connector road constructed up to the property boundary toward a future signalised intersection at Maroondah Hwy.* | No roundabout is currently proposed at the location nominated by Council noting that the creation of a fourth leg as nominated by Council would impact the nominated drainage reserve.<br>The treatment of the intersection as a standard T-intersection with priority to the East-West link road is an appropriate treatment in this location.<br>We are satisfied that a direct link from the development site to the allotment located to the west as nominated by Council is not required.<br>Notwithstanding the above, alternate access to East Ridge Drive from the allotment to the west could be readily created via a connection north of the proposed drainage reserve. This link is shown in the image below and demonstrated that further east-west connections are not prevented by the current development road layout. |

| Council RFI / Comments | Discussion |
|---|---|
|  | |
| *Link through to Hedwig Drive and East Ridge Drive (Council Roads) to have a minimum pavement width of 10.6m comprising 2 x 2.3m parking lanes adjacent to residential development and 2x 3m through lanes.* | The internal road volumes along the proposed road network are expected to accommodate less than 2,000 vehicles per day allowing for the development traffic and any diverted trips from the residential catchment.<br>On this basis we are satisfied that the currently proposed carriageway of 7.0m is acceptable and in line with an Access Street Level 2 as defined under Clause 56.06.<br>The peak volumes along the East-west link road will be close to 1,000 veh/day. If required on-street car parking could be banned along one side (north side) noting that there is limited reliance on on-street car parking in this area as the retirement village development will be completely self sufficient in regard to car parking internally. |
| *From a broader precinct access perspective - Manchester Road/ East-West Link Road needs to be a signalised intersection.* | As detailed within this report, the traffic impacts associated with the proposed development do not warrant the signalisation intersection between Manchester Road and the East-West Link Road.<br>Any future links to other properties located to the west are speculative and these properties have the benefit of direct connections to Maroondah Highway.<br>On the basis of the above, we are satisfied that the current development scheme does not require the inclusion of traffic signals at this location. |
| *Extension of Hedwig Drive must be as two-way access.* | The access to Hedwig Drive was originally proposed as a one-way connection (northbound). Notwithstanding, the |

| Council RFI / Comments | Discussion |
|---|---|
| | plans have been amended to include a two-way connection as requested by Council. |

# 7. Conclusions

Having undertaken a detailed traffic engineering assessment of the proposed retirement village & residential subdivision development at 275 Manchester Road, Chirnside Park, we are of the opinion that there are no traffic engineering reasons why a planning permit for the proposed mixed-use development at 275 Manchester Road, Chirnside Park should be refused.

# Appendix A

## Development Plans

## SITE PLAN LEGEND

- RETAINING WALLS
- RETAINING WALL UNDER BUILDING WITH BATTER
- FEATURE GABION RETAINING WALL
- RETAINING WALL WITH CREEPERS

Council RFIs

Voluntary Changes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**Summerset Chirnside Park**

275 Manchester Road, Chirnside Park 3116

**Site Plan - Overall**

1: 1000 @A1

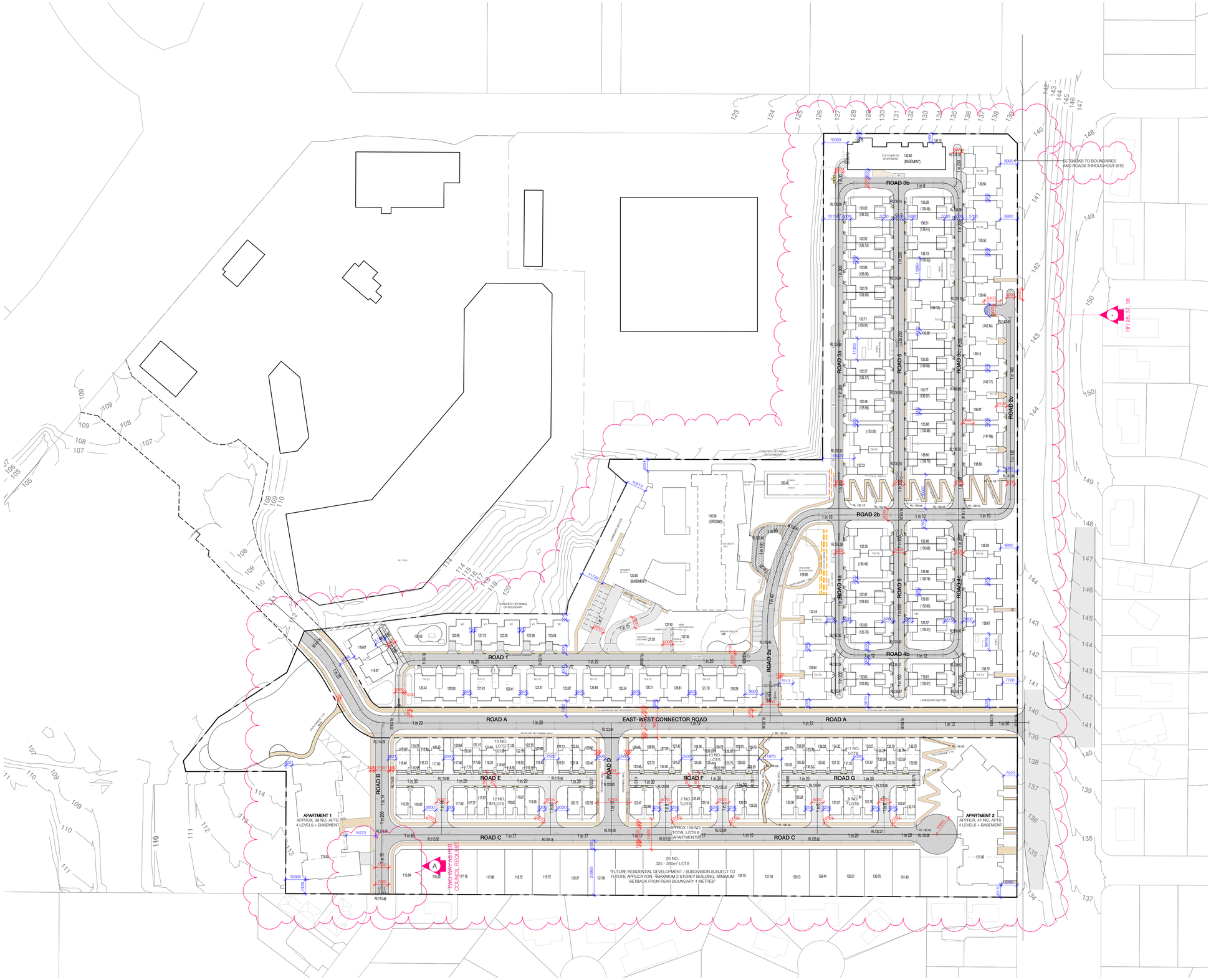
TOWN PLANNING

06.05.2022

**210085/TP011**

**B**

A1





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# Summerset Chirnside Park

275 Manchester Road, Chirnside Park 3116

## Road and Path Network

1 : 1000 @ A1

TOWN PLANNING

06.05.2022

**210085/TP020**

**A**

A1


Interface - Road A

Interface - Road B, C, E, F & G

A
Countour Information Added

Council RFIs

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**Summerset Chirnside Park**

275 Manchester Road, Chirnside Park 3116

**Road Interfaces - Sheet 1**

1 : 1000 @ A1

TOWN PLANNING

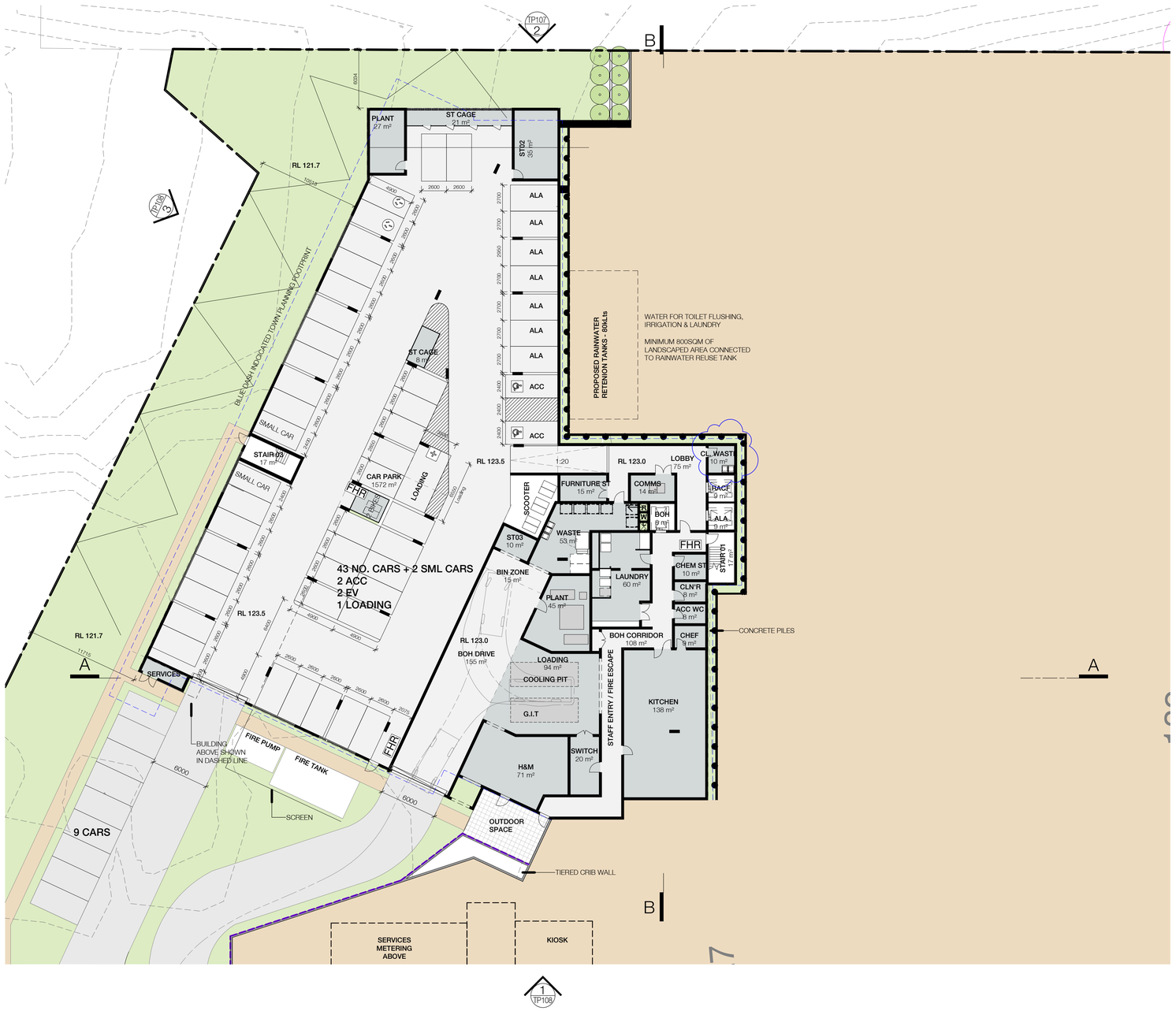
**210085/TP021**

RFI A.2

**A**

06.05.2022

A1




## LEGEND

Voluntary Changes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# Summerset Chirnside Park Main Building

275 Manchester Road, Chirnside Park 3116

## Main Building - Basement Plan

1 : 250 @ A1

TOWN PLANNING

13.04.2022

**210085/TP101**

**A**

A1


## LEGEND

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# Summerset Chirnside Park Main Building

275 Manchester Road, Chirnside Park 3116

## Main Building - Ground Floor Plan

1 : 250 @ A1

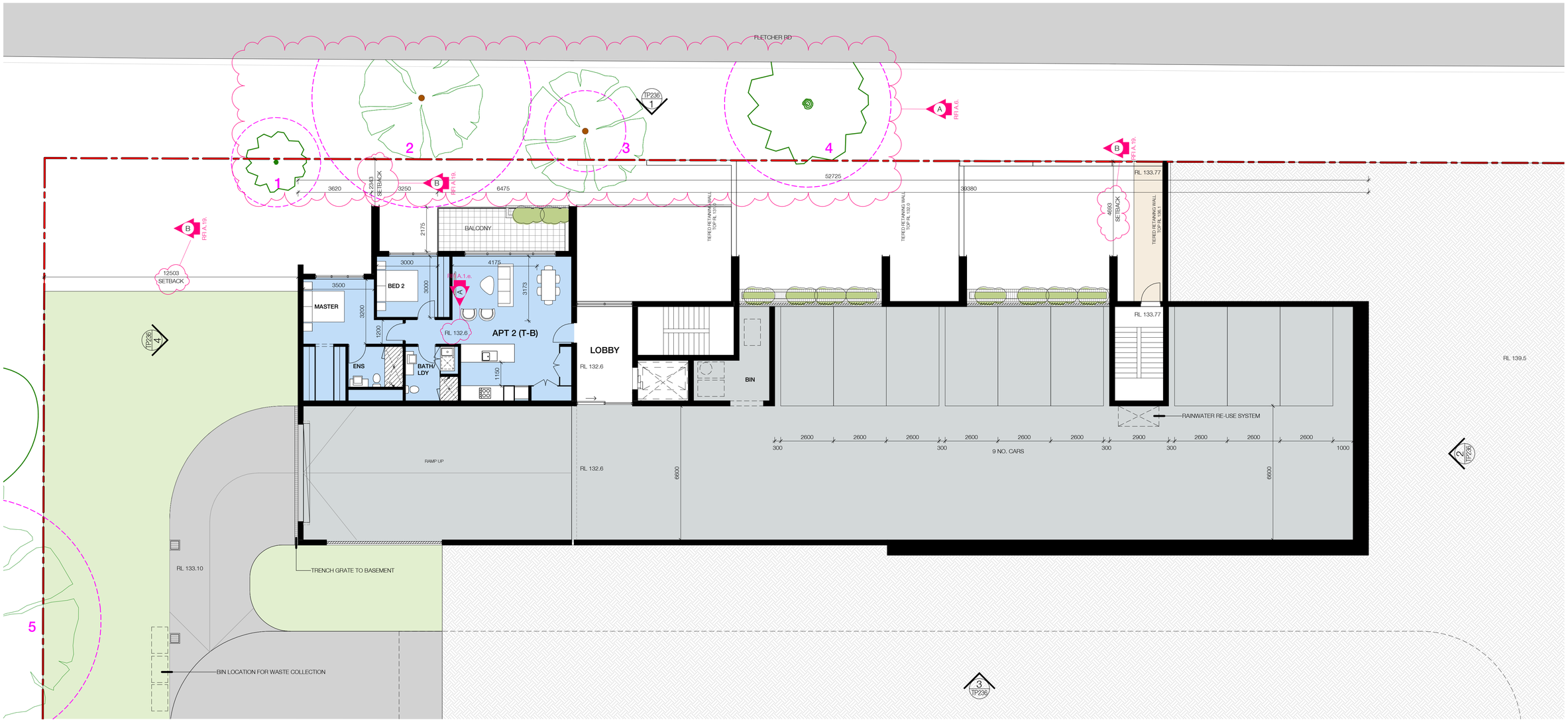
TOWN PLANNING

13.04.2022

**210085/TP103**

**A**

A1




FLETCHER RD APARTMENTS - LOWER GROUND FLOOR

Scale 1 : 100

## LEGEND

Council RFIs

Voluntary Changes

RFI A.1.c.

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Summerset Chirnside Park

275 Manchester Road, Chirnside Park 3116

Fletcher Road Apartment Building

Lower Ground Plan

1 : 100 @ A1

TOWN PLANNING

210085/TP231

06.05.2022

B

A1


APARTMENT BUILDING 1 - BASEMENT FLOOR PLAN

Scale 1 : 200


APARTMENT BUILDING 1 - GROUND FLOOR PLAN

Scale 1 : 200

## LEGEND

Council RFIs

Voluntary Changes


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**Summerset Chirnside Park**

275 Manchester Rd Chirnside Park 3116

**Apartment Building 1 - Floorplans**
**Sheet 1**

1 : 200 @ A1

TOWN PLANNING

13.04.2022

**210085/TP401**

**A**

A1


APARTMENT 2 - BASEMENT FLOOR PLAN
Scale 1 : 200


APARTMENT 2 - GROUND FLOOR PLAN
Scale 1 : 200

VGVGVGVG

## LEGEND

Council RFIs

Voluntary Changes

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**Summerset Chirnside Park**

275 Manchester Rd Chirnside Park 3116

**Apartment Building 2 - Floorplans**
**Sheet 1**

1 : 200 @ A1

TOWN PLANNING

13.04.2022

**210085/TP405**

**A**

A1

# Appendix B

## Manchester Road – Functional Layout

## SIGN SCHEDULE

| | | |
|---|---|---|
| #2 | GIVE WAY | R1-2 |
| #7 | | D4-1-3(L) |
| #14 | ONE WAY | R2-2(R) |

1.5 3.0 7.0 2.0 2.5

75.0 LEFT TURN LANE (INCLUDING TAPER)

3.0 3.5

75.0 RIGHT TURN LANE (INCLUDING TAPER)

92.5 RIGHT TURN LANE (INCLUDING TAPER)

#2 #7 #14

MELWAY MAP
REF 37 G7

**PRELIMINARY PLAN**
FOR DISCUSSION
PURPOSES ONLY

**WARNING**
BEWARE OF ALL SERVICES/ASSETS
THE LOCATIONS OF ALL SERVICES/ASSETS ARE APPROXIMATE ONLY AND THEIR EXACT POSITION SHOULD BE PROVEN ON SITE.
NO GUARANTEE IS GIVEN THAT ALL EXISTING SERVICES/ASSETS ARE SHOWN.

| ISSUE | ISSUE DESCRIPTION | ISSUE DATE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

GENERAL NOTES
1 BASE INFORMATION FROM FEATURE SURVEY (AA0183FLBB.DWG) / AERIAL PHOTOGRAPH (SOURCE NEARMAP NOV 2021)
2 ALL DIMENSIONS ARE TO FACE OF KERB & CHANNEL
3 MAIN ROAD - MANCHESTER ROAD (SPEED ZONE 70km/h)
4 ALL PROPOSED FOOTPATHS AND PRAM CROSSINGS ARE TO BE CONSTRUCTED WITH TACTILE GROUND SURFACE INDICATORS TO DDA COMPLIANCE GUIDELINES REFER TO AS 1428.4:2009

| | |
|---|---|
| DESIGNED | S. O'KEEFE 23 NOV 2021 |
| CHECKED/APPROVED | M. O'SHEA 23 NOV 2021 |
| FILE NAME | G30557-01-00.dgn |


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# MANCHESTER ROAD
## CHIRNSIDE PARK
YARRA RANGES COUNCIL
## FUNCTIONAL LAYOUT PLAN

SCALE 1:500 (A3) 0 2.5 5 7.5 10 | SHEET No. | DWG No. G30557-01-01

## SIGN SCHEDULE

| | | |
|---|---|---|
| #2 | GIVE WAY | R1-2 |
| #7 | | D4-1-3(L) |
| #14 | ONE WAY | R2-2(R) |

## DESIGN VEHICLE

VEHICLE USED IN SIMULATION

(VEHICLE SPEED - 5km/h)

8.80

1.50 5.00

8.8m MRV
meters

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

### LEGEND

- FRONT WHEELS
- REAR WHEELS
- VEHICLE BODY
- BODY CLEARANCE

1.5 3.0 7.0 2.0 2.5

75.0 LEFT TURN LANE (INCLUDING TAPER)

3.0 3.5

75.0 RIGHT TURN LANE (INCLUDING TAPER)

92.5 RIGHT TURN LANE (INCLUDING TAPER)

3.5

#2 #7 #14

MELWAY MAP
REF 37 G7

**PRELIMINARY PLAN**
FOR DISCUSSION PURPOSES ONLY

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| ISSUE | ISSUE DESCRIPTION | ISSUE DATE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

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4 ALL PROPOSED FOOTPATHS AND PRAM CROSSINGS ARE TO BE CONSTRUCTED WITH TACTILE GROUND SURFACE INDICATORS TO DDA COMPLIANCE GUIDELINES REFER TO AS 1428.4:2009

DESIGNED
S O'KEEFE 23 NOV 2021

CHECKED/APPROVED
M O'SHEA 23 NOV 2021

FILE NAME
G30557-01-00.dgn

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# MANCHESTER ROAD
## CHIRNSIDE PARK
YARRA RANGES COUNCIL
## FUNCTIONAL LAYOUT PLAN

SCALE 1:500 (A3) 0 2.5 5 7.5 10
SHEET No.
DWG No. G30557-01-01

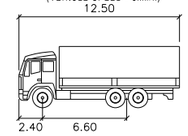
## SIGN SCHEDULE

| | | |
|---|---|---|
| #2 | GIVE WAY | R1-2 |
| #7 | | D4-1-3(L) |
| #14 | ONE WAY → | R2-2(R) |

## CHECK VEHICLE

VEHICLE USED IN SIMULATION

(VEHICLE SPEED - 5km/h)




12.5m HRV

| | meters |
|---|---|
| Width | : 2.50 |
| Track | : 2.50 |
| Lock to Lock Time | : 6.0 |
| Steering Angle | : 35.2 |

LEGEND

- FRONT WHEELS
- REAR WHEELS
- VEHICLE BODY
- BODY CLEARANCE

1.5 3.0 7.0 2.0 2.5

75.0 LEFT TURN LANE (INCLUDING TAPER)

75.0 RIGHT TURN LANE (INCLUDING TAPER)

92.5 RIGHT TURN LANE (INCLUDING TAPER)

3.5

#2 #7 #14

MELWAY MAP REF 37 G7

**PRELIMINARY PLAN**

FOR DISCUSSION PURPOSES ONLY

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| ISSUE | ISSUE DESCRIPTION | ISSUE DATE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

GENERAL NOTES

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| | |
|---|---|
| DESIGNED | S O'KEEFE 23 NOV 2021 |
| CHECKED/APPROVED | M O'SHEA 23 NOV 2021 |
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# MANCHESTER ROAD
## CHIRNSIDE PARK
YARRA RANGES COUNCIL
## FUNCTIONAL LAYOUT PLAN

SCALE 1:500 (A3) 0 2.5 5 7.5 10

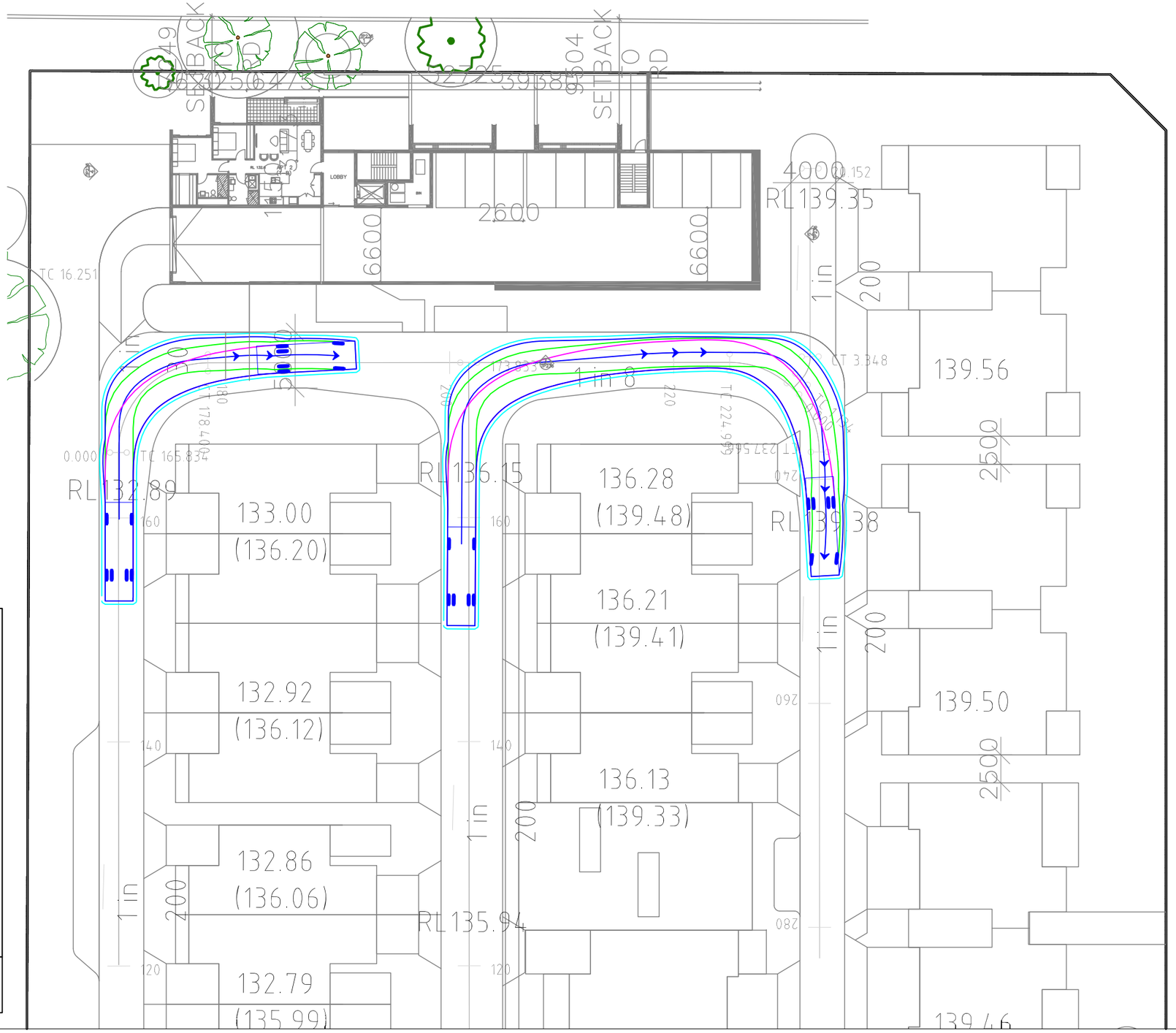
SHEET No.

DWG No. G30557-01-01

# Appendix C

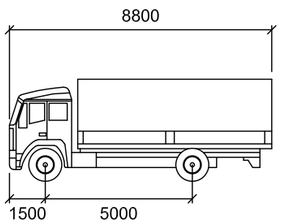
## Service Vehicle Swept Path Review

SERVICE VEHICLE CIRCULATION




VEHICLE USED IN SIMULATION

(VEHICLE SPEED - 5KM/H)




| MRV (AS 2890.2) | | mm |
|---|---|---|
| Width | : | 2500 |
| Track | : | 2500 |
| Lock to Lock Time | : | 6.0 |
| Steering Angle | : | 34.0 |

**LEGEND**

REAR WHEELS — VEHICLE BODY

FRONT WHEELS — BODY CLEARANCE

| REV | DATE | NOTES | DESIGNED BY | CHECKED BY |
|---|---|---|---|---|
| A | 17-DEC-2021 | INTERNAL REVIEW | M. O'SHEA | K. BALLANTYNE |
| B | 20-APR-2022 | RFI RESPONSE | F. BANH | M. O'SHEA |

**275 MANCHESTER ROAD, CHIRNSIDE PARK**

PROPOSED RETIREMENT VILLAGE DEVELOPMENT

**GENERAL NOTES:**

**FILE NAME:** G30557-01-03

**SHEET NO.:** 01

N

SCALE: 1:400 (A3)

0 2 4



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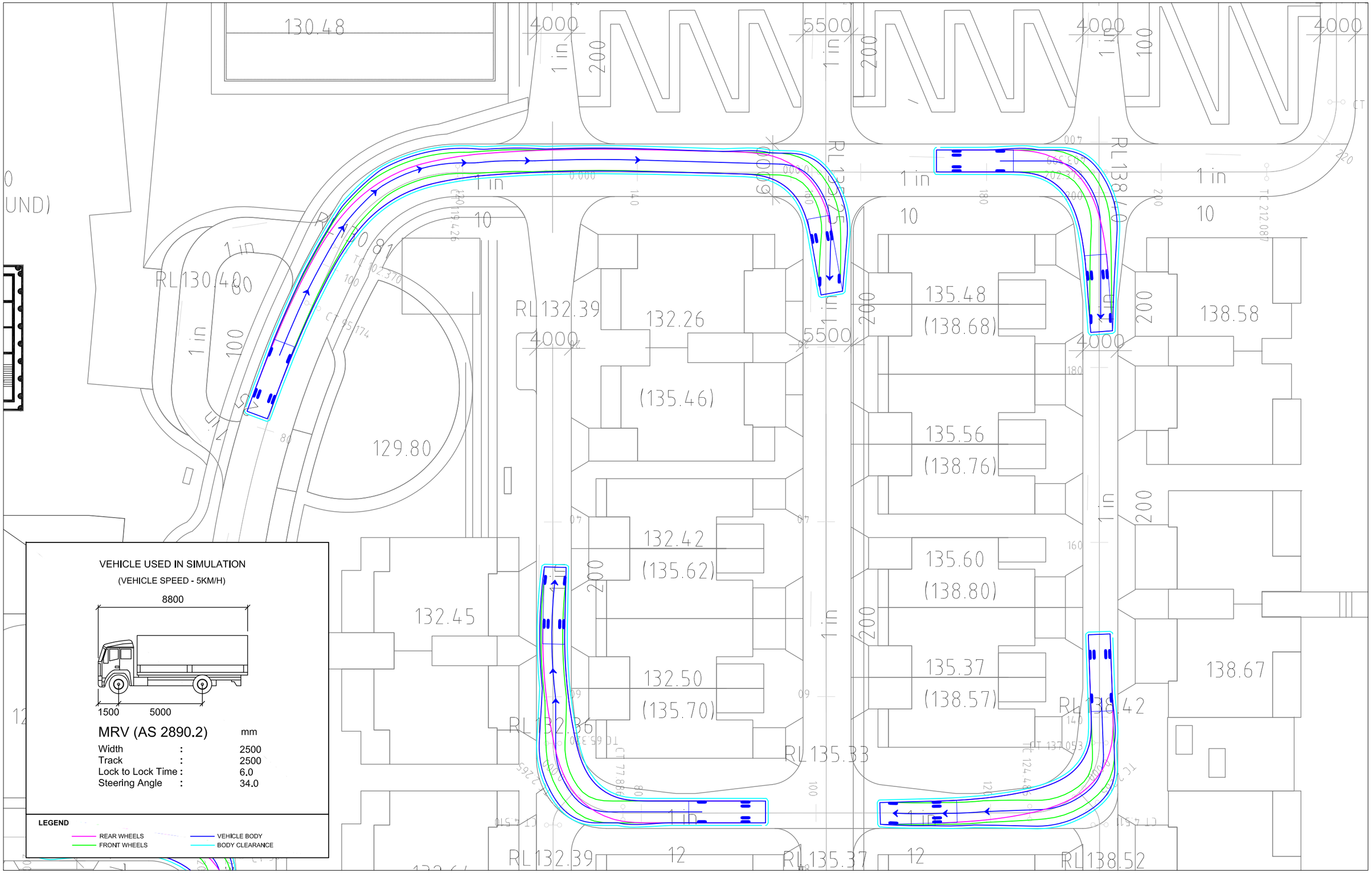
SERVICE VEHICLE CIRCULATION




| REV | DATE | NOTES | DESIGNED BY | CHECKED BY |
|---|---|---|---|---|
| A | 17-DEC-2021 | INTERNAL REVIEW | M. O'SHEA | K. BALLANTYNE |
| B | 20-APR-2022 | RFI RESPONSE | F. BANH | M. O'SHEA |

**275 MANCHESTER ROAD, CHIRNSIDE PARK**
PROPOSED RETIREMENT VILLAGE DEVELOPMENT

**GENERAL NOTES:**

**FILE NAME:** G30557-01-03
**SHEET NO.:** 02

SCALE: 1:400 (A3)



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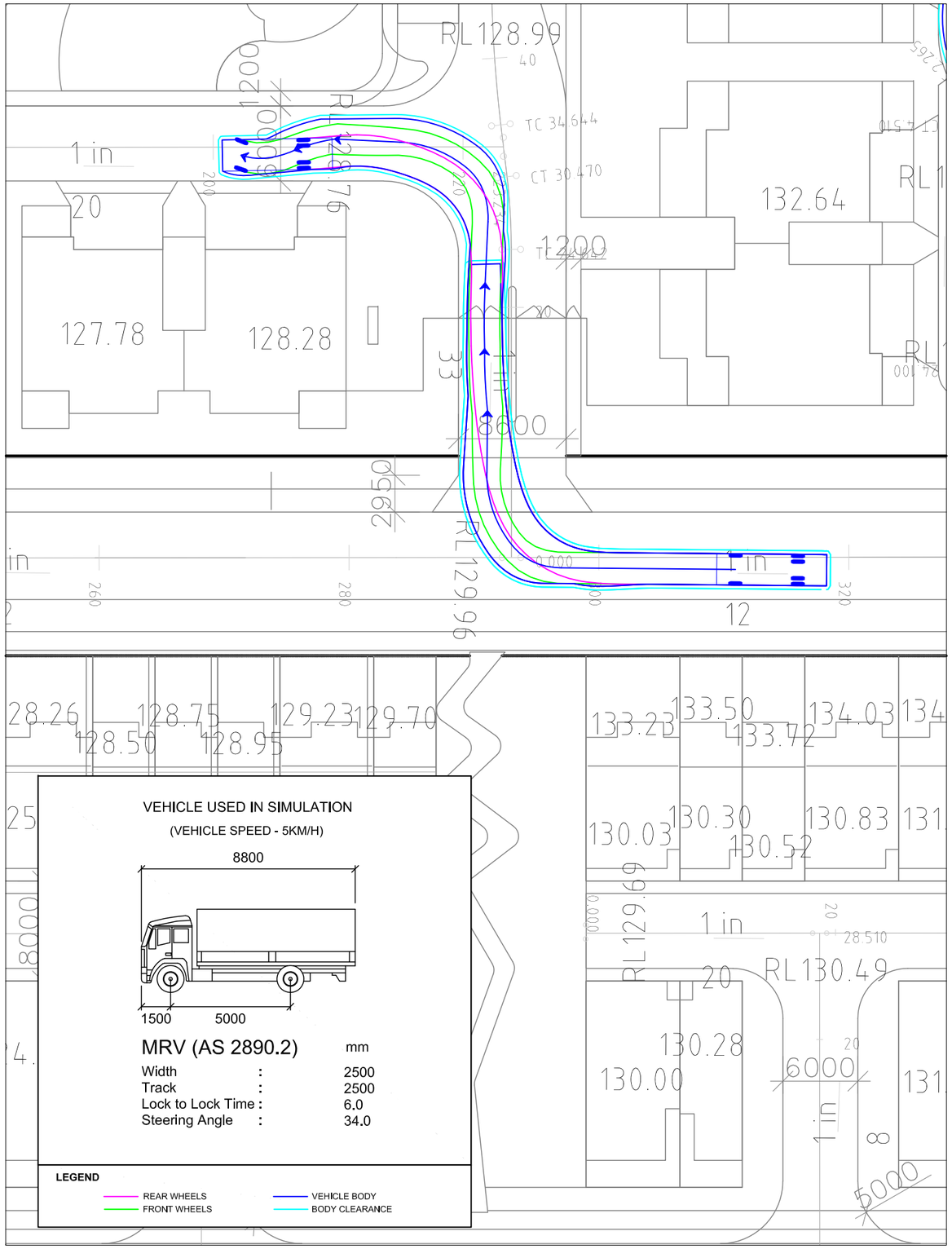
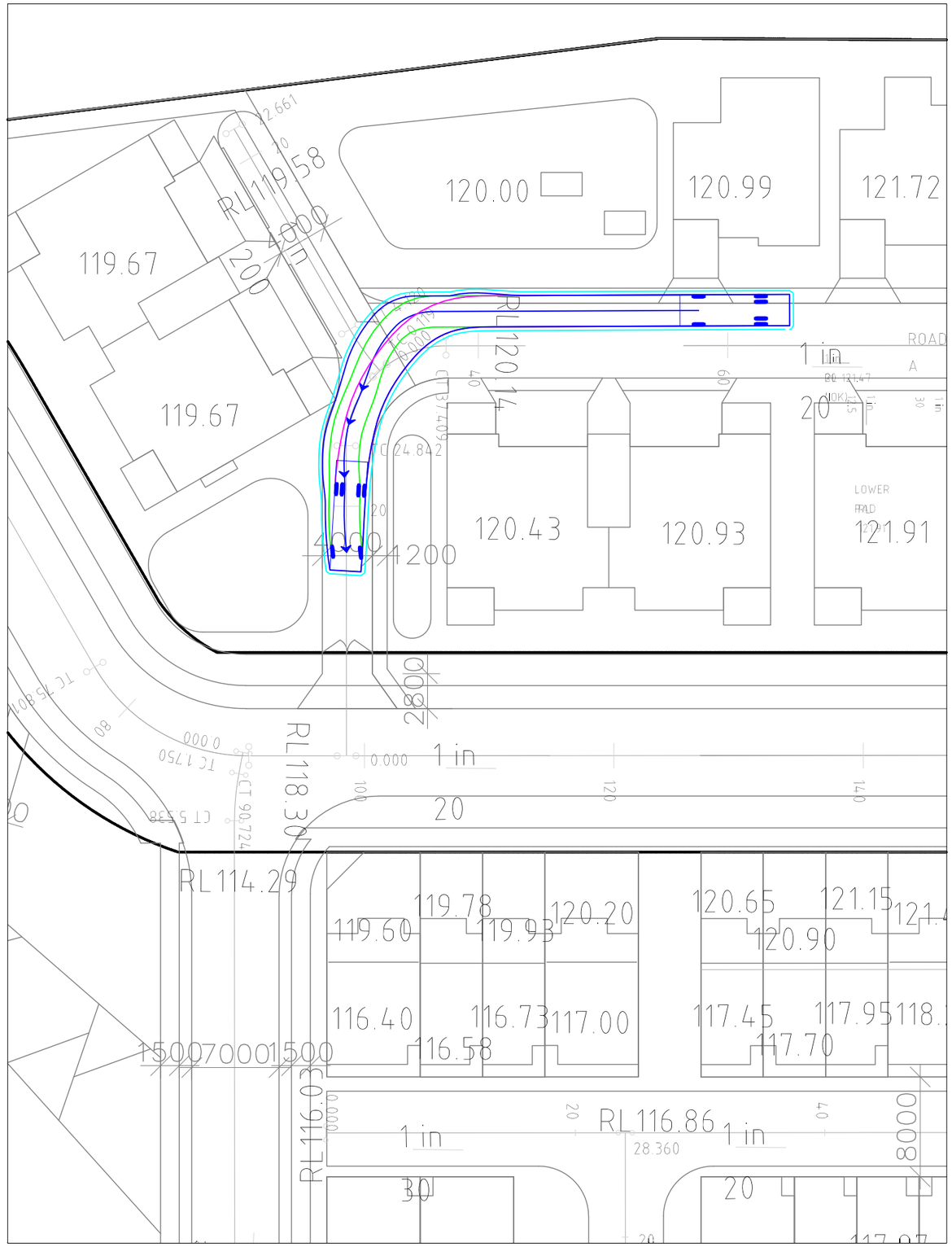
SERVICE VEHICLE CIRCULATION




| REV | DATE | NOTES | DESIGNED BY | CHECKED BY |
|---|---|---|---|---|
| A | 17-DEC-2021 | INTERNAL REVIEW | M. O'SHEA | K. BALLANTYNE |
| B | 20-APR-2022 | RFI RESPONSE | F. BANH | M. O'SHEA |

**275 MANCHESTER ROAD, CHIRNSIDE PARK**
PROPOSED RETIREMENT VILLAGE DEVELOPMENT

**GENERAL NOTES:**

**FILE NAME:** G30557-01-03
**SHEET NO.:** 03

N

SCALE: 1:400 (A3)
0 2 4



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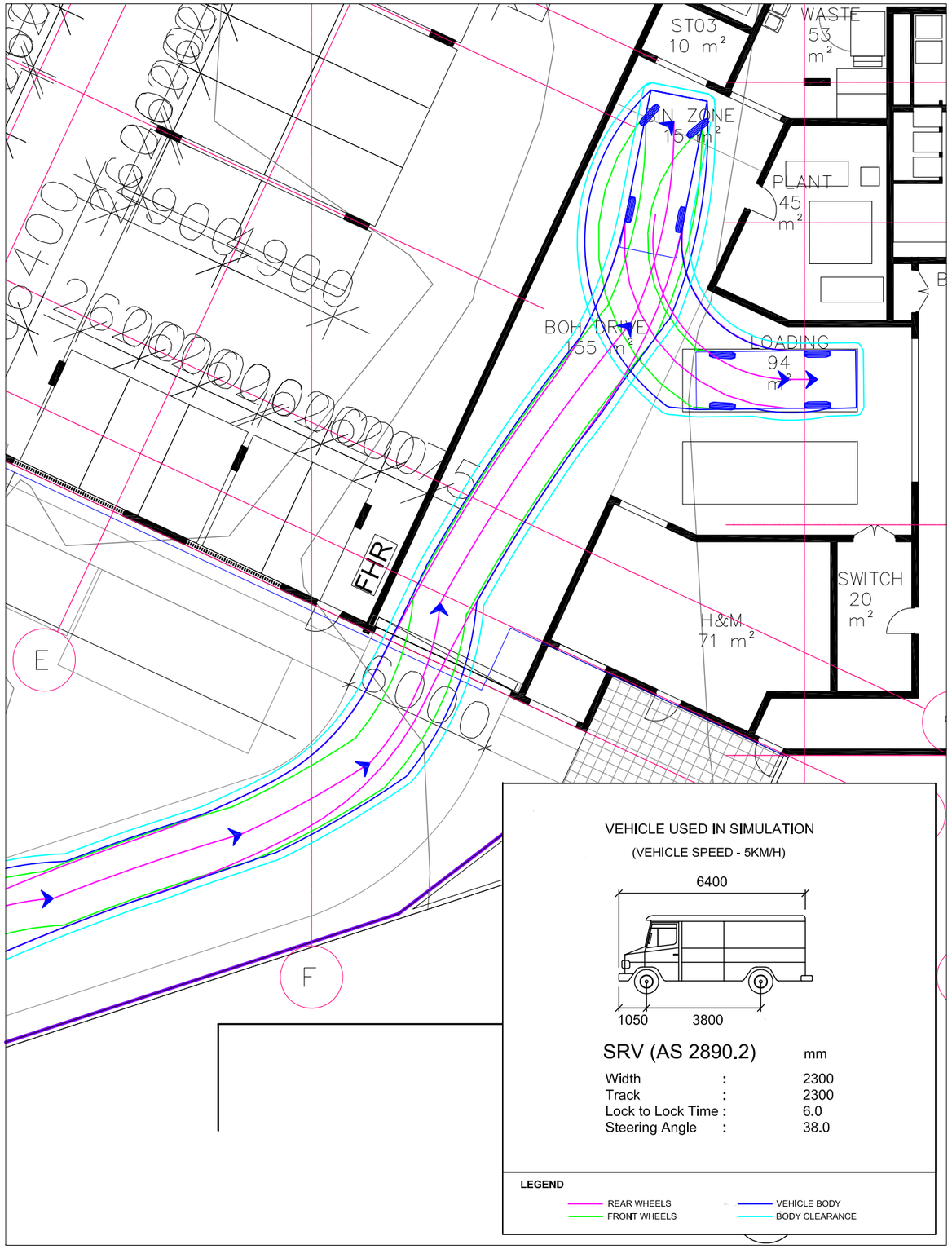
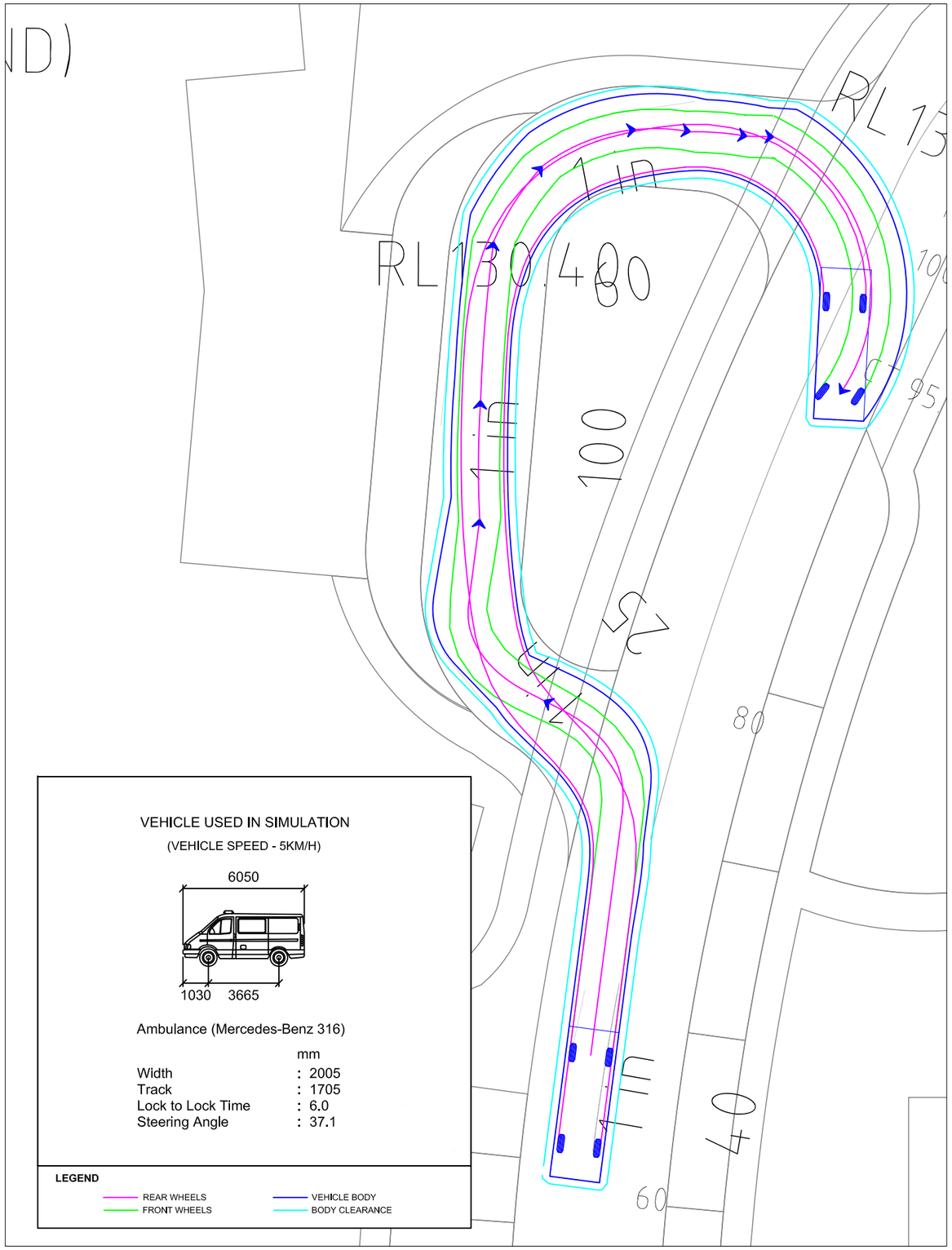
LOADING BAY ACCESS




PORTE COCHERE ACCESS




| REV | DATE | NOTES | DESIGNED BY | CHECKED BY |
|---|---|---|---|---|
| A | 17-DEC-2021 | INTERNAL REVIEW | M. O'SHEA | K. BALLANTYNE |
| B | 20-APR-2022 | RFI RESPONSE | F. BANH | M. O'SHEA |

# 275 MANCHESTER ROAD, CHIRNSIDE PARK

PROPOSED RETIREMENT VILLAGE DEVELOPMENT

**GENERAL NOTES:**

**FILE NAME:** G30557-01-03

**SHEET NO.:** 04

N

SCALE: 1:200 (A3)

0 2 4



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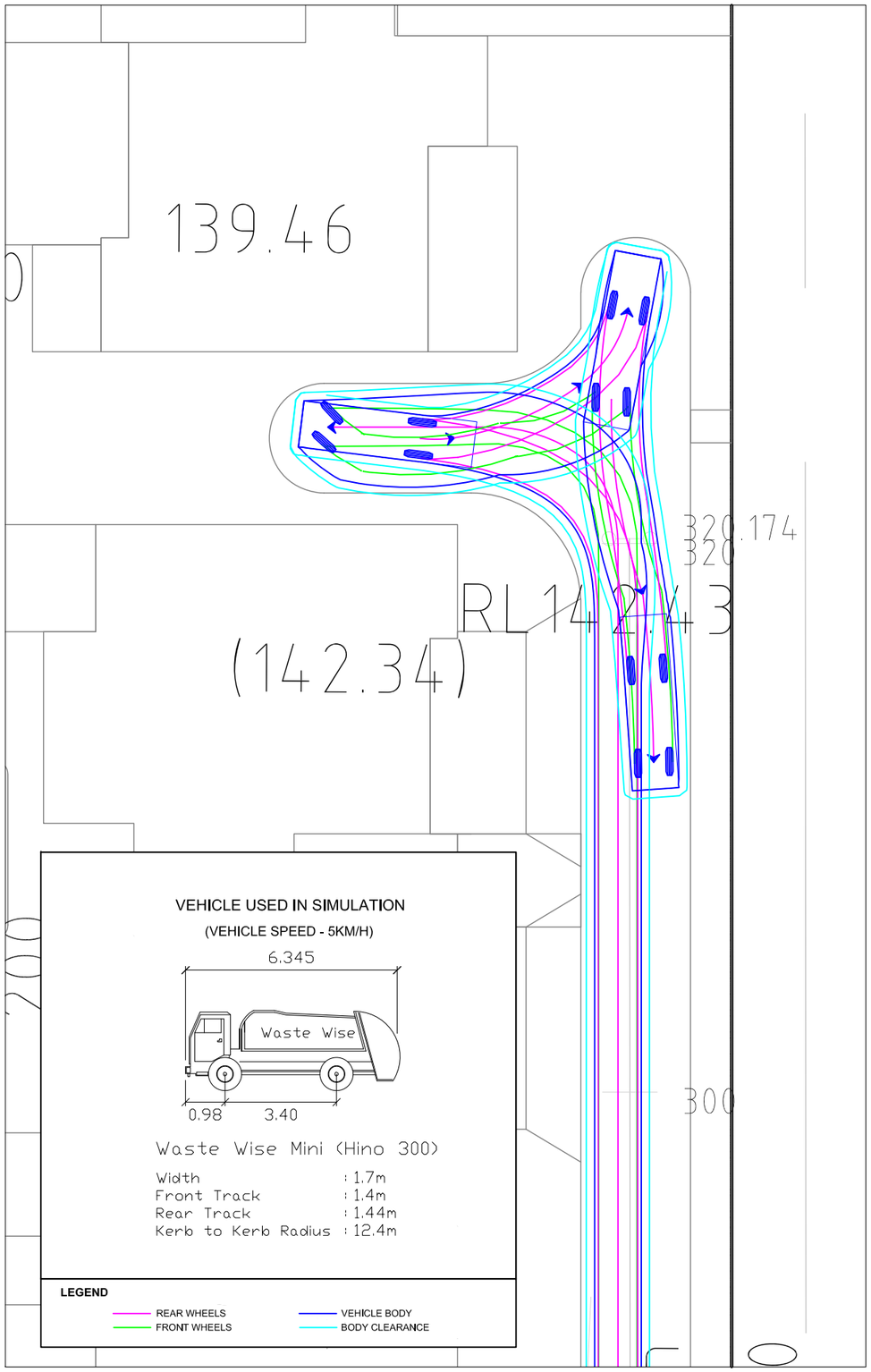
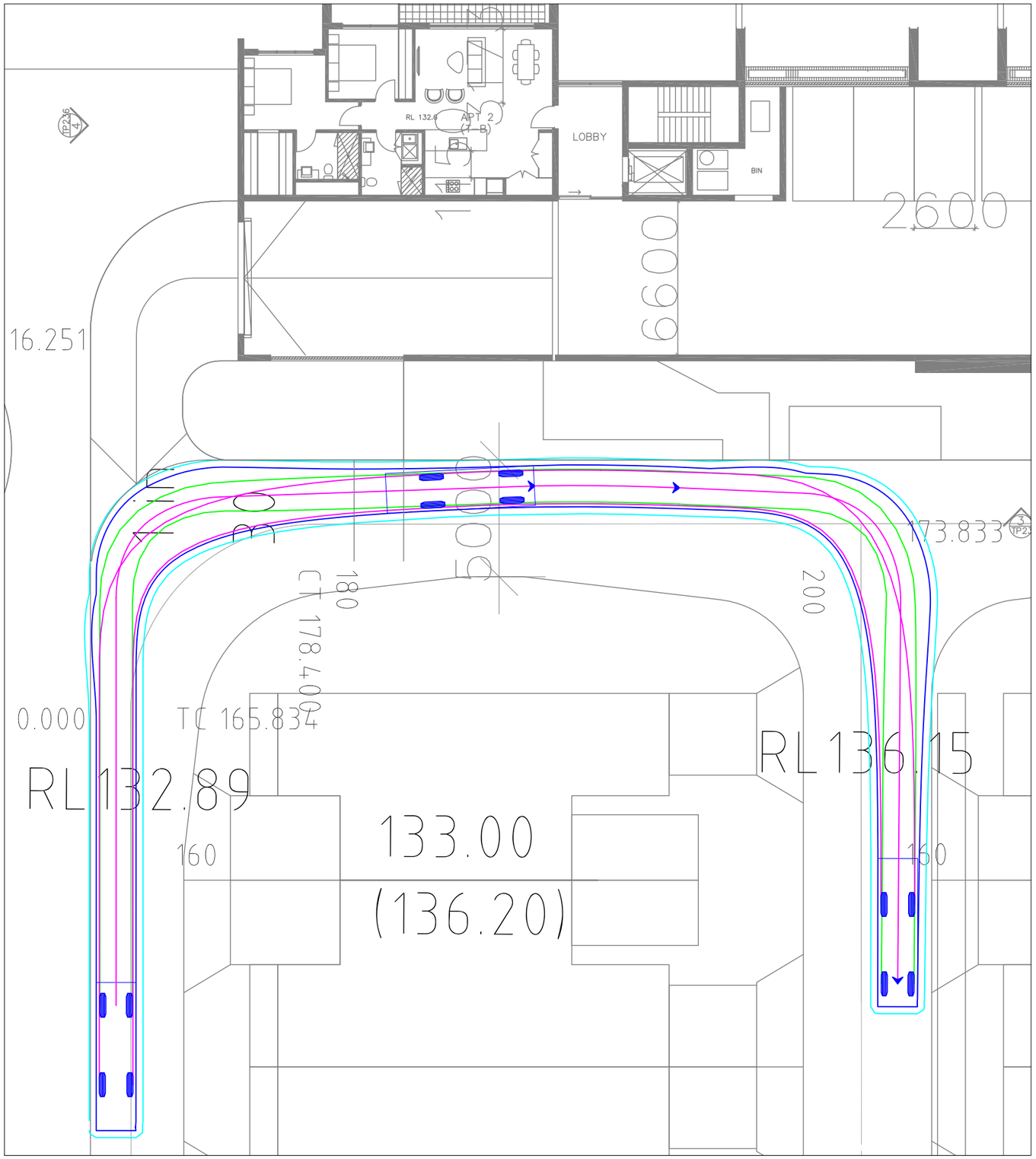
WASTE TRUCK TURN AROUND




| REV | DATE | NOTES | DESIGNED BY | CHECKED BY |
|---|---|---|---|---|
| A | 20-APR-2022 | RFI RESPONSE | F. BANH | M. O'SHEA |

**275 MANCHESTER ROAD, CHIRNSIDE PARK**
PROPOSED RETIREMENT VILLAGE DEVELOPMENT

**GENERAL NOTES:**

**FILE NAME:** G30557-01-03
**SHEET NO.:** 05

N

SCALE: 1:200 (A3)
0 2 4



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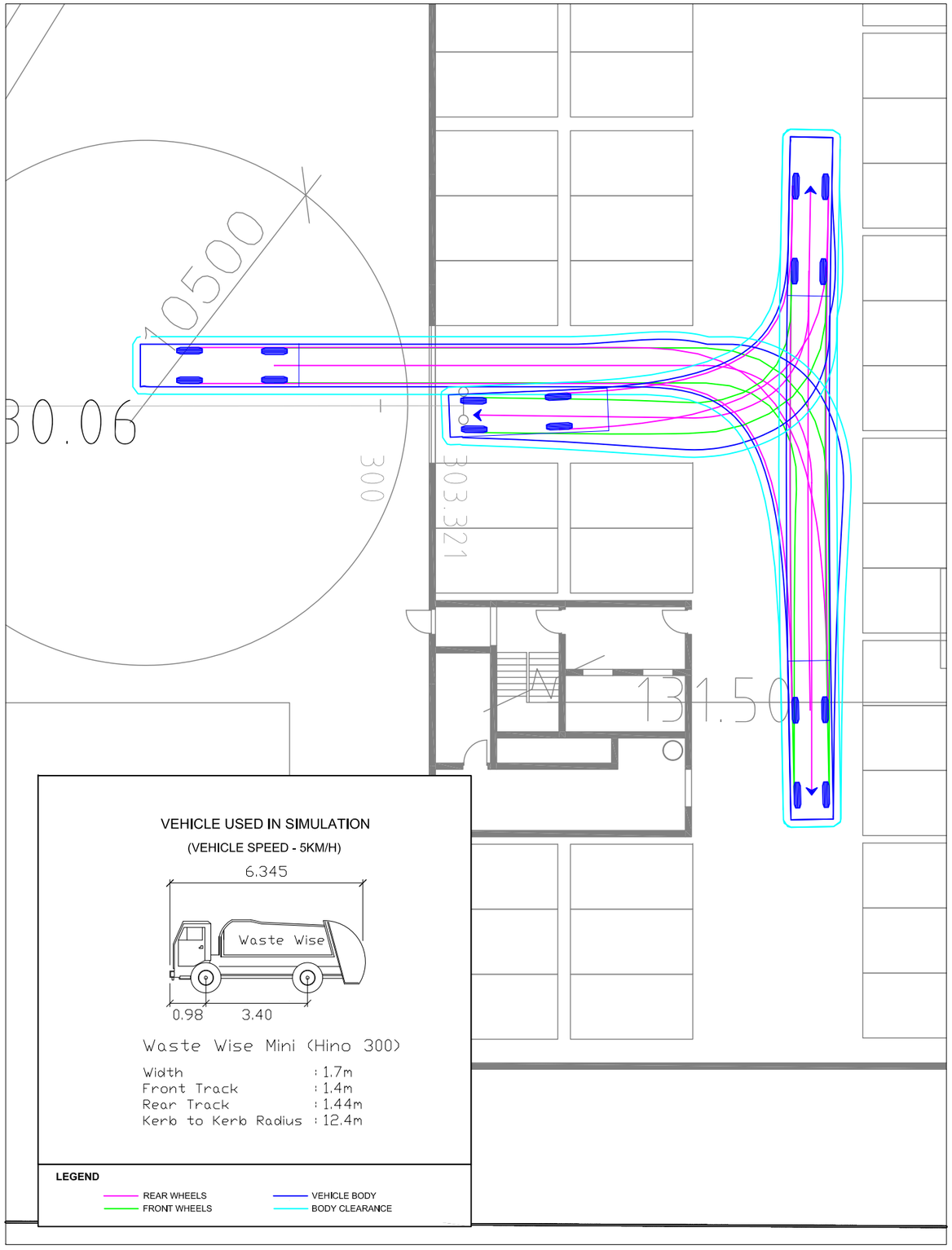
WASTE TRUCK TURN AROUND - APARTMENTS





VEHICLE USED IN SIMULATION

(VEHICLE SPEED - 5KM/H)




Waste Wise Mini (Hino 300)

| | |
|---|---|
| Width | : 1.7m |
| Front Track | : 1.4m |
| Rear Track | : 1.44m |
| Kerb to Kerb Radius | : 12.4m |

**LEGEND**

REAR WHEELS — VEHICLE BODY

FRONT WHEELS — BODY CLEARANCE

| REV | DATE | NOTES | DESIGNED BY | CHECKED BY |
|---|---|---|---|---|
| A | 20-APR-2022 | RFI RESPONSE | F. BANH | M. O'SHEA |

**275 MANCHESTER ROAD, CHIRNSIDE PARK**

PROPOSED RETIREMENT VILLAGE DEVELOPMENT

**GENERAL NOTES:**

**FILE NAME:** G30557-01-03

**SHEET NO.:** 06

N

SCALE: 1:200 (A3)

0 2 4



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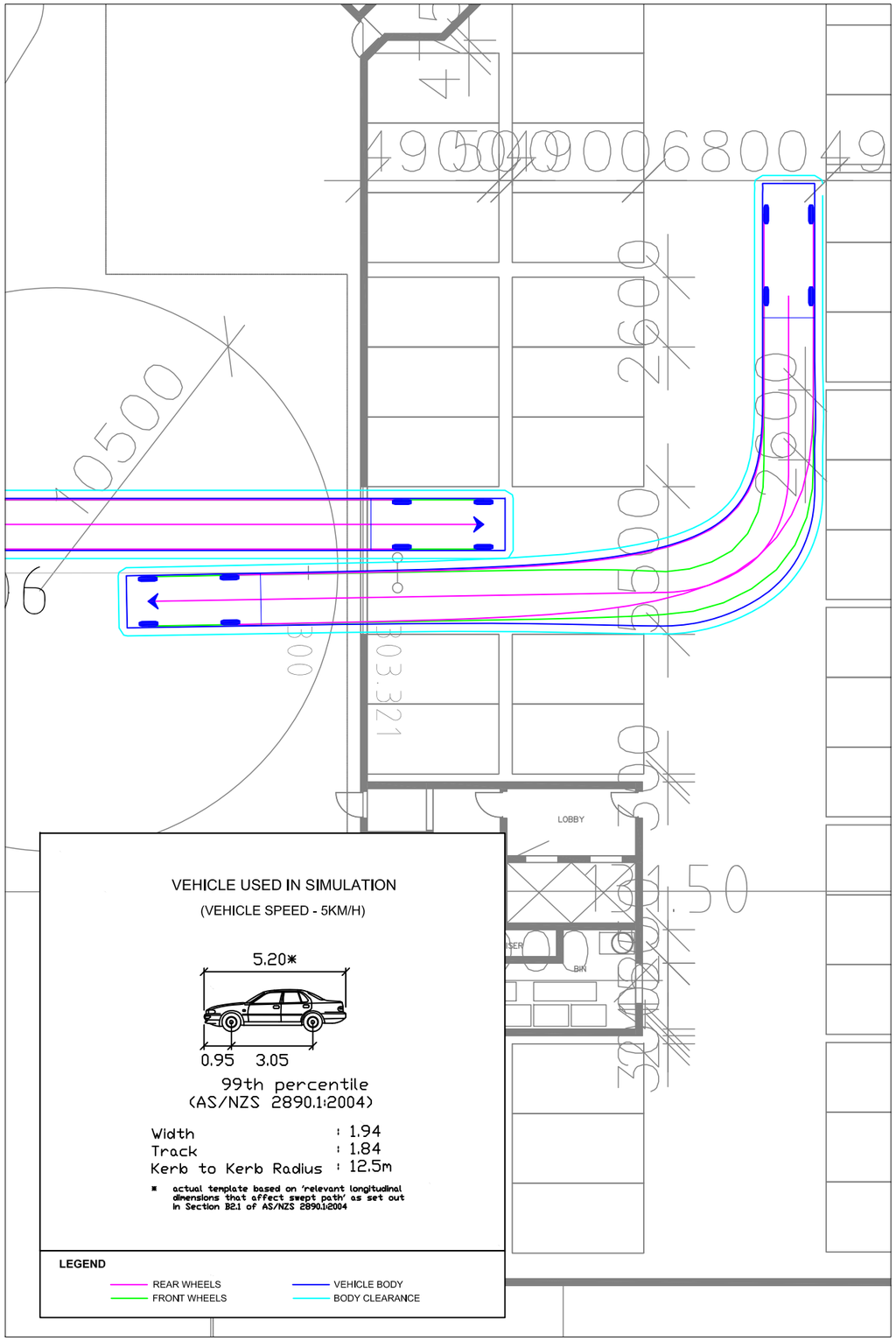
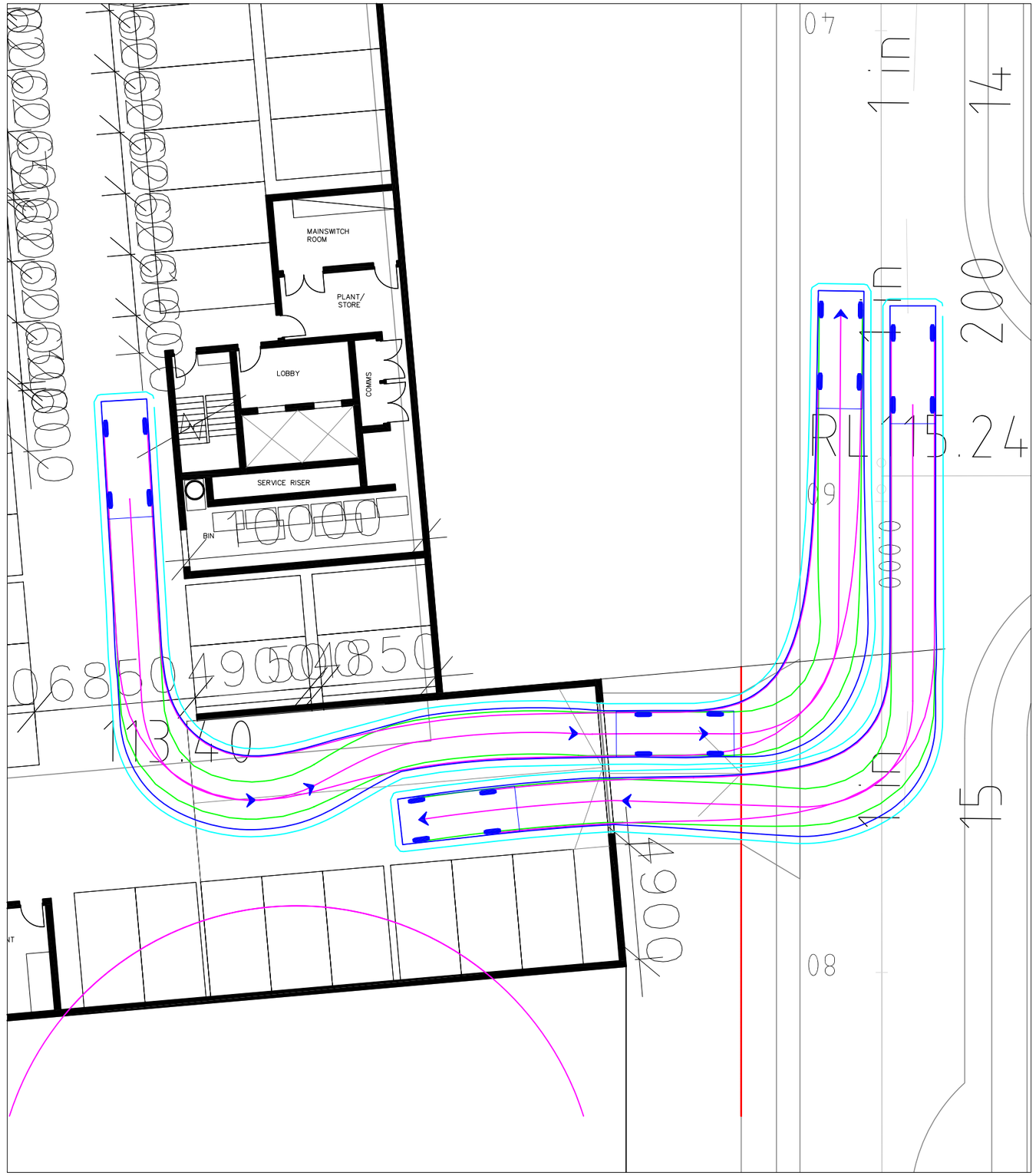
B99 PASSING - APARTMENTS




| REV | DATE | NOTES | DESIGNED BY | CHECKED BY |
|---|---|---|---|---|
| A | 20-APR-2022 | RFI RESPONSE | F. BANH | M. O'SHEA |

**275 MANCHESTER ROAD, CHIRNSIDE PARK**
PROPOSED RETIREMENT VILLAGE DEVELOPMENT

**GENERAL NOTES:**

**FILE NAME:** G30557-01-03
**SHEET NO.:** 07

SCALE: 1:200 (A3)



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# Appendix D

## Manchester Road – Sidra Assessment

# MOVEMENT SUMMARY

## Site: 2 [Stop 3-way Stage 2 (Median) - AM PEAK]

## Network: N101 [Network1 - AM PEAK]

Staged crossing Stage 2 (Median) at three-way intersection with 5-lane major road.
Give-way behaviour assumed at Stage 2.
Site Category: (None)
Giveway / Yield (Two-Way)

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Median Storage Area | | | | | | | | | | | | | | |
| 3 | R2 | 62 | 0.0 | 62 | 0.0 | 0.117 | 5.6 | LOS A | 0.4 | 2.4 | 0.63 | 0.63 | 0.63 | 45.4 |
| Approach | | 62 | 0.0 | 62 | 0.0 | 0.117 | 5.6 | LOS A | 0.4 | 2.4 | 0.63 | 0.63 | 0.63 | 45.4 |
| West: Maroondah Highway (SB) - North Leg | | | | | | | | | | | | | | |
| 11 | T1 | 768 | 2.0 | 768 | 2.0 | 0.200 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 60.0 |
| 12 | R2 | 22 | 0.0 | 22 | 0.0 | 0.012 | 5.7 | LOS A | 0.0 | 0.0 | 0.00 | 0.63 | 0.00 | 50.5 |
| Approach | | 791 | 1.9 | 791 | 1.9 | 0.200 | 0.2 | NA | 0.0 | 0.0 | 0.00 | 0.02 | 0.00 | 59.8 |
| All Vehicles | | 853 | 1.8 | 853 | 1.8 | 0.200 | 0.6 | NA | 0.4 | 2.4 | 0.05 | 0.06 | 0.05 | 59.1 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network 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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 1 [Stop 3-way Stage 1 (Minor Road) - AM PEAK]

## Network: N101 [Network1 - AM PEAK]

Staged crossing Stage 1 (Minor Road) at three-way intersection with 5-lane major road. Major road turn lane is treated as a full-length lane.
Site Category: (None)
Stop (Two-Way)

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: New Local Road | | | | | | | | | | | | | | |
| 1 | L2 | 35 | 0.0 | 35 | 0.0 | 0.032 | 9.1 | LOS A | 0.1 | 0.8 | 0.35 | 0.86 | 0.35 | 51.5 |
| 2 | T1 | 25 | 0.0 | 25 | 0.0 | 0.039 | 11.4 | LOS B | 0.1 | 1.0 | 0.54 | 0.91 | 0.54 | 45.0 |
| Approach | | 60 | 0.0 | 60 | 0.0 | 0.039 | 10.1 | LOS B | 0.1 | 1.0 | 0.43 | 0.88 | 0.43 | 49.6 |
| East: Maroondah Highway (NB) - South Leg | | | | | | | | | | | | | | |
| 4 | L2 | 13 | 0.0 | 13 | 0.0 | 0.145 | 5.6 | LOS A | 0.0 | 0.0 | 0.00 | 0.03 | 0.00 | 58.1 |
| 5 | T1 | 546 | 2.0 | 546 | 2.0 | 0.145 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.01 | 0.00 | 59.8 |
| 6 | R2 | 37 | 0.0 | 37 | 0.0 | 0.020 | 5.7 | LOS A | 0.0 | 0.0 | 0.00 | 0.63 | 0.00 | 50.5 |
| Approach | | 596 | 1.8 | 596 | 1.8 | 0.145 | 0.5 | NA | 0.0 | 0.0 | 0.00 | 0.05 | 0.00 | 59.5 |
| North: Median Storage Area | | | | | | | | | | | | | | |
| 8 | T1 | 12 | 0.0 | 12 | 0.0 | 0.045 | 8.8 | LOS A | 0.2 | 1.2 | 0.59 | 0.94 | 0.59 | 45.2 |
| 9 | R2 | 11 | 0.0 | 11 | 0.0 | 0.045 | 10.3 | LOS B | 0.2 | 1.2 | 0.59 | 0.94 | 0.59 | 44.4 |
| Approach | | 22 | 0.0 | 22 | 0.0 | 0.045 | 9.5 | LOS A | 0.2 | 1.2 | 0.59 | 0.94 | 0.59 | 44.8 |
| All Vehicles | | 678 | 1.6 | 678 | 1.6 | 0.145 | 1.6 | NA | 0.2 | 1.2 | 0.06 | 0.15 | 0.06 | 58.3 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network 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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 2 [Stop 3-way Stage 2 (Median) - PM PEAK]

## Network: N101 [Network1 - PM PEAK]

Staged crossing Stage 2 (Median) at three-way intersection with 5-lane major road.
Give-way behaviour assumed at Stage 2.
Site Category: (None)
Giveway / Yield (Two-Way)

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: Median Storage Area | | | | | | | | | | | | | | |
| 3 | R2 | 66 | 0.0 | 66 | 0.0 | 0.115 | 4.9 | LOS A | 0.4 | 2.3 | 0.60 | 0.59 | 0.60 | 46.1 |
| Approach | | 66 | 0.0 | 66 | 0.0 | 0.115 | 4.9 | LOS A | 0.4 | 2.3 | 0.60 | 0.59 | 0.60 | 46.1 |
| West: Maroondah Highway (SB) - North Leg | | | | | | | | | | | | | | |
| 11 | T1 | 697 | 2.0 | 697 | 2.0 | 0.181 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 60.0 |
| 12 | R2 | 37 | 0.0 | 37 | 0.0 | 0.020 | 5.7 | LOS A | 0.0 | 0.0 | 0.00 | 0.63 | 0.00 | 50.5 |
| Approach | | 734 | 1.9 | 734 | 1.9 | 0.181 | 0.3 | NA | 0.0 | 0.0 | 0.00 | 0.03 | 0.00 | 59.7 |
| All Vehicles | | 800 | 1.7 | 800 | 1.7 | 0.181 | 0.7 | NA | 0.4 | 2.3 | 0.05 | 0.08 | 0.05 | 58.9 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network 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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 1 [Stop 3-way Stage 1 (Minor Road) - PM PEAK]

## Network: N101 [Network1 - PM PEAK]

Staged crossing Stage 1 (Minor Road) at three-way intersection with 5-lane major road. Major road turn lane is treated as a full-length lane.
Site Category: (None)
Stop (Two-Way)

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flows Total veh/h | HV % | Arrival Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: New Local Road | | | | | | | | | | | | | | |
| 1 | L2 | 23 | 0.0 | 23 | 0.0 | 0.022 | 9.2 | LOS A | 0.1 | 0.6 | 0.37 | 0.85 | 0.37 | 51.4 |
| 2 | T1 | 42 | 0.0 | 42 | 0.0 | 0.076 | 12.6 | LOS B | 0.3 | 1.9 | 0.59 | 0.97 | 0.59 | 43.8 |
| Approach | | 65 | 0.0 | 65 | 0.0 | 0.076 | 11.4 | LOS B | 0.3 | 1.9 | 0.51 | 0.93 | 0.51 | 47.4 |
| East: Maroondah Highway (NB) - South Leg | | | | | | | | | | | | | | |
| 4 | L2 | 49 | 0.0 | 49 | 0.0 | 0.182 | 5.6 | LOS A | 0.0 | 0.0 | 0.00 | 0.08 | 0.00 | 57.6 |
| 5 | T1 | 651 | 2.0 | 651 | 2.0 | 0.182 | 0.0 | LOS A | 0.0 | 0.0 | 0.00 | 0.04 | 0.00 | 59.6 |
| 6 | R2 | 24 | 0.0 | 24 | 0.0 | 0.013 | 5.7 | LOS A | 0.0 | 0.0 | 0.00 | 0.63 | 0.00 | 50.5 |
| Approach | | 724 | 1.8 | 724 | 1.8 | 0.182 | 0.6 | NA | 0.0 | 0.0 | 0.00 | 0.06 | 0.00 | 59.3 |
| North: Median Storage Area | | | | | | | | | | | | | | |
| 8 | T1 | 23 | 0.0 | 23 | 0.0 | 0.087 | 10.7 | LOS B | 0.3 | 2.3 | 0.66 | 0.99 | 0.66 | 43.5 |
| 9 | R2 | 14 | 0.0 | 14 | 0.0 | 0.087 | 12.4 | LOS B | 0.3 | 2.3 | 0.66 | 0.99 | 0.66 | 42.8 |
| Approach | | 37 | 0.0 | 37 | 0.0 | 0.087 | 11.3 | LOS B | 0.3 | 2.3 | 0.66 | 0.99 | 0.66 | 43.2 |
| All Vehicles | | 826 | 1.6 | 826 | 1.6 | 0.182 | 1.9 | NA | 0.3 | 2.3 | 0.07 | 0.17 | 0.07 | 57.9 |

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Network 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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.