



Traffic Impact Assessment

24 Valencia Road, Carmel WA 6076

August 2017



APEX ENGINEERS

Type of Assessment: Traffic Impact Assessment

Site Location: 24 Valencia Road, Carmel WA 6076

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1. Introduction

APEX Engineers were engaged by Mr. Dinu Ekanayake to provide a traffic impact assessment as a part of the development application for the proposed Valencia Aged Care development at 24 Valencia Road in Carmel WA.

This report has been structured into the following sections:

- **Section 2** Describes the existing transport conditions in the locality and provides an overview of the proposed development;
- **Section 3** Assesses the car parking provision requirements applicable for the subject development;
- **Section 4** Provides a review of proposed on-site car parking design against Australian Standards;
- **Section 5** Provides an estimate of the traffic impact anticipated to be generated by the proposed development on the surrounding local road network; and
- **Section 6** Provides the summary and conclusions of the study.

2. Background and Existing Conditions

2.1 Site Description and Local Road Network

The subject site includes a land area of approx. 12,143 square metres and is located fronting Valencia Road. The site currently includes a nursing home with on-site car parking at site frontage.

Valencia Road, at the site frontage, is a local road which includes an undivided carriageway providing one traffic lane in each direction. It connects Carmel Road East (to the northwest) with Union Road (to the southeast). The site vicinity is characterised predominantly by low density residential premises and undeveloped land.

Figure 1 below illustrates the location of the subject site from a street map view while **Figure 2** illustrates the site in aerial perspective. **Figure 3** illustrates the view of Valencia Road, as seen at the site frontage.



Figure 1: Location of the Subject Site (Street map view)

2.2 Proposal Details

The subject proposal seeks to expand the operations of the existing nursing home located at 24 Valencia Road in Carmel. It is understood that the existing nursing home currently includes a total of 66 beds and 14 staff members (staff to patient ratio of 1:5). The proposed development seeks to construct a new building within the land located at the rear of the existing nursing home. The proposed building will include 80 beds with 14 staff members.



Figure 2: Location of the Subject Site (Aerial view)



Figure 3: Valencia Road as seen at the Site Frontage

3. Parking Provision Requirements

The car parking provision requirements for the proposed development were determined in accordance with the parking rates prescribed in Table 3 of Shire of Kalamunda Local Planning Scheme No. 3. In relation to 'Aged Residential Care' developments, this policy document stipulates a requirement of ***1 car space per employee plus 1 car bay per 10 beds.***

The following table illustrates the car parking provision applicable to the overall site.

Table 1: Statutory Parking Provision Requirements

Component	Quantity	Statutory parking provision rate	Required car spaces
Number of staff	30 (existing site includes 14 staff members, the proposed site will require 16 staff members)	1 car space per employee	30 car spaces
Number of beds	146 (existing site has 66 beds, the proposed site will provide 80 beds)	1 car bay per 10 beds	14.6 car spaces
Total car parking provision requirement			45 car spaces (rounded up)

As per the above table, the overall site should provide 45 on-site car parking spaces. The existing site currently includes 24 on-site car parking spaces at the site frontage. The proposed development includes provision of 21 additional car spaces (includes two disability accessible car spaces) at two locations. Therefore, the overall parking provision on-site is 45 car spaces, which satisfies the Council DCP parking provision requirement.

4. Parking Design Review

Figure 4 illustrates the locations of the existing and proposed car parking areas. It is noted that the proposed development will retain the existing (already approved) on-site hard stand car parking area at the site frontage. Therefore, the existing on-site car parking area is assumed to be compliant against the relevant requirements outlined in AS 2890.1 and AS 2890.6. Accordingly, the proposed car parking spaces have been assessed for design compliance against the requirements outlined in AS 2890.1 and AS 2890.6.

4.1 Regular Car Spaces

The proposed car parking area labelled A (in **Figure 4**) provides a total of 8 visitor car parking spaces (excluding the accessible car space and the ambulance bay). The visitor car spaces are categorised as user class 3 (short term parking at hospitals and medical centres) under AS 2890.1:2004. These car spaces are required to be designed at 2.6m width by 5.4m length, with an aisle width of 5.8m behind the car spaces. All proposed car spaces, within this area, comply with the above dimensional requirements.

The proposed car parking area labelled B (in **Figure 4**) provides a total of 11 staff car parking spaces (excluding the accessible car space and the delivery bay). The staff car spaces are categorised as user class 1A (employee parking) under AS 2890.1:2004. These car spaces are required to be designed at 2.4m width by 5.4m length, with an aisle width of 5.8m behind the car spaces. All proposed car spaces, within this area, comply with the above dimensional requirements.

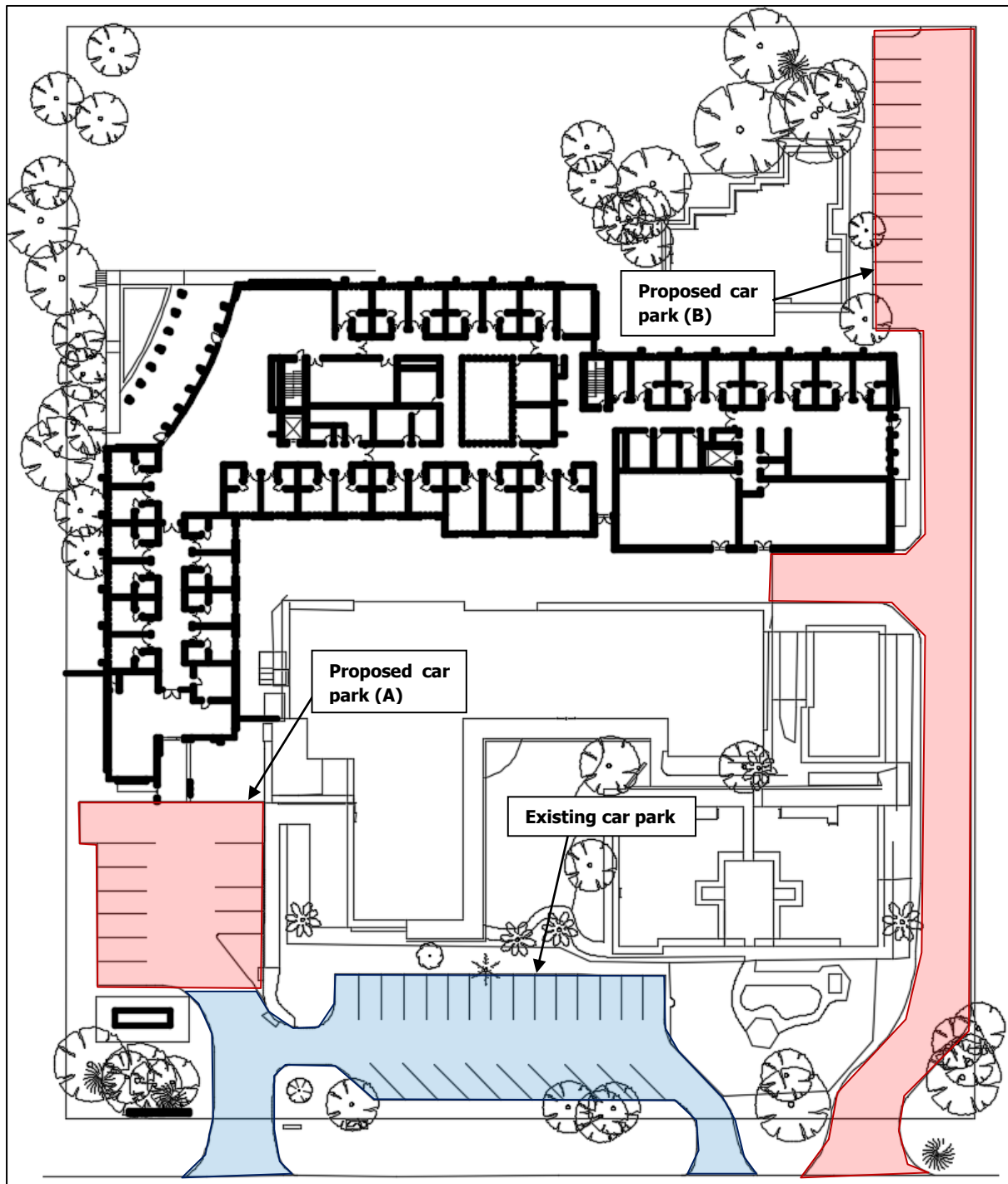


Figure 4: Existing and Proposed Car Parking Areas

4.2 Disability Accessible Car Spaces

One disability accessible space is provided within each proposed car parking area (labelled A and B in **Figure 4** above). According to AS 2890.6:2009, disability accessible parking spaces shall be designed with minimum dimensions of 2.4m width and 5.4m length and an aisle width of 5.8m. Each accessible car space shall be accompanied by a shared space, located adjacent to it, possessing equal dimensions. Both disability accessible car spaces have been designed to satisfy the above requirements.

4.3 Additional Lateral Clearances

When car spaces are located adjacent to a blind aisle (end of aisle), AS 2890.1 requires the aisle to be extended by an additional 1m in order to allow reverse exit manoeuvres by the vehicles parked in these spaces. It is noted that the last car space, within the proposed car parking area B, is located adjacent to a blind aisle. Accordingly, the aisle has been extended by 1m at this location.

4.4 Gradients within Parking Modules

AS 2890.1 stipulates that parking modules, at maximum, should have a maximum grade of 1 in 16 (measured in any direction other than parallel to the angle of parking) and 1 in 20 (measured parallel to the angle of parking). The proposed parking modules do not include any grades beyond 1 in 20 and are therefore compliant with the above requirement.

In addition, AS 2890.6 stipulates that the disability accessible car parking spaces and the shared areas shall not exceed the grade of 1:40 in any direction. The proposed disability accessible car parking spaces are at grade with no gradients.

4.5 Two Way Driveway Width

AS 2890.1 requires combined two way access driveways to be 5.5m wide (minimum). The proposed two-way driveway to the rear parking area (labelled B in **Figure 4**) is designed at 5.5m width.

4.6 Ambulance Parking

The proposed development includes an ambulance bay within the car parking area A (as outlined in **Figure 4**). Therefore, the ambulance is the largest vehicle expected to enter the car parking area A. It is noted that the typical ambulance is categorised as a small rigid vehicle (SRV). Based on AS 2890.2, a SRV will require a service bay of 3.5m width and 6.4m length. The ambulance service bay within the proposed car parking area A complies with the above identified dimensions.

4.7 Delivery Vehicle Parking

The proposed development is expected to receive deliveries through 8.8m Medium Rigid Vehicles (MRVs). This vehicle therefore is the largest vehicle expected to enter the proposed parking area B (as outlined in **Figure 4**). Based on AS 2890.2, a MRV will require a service bay of 3.5m width and 8.8m length. The proposed delivery bay within the car parking area B complies with the above identified dimensions.

4.8 Swept Path Assessment

Swept path tests have been undertaken (using AutoTURN software - the industry standard vehicle swept path assessment software) for the anticipated critical movements within the proposed car parking areas. The following sub-sections illustrate the results of swept path tests for various scenarios.

4.8.1 Ambulance Access

A swept path assessment has been undertaken for a typical ambulance, in order to investigate the manoeuvrability conditions of this vehicle within car parking area A. The following figure illustrates the template of the ambulance used in the swept path simulation (note that this ambulance template includes dimensions slightly larger than a typical SRV as specified in AS 2890.2, therefore the swept path test results are deemed conservative).

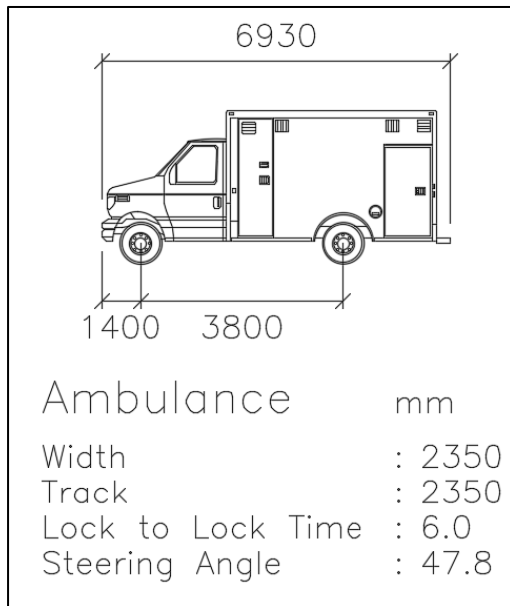


Figure 5: Template of the Ambulance Used to Simulate Swept Path

The following figure indicates the swept path results obtained for the anticipated movements of the ambulance, within the proposed car parking area. It is noted that the Blue and Cyan colour lines in the swept paths indicate the front and rear tyre tracks of the vehicle, respectively, while the Red colour of the swept paths indicate the vehicle body envelop.

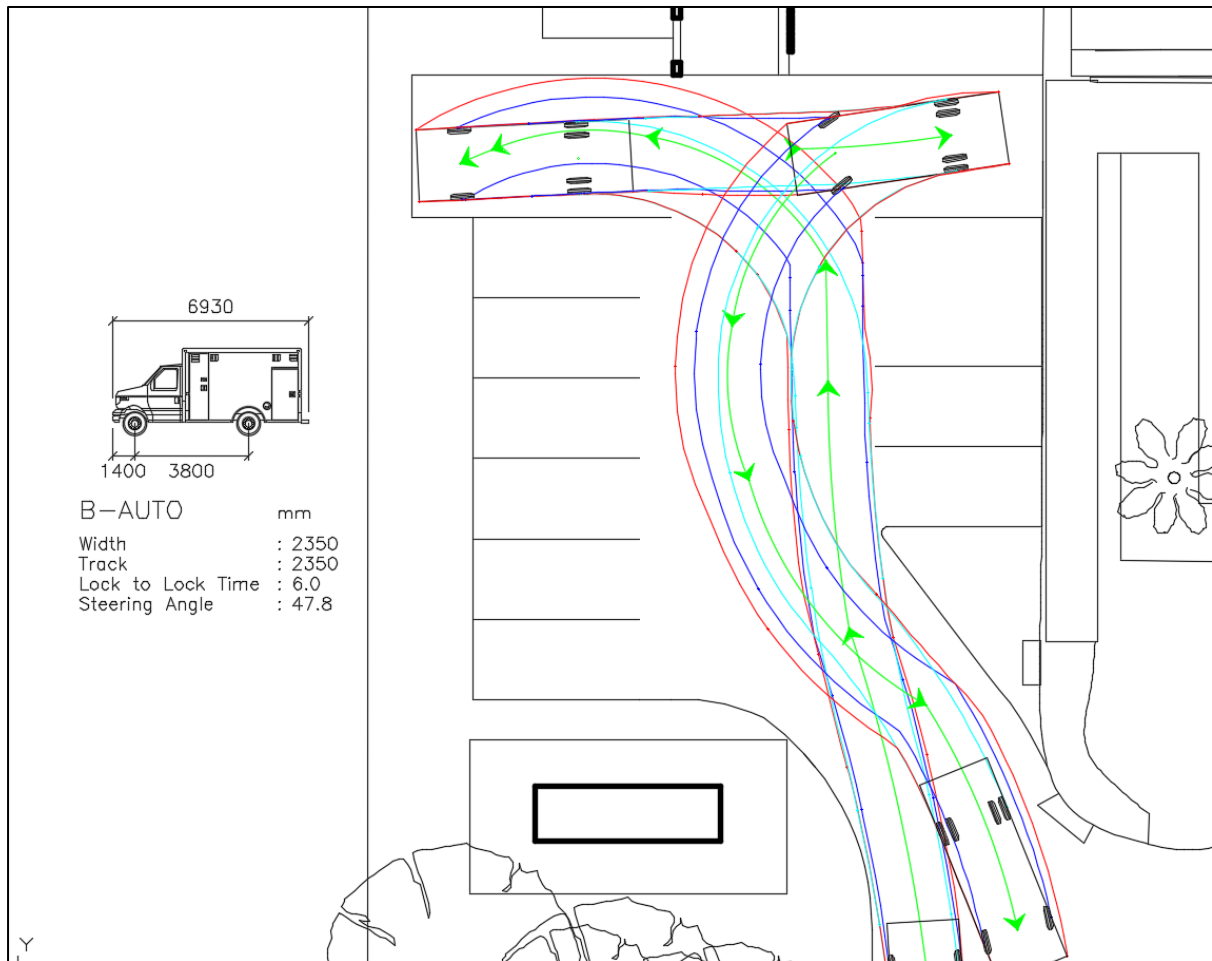


Figure 6: Swept Path for an Ambulance within the Proposed Car Park

As can be seen from the above figure, a typical ambulance can sufficiently manoeuvre inside the car parking area A, within the proposed design constraints. This vehicle can enter the site in forward motion and reverse into the ambulance bay and exit forward onto Valencia Road.

4.8.2 Medium Rigid Vehicle Access

A swept path assessment has been undertaken for a MRV, in order to investigate the manoeuvrability conditions of this vehicle within car parking area B. The following figures illustrate the template of the MRV used to simulate the swept path (it is noted that this vehicle template is developed according to the dimensions specified in AS 2890.2).

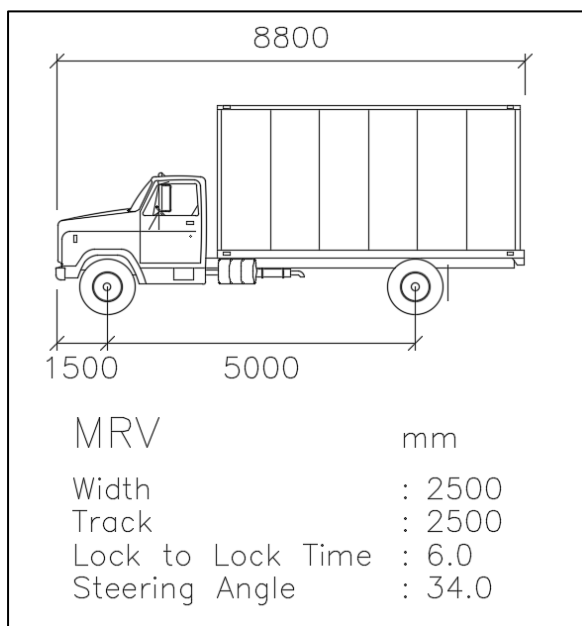


Figure 7: Template of the MRV Used to Simulate Swept Path

The following figure indicates the swept path results obtained for the anticipated movements of the MRV, within the proposed car parking area B. It is noted that the Blue and Cyan colour lines in the swept paths indicate the front and rear tyre tracks of the vehicle, respectively, while the Red colour of the swept paths indicate the vehicle body envelop.

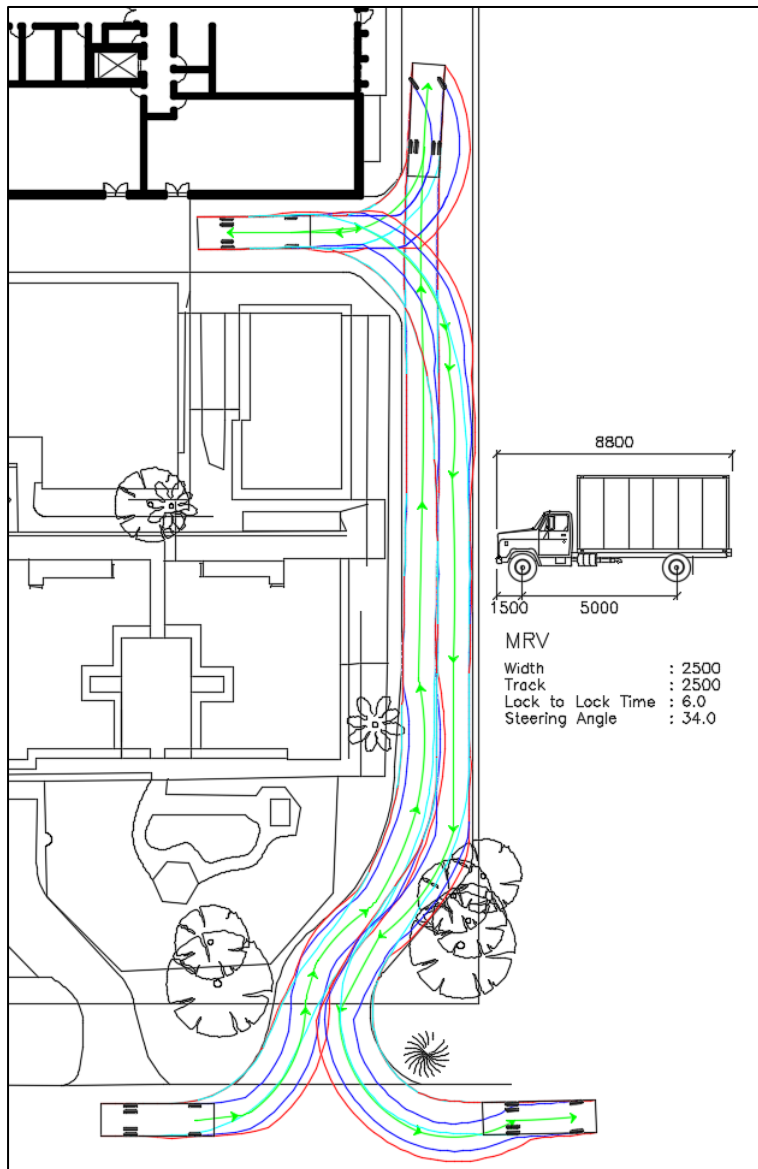


Figure 8: Swept Path for a MRV within the Proposed Car Park

As can be seen from the above figure, the 8.8m MRV can sufficiently manoeuvre inside the car park B, within the proposed design constraints. This vehicle can enter the site in forward motion and reverse into the loading bay and exit forward onto Valencia Road.

4.8.3 Simultaneous Vehicle Movements

The proposed car parking areas and driveways have been tested for the anticipated critical scenarios which involve simultaneous movement of vehicles. In this regard, the following scenarios have been tested (using the same respective templates for each vehicle, as outlined earlier);

1. A passenger vehicle entering while an ambulance exits car park A – see **Figure 9.**
2. An ambulance entering while a passenger vehicle exits car park A – see **Figure 10.**
3. A passenger vehicle entering while an MRV exits car park B – see **Figure 11.**
4. An MRV entering while a passenger vehicle exits car park B – see **Figure 12.**

Based on the swept path results, it is evident that the proposed two-way driveways within each car park, can sufficiently accommodate the critical simultaneous vehicle movement scenarios.

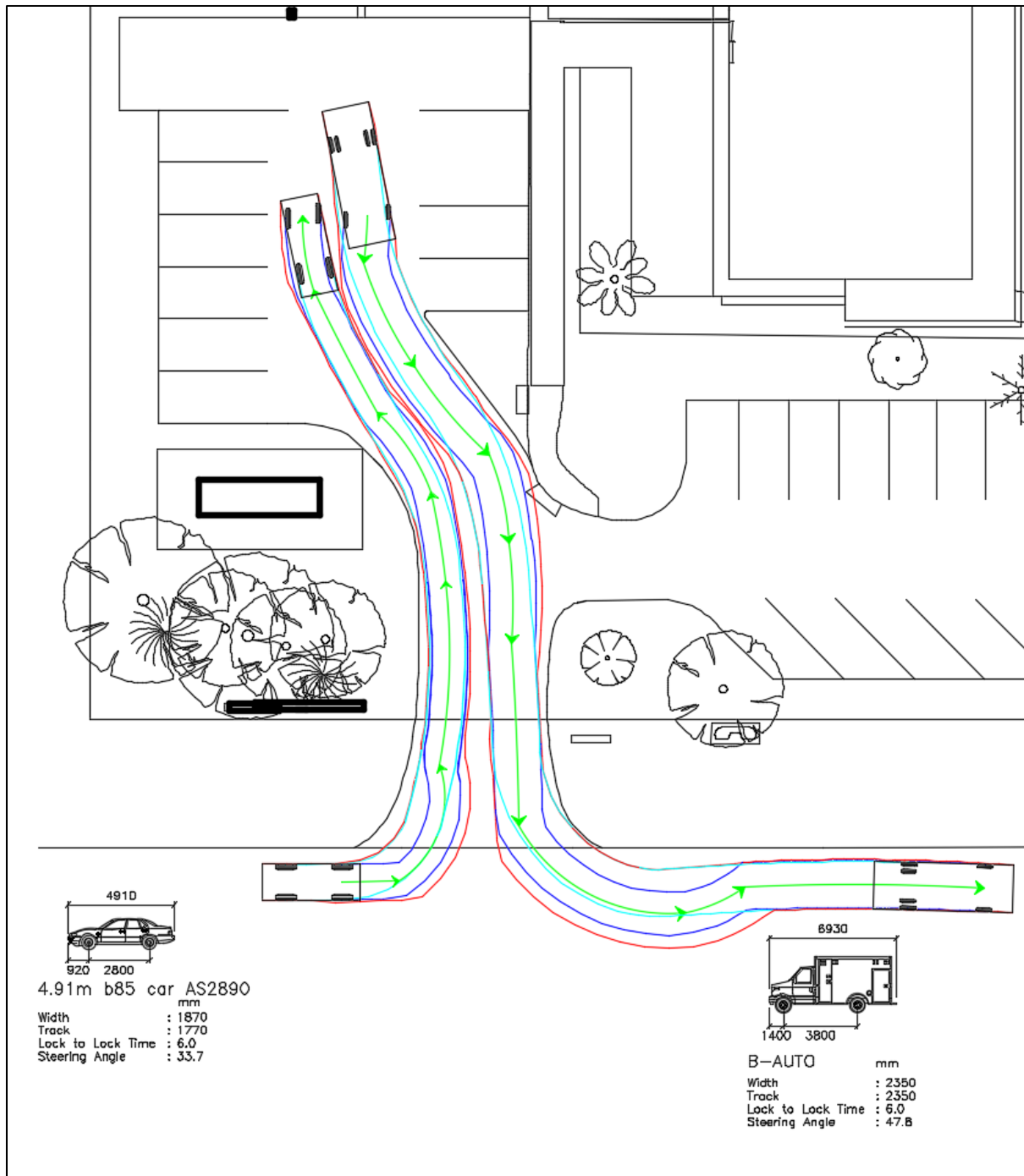


Figure 9: Passenger Vehicle Entering while an Ambulance Exits - Car Park A

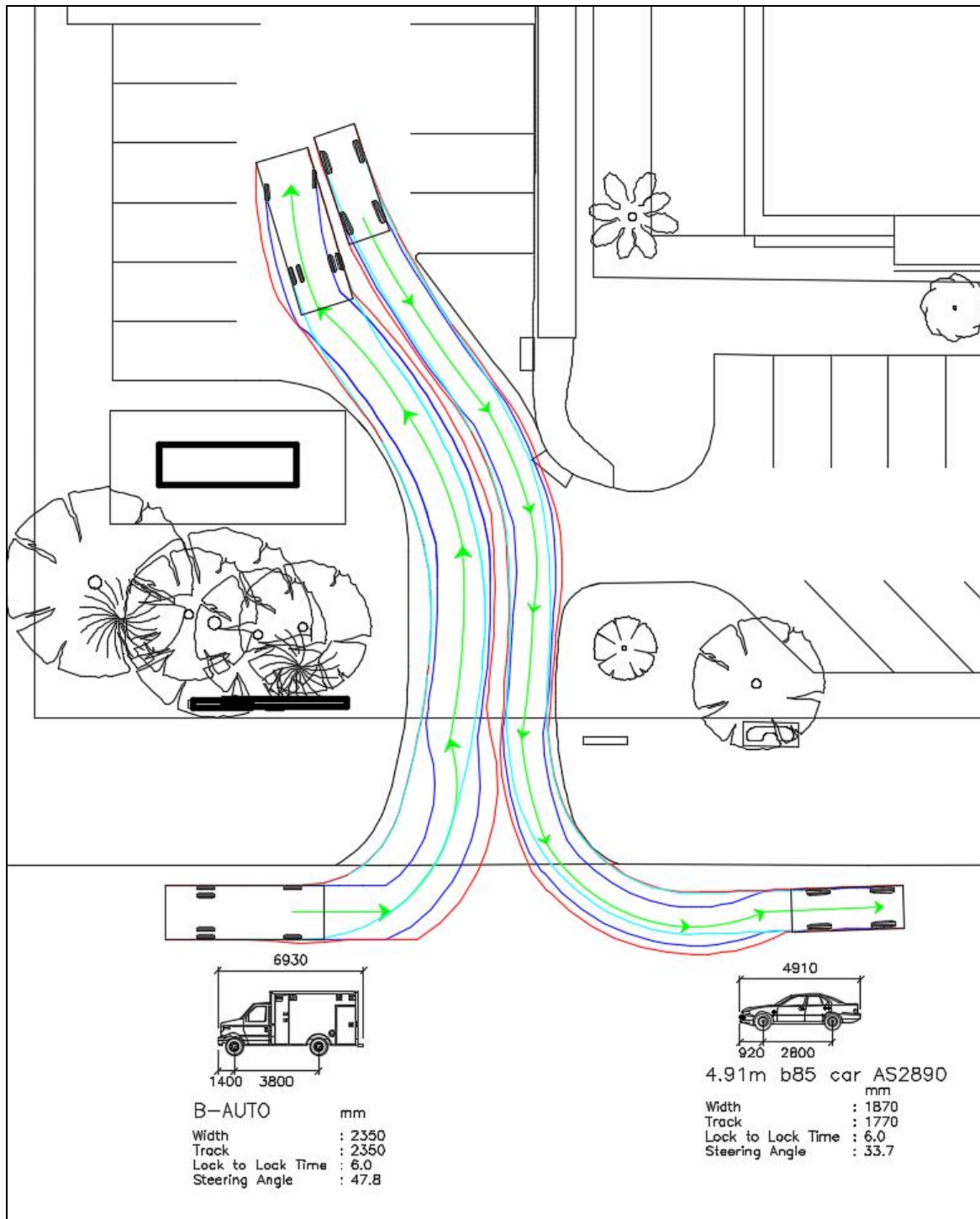


Figure 10: Passenger Vehicle Exiting while an Ambulance Enters - Car Park A

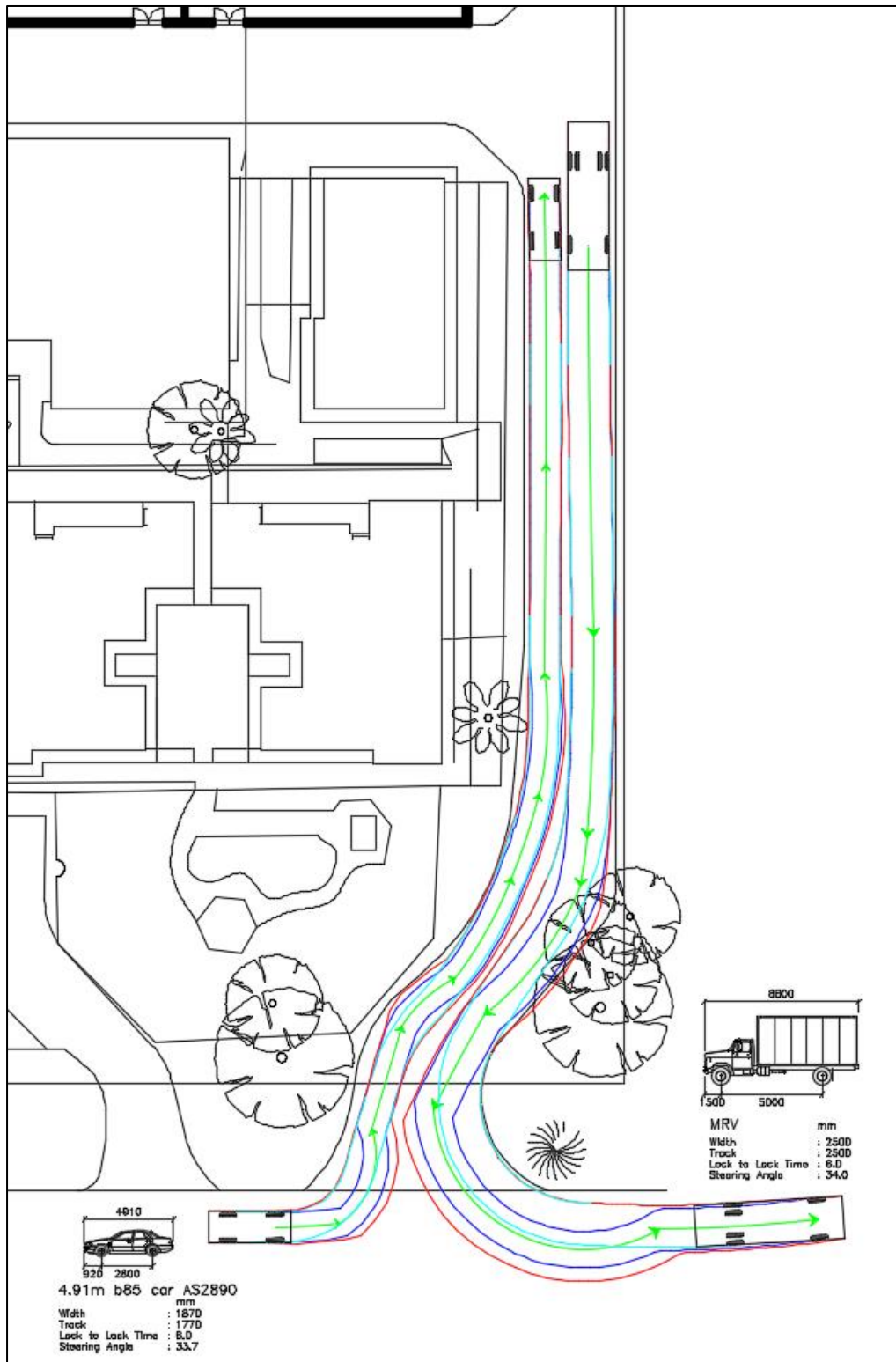


Figure 11: Passenger Vehicle Entering while an MRV Exits - Car Park B

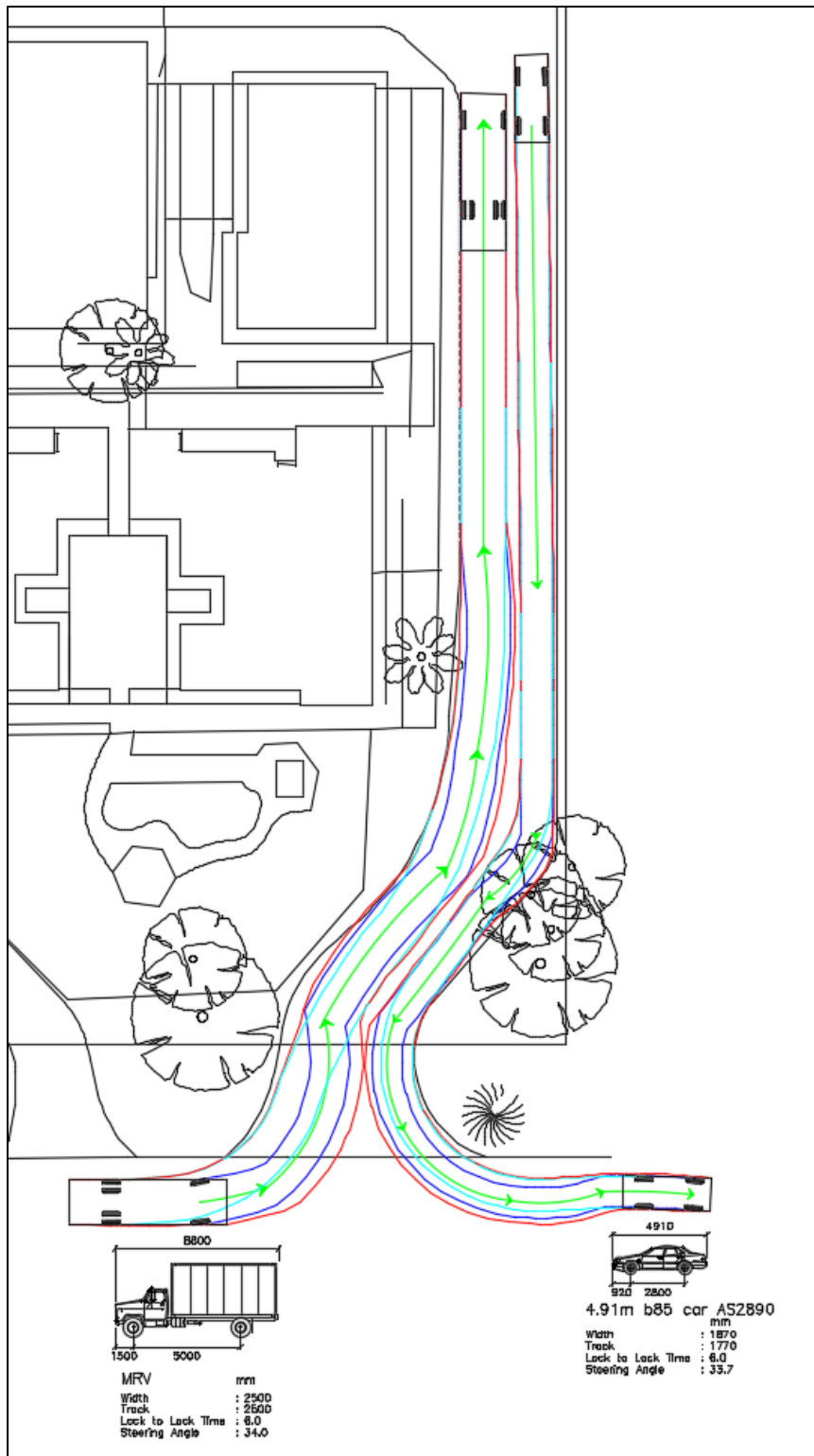


Figure 12: Passenger Vehicle Exiting while an MRV Enters - Car Park B

5. Traffic Impact Assessment

A traffic impact assessment was undertaken to determine in potential impacts caused by the proposed development upon the local road network. In estimating the anticipated number of daily and peak hour trips, the trip rates stipulated in the *RMS Guide to Traffic Generating Developments (2002)* have been used. In relation to 'Housing for aged and disabled persons', this document stipulates the following daily and peak hour trips rates;

- Daily vehicle trips = 1 - 2 per dwelling
- Evening peak hour vehicle trips = 0.1 - 0.2 per dwelling

Adopting the higher end values of the trip rates stipulated above, for conservative estimation, the proposed 80 bed (dwelling) expansion of the existing nursing home will generate some 160 daily trips and 16 peak hour trips.

The above established daily and peak hour trips for the proposal can be considered as a good conservative estimate. In any case, the derived peak hour traffic generation level for the proposed site is considered to be low. The estimated 16 peak hour trips will likely include a split of 50% in and 50% out trips (i.e. some 8 trips entering the site and 8 trips existing the site, in the peak hour period). These trips will generally be spread out across the hour (i.e. no bunched arrivals or departures are expected).

All these trips will be realised at the midblock of Valencia Road. It is noted that Valencia Road is a local road, which predominantly caters for the low density residential dwellings located on either side. Therefore, the existing levels of through traffic on Valencia Road is expected to be well below its capacity. As a result, the predicted peak hour traffic generated from the proposal is unlikely to eventuate into any adverse impacts on existing traffic conditions within the site vicinity.

6. Conclusions

APEX Engineers were engaged by Mr. Dinu Ekanayake to provide a traffic impact assessment as a part of the development application for the proposed Valencia Aged Care development at 24 Valencia Road in Carmel WA.

The subject proposal seeks to expand the operations of the existing nursing home located at 24 Valencia Road in Carmel. It is understood that the existing nursing home currently includes a total of 66 beds and 14 staff members (staff to patient ratio of 1:5). The proposed development seeks to construct a new building within the land located at the rear of the existing nursing home. The proposed building will include 80 beds with 14 staff members.

A parking provision assessment was undertaken using the parking rates prescribed in Table 3 of Shire of Kalamunda Local Planning Scheme No. 3 for 'Aged Residential Care' developments. Accordingly, a statutory parking provision requirement of 45 spaces was established for the overall site (existing + proposed components). The existing site currently includes 24 on-site car parking spaces at the site frontage. The proposed development includes provision of 21 additional car spaces (including two disability accessible car spaces) at two locations. Therefore, the overall parking provision on-site is 45 car spaces, which satisfies the Council DCP parking provision requirement.

The proposed car park design was assessed with reference to the AS 2890.1:2004, AS 2890.2:2002 and AS 2890.6:2009. It was found that the overall design, were in compliance with the relevant design standards. The swept path assessments undertaken confirmed that all anticipated critical vehicle movements can be accommodated within the proposed design constraints.

The daily and peak hour trip generations for the proposed development were determined from the trip rates stipulated in the Guide to Traffic Generating

Developments (RMS, 2002) in relation to 'Housing for aged and disabled persons'. Adopting the higher end values of the trip rates offered within this guide, the proposed 80 bed expansion of the existing nursing home will generate some 160 additional daily trips and 16 additional peak hour trips. The established peak hour traffic generation level for the proposed site is considered to be low, since the 16 peak hour trips will likely include a split of 50% in and 50% out trips (i.e. some 8 trips entering the site and 8 trips exiting the site, in the peak hour period). These trips will generally be spread out across the hour (i.e. no bunched arrivals or departures are expected). All these trips will be realised at the midblock of Valencia Road. It is noted that Valencia Road is a local road, which predominantly caters for the low density residential dwellings located on either side. Therefore, the existing levels of through traffic on Valencia Road is expected to be well below its capacity. As a result, the predicted peak hour traffic generated from the proposal is unlikely to eventuate into any adverse impacts on existing traffic conditions within the site vicinity.

In light of the above, the proposed development is expected to accommodate its own parking demand and will impose generally negligible traffic impacts to the local road network.