apex ENGINEERS

adding value through resilient engineering

Traffic Impact Assessment

26 – 30 Cutler Drive, Wyong NSW 2259

October 2022

Type of Assessment: Traffic Impact Assessment

Site Location: 26 – 30 Cutler Drive, Wyong NSW 2259

Prepared for: Barry Rush and Associates

Prepared by: APEX Engineers

ABN 52 487 919 980

www.apexengineers.com.au

TABLE OF CONTENTS

LIST OF FIGURES AND TABLES

1. INTRODUCTION

APEX Engineers were engaged by Barry Rush and Associates to provide a traffic impact assessment as a part of the development application for the proposed Seniors Housing development, located at 26 – 30 Cutler Drive in Wyong ('subject site').

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 relevant statutory parking provision requirements applicable to the subject development;
- Section 4 Provides a review of the proposed car park design under the relevant 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 is located at 26 – 30 Cutler Drive in Wyong and currently includes 3 separate lots/residential dwellings. The overall site includes 1,704 sqm of land area. The site vicinity is predominantly characterised by low-density residential dwellings.

At the site frontage, Cutler Drive includes one traffic lane and one kerbside parking lane in each direction with a double barrier median along the centre of the carriageway.

Figure 1 below highlights the site location from an aerial perspective.

Figure 1: Location of the subject site

2.2 Details of the Proposed Development

The subject proposal involves consolidating the existing 3 lots at 26, 28 and 30 Cutler Drive to construct a multi-dwelling Seniors Housing development under the State Environmental Planning Policy (Housing) 2021 (Housing SEPP), with the subject development application to be made by a social housing provider. The proposed development includes 12 dwellings (5 x 1-bedroom dwellings + 7 x 2-bedroom dwellings).

The proposal includes provision for 8 on-site car parking spaces (including 2 disability-accessible spaces). These car spaces will be accessed through a driveway off Cutler Drive. Figure 2 shows the proposed site layout plan.

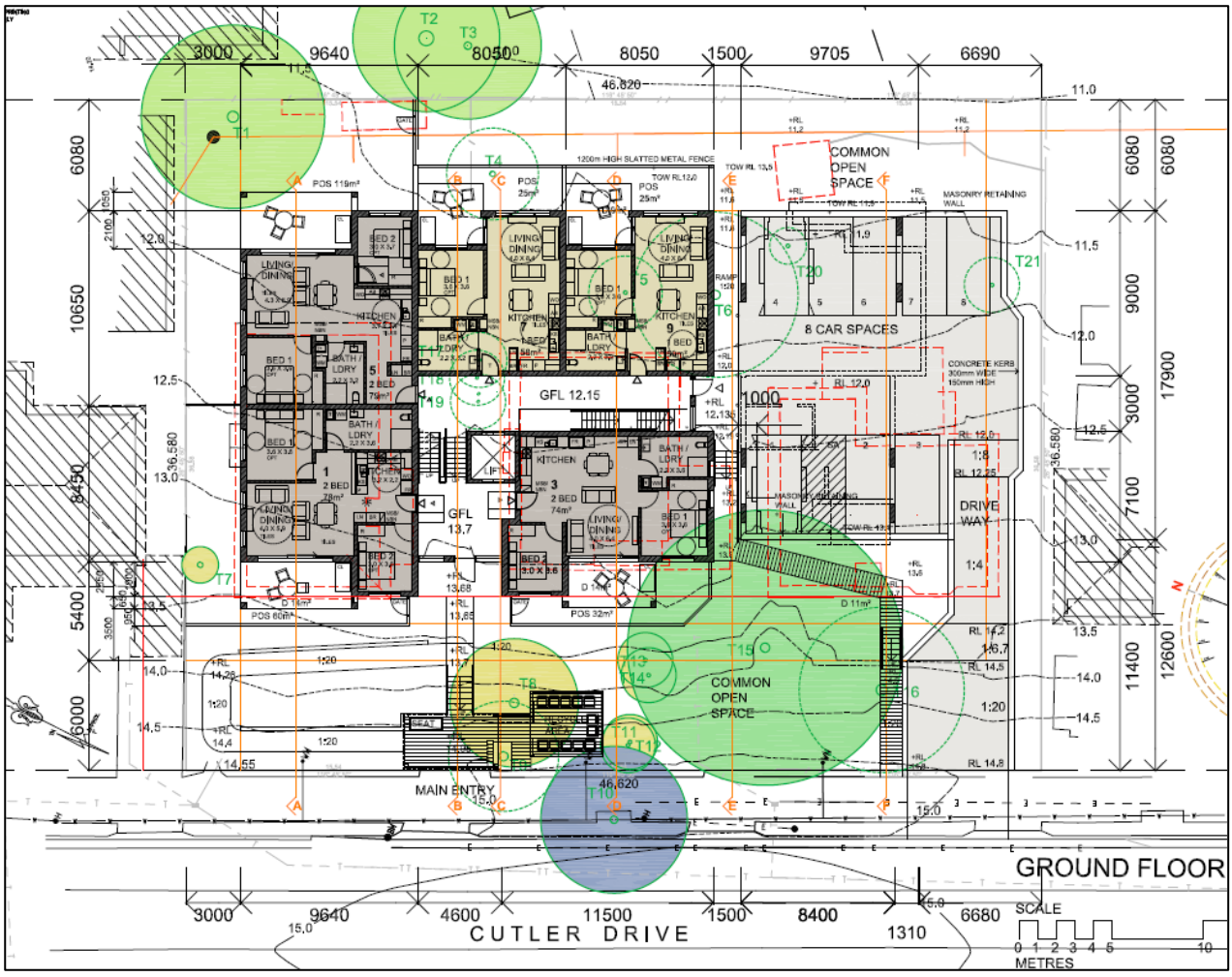

Figure 2: Site layout plan

2.3 Public Transport Services

The subject site has easy access to bus stops on Pacific Highway (350m from the site, 5 minute walk) that service the following bus routes (in both directions):

- 16 (Wyong to The Entrance)
- 19 (Wyong to Gosford)
- 26 (Wallsend to Newcastle West via Kotara & Newcastle Interchange)
- 78 (Tuggerah to Lake Haven via Wadlaba & Warnervale)
- 79 (Lake Haven to Tuggerah via Woongarrah, Hamlyn Terrace & Wattanobi) *
- 80 (Tuggerah to Lake Haven via Pacific Hwy & Lake Haven Dr)
- 81 (Lake Haven to Tuggerah via Kanwal, Wyongah & Wadalba)
- 93 (Bulli via East Woonona)
- 94 (Budgewoi to Tuggerah via San Remo & Wyong)

**This service can also be accessed on Cutler Drive, approx. 100m (1-minute walk) from the site*

Figure 3 shows the local public transport network map for the subject site.

Figure 3: Local public transport services

3. PARKING PROVISION ASSESSMENT

In relation to independent living units, Section 108(2)(j) of the State Environmental Planning Policy (Housing) 2021 (Housing SEPP) states a requirement of 1 car space for every 5 dwellings when the development application is made by a social housing provider (which is the case for the current proposal).

Applying the above parking rate, the proposed development with 12 dwellings should provide 2 car parking spaces (rounded to the nearest whole number).

The proposed development includes provision for a total of 8 car spaces, which include 2 disability-accessible car spaces. Therefore, the proposed development satisfies the relevant minimum parking provision requirement.

4. CAR PARKING DESIGN REVIEW

This section provides a review of the proposed on-site car parking design against the minimum requirements in the Australian Standards. This section shall be read in conjunction with the complete site layout plans submitted as a part of the Development Application.

Figure 4 illustrates the proposed on-site car parking layout plan at the subject site.

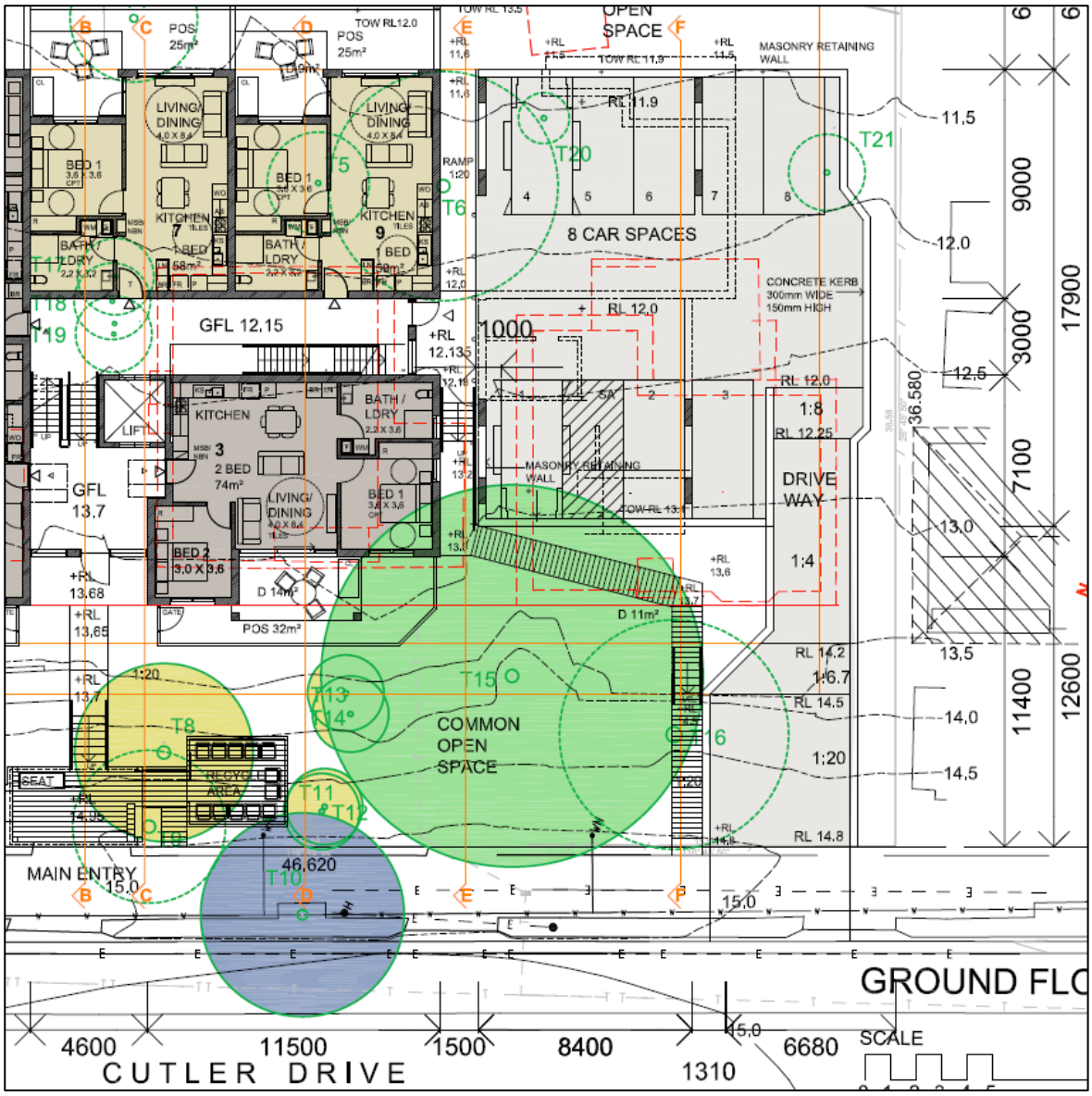

Figure 4: Proposed on-site car parking layout

4.1 Regular Car Space Dimensions

Based on AS 2890.1:2004, 90-degree car spaces which are categorised under user class 1A (residential parking) are required to be 2.4m wide by 5.4m long with 5.8m of aisle width.

The proposed regular car spaces comply with the above dimensional requirements.

4.2 Disability Accessible Car Space Dimensions

Based on AS 2890.6 – 2009, the disability-accessible car spaces should be designed as follows:

- The disability-accessible car parking space should be designed at 2.4m width and 5.4m length (with 5.8m aisle width);
- A shared space of equal dimensions shall be provided adjacent to the car parking space; and
- Both the car parking space and the shared space should indicate appropriate line markings. The shared space should include a bollard in order to prevent motorists from parking at this location.

Both proposed disability-accessible car spaces comply with the above requirements.

4.3 Lateral Clearances

At blind aisles (end of the 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 the corner spaces. This required 1m extension is available within the proposed design (adjacent to car spaces 1 and 4).

When car spaces are located adjacent to vertical obstructions (>150mm high), a further 300mm clearance is required for the car space width for door opening. This requirement has been satisfied in car spaces 1, 3, 4 and 8 which include 300mm clearance from adjacent walls.

4.4 Gradients within Parking Modules

AS 2890.1 states that parking modules, at maximum, should have a grade of 1 in 16 (measured in any direction other than parallel to the angle of parking). In addition, AS 2890.6 states that the disability-accessible car parking space and the shared area shall not exceed the grade of 1:40 in any direction. The proposed car parking modules are at grade and therefore comply with the above requirements.

4.5 Driveway Width

Based on AS 2890.1, the proposed access to the car parking area (off Cutler Drive) is categorised under access category 1 (<25 car spaces, frontage road local). Therefore, the entry/exit combined access points should provide at least 3m in width.

Notwithstanding the above, provision has been made at the driveway entry point to accommodate two-way movements - i.e., a width of 5.5m (with 300mm clearance on either side from obstructions) is available for a length of 6m from the site boundary.

The remaining ramp section has been designed as a one-way ramp. Based on AS 2890.1, one-way ramps should be designed to include a minimum width of 3m. In addition, 300mm clearance is required on either side of the ramp if bound by walls. Accordingly, the proposed one-way ramp section has been designed at a 3.6m width (with 300mm clearance on either side from obstructions).

4.6 Gradient of Access Driveway

In relation to the gradient of the access driveway, AS 2890.1 requires the first 6m into the car park to include a maximum grade of 5% (1 in 20). The first 6m of the driveway into the proposed car park (off Cutler Drive) includes a maximum grade of 5%.

4.7 Driveway Grade

AS 2890.1-2004 states the grade requirements for straight ramps at private or residential car parks as follows:

(i) Longer than 20 m—1 in 5 (20%) maximum.

(ii) Up to 20 m long—1 in 4 (25%) maximum. The allowable 20 m maximum length shall include any parts of grade change transitions at each end that exceed 1 in 5 (20%).

(iii) A stepped ramp comprising a series of lengths each exceeding 1 in 5 (20%) grade shall have each two lengths separated by a grade of not more than 1 in 8 (12½%) and at least 10 m long.

Furthermore, where the difference in grade between two sections of ramp or floor is greater than 1:8 (12.5 percent) for a summit grade change, or greater than 1:6.7 (15 percent) for a sag grade change, the ramp must include a transition section of at least 2 metres to prevent vehicles scraping or bottoming.

The length of the proposed driveway ramp is less than 20m and it includes a maximum grade of 1:4 (25%), which complies with the above requirements. The grade transitions at either end of the 25% grade ramp section have been facilitated by transition sections of 2m at 1:8 (12.5%) and 1:6.7 (15%) grades. The transitions of grades are therefore compliant with the relevant requirements.

4.8 Column Positioning

All car spaces have been designed in accordance with Figure 5.2 of AS 2890.1 which provides the design envelop around parked vehicles to be kept clear of columns, walls and obstructions.

4.9 Headroom Clearance

For the proposed car park, the design vehicle is the disability-accessible car – based on AS 2890.6 this vehicle requires a headroom of 2.5m minimum above the car space and the shared space (also a minimum headroom clearance of 2.2m is required along the path of the vehicle to and from the car spaces). Accordingly, provision has been made for a minimum headroom clearance of 2.2m throughout the path of vehicles and 2.5m above the disability-accessible car spaces and the shared space.

4.10 Vehicle Manoeuvrability Conditions

In order to investigate the anticipated manoeuvrability conditions of vehicles using the proposed car spaces, swept path assessments were undertaken using AutoTURN software (the industry standard vehicle swept path assessment software). Figure 5 illustrates the template of the 85th percentile vehicle (B85 vehicle) used to simulate the swept paths (it is noted that this 85th percentile vehicle template is developed according to the dimensions specified in AS 2890.1-2004).

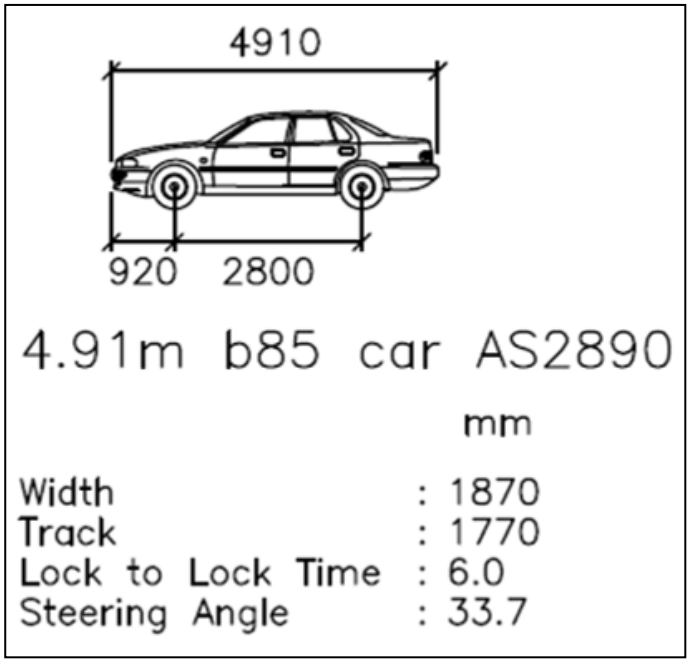

Figure 5: Template of the 85th percentile vehicle (AS2890.1-2004)

Figures 6-12 illustrate the results obtained from the swept path analysis.

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 Black colour of the swept paths indicates the vehicle body (the Green colour line indicated the centreline of the swept path while the dashed Red colour lines indicate the 300mm vehicle body clearance envelop).

The results of the swept paths reveal the following:

- All car spaces (except car spaces 2 and 3) can be accessed without requiring any correctional manoeuvres.
- Vehicles using car spaces 2 and 3 will require a single correction when exiting due to their location relating to the ramp landing.

In summary, the above identified level of manoeuvrability is considered acceptable for a low turnover residential development, where the drivers are regular users familiar with the layout and constraints of the car park.

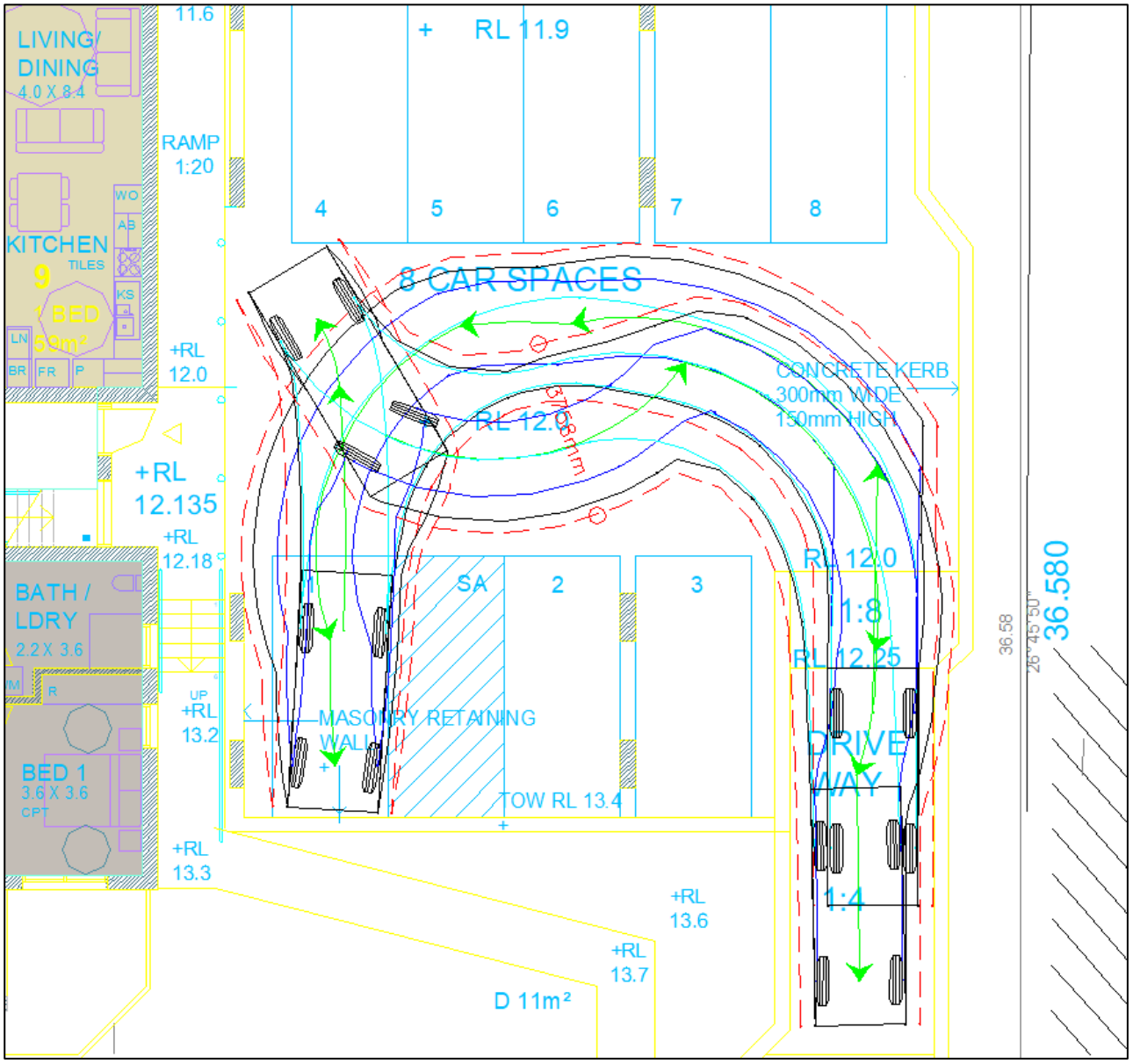

Figure 6: Entry and exit movements at car space 1

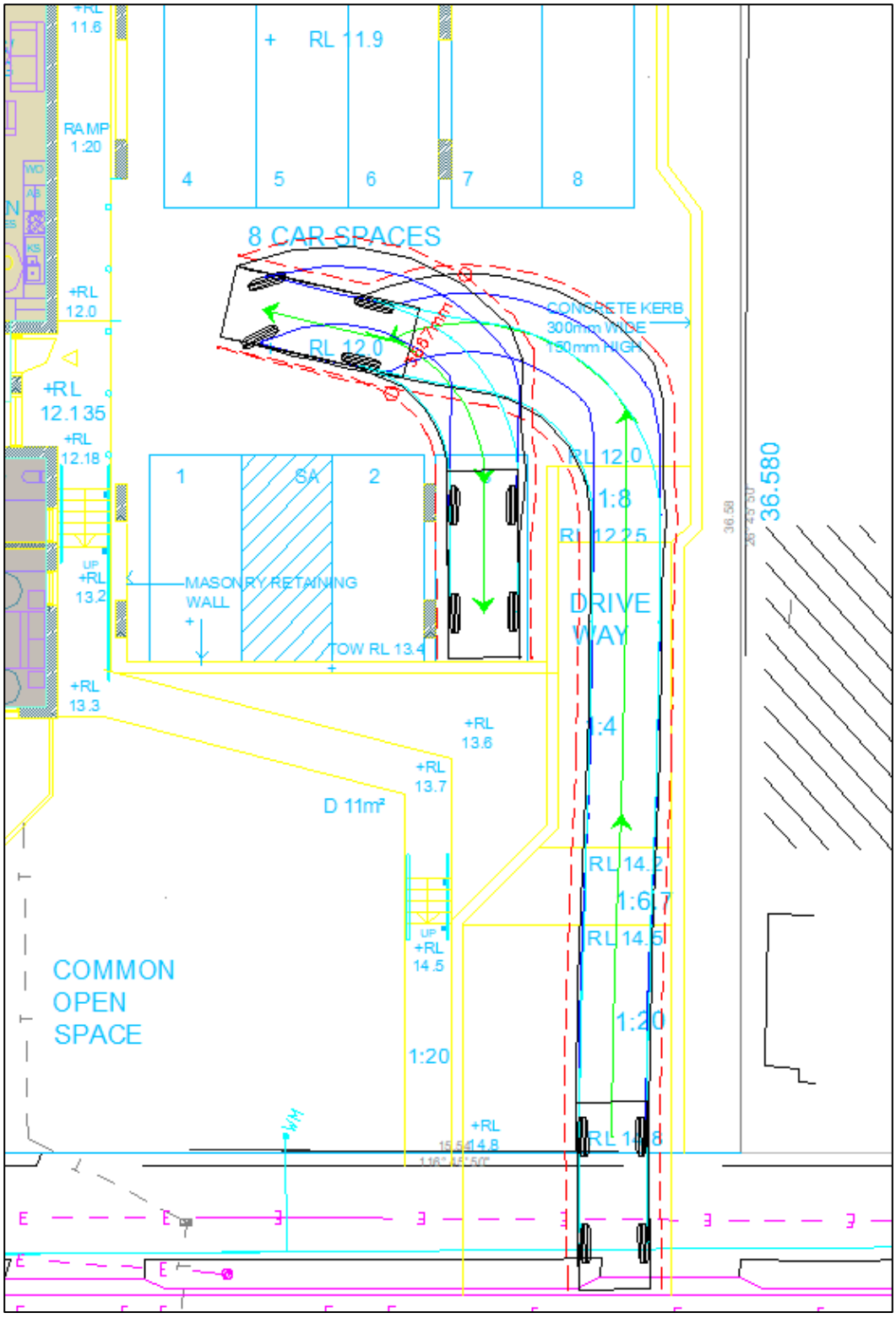

Figure 7: Entry movement at car space 3 (similarly for car space 2)

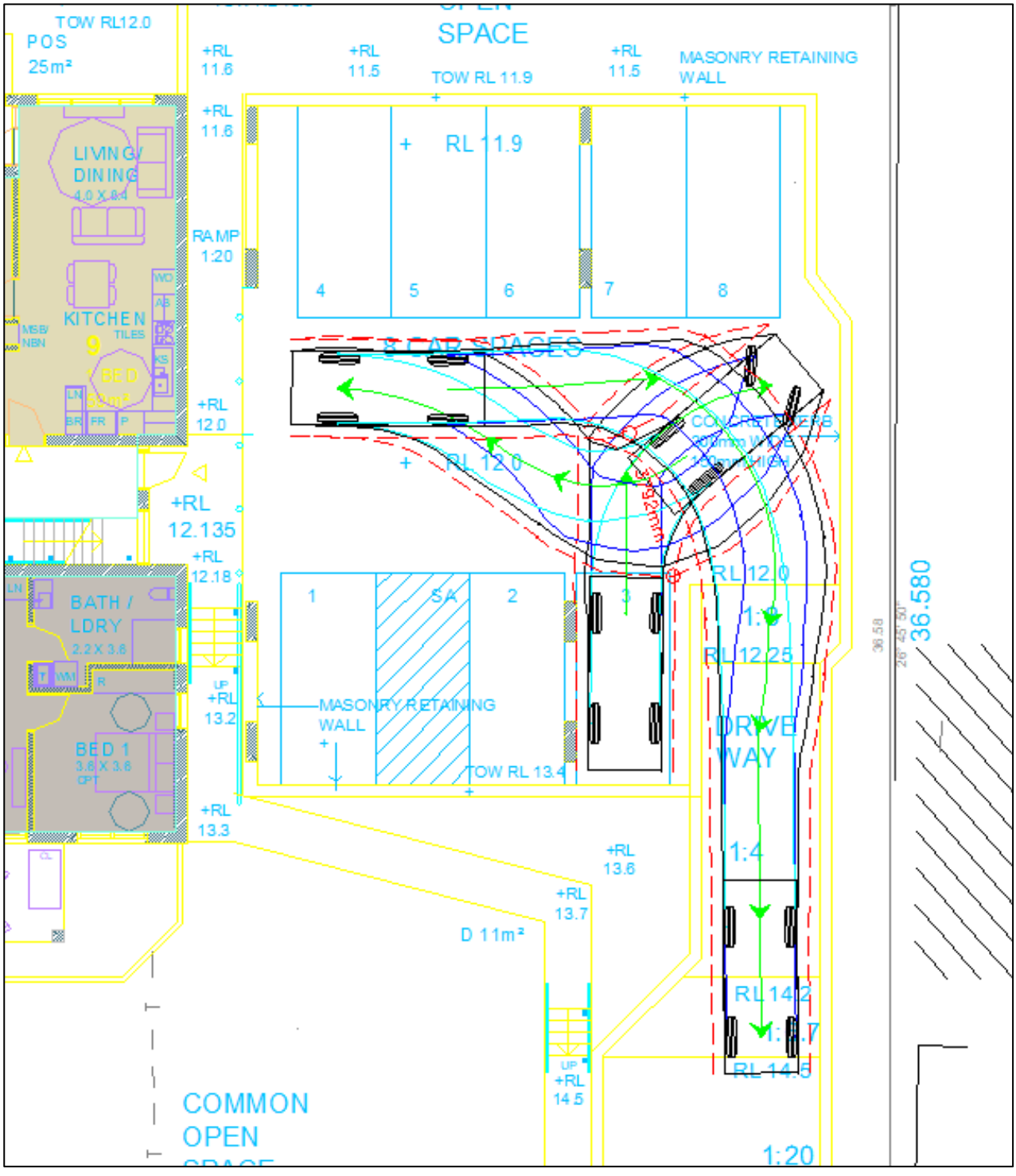

Figure 8: Exit movement at car space 3 (similarly for car space 2)

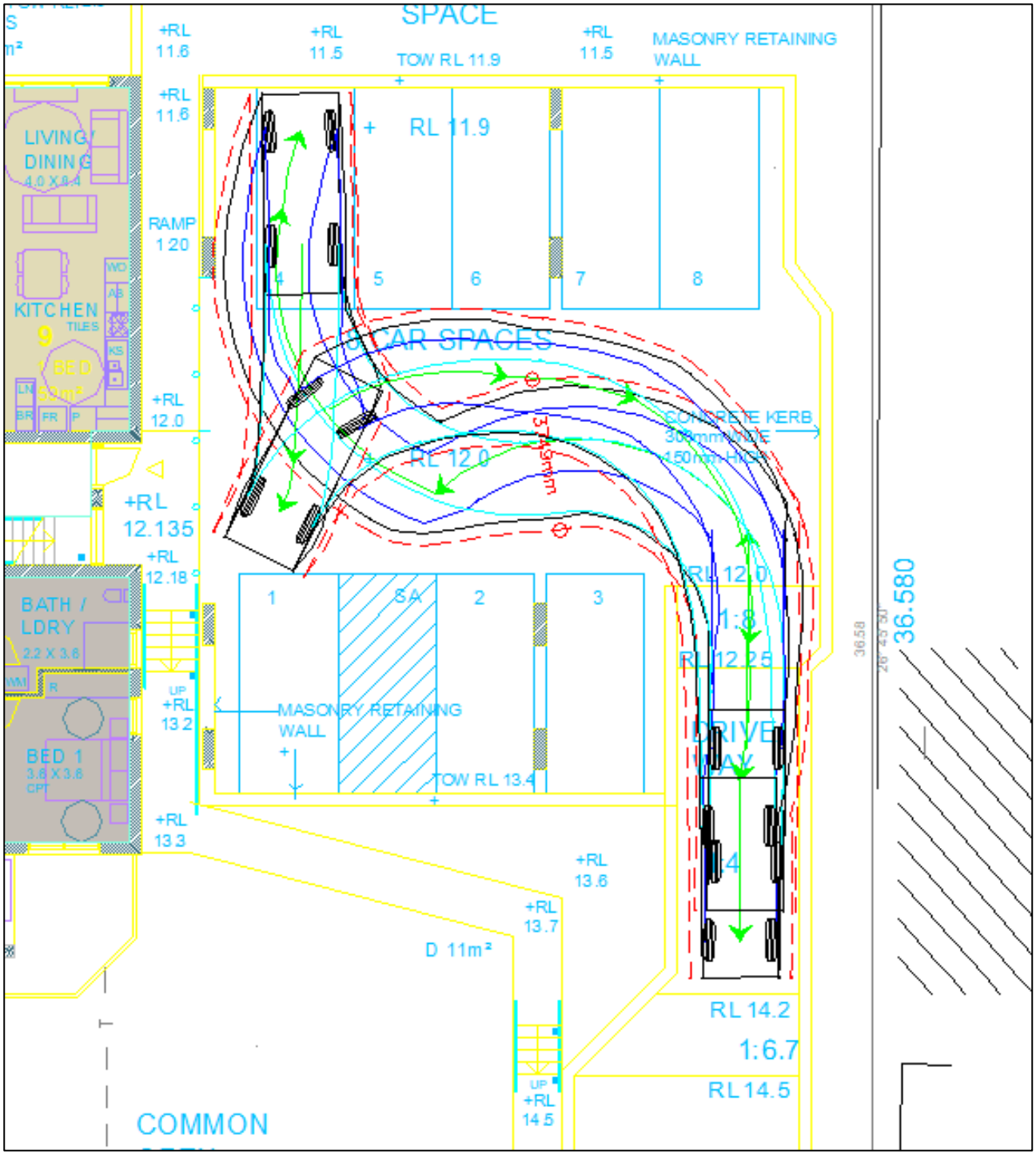

Figure 9: Entry and exit movements at car space 4

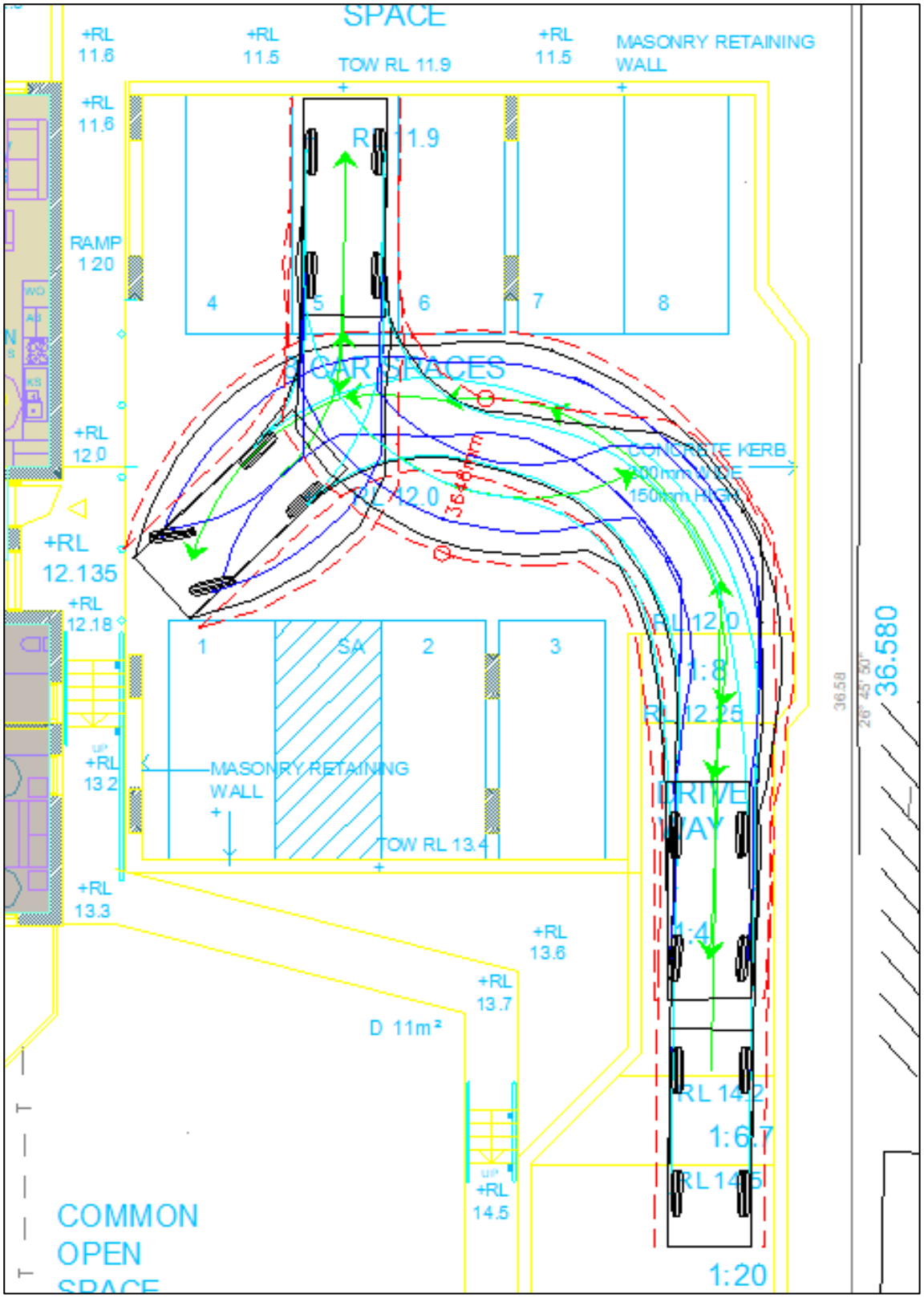

Figure 10: Entry and exit movements at car space 5

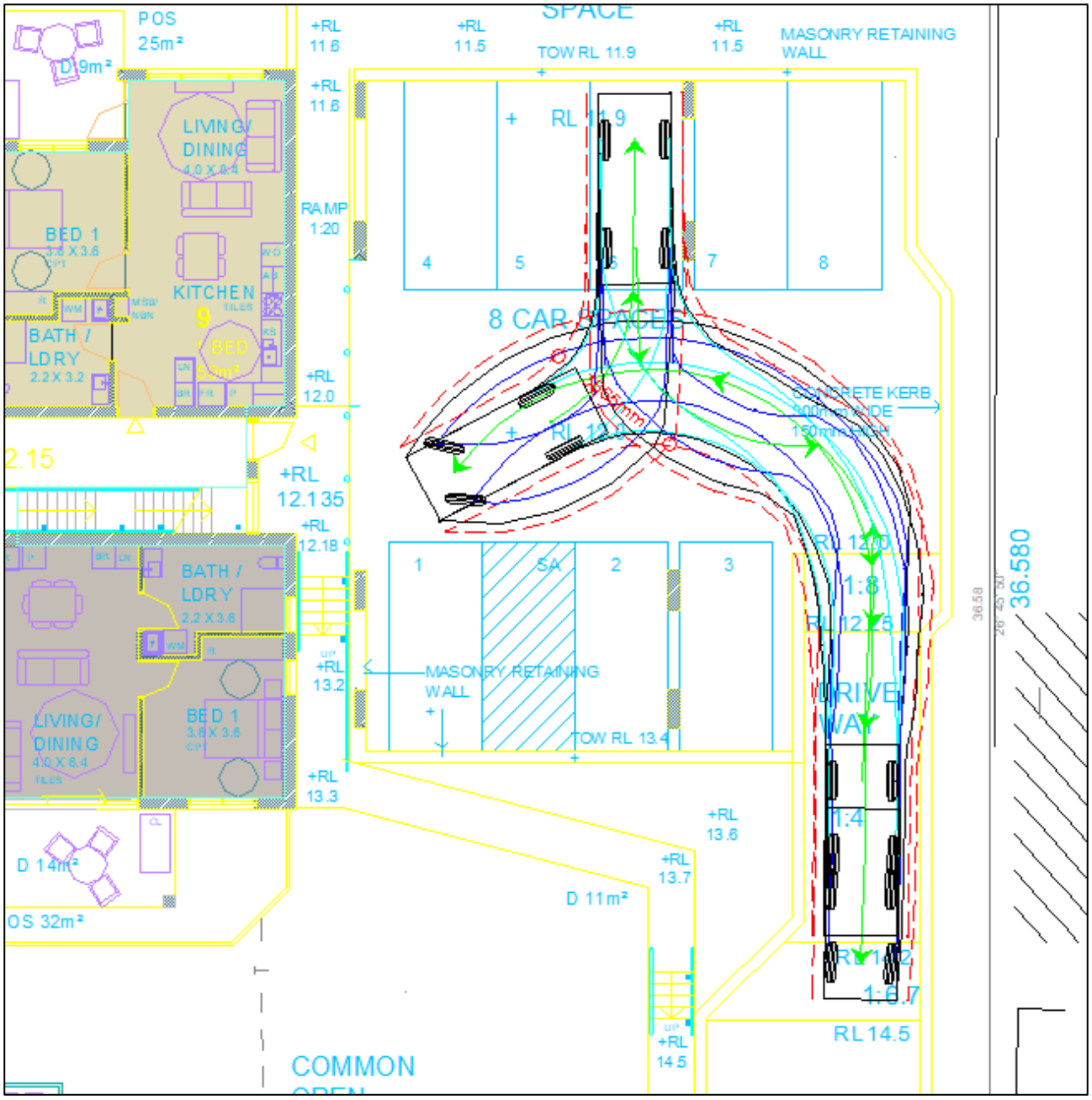

Figure 11: Entry and exit movements at car space 6 (similarly for car space 7)

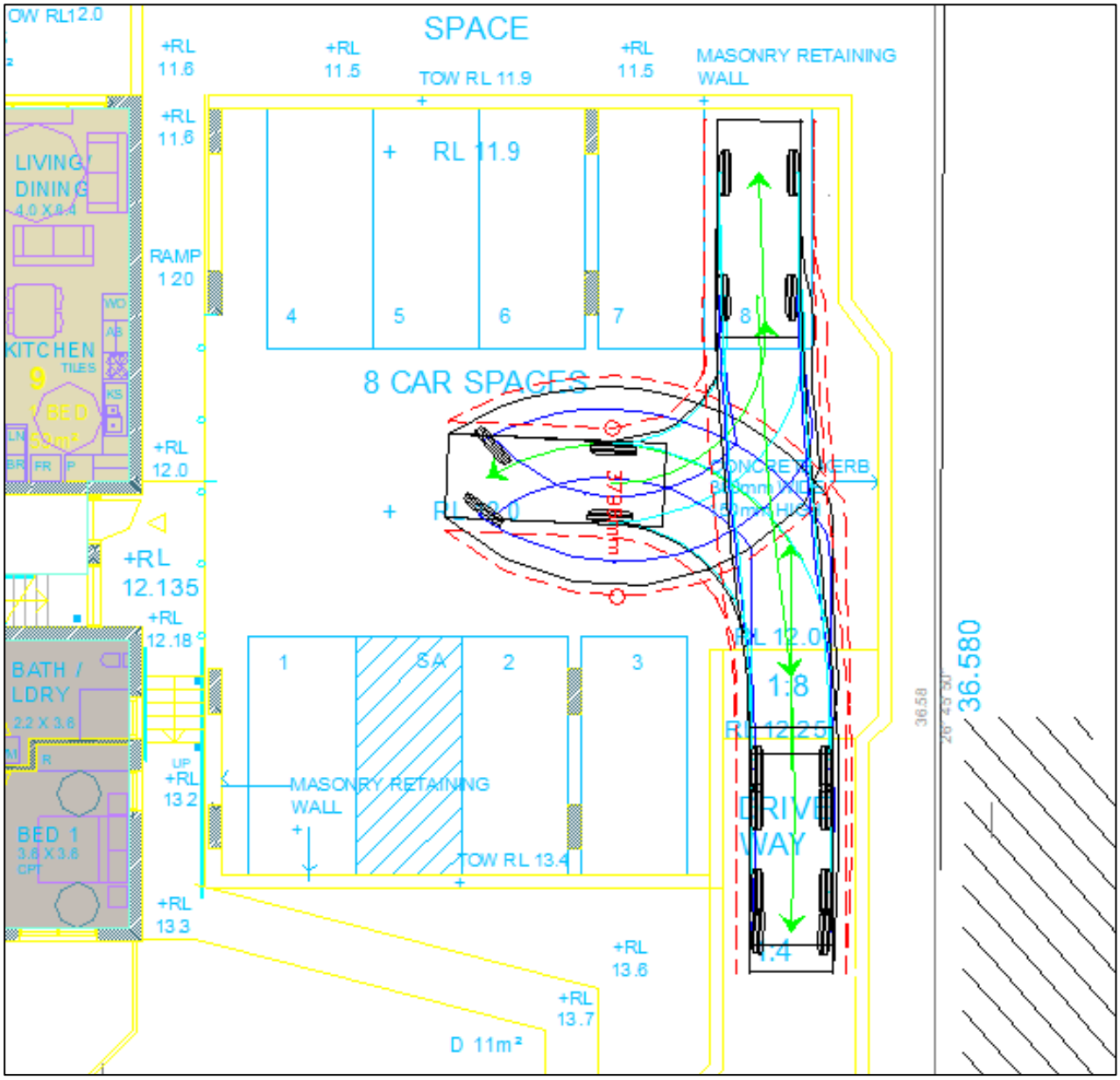

Figure 12: Entry and exit movements at car space 8

4.11 Pedestrian Sight Distance Availability

AS 2890.1 requires a sight triangle of 2.5m length by 2m width, to be provided at the site egress location, to ensure sufficient sight distance availability for pedestrians. This requirement is illustrated in Figure 13.

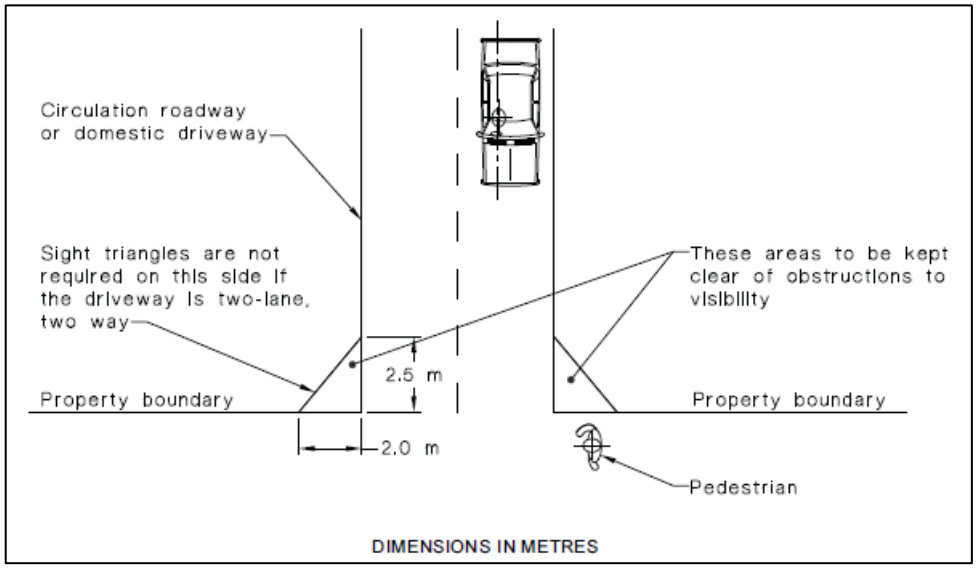

Figure 13: Pedestrian sight distance requirement (AS 2890.1)

Figure 14 illustrates the preservation of the pedestrian sight triangle at the proposed vehicle access point off Cutler Drive. It is noted that since the first 6m of the driveway is designed to cater for two-way movements, the pedestrian sight triangle is only required towards the left-hand side of a vehicle exiting the site. As can be seen, the required sight triangle is preserved within the proposed design, within the subject site.

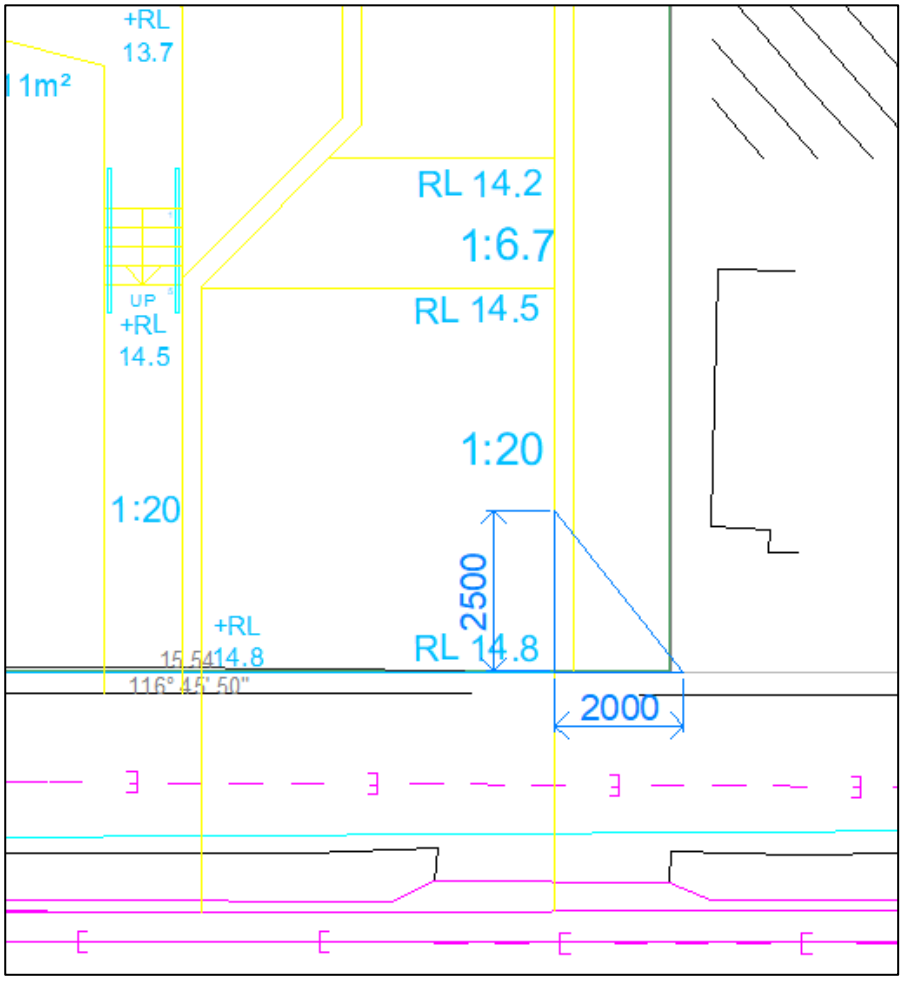

Figure 14: Proposed preservation of the pedestrian sight triangle

5. TRAFFIC IMPACT ASSESSMENT

A traffic impact assessment was undertaken to determine the potential impacts caused by the proposed development on the local road network. According to the *Guide to Traffic Generating Developments – Updated Traffic Surveys TDT 2013 / 04a (Transport for NSW, 2013)*, housing for seniors has the following trip-generation levels:

- Weekday daily vehicle trips = 2.1 per dwelling, and
- Weekday peak hour vehicle trips = 0.4 per dwelling*

**The morning site peak hour does not generally coincide with the network peak hour*

Applying the above rates to the proposed development which includes 12 dwellings, leads to the following trip generation levels:

- 26 daily trips, and
- 5 peak hour trip.

The above trips will manifest as turning movements at the midblock of Cutler Drive.

The above-determined daily and peak hour trips indicate a conservative (on the high side) estimate since the traffic generation potential of the existing three dwellings within the subject land has not been offset. In any event, the traffic generation potential of the proposal is considered to be minor and is therefore not expected to have any noteworthy impact on the existing traffic operations on Cutler Drive.

6. CONCLUSIONS

APEX Engineers were engaged by Barry Rush and Associates to provide a traffic impact assessment as a part of the development application for the proposed Seniors Housing development, located at 26 – 30 Cutler Drive in Wyong.

The subject site is serviced by several bus routes, that can be accessed from bus stops located on Pacific Highway, within a 5-minute walk of the subject site.

Based on the parking rates prescribed in Section 108(2)(j) of the State Environmental Planning Policy (Housing) 2021 (Housing SEPP), the proposed development should provide 2 car parking spaces. The proposed development includes provision for a total of 8 car spaces, which include 2 disability-accessible car spaces. Therefore, the proposed development satisfies the relevant minimum parking provision requirement.

The proposed car parking design was assessed with reference to AS 2890.1 and AS 2890.6. It was found that the proposed car park design is generally compliant with the relevant design requirements. The swept path assessments carried out revealed sufficient manoeuvrability conditions for vehicles using the proposed car park.

The daily and peak hour trip generations for the proposed development were determined from the trip rates provided in the *Guide to Traffic Generating Developments – Updated Traffic Surveys TDT 2013 / 04a (Transport for NSW, 2013)* for housing for seniors. Based on these rates, the proposed development is estimated to generate 5 peak hour trips and 26 daily trips. This number of trips is considered minimal and is unlikely to eventuate into any noticeable impacts on the local road network.

apex
ENGINEERS

adding value through
resilient engineering

m 0416 137 635
e info@apexengineers.com.au
w www.apexengineers.com.au