apex ENGINEERS

adding value through resilient engineering

Traffic Impact Assessment

21-23 Phillips Avenue & 5 Richardson Avenue,
Regents Park NSW 2143

March 2021

Type of Assessment: Traffic Impact Assessment

Site Location: 21-23 Phillips Avenue & 5 Richardson Avenue, Regents Park NSW 2143

Prepared for: Barry Rush & Associates Pty Ltd

Prepared by: APEX Engineers

ABN 52 487 919 980

www.apexengineers.com.au

Disclaimer

TABLE OF CONTENTS

1. Introduction 4
2. Background and Existing Conditions 4
   - 2.1 Site Description and Local Road Network 4
   - 2.2 Details of the Proposed Development 6
   - 2.3 Public Transport Services 6
3. Parking Provision Assessment 8
4. Car Parking Design Review 10
   - 4.1 Regular Car Space Dimensions 11
   - 4.2 Disability Accessible Parking Spaces 11
   - 4.3 Circulation / Vehicle Conflicts 12
   - 4.4 Gradients within Parking Modules 12
   - 4.5 Gradient of Access Driveway 12
   - 4.6 Driveway Grade 13
   - 4.7 Vehicle Manoeuvrability Conditions 13
   - 4.8 Pedestrian Sight Distance Availability 17
5. Traffic Impact Assessment 21
6. Conclusions 22

LIST OF FIGURES AND TABLES

Figure 1: Location of the subject site 5
Figure 2: Phillips Avenue as seen at the site frontage 5
Figure 3: Local public transport map 7
Figure 4: Proposed ground level car parking plan 10
Figure 5: Template of an 85th percentile vehicle (as per AS2890.1-2004) 14
Figure 6: In and out movements of a vehicle using car space 2 15
Figure 7: In and out movements of a vehicle using car space 3 15
Figure 8: In and out movements of a vehicle using car space 4 16
Figure 9: In and out movements of a vehicle using car space 5 16
Figure 10: In and out movements of a vehicle using car space 6 17
Figure 11: Pedestrian sight distance requirement (AS 2890.1) 17
Figure 12: Pedestrian sight distance preservation 18
Figure 13: Pedestrian sight distance availability on Richardson Avenue driveway 19
Figure 14: Existing boundary wall adjacent the driveway on Richardson Avenue 20

1. INTRODUCTION

APEX Engineers were engaged by Barry Rush & Associates Pty Ltd to provide a traffic impact assessment as a part of the development application for the proposed Seniors Living development (under SEPP SL Housing, with the subject development application to be made by a social housing provider), located at 21-23 Phillips Avenue & 5 Richardson Avenue in Regents Park.

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 for the subject development;
- Section 4 Provides a review of the proposed car park design in accordance with 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 21-23 Phillips Avenue & 5 Richardson Avenue in Regents Park and comprises of 3 residential lots. The lots at 23 Phillips Avenue and 5 Richardson Avenue currently include single residential dwellings with vehicle access off Richardson Avenue. The immediate site vicinity is characterised predominantly by low density residential uses.

At the site frontage, both Phillips Avenue and Richardson Avenue are local road with undivided carriageways catering for bi-directional traffic, with time unrestricted kerbside parking between vehicle crossovers.

Figure 1 below highlights the site location from an aerial perspective while Figure 2 illustrates Phillips Avenue as seen at the site frontage.

Figure 1: Location of the subject site

Figure 2: Phillips Avenue as seen at the site frontage

2.2 Details of the Proposed Development

The subject proposal involves demolition of the existing structures at the subject site and subsequent construction of a two-storey multi dwelling Seniors Living development (under SEPP SL Housing, with the subject development application to be made by a social housing provider). The proposed development will include a total of 12 residential units (6 x 1-bedroom units + 6 x 2-bedroom units) with a total of 6 on-site car parking spaces including 3 disability accessible car spaces (with vehicle access off Phillips Avenue for 5 car spaces and off Richardson Avenue for 1 car space).

2.3 Public Transport Services

The locality of the subject site was assessed for public transport options likely to be utilised by prospective tenants. The following bus services were identified as accessible from the subject site:

- Bus stops (in each direction) which serve Route 908 (Merrylands to Bankstown via Birrong & Auburn) are located on Fourth Avenue, 400m (5-minute walk) from the subject site.

At least one bus (Route 908) per hour services the above identified bus stops, between 6am and 7pm each day from Monday to Friday, between 8am and 6pm on Saturdays, and between 9am and 5pm on Sundays.

- Bus stops (in each direction) which serve Route 909 (Bankstown to Parramatta via Birrong & Auburn) are located on Kingsland Road, 300m (4-minute walk) from the subject site.

At least one bus (Route 909) per hour services the above identified bus stops, between 6am and 10pm each day from Monday to Friday, between 8am and 6pm on each Saturday and Sunday.

In addition to the above bus services, the residents can use train services from Regents Park station which is located 900m (12-minute walk) from the subject site. The Regents Park station services T3 (Bankstown) Line that connects Liverpool and Bankstown.

Figure 3 outlines the local public transport map for the subject site.

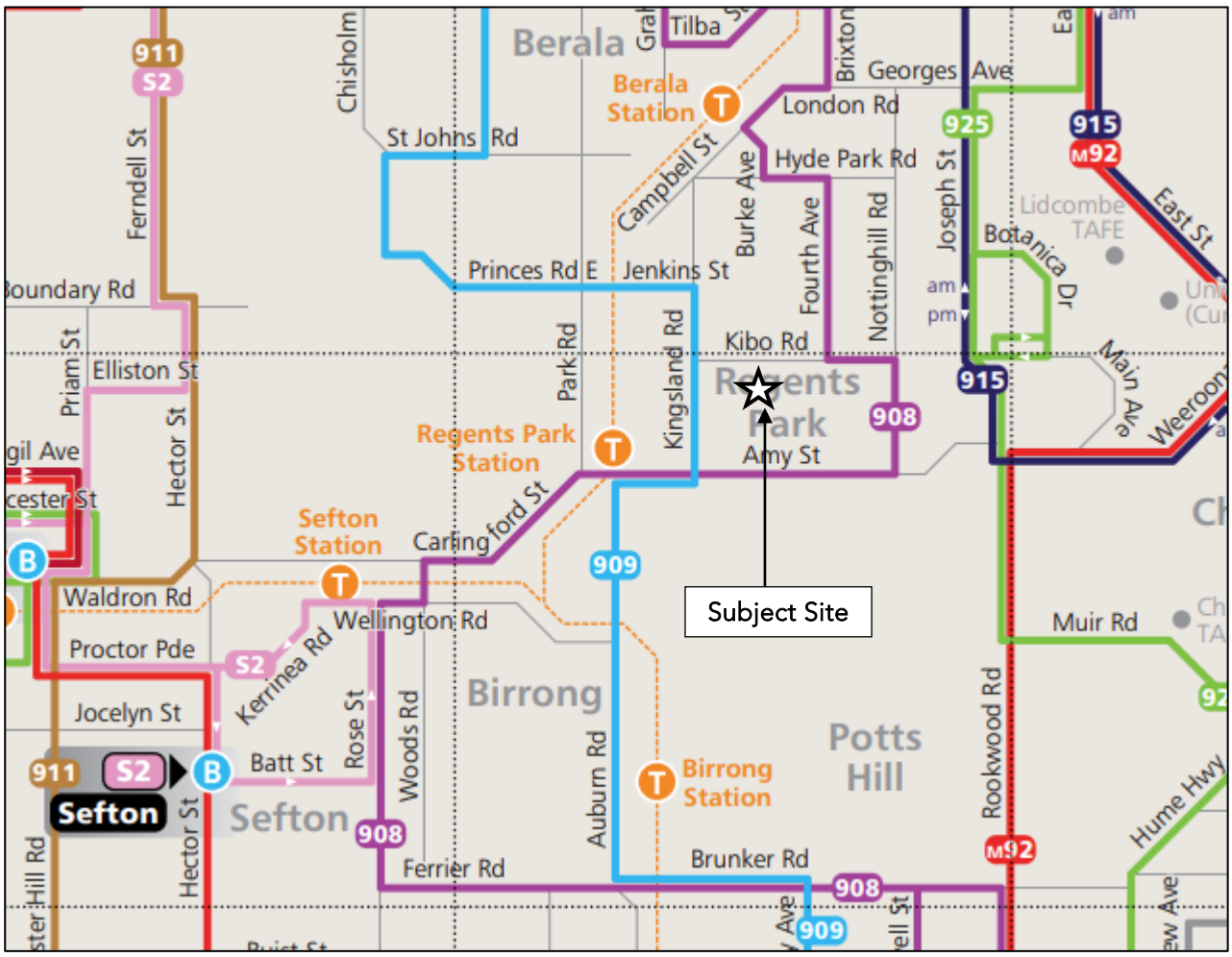

Figure 3: Local public transport map

3. PARKING PROVISION ASSESSMENT

The car parking provision requirements for the proposed development were determined based on two policy documents as follows:

1) State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004; and
2) State Environmental Planning Policy (Affordable Rental Housing) 2009.

In relation to self-contained dwellings, Division 4 of the State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 document stipulates a requirement of 1 car space for each 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 3 car parking spaces (rounded up). All three of these car spaces must comply with the requirements outlined in AS 2890.6 - 2009 (Off-street parking for people with disabilities). The proposed development includes provision for a total of 6 car spaces, which include 3 disability accessible car spaces. Therefore, the proposed development conveniently satisfies the relevant parking provision requirement based on Division 4 of the State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004.

Division 6 (Residential development—Land and Housing Corporation) of the State Environmental Planning Policy (Affordable Rental Housing) 2009, stipulates the following minimum car parking provision requirement for residential developments with 20 dwellings or less on a single site:

(i) for development on land in an *accessible area*—0.4 parking spaces for each dwelling containing 1 bedroom, 0.5 parking spaces for each dwelling containing 2 bedrooms and 1 parking space for each dwelling containing 3 or more bedrooms, or

(ii) for development that is not in an *accessible area*—0.5 parking spaces for each dwelling containing 1 bedroom, 1 parking space for each dwelling containing 2

bedrooms and 1.5 parking spaces for each dwelling containing 3 or more bedrooms

In the above policy, an *accessible area* means land that is within:

a) *800 metres walking distance of a public entrance to a railway station or a wharf from which a Sydney Ferries ferry service operates, or*

b) *400 metres walking distance of a public entrance to a light rail station or, in the case of a light rail station with no entrance, 400 metres walking distance of a platform of the light rail station, or*

c) *400 metres walking distance of a bus stop used by a regular bus service (within the meaning of the Passenger Transport Act 1990) that has at least one bus per hour servicing the bus stop between 06.00 and 21.00 each day from Monday to Friday (both days inclusive) and between 08.00 and 18.00 on each Saturday and Sunday.*

As discussed in Section 2.3, the subject site is located within approx. 300m from bus stops (in each direction) servicing bus route 909 that has a frequency which satisfies condition (c) above. Therefore, the subject site is within an accessible area.

Accordingly, adopting the parking rate for developments in accessible areas, the proposed development (with 6 x 1-bedroom units and 6 x 2-bedroom units) should provide a total of 6 car spaces. The proposed development includes provision for 6 car spaces (which include 3 disability accessible car spaces). Therefore, the proposed development satisfies the relevant parking provision requirement based on the State Environmental Planning Policy (Affordable Rental Housing) 2009.

4. CAR PARKING DESIGN REVIEW

This section will carry out the necessary checks to certify whether the proposed on-site car parking area has been designed to satisfy the minimum requirements outlined in the Australian Standards (AS 2890.1 and AS 2890.6). This section shall be read in conjunction with the complete site layout plans submitted as a part of the Development Application lodgement.

Figure 4 illustrates the ground level car parking layout plan for the proposed development.

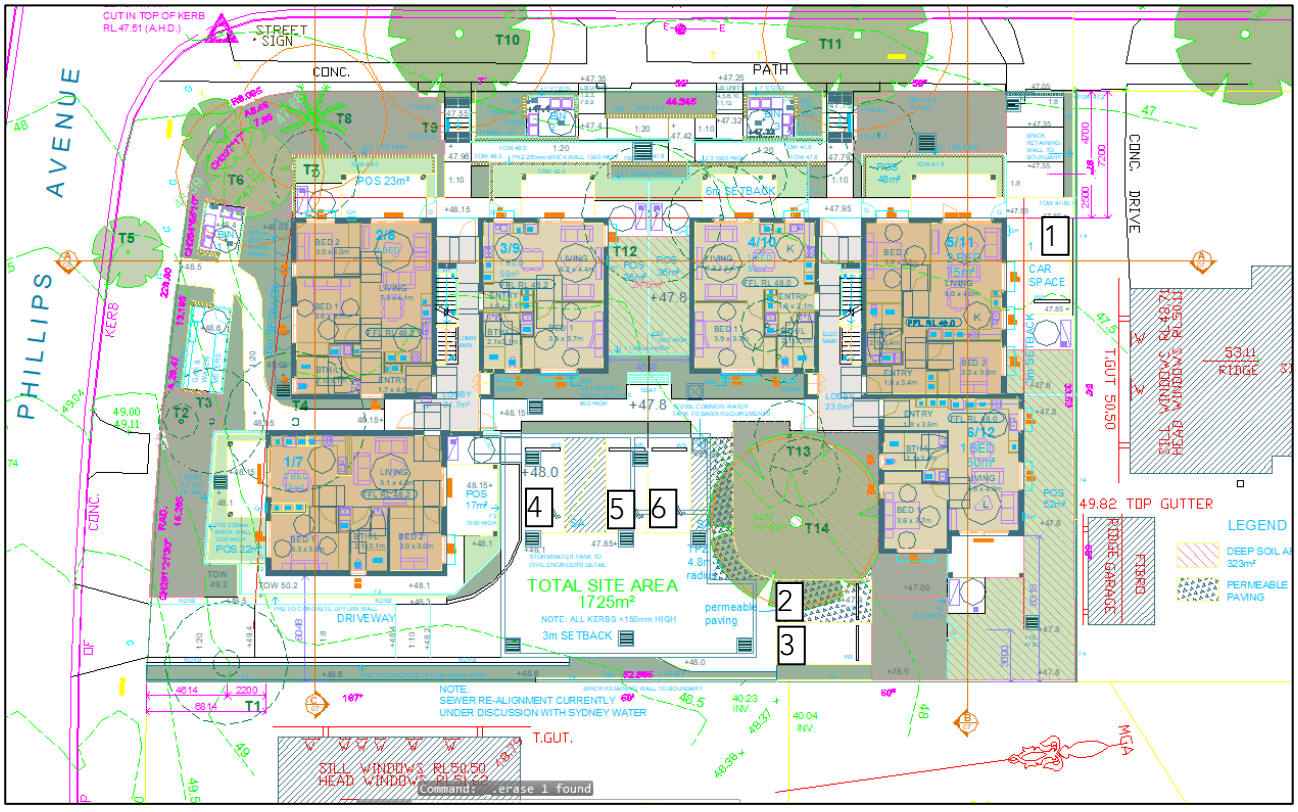

Figure 4: Proposed ground level car parking plan

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*. All the regular car space dimensions and aisle widths have been designed to comply with the above identified AS 2890.1 requirements.

*Note that the vehicle using car space 1 will be reversing out on to Richardson Avenue and therefore the aisle width requirement is not applicable.

Additionally, AS 2890.1 requires provision of additional 300mm clearance (for door opening) when car spaces are located adjacent to vertical obstructions higher than 150mm. Car space 1 is located adjacent to high obstructions on either side – therefore this car space is designed at >3m width (2.4m minimum width + 300mm clearance on one side), which satisfies the minimum dimensional requirement outlined in AS 2890.1.

4.2 Disability Accessible Parking Spaces

The disability accessible parking spaces shall be designed in accordance with AS 2890.6:2009, as follows;

- The disablity accessible car parking space should be designed at 2.4m width and 5.4m length;
- 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 parking at this location.

It is noted that car spaces 4, 5 and 6 are disability accessible spaces and they comply with the above requirements.

4.3 Circulation / Vehicle Conflicts

Based on AS 2890.1, the proposed access to the car parking area (off Phillips Avenue) is categorised under access category 1 (<25 car spaces, frontage road local). Therefore, the entry/exit combined access points should provide at least 3m width. Accordingly, the proposed driveway to the parking area off Phillips Avenue is designed at 3m width (with 300mm clearance on either side from vertical obstructions higher than 150mm).

Clause 3.2.2 of AS 2890.1 requires two-way vehicle access in cases where the driveway is longer than 30m or if the development generates 30 or more vehicle movements in a peak hour. The subject driveway is not longer than 30m and the proposed development includes a peak hour traffic generation potential that is considerably less than 30 trips (see Section 5). As such, the proposed one-way access arrangement is deemed suitable for the proposed development.

However, in order to minimise any potential vehicle conflicts, a sign that states 'Give way to entering vehicles' can be installed within the rear parking area, so that drivers exiting the site can wait and give way to drivers entering the site. This can be an effective conflict management measure particularly since the straight configuration of the driveway enables the drivers exiting the site to obtain a direct line of sight all the way to Phillips Avenue.

4.4 Gradients within Parking Modules

AS 2890.1 stipulates 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 stipulates 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 spaces include grades well below the above identified limits.

4.5 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 into the proposed car park (off Philips Avenue) includes a grade of 5%.

4.6 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 that 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 proposed driveway ramps (off both Philips Avenue and Richardson Avenue) include maximum grades of 12.5%. Therefore, the maximum summit and sag grade changes along the proposed ramps are both in the order of 12.5%. Accordingly, the summit and sag grade changes do not exceed 12.5% and 15%, respectively, thus complying with the relevant gradient change requirements.

4.7 Vehicle Manoeuvrability Conditions

In order to investigate the anticipated manoeuvrability conditions of vehicles, entering and exiting the proposed car spaces, swept path assessments were undertaken using AutoTURN software (the industry standard vehicle swept path assessment software). The following figure 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).

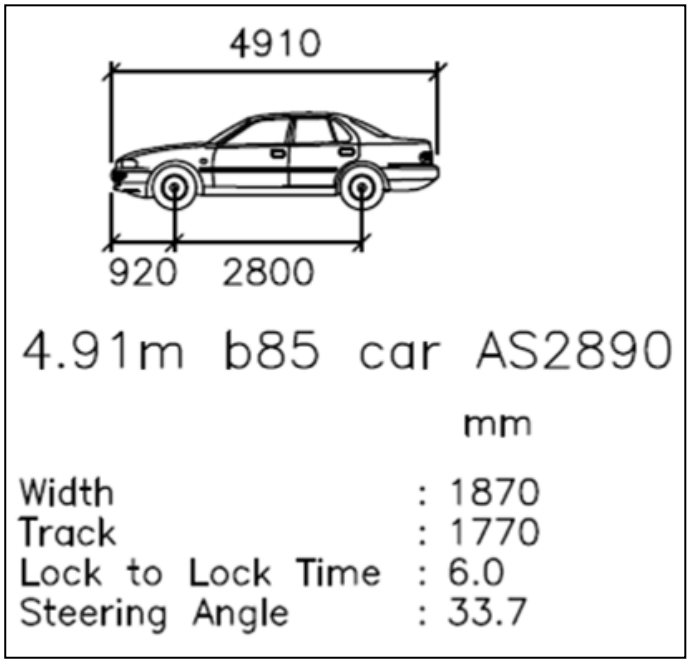

Figure 5: Template of an 85th percentile vehicle (as per AS2890.1-2004)

The following figures (Figures 6-10) 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 indicate 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).

As can be seen from the swept path results above, vehicles can enter and exit each on-site car space* while retaining the 300mm clearance envelop any obstructions and without requiring an any correctional manoeuvres (with the exception of car space 3, which requires the driver to carry out one additional correction when exiting this space). This level of manoeuvrability is considered acceptable for low turnover residential developments, where the drivers will likely be regular users who are familiar with the layout of the car park.

*Note that swept path testing was not carried out for car space 1 since the vehicle using this space will reverse out on to Richardson Avenue when exiting.

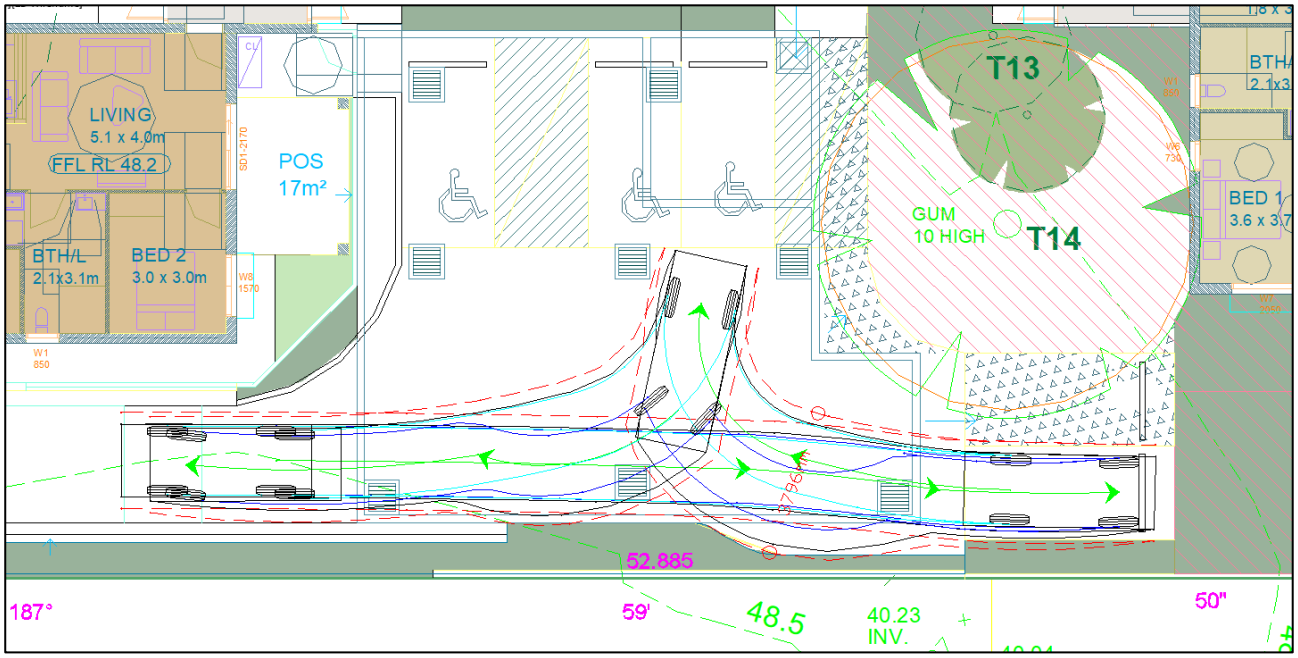

Figure 6: In and out movements of a vehicle using car space 2

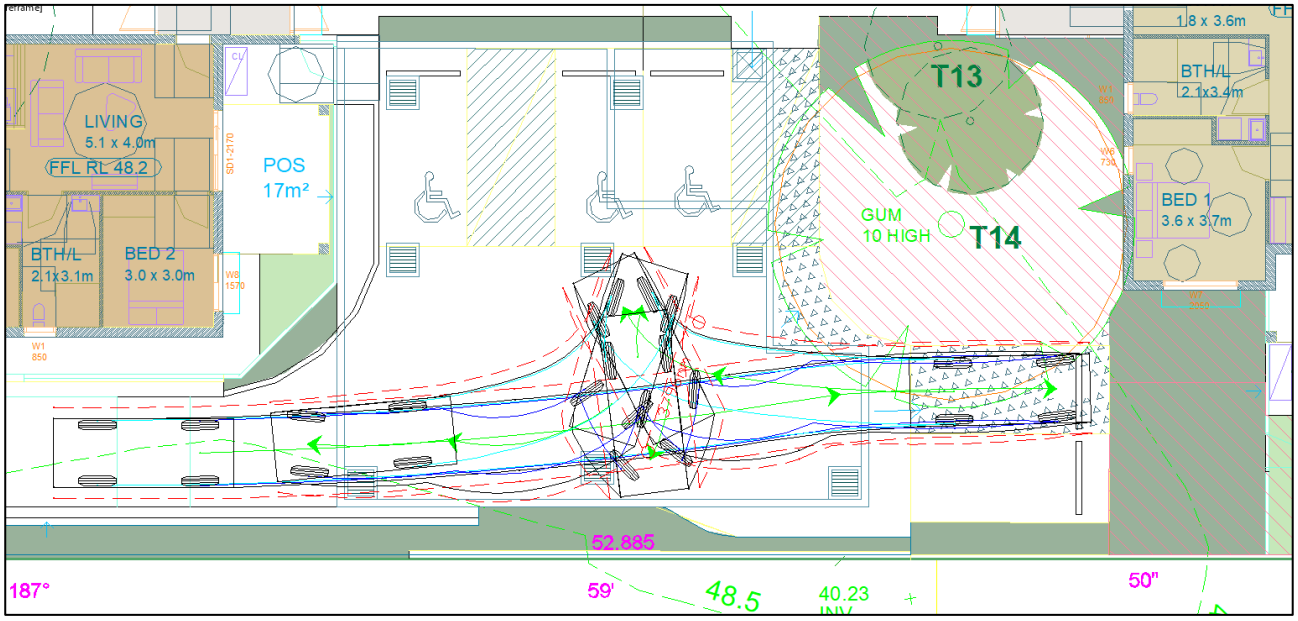

Figure 7: In and out movements of a vehicle using car space 3

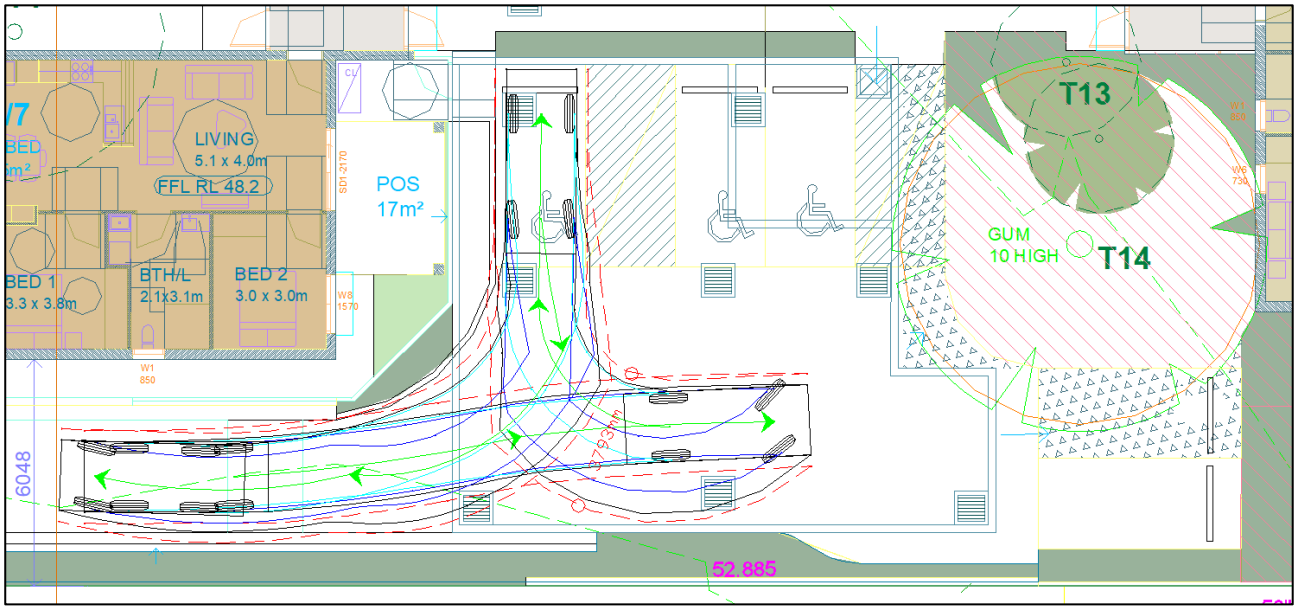

Figure 8: In and out movements of a vehicle using car space 4

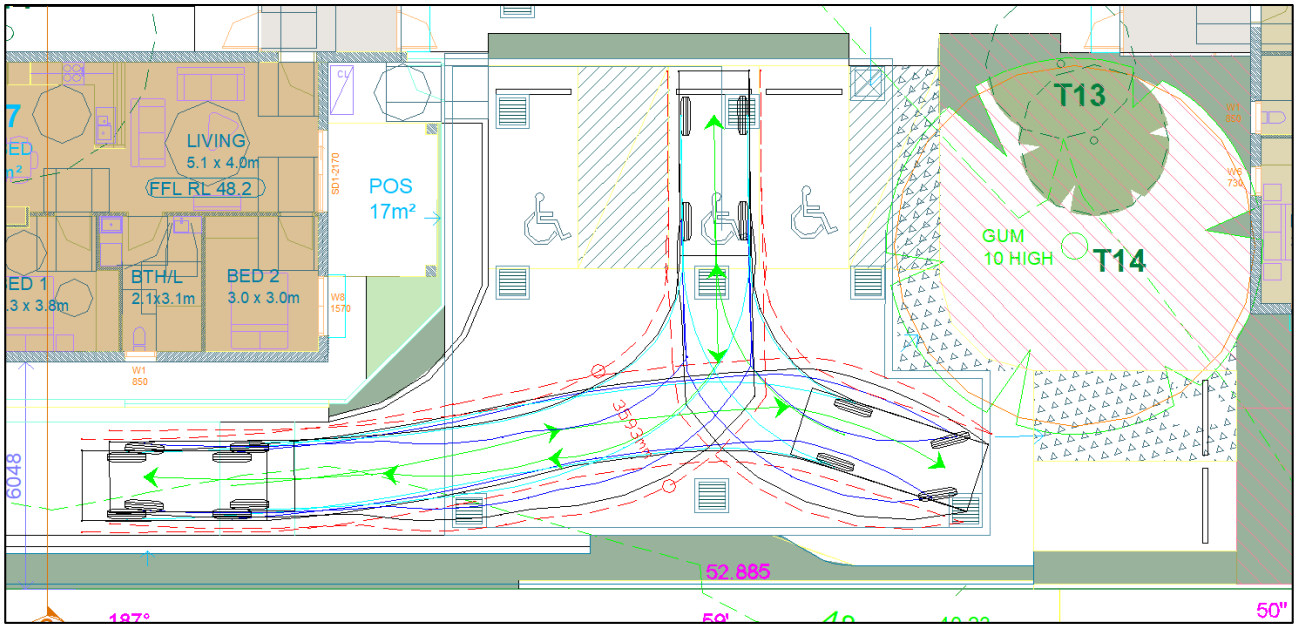

Figure 9: In and out movements of a vehicle using car space 5

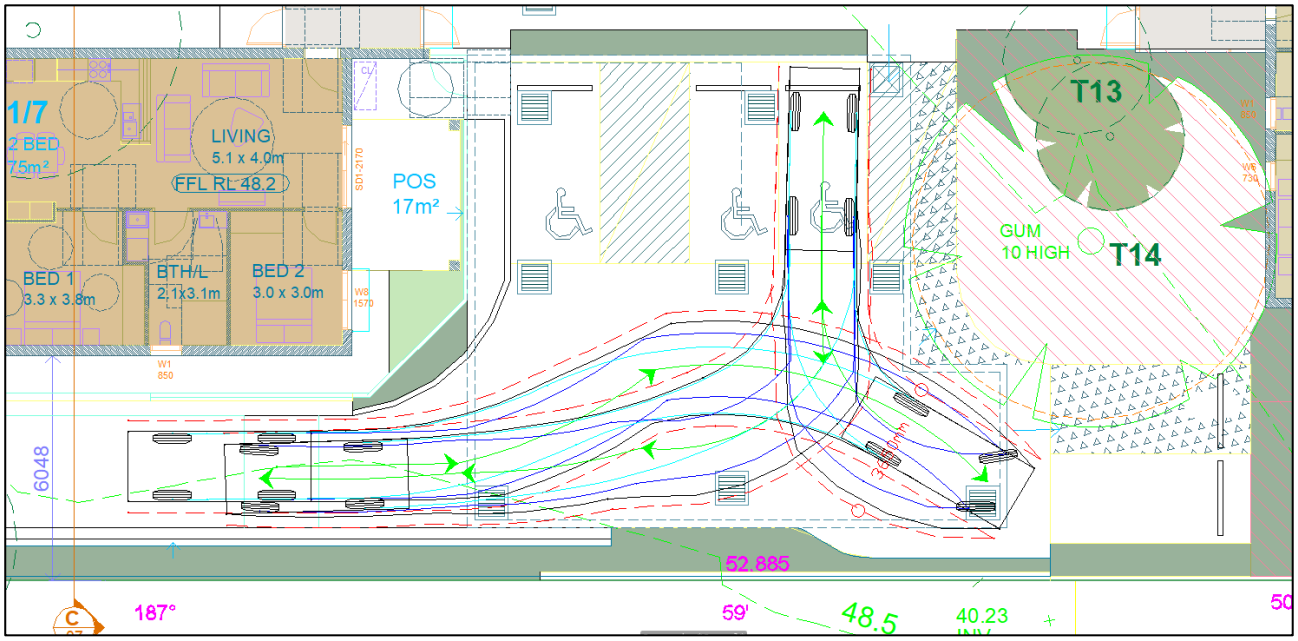

Figure 10: In and out movements of a vehicle using car space 6

4.8 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, in order to ensure sufficient sight distance availability for pedestrians. This requirement is illustrated below.

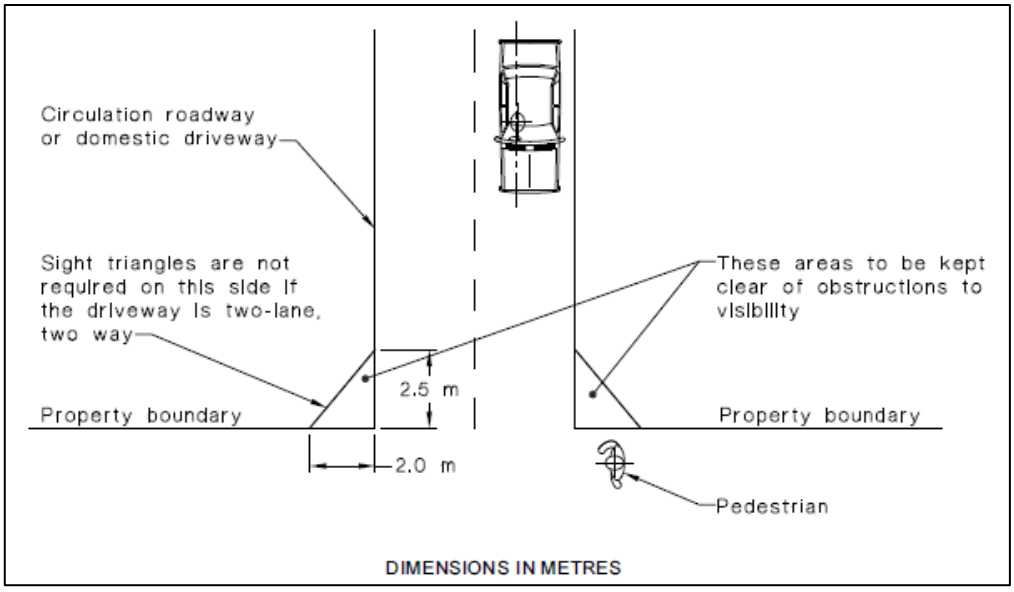

Figure 11: Pedestrian sight distance requirement (AS 2890.1)

The following figure illustrates the preservation of pedestrian sight triangles at the proposed sight access location off Phillips Avenue.

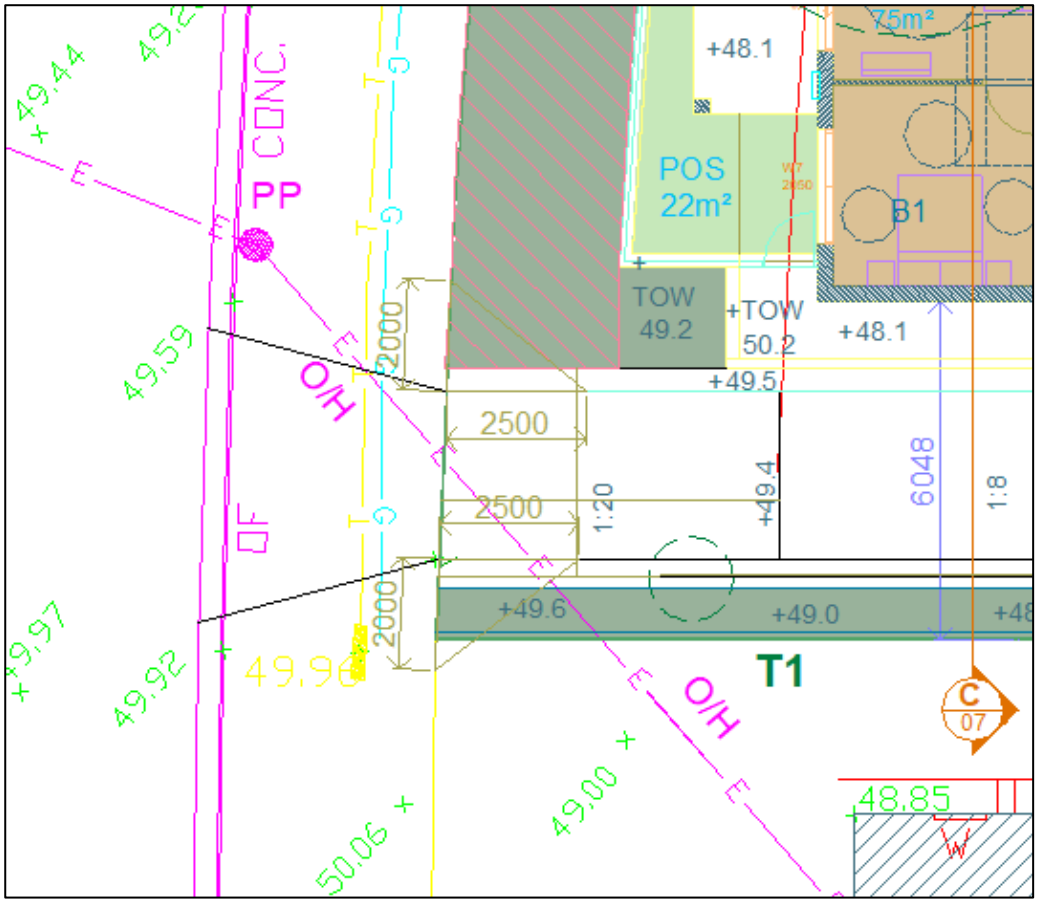

Figure 12: Pedestrian sight distance preservation

As can be seen, the sight triangle to the right-hand side of a driver exiting the site is fully preserved. However, the sight triangle to the left-hand side of a driver exiting the site is preserved only up to the site boundary. This arrangement is acceptable considering the current conditions, where the boundary does not include a wall or a structure higher than 1.15m (based on AS 2890.1, 1.15m is considered to be the typical driver eye height).

Figure 13 illustrates the pedestrian sight distance availability for the driveway on Richardson Avenue. Note that the distance from the boundary for the sight triangle for this case has been taken to be 3.5m (as opposed to the 2.5m specified in AS 2890.1), to conservatively represent the location of the driver since vehicles will be reversing out of

this location. As can be seen from the figure below, there are no obstruction proposed on the right side of a driver reversing out of the site. Figure 14 shows the current situation at the site boundary – i.e, the left-hand side of a driver exiting the site. It appears that the existing boundary wall is <1.15m in height (for approx. 5m from the site boundary) and is therefore acceptable (1.15m is considered to be the driver eye height). However, if the proposal is seeking to replace this boundary wall with a brick retaining wall, this wall should be conditioned to be <1.15m in height.

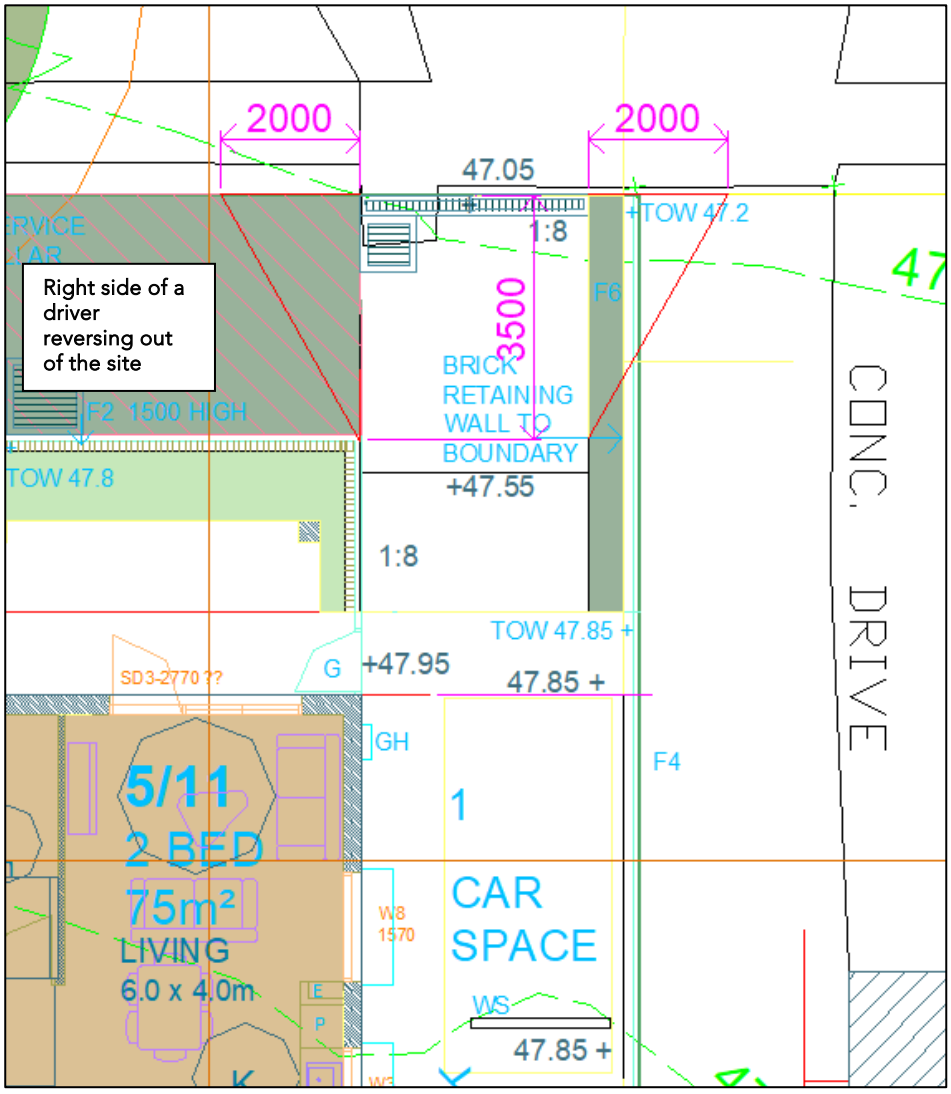

Figure 13: Pedestrian sight distance availability on Richardson Avenue driveway

Figure 14: Existing boundary wall adjacent the driveway on Richardson Avenue

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. According to the Guide to *Traffic Generating Developments (RMS 2002)*, housing for aged and disabled persons include the following trip generation features:

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

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

- 24 daily trips, and
- 3 evening peak hour trips.

The above trips will manifest as turning movements at the midblock of Phillips Avenue and/or Richardson Road, at the site frontage.

It is noted that the above established peak hour and daily trip levels are conservative since they have been determined notwithstanding the traffic generation levels from the two existing residential dwellings located within the subject site. Even if the full trip generation rate is realised, the above trip figures are insignificant (peak hour trip generation level of 3 trips). As such, no impacts to the existing traffic conditions are anticipated to result from the additional traffic generated by the proposed development.

6. CONCLUSIONS

APEX Engineers were engaged by Barry Rush & Associates Pty Ltd to provide a traffic impact assessment as a part of the development application for the proposed Seniors Living development (under SEPP SL Housing, with the subject development application to be made by a social housing provider), located at 21-23 Phillips Avenue & 5 Richardson Avenue in Regents Park.

The subject site is serviced by two bus routes, which can be accessed from bus stops located within 400m (<5-minute walk) radius of the subject site. In addition to the bus services, the residents can use train services from Regents Park station which is located 900m (12-minute walk) from the subject site.

A parking provision assessment was undertaken in accordance with the State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 and the State Environmental Planning Policy (Affordable Rental Housing) 2009. Based on the parking rates presented in the State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004, the proposed development should provide 3 car parking spaces (all 3 disability accessible car spaces). Based on the parking rates presented in the State Environmental Planning Policy (Affordable Rental Housing) 2009, for land within an accessible area, the proposed development should provide 6 car spaces. The proposed development includes provision for 6 car spaces which include 3 disability accessible car spaces – which satisfies the requirements obtained from both policy documents considered above.

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 compliant with the relevant design requirements. The swept path assessments carried out reveal sufficient manoeuvrability conditions for vehicles using all car spaces.

The daily and evening peak hour trip generations for the proposed development were determined from the trip rates stipulated in the Guide to Traffic Generating Developments (RMS, 2002) for housing for elderly. Using the rates offered within this guide, an evening

peak hour rate of 3 trips and a daily trip rate of 24 trips was established. This number of trips are considered minimal and are unlikely to eventuate into any adverse impacts to 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