NK TRAFFIC
TRAFFIC AND TRANSPORT CONSULTANTS

PROPOSED CONSTRUCTION OF MULTI UNITS

35 – 37 KARNE ST SOUTH & 71 – 83 GRAHAM RD NARWEE

TRAFFIC REPORT

Assessment of Traffic and Parking Implications

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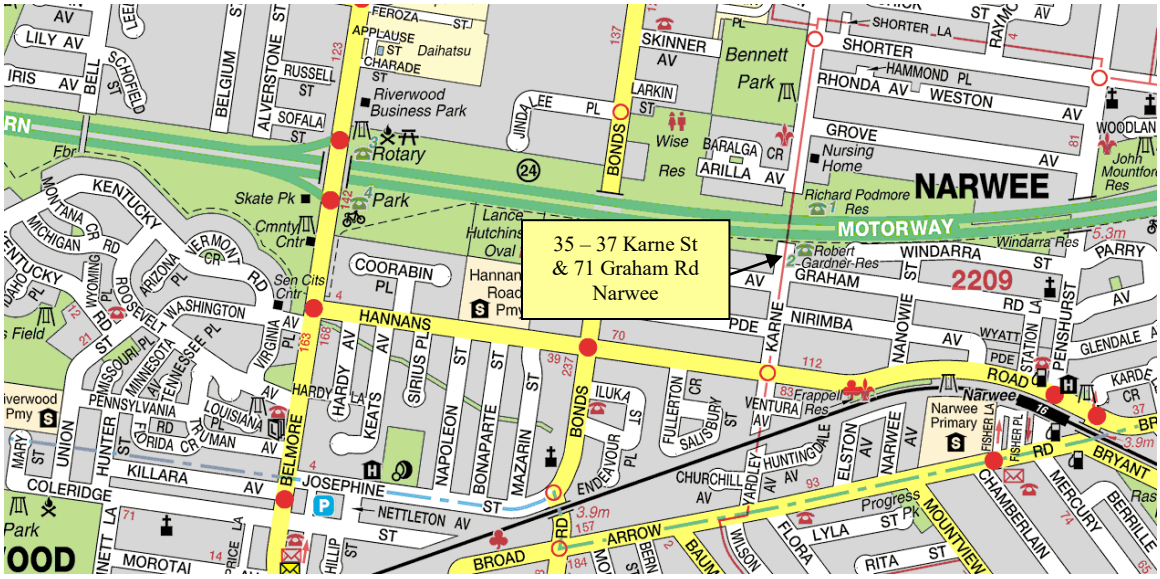
CONTENTS



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LOCALITY MAP
35 – 37 KARNE ST SOUTH & 71 – 83 GRAHAM RD NARWEE

1.0 INTRODUCTION

NK TRAFFIC was commissioned by Pavlakos Capital to prepare a traffic report for the construction of 46 residential units and a basement car parking containing 39 car parking spaces designed by Vanovactuon Architects.

The development is located at 35 – 37 Karne St South & 71-83 Graham Rd Narwee. The site comprises of Lots 7 & 8 in DP 23841 & Lots A & B in DP387057 (Graham Street) and Lots 2 & 3 in DP23841 (Karne Street South).

A Development Application has been submitted with Canterbury Bankstown Council for consideration and determination. This application was also submitted under the provisions of the State Environmental Planning Policy (Affordable Rental Housing) 2009.

This traffic report assesses the traffic and parking implications of the above proposal and is prepared to accompany the development application. The proposal is under consideration of section 79C of the Environmental Planning and Assessment Act.

Council's DCP refers to the requirement for a traffic impact assessment prepared by transport consultants if it considered there would be significant impacts on the surrounding road parking or public transport.

The DCP B1.2.3 refers to controls for specific developments listed in Table B1.1 which includes Multi dwelling developments.

2.0 DESCRIPTION OF THE PROPOSAL

The site is located at the intersection of Karne Street and Graham Rd Narwee. The proposal includes the demolition of the existing dwellings and a shop at 35 – 37 Karne St & 71 Graham Rd Narwee and the construction of 46 residential units, which includes a ground level carpark for 43 car parking spaces. The proposal is a 4 storey residential flat building. The proposed vehicle access to the basement is via designed via Karne Street. The site is zoned R4 and comprises

Lots 7 & 8 in DP 23841 & Lots A & B in DP 387057.
The proposed development is permissible under the Canterbury Bankstown Local Environmental Plan. The site has frontage to Karne St of 57.725 m and to Graham Rd of 35.96 m. The size of the site is 2460.6 m.² The site is currently occupied with three detached single storey dwellings and a single-storey shop. The proposal includes 46 dwellings comprising of the following:

19 x one - bedroom dwellings
23 x two – bedroom dwellings
4 x three - bedroom dwellings

21 of the proposed dwellings are allocated as affordable housing. Attached are the Architectural Drawings (***Annex.1).***

SITE PLAN
35 – 37 KARNE ST NARWEE

3.0 EXISTING TRAFFIC CONDITIONS

Karne Street is a two way local 12.8m road with two unmarked travelling lanes and kerbside parking lanes in each direction. Karne Street is a ‘dead end’ street to the north at the M5 Freeway and also to the south at the rail line. The speed limit in Karne Street and Graham Rd are 50 km/hour. There is a concrete footpath at the front of the site along Graham Rd and grassed footpath along Karne St.

Access to the existing site is via 4 x 3-metre wide driveways providing access to the existing properties.

Road Network surrounding the site

Karne Street South is located south of the M5 Freeway and north of the Railway Line. Karne Street does not provide access to *'through traffic'* as at the location Karne St and Graham Rd function as low volume local streets connected to the local road network. Traffic travelling through both, Karne Street and Graham Rd is local and provides access to residents with destination in these two streets.

This results in both street having low traffic volumes, typical of a local street environment. Traffic volume surveys were undertaken by *NK Traffic* on Thursday 21 March 2019 in the morning (8.30 – 9.30 am) and in the afternoon peak hours (4.00 - 5.00 pm). The traffic surveys were undertaken to assess the existing traffic volumes and to determine the proposal's likely impact on the local road network.The traffic surveys undertaken showed the following vehicular volumes in Karne St

TABLE 1: Vehicular Volume survey Karne St (Thursday 21/03/19)

Karne Street	Southbound	Northbound	Total
8.30 am – 9.30 am	5 vehicles	3 vehicles	8 vehicles
4.00 pm – 5.00 pm	4 vehicles	2 vehicles	6 vehicles

TABLE 2: Vehicular Volume survey Graham Rd (Thursday 21/03/19)

Graham Rd	Eastbound	Westbound	Total
8.30 am – 9.30 am	8 vehicles	5 vehicles	13 vehicles
4.00 pm – 5.00 pm	6 vehicles	4 vehicles	10 vehicles

There were no heavy vehicles recorded during the period of the survey. As shown in Table 1, in the morning peak, 13 cars and in the afternoon peak, 10 cars recorded at the front of the site. The above surveys indicate very low traffic volumes in both directions, at the front of Karne St and in Graham Rd.

The Environmental Capacity concept, which is applied in traffic management, is adopted in RTA's Guide to Traffic Generating Developments and provides Environmental Capacity Performance standards for Residential Streets. In terms of Environmental Capacity of a local Street, these volumes are considered low and typical of a local road. Taking into consideration the above, the amount of traffic expected to be generated by the additional number of vehicle movements will not be significant on the road network and will not change the streets level of service.

Intersection of Karne St and Graham Rd.

A Traffic modelling assessment has been undertaken of the impact at the intersection of Karne St and Graham Rd. The performance of the intersection was assessed using the Intersection Modelling software program *INTANAL*. The model provides parameters of the performance of an intersection including the degree of saturation. In accordance with the adequacy of the capacity of an intersection, it is assessed by whether it can physically and operationally cater for the traffic using it. The recommended Criteria for evaluating capacity of the intersection is shown in the following Table 3.

TABLE 3 Criteria for Evaluating Capacity of Intersection

Level of Service	***Degree of Saturation***	***Ave. Delay / Veh. (Seconds)***
A good operation	Less than 0.80	Less than 14
B good with acceptable delays	Less than 0.80	15 - 28
C satisfactory	0.80 – 0.85	29-42
D poor but manageable	0.85 - 0.90	43-56
E at capacity	0.90 and over	57-70
F unsatisfactory	Over 0.90	Over 70

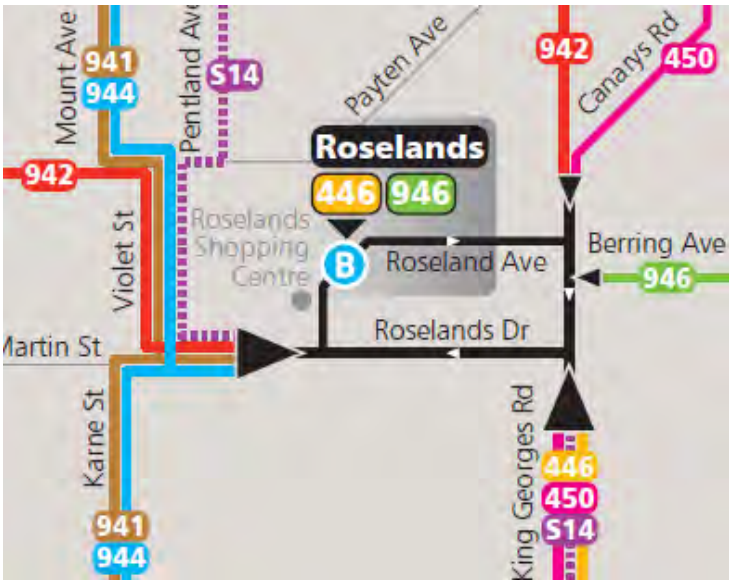
*The Environmental Traffic Capacity is defined as the maximum number of vehicles that should be permitted to pass through a given environmental situation over time.

INTERSECTION OF KARNE ST & GRAHAM RD

The assessment at the above intersection, when compared with the above criteria showed that the Intersection of Karne Street and Graham Road operates at LOS A, during both the morning and the afternoon peaks. The existing minimum queuing of vehicles during the morning or afternoon traffic peaks has no impact on the above intersection. The low additional number of traffic generated by the above development does not change the Level of Service (LOS) at the above intersection. The Level of Service will be still operating as 'A'.

4.0 PUBLIC TRANSPORT

There are bus services within short walking distance from the proposal. The existing convenient access to Public Transport is expected to discourage the use of private vehicles. Bus Services 941 and 944 through Karne St and Graham Rd provide bus Services in close proximity to the site connecting adjacent Regions. There are also buses services, travelling in walking distance to the site, such as the 303, 400 and 410 bus routes.

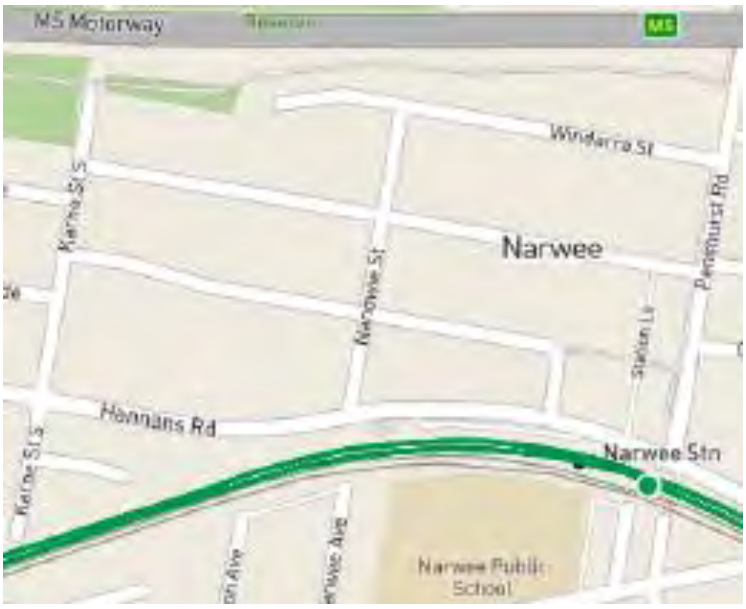


Source: Sydney Buses

The frequent Sydney Bus Service in close proximity to the site provide connection between Roselands and Hurstville other Sydney Regions within Sydney Metropolitan area. In addition to the high accessibility to frequent bus services, Narwee train Station is in walking distance to the proposal. The Narwee train station has access via Penshurst Rd from the north and Hurst Place from the south.

TRAIN ACCESS

The high accessibility to public transport is to the benefit of the development's residents and its visitors. The good transport connection provides opportunities for residents and visitors of the above development to travel via public transport, which results in reducing the need to use private vehicles



Train and Bus Connections in walking distance from the Site

5.0 TRAFFIC GENERATION

RTA's Guide to Traffic Generating Developments provides the following guide in relation to the peak traffic generation associated with this type of proposal.

TABLE 4 Peak Vehicle Trips / Medium Density Residential Dwellings

Up to 2 bedrooms	4-5 / dwelling	0.4 – 0.5 / dwelling
3 bedrooms or more	5-6.5 / dwelling	0.5 – 0.65 dwelling

(RTA Guide to Traffic Generating Developments -Oct 2002)

In accordance with the Traffic Generation Guide, the amount of traffic to be generated in Karne Street and Graeme Rd during the peak hour scenario, which in the morning peak, is: 0.5 x 46 = 23 vehicles per peak hour.

The updated Traffic Generation Guide (Transport – RMS Technical Direction TDT 2013/ 04a) provides the following rates for traffic generation of units in the Sydney Metropolitan area:

AM peak (1 hour) vehicle trips per unit 0.19.
PM peak (1 hour) vehicle trips per unit 0.15.
Daily vehicle trips per unit 1.52 per unit.

In accordance with the above (TDT 2013/ 04a) the 43 units are expected to generate the following

AM peak trips: 0.19 x 43 = 8.17 *say* 9 trips per hour
PM peak trips: 0.15 x 43 = 6.45 *say* 7 trips per hour
Daily peak trips: 1.52 x 43 = 65.36 *say* 66 daily trips

In accordance with the above table, this amount of traffic is spread in both directions. This number is also very conservative, as there will be trips by public transport which means that travelling by private vehicles will be substantially reduced.

The above number of vehicles when added to the existing street traffic volumes would have insignificant effect to the surrounding road network. Therefore, this amount of traffic generated as a result of the proposal is insignificant in the overall road network.

The RMS has provided guidelines for assessing amenity impacts, described as: "Environmental Capacity Thresholds for Urban Roads, (Guide to Traffic Generating Developments – Oct. 2002). The following table provides a summary of these thresholds.

"Environmental Capacity" thresholds for Urban Roads, (Guide to Traffic Generating Developments – Oct. 2002)". The following table provides a summary of these thresholds.

TABLE 5. Environmental Capacity Performance Standards

Road Class	Road Type	Max Peak Hour Volume (veh/hr)
Local	Access way	100
Local	Street	200-300
Collector	Street	500

(RTA Guide to Traffic Generating Developments –October2002

6.0 ACCESS AND PARKING

The Canterbury Development Control Plan 2012 B1 – Transport and Parking states the following objectives (B1.1)

- To provide adequate car, bicycle and service vehicle facilities for the building users and visitors, depending on building type and proximity to public transport.
- To ensure casual parking on streets is available in centres to support local business.
- To minimise overflow parking and other traffic impacts in residential streets and neighbourhoods.
- To ensure servicing by larger vehicles occurs off-street in such a way that

reduces the impacts on the pedestrian environment.

- To ensure vehicle facilities are compliant, functional or safe.
- To encourage reduced car dependency through encouraging alternative means of transport such as cycling, walking and public transport.
- To ensure vehicle traffic is managed and roads to not inhibit the performance of business centres, presenting barriers to pedestrian movement, or segregating.
- To minimise the visual impact of parking structures on the appearance of streetscapes.

The Canterbury Development Control Plan 2012 B1 – Transport and Parking states the following controls related to the design of the car parking areas.

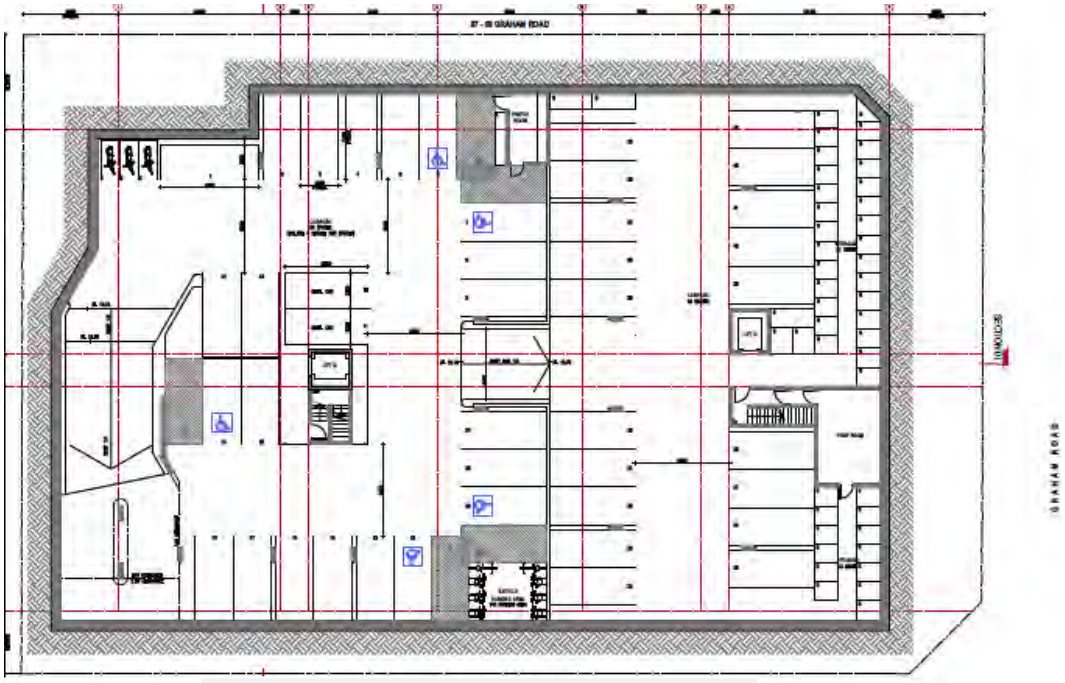
Access arrangements

The following issues have been considered in order to assess whether the City of Canterbury/Bankstown Council's Car Parking and Access objectives have been met and AS/NZS 2890.1- 2004 have been complied with.

The access to the parking area is designed using the B99 base swept path in accordance with AS/NZ 2890.1 – 2004. The turning path areas indicate that cars could adequately access the car parking area and manoeuvre safely in and out of the car parking spaces.

The parking spaces and access to the driveway has been assessed using the B99 Design Templates in accordance with AS/NZS 2890.1:2004, the driveway access is designed to allow for vehicles entering and exiting in a forward direction with minimum conflict.

The 6.0 m - wide parking aisle allows for manoeuvring of all vehicles to enter and exit the parking spaces in a safe and practical manner. Cars can easily access all parking spaces in a practical and safe manner.



CAR PARK – BASEMENT 1

AS/NZ 2890.1:2004 (3.2.2) indicates driveway widths 3.00 - 6.0 m are suitable for these types of developments. The proposal provides a wider driveway width, as the existing driveway is combined with the adjacent development

The assessment demonstrates that the access driveway into and out of the proposed development allows for adequate manoeuvring for cars to enter, park and exit in a convenient manner.

KARNE STREET FRONTAGE

7.0 PARKING SUPPLY

Canterbury Council's DCP -Car Parking

The proposal is also assessed in accordance with Canterbury DCP related to Parking rates. The following parking rates apply in accordance with Council's DCP (CDCP2012 –B1.3.1).

Canterbury Council refers to parking rates for Multi Dwelling Housing, Attached Dwellings & Residential Flat Buildings. The following applies:

1 space per 1 bedroom
1.2 space per 2 bedroom
2 spaces per 3 bedrooms

Visitor parking: 1 space per 5 dwellings.
One wash bay. In relation to accessible spaces for residents 1 space per 5 dwellings and for visitors 1 space per 10 dwellings.

TABLE 6 –Car Parking Requirements – Canterbury DCP B1.3.1.

DEVELOPMENT	OFF – STREET PARKING SPACES REQUIRED	
1 bed	1 per dwelling	19.00
2 bed	1.2 per dwelling	27.6
3 bed or more	2 per dwelling	8
Visitors	0.2 per dwelling	9.2
Servicing / car wash > 10 bays	1 space	1
Number of required parking spaces		65

The application has been submitted under the provisions of the State Environmental Planning Policy (Affordable Rental Housing) 2009.
As the proposal is considered as Affordable Rental House development, the parking supply is also assessed in accordance with the State Environmental Planning Policy (Affordable Rental Housing) requirements providing the following parking rates:

State Environmental Planning Policy (Affordable Rental Housing) 2009:
"At least 0.5 parking spaces are provided for each dwelling"

TABLE 7 –Car Parking Requirements – (AHSEPP 14.2) SEP (Affordable Rental Housing)

DEVELOPMENT	OFF – STREET	REQUIRED	PROVIDED
1 bed	0.5 per dwelling	9.50	9
2 bed	1.0 per dwelling	23.0	23
3 bed or more	1.5 per dwelling	6.0	6
Accessible spaces			5

Number of required parking spaces		39	43
Bicycle parking requirements	**Rates**	**PROVIDED**	
Residents Parking Residential Visitors	0.200/Dwelling 0.100 dwelling	9 5	
Total Bicycle parking spaces		14	

As the proposed development is in compliance with the SEP (Affordable Rental Housing) 2009, the parking rates are reduced and in accordance with the following.

19 x 1 bedroom = 9.5 spaces
23 x 2 bedroom = 23 spaces
4 x 1 bedroom = 6 spaces

The proposal provides 43 parking spaces. In accordance with the above, the parking spaces provided are considered adequate for the proposal's parking demand and in accordance with AHSEPP 14.2.

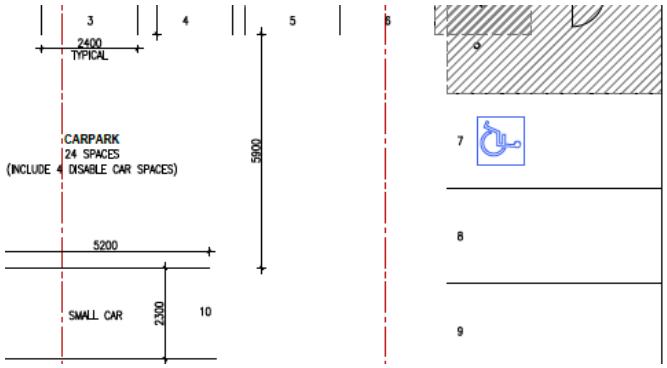


Figure 1 – Parking space design

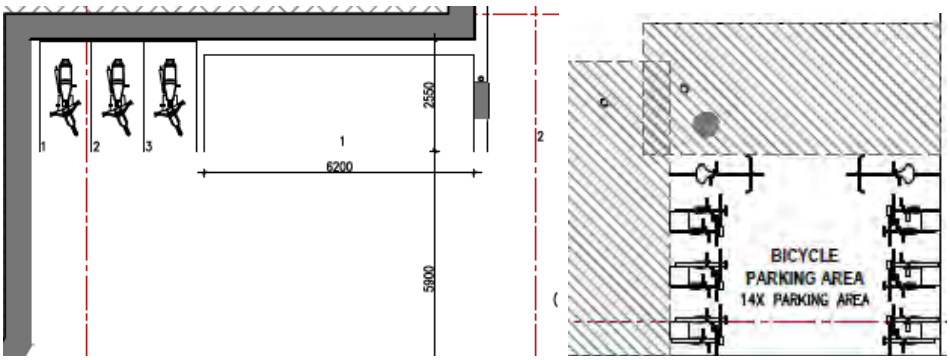
Canterbury DCP 2012 provides information related to design standards to be followed for the off-street car parking and access areas. The designed parking area has been assessed in accordance with the above DCP and the following requirements.

Assessment of parking bays and access areas

These spaces have been designed at 90-degree angle and in accordance with AS/NZS 2890.1- 2004. The parking has also been designed in accordance with Canterbury DCP. The visitor parking spaces are 90 degree and are designed in a practical manner. Next to the visitor parking is a turning bay located at the end of the parking aisle. In accordance with AS 2890.1 the parking bay widths shall be 2.4 m x 5.4 m. The designed dimensions of the parking spaces comply. The set out design of the parking and the unrestricted site distances within the car parking areas allows for convenient and safe access to the access with minimum conflict between vehicular and pedestrian traffic. The DCP refers to the following:

Service Vehicles

The layout of service areas shall be designed to facilitate the specific loading and unloading operations of the development. The proposed car parking area is designed in accordance with Off Street Parking and AS 2890.1 – Off Street Parking. The parking set up and dimensions of these spaces have been assessed and comply with AS/NZS 2890.1- 2004. The car park design allows for safe manoeuvring in and out of the parking bays.

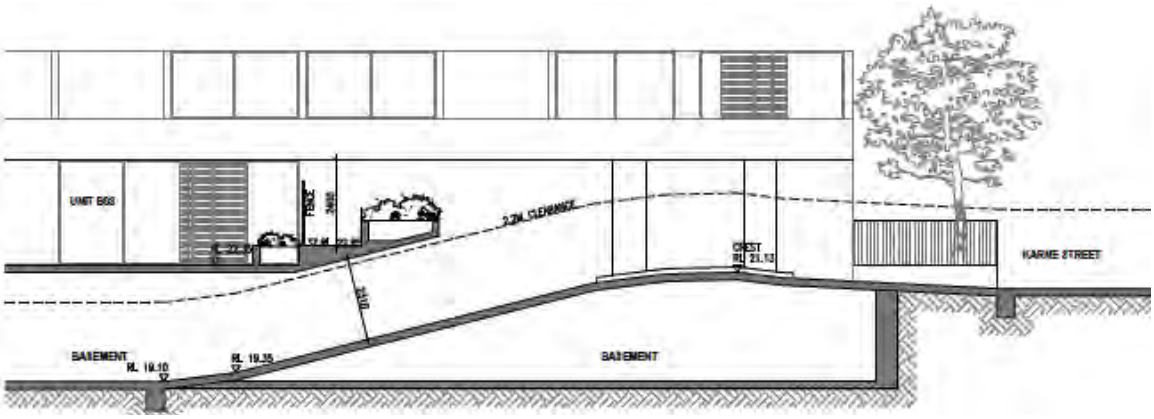


Bicycle Parking Spaces

The turning manoeuvring clearances for the car parking area have been assessed in accordance with AS/NZS 2890.1 and the RTA's (RMS) Guide to Generating Developments. The B85 and vehicle templates have been applied and showed that; cars can enter and exit the off-street parking bays with adequate clearances. Vehicles can enter in the off-street parking area in a forward direction.

The parking aisle is 6 metres which allows vehicles to enter and exit the garaged parking spaces in a safe manner. The width of the driveway is 6 metres.

Access in and out of the proposed driveway has also been assessed in accordance with AS/NZS 2890.1:2004 and the design allows for easy manoeuvring in and out of the driveway in a convenient and safe way.



Ramp – Cross Section

In accordance also with RTA's Guide to Traffic Generating Developments, the proposed access driveways - ingress and egress, are Type 1, which is in accordance with the following Table, requires a combined minimum 3-6 metres.

Canterbury DCP 2102 refers to the following:

C6 Maximum 6 m width for access driveways.

C7 Vehicular access should be via secondary streets, rear lanes or internal driveways where possible.

C15 Provide signposting in accordance with AS 2890.1

C16 Maintain pedestrian safety by minimising the potential for vehicular and pedestrian conflict, and in particular limit the number of vehicular access points:

a) *Provide clear sight lines at pedestrian and vehicular crossings,*
b) *Separate and clearly distinguishing between pedestrian and vehicular sentries;*

The designed width of the driveway is approximately 6 metres. Therefore, this is adequate and in accordance with RTA's Guide to Traffic Generating Developments and with AS 2890.1. The design of the parking area has been assessed and shows that it complies with AS/NZS 2890.1.

TABLE 8 – Criteria re driveway widths AS 2890.1

Recommended driveway types

Type	Entry Width (Metres) W	Exit Width (Metres) W	Min Separation of Driveways (Metres)	Splay at Kerbline (Metres) S	Kerb Return Turnout Radius (Metres) R
1	3-6	combined	NA	0.5	-
2	6-9	combined	NA	1	-
3	6	4-6	1-3	1	2-9
4	6-8	6-8	1-3	1	2-9
5	Direct feed from a controlled intersection via a dedicated public roadway				
6	8-10	8-10	3	1	2-9
7	10-12	10-12	3	1	2-9

Guide to Traffic Generating Developments. October 2002 Issue 2.2 6-3

Selection of driveway type based on parking spaces Road

Frontage	Number of Car Parking Spaces Served by the Driveway					
	Less than 25	25-100	101-300	301-600	More than 600	Heavy Vehicles
Major	1 - 2	2 - 3	3 - 4	4	5	7
Minor	1	1 - 2	2 - 3	3 - 4	4	6

RTA's Guide to Traffic Generating Developments

The above On-Street and Off – Street parking have been assessed in accordance with AS/NZS 289.1:2004 (Off-Street Car Parking) and Canterbury Bankstown Council's DCP.

The surrounding properties have all off-street parking. As a result, the parking associated with the proposal will not impact the surrounding residential area nor access or parking activities associated with other surrounding developments and will have no adverse on-street parking impact.

In conclusion there is no impact identified to the parking demand of the surrounding developments and neighbourhood amenity is not compromised. In accordance with the above, the total amount of off-street parking spaces provided for the needs of the proposed development are adequate for its parking demand.

8.0 CONCLUSION

1. This traffic and parking report includes the assessment of the traffic and parking implications for the proposed construction of for the construction of 46 residential units and a basement car parking containing 43 car parking spaces designed. The site is zoned R4. The proposed development is also permissible under the State Environmental Planning Policy (SEEP) Affordable Rental Housing 2009 under the Canterbury DCP 2012.

2. This Traffic Impact Report has been prepared to supplement the development application submitted to Canterbury Bankstown Council for consideration. This traffic and parking assessment requires to be considered in conjunction with the Architectural plans submitted to Council.

3. The proposed Development has been designed and assessed in accordance with the Canterbury Development Control Plan DCP 2012. It has been assessed also in accordance with AS/NZS 2890.1:2004 – Off-Street Car parking, and RTA's Guide to Traffic Generating Developments.

4. The Car Parking requirements have been assessed in accordance with Canterbury Council's DCP 2012. Council's DCP Parking and Access requirements have been assessed. The parking provision of the proposed development is in compliance with the SEP (Affordable Rental Housing) 2009.

5. In accordance with the rates provided by the (Affordable Housing Policy – AHSEPP) parking requirements, the number of required car parking spaces are 39.The proposal provides 43 parking spaces including 5 accessible parking spaces. Therefore the parking component of the proposal complies.

6. The assessment demonstrates that the access area into and out of the proposed development provides adequate manoeuvring for cars to enter and exit the car parking area in a convenient manner.

7. The parking associated with the proposal, is not expected to adversely impact the parking demand of the surrounding residential properties. The design of the off-street parking area and access arrangements for the proposed development is supported.

8. Overall, in terms of parking and access arrangements, the proposal provides satisfactory arrangements and complies with Canterbury Development Control Plan 2102 and AS/NZS 2890.1:2004 – Off-Street Car parking, the RMS Guide to Traffic Generating Developments.

9. The assessment based on the Guide to Traffic Generating Developments and the updated Traffic Generation Guide (Transport – RMS Technical Direction TDT 2013 / 04a) showed that the vehicle trips generated by the proposed development during peak hours are very low and will have insignificant and not noticeable impact on the surrounding road network.

10. In conclusion, the design and access arrangements for the proposed development are in accordance with the Canterbury DCP 2012 AS/NZS 2890.1:2004, the Affordable Housing Policy –AHSEPP) and the RMS Guide to Traffic Generating Developments and Canterbury Bankstown Council Planning Controls. There are no obvious adverse traffic and parking implications identified as a result of the proposed development. The traffic and parking arrangements for the proposed development at 35-37 Karne Street is supported.


KARNE STREET SOUTH
KARNE STREET SOUTH


GRAHAM ROAD
GRAHAM ROAD