1-9 Allengrove Crescent
North Ryde
Transport Impact Assessment

transportation planning, design and delivery

13S1248000 03/05/13

GTAconsultants

1-9 Allengrove Crescent

North Ryde,

Transport Impact Assessment

Issue: E 03/05/13

Client: SJB Architects
Reference: 13S1248000
GTA Consultants Office: NSW

Quality Record

Issue	Date	Description	Prepared By	Checked By	Approved By
A	01/02/13	Final	Marguerite Aziz, Rhys Hazell	Rhys Hazell	
B	05/02/13	Final - amended	Marguerite Aziz, Rhys Hazell	Rhys Hazell	
C	06/02/13	Final - amended	Marguerite Aziz, Rhys Hazell	Rhys Hazell	
D	15/02/13	Final - amended	Marguerite Aziz, Rhys Hazell	Rhys Hazell	
E	03/05/13	Final - Pedestrian access and SJB amendments	Marguerite Aziz, Rhys Hazell	Rhys Hazell	

GTAconsultants
MELBOURNE • SYDNEY • BRISBANE • CANBERRA
ADELAIDE • GOLD COAST • TOWNSVILLE
www.gta.com.au

Table of Contents

Appendices

Figures

Tables

1. Introduction

1.1 Background

It is understood that a development application is to be lodged with City of Ryde for a proposed development located in the block bounded by Epping Road, Lane Cove Road and Allengrove Crescent. It is proposed to demolish the majority of the existing on-site dwellings and construct 179 residential apartments dispersed across seven buildings of varying heights, to a maximum of five storeys.

GTA Consultants was commissioned by SJB Architects in December 2012 to undertake a transport impact assessment for the proposed development, subsequent to the Transport and Accessibility Report prepared by Traffix[1] at the Concept Plan Application Stage.

1.2 Purpose of this Report

This report sets out an assessment of the anticipated transport implications of the proposed development, including consideration of the following:

i existing traffic and parking conditions surrounding the site;
ii suitability of the proposed parking in terms of supply (quantum) and layout;
iii service vehicle requirements;
iv pedestrian and bicycle requirements;
v the traffic generating characteristics of the proposed development;
vi suitability of the proposed access arrangements for the site; and
vii the transport impact of the development proposal on the surrounding road network.

1.3 References

In preparing this report, reference has been made to the following:

- an inspection of the site and its surrounds in December 2012
- Transport and Accessibility Impact Study, Traffix, May 2011
- City of Ryde Development Control Plan (DCP), 2010
- Australian Standard/ New Zealand Standard, Parking Facilities, Part 1: Off-Street Car Parking AS/NZS 2890.1:2004
- Australian Standard, Parking Facilities, Part 2: Off-Street Commercial Vehicle Facilities AS 2890.2:2002
- Australian Standard / New Zealand Standard, Parking Facilities, Part 6: Off-Street Parking for People with Disabilities AS/NZS 2890.6:2009
- Planning Guidelines for Walking and Cycling, December 2004
- plans for the proposed development prepared by SJB Architects, Drawing Number DA-201-DA-204, Revision 07, dated 31 January 2013; and
- other documents and data as referenced in this report.

[1] Transport and Accessibility Impact Study, Traffix, May 2011

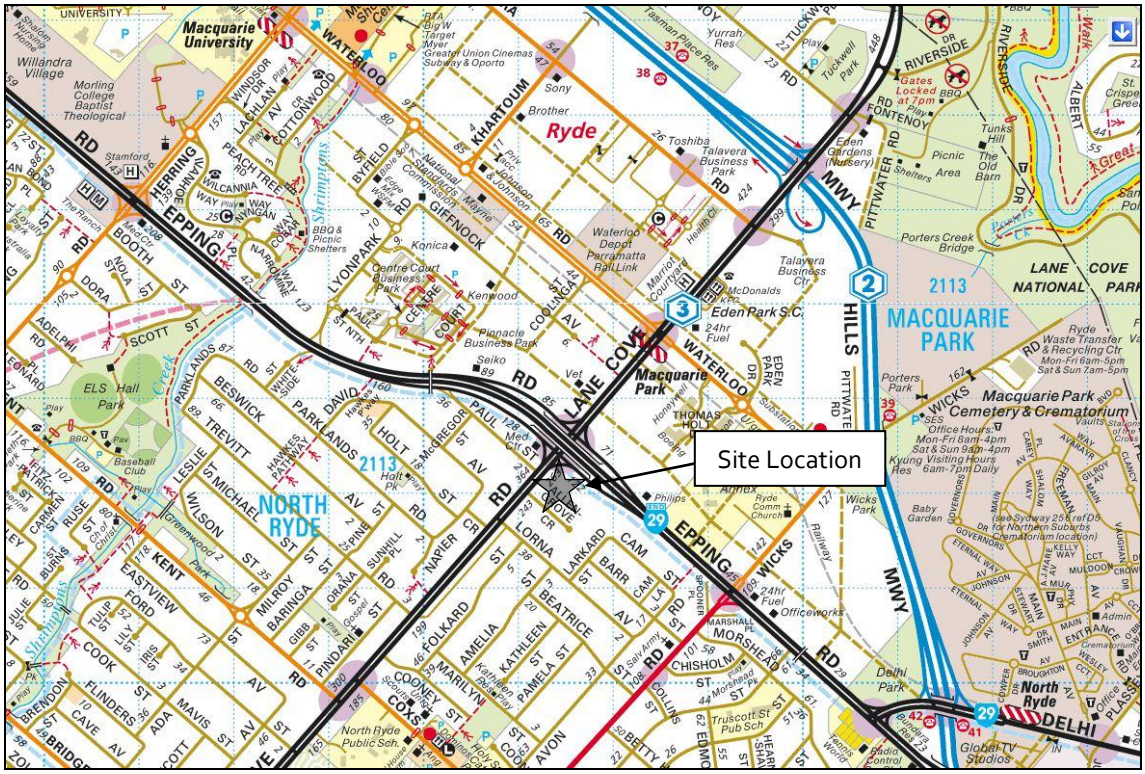
2. Existing Conditions

The subject site is located at 1-9 Allengrove Crescent, North Ryde and approximately 12 kilometres north-west of Sydney CBD. The site of approximately 12,300m^2 currently has a land use classification as Residential and is generally occupied by detached residential dwellings.

The surrounding properties predominantly include a mix of detached and medium density residential land uses.

The location of the subject site and its surrounding environs is shown in Figure 2.1.

Figure 2.1: Subject Site and Its Environs



2.1 Road Network

2.1.1 Adjoining Roads

Epping Road

Epping Road is a State Road (MR 373) that generally runs in an east-west direction between the M2 Motorway and Lane Cove Tunnel in the east and Blaxland Road, Epping in the west. It is a two-way divided road configured with 3 lanes in each direction with additional turning bays at major intersections with a posted speed limit of 80km/h. The westbound off-ramp from Epping Road to the grade separated overpass at Lane Cove Road bounds the site to the north.

Lane Cove Road

Lane Cove Road is a State Road (MR 162) that runs in north-south direction adjacent to the western boundary of the site. It forms a continuation of Homebush Bay Drive to the south and joins with Mona

Vale Road to the north. It is a two-way divided road configured with a 6-lane, 22 metre wide carriageway. Lane Cove Road has a posted speed limit of 70km/h in the vicinity of the site, with kerbside parking not permitted.

Lane Cove Road is shown in Figure 2.2.

Allengrove Crescent

Allengrove Crescent is a local road and travels in an east-west direction along the southern boundary of the site. It is a two-way road configured with a 7.4 metre wide carriageway and a 50km/h speed limit. Allengrove Crescent intersects with Lane Cove Road in the south-west corner of the site at a priority controlled intersection. Access is restricted to left-in/ left-out movements.

Time restricted kerbside parking is permitted on both sides of Allengrove Crescent with one traffic lane providing for two-way movements where parking demand is high.

Allengrove Crescent is shown in Figure 2.3.

Figure 2.2: Lane Cove Road (looking south)

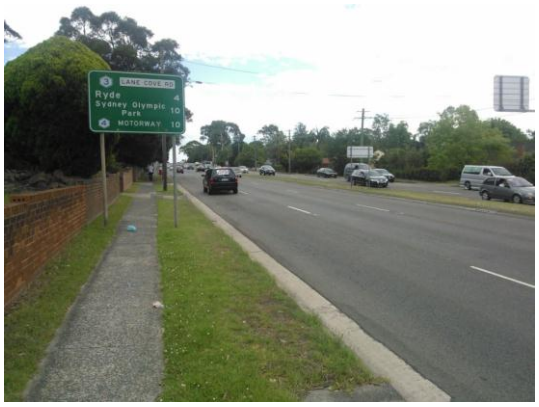


Figure 2.3: Allengrove Crescent (looking west)

2.2 Traffic Volumes

The Roads and Maritime Services (RMS) *Guide to Traffic Generating Developments* (2002) has been used to understand the existing traffic generation of both Allengrove Crescent and the site. The Guide recommends application of a generation rate of 0.85 trips per dwelling (dwelling houses). A total of 12 vehicles per hour are generated by the existing on-site dwellings during the weekday AM and PM peak hours, with up to 17 vehicles generated by Allengrove Crescent dwellings, five of which are located within the boundaries of the proposed development.

On the basis of the above assessment, it is clear that the intersection of Lane Cove Road/ Allengrove Crescent currently operates satisfactorily with minimal queues and delays on all approaches.

2.3 Car Parking

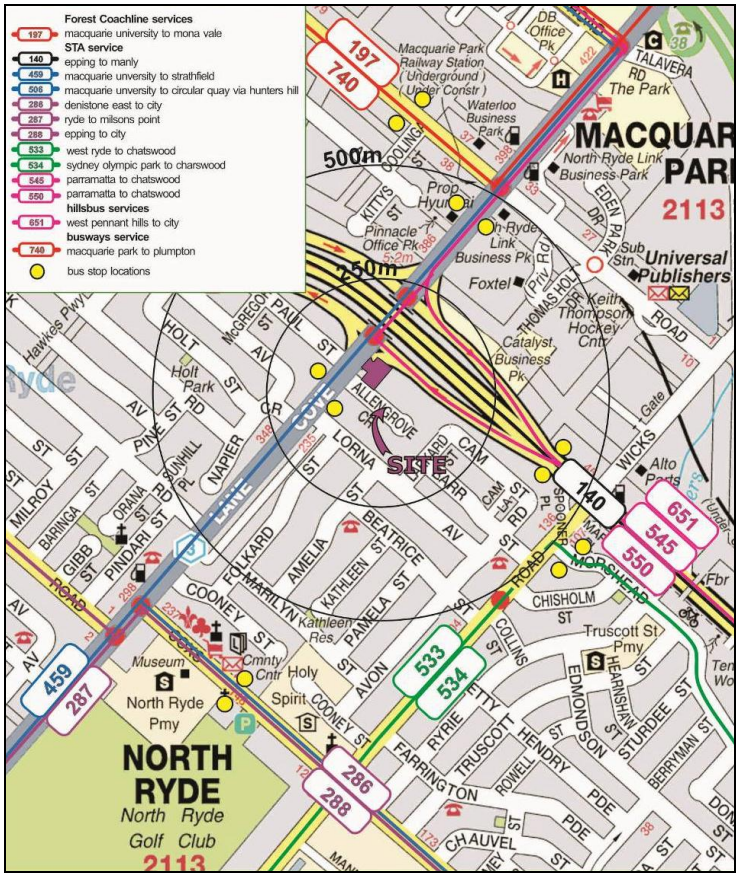
On-street parking within Allengrove Crescent in the vicinity of the site is under a 2P resident parking scheme with 26 on-street car spaces between the eastern boundary of the proposed development and Lane Cove Road. On-site observations conclude that the area experiences moderate demand with 10-15 vehicles typically parked on-street during a typical weekday.

Given that Allengrove Crescent is approximately 7.5m wide, the area generally operates as one traffic lane for two-way operation with resident driveways providing passing opportunities.

2.4 Public Transport

The site is well serviced by public transport facilities including both bus and rail. The site benefits from good access to the bus network via Lane Cove Road and Epping Road. A bus stop is located on Lane Cove Road with about 200m walking from the site. The Macquarie Railway Station is located approximately 400 metres to the north of the site. A summary of the public transport facilities is shown Figure 2.4.

Figure 2.4: Existing Public Transport Facilities



Source: Transport and Accessibility Impact Study, Traffix, May 2011

2.5 Walking and Cycling Facilities

There are well established walking and cycling facilities in the vicinity of the site including pedestrian paths located on both sides Lane Cove Road and the off-ramp/ on-ramp to/ from Epping Road north of the site. These combine to link the site with Macquarie Park Railway Station, located on the corner of Wicks Road and Waterloo Road approximately 400m north of the site.

Established on-road and off-road cycling paths are located throughout the local areas including local streets east of the site and more established facilities that link residential areas west of the site with Macquarie Shopping Centre, Macquarie University and the commercial centre of North Ryde.

3. Concept Plan Application

3.1 Overview

A transport and accessibility impact study was undertaken by Traffix in May 2011 at the Concept Plan Application stage. The report responds to the relevant issues raised by the Director General's Requirements (DGRs) dated 11 June 2010.

The proposed development at the time included a larger number of apartments than the current proposal detailed in this report, with the Traffix investigation largely concentrating on the use of the Macquarie Park Corridor Paramics microsimulation model to assess the external traffic impacts. It is noted that this traffic modelling has thus been adopted as part of this study, with the details relating to this considered in Section 8 of this report.

The results of the Traffix assessment included the following:

- The proposed high density residential development was considered appropriate on traffic/ transport planning grounds.
- The traffic assessment took a conservative approach by adopting a higher traffic generation rate of 0.4 vehicles per dwelling during any peak hour. The anticipated site generation had a minor impact on the operation of intersections in the vicinity of the site.
- The provision of car parking was in accordance with the DGRs and marginally short of City of Ryde DCP. There would be minimal impact to on-street parking in the vicinity of the site.
- The Macquarie Park Paramics model was assessed together with SIDRA INTERSECTION modelling of individual intersections. The results indicated that all study intersections would remain operating close to or at existing levels, including future queuing and average delays.
- The site access and car park layout assessment concluded that it was designed appropriately with the design to be reassessed in more detail at the project application stage.
- The proposed development would have a minor impact to the residential amenity within Allengrove Crescent, with consideration for the levels set by the RMS.

4. Development Proposal

4.1 Land Uses

The proposal includes the demolition of the existing on-site detached residential dwellings and the construction of 179 residential apartments dispersed across five buildings of varying heights, to a maximum of five storeys, as summarised in Table 4.1.

Table 4.1: Development Schedule

Use	Dwelling Type	No. of Apartments/ Size
Residential	Studio	17
	1 bedroom	75
	2 bedroom	77
	3 bedroom	10
Total		**179**

4.2 Vehicle Access

Vehicle access to the basement car park is proposed via a new 6m wide two-way driveway to Allengrove Crescent. The access driveway will provide for all vehicles accessing the site, including for service/ garbage collection purposes.

A separate dedicated service road for intermittent use by occasional service vehicles (landscaping, maintenance etc) and emergency vehicles is also proposed via Allengrove Crescent along the eastern boundary of the site.

The suitability of the proposed access arrangements is discussed in Section 5.2 of this report.

4.3 Car Parking

The proposed development will provide a total of 218 car parking spaces, the breakdown of car parking are as follows:

- 179 residential car spaces (including 18 adaptable residential spaces)
- 36 visitor car spaces
- 1 car share space.

In addition, 2 service vehicle spaces are proposed within basement level 1.

The suitability of the car parking provision and layout is discussed in Section 5 of this report.

4.4 Pedestrian Facilities

Pedestrian access to the site is proposed via several locations on all three site frontages along the northern, western and southern boundaries. Internal pedestrian facilities and linkages combine to provide safe and secure access between the proposed residential buildings to ensure connectivity and opportunity for passive surveillance.

It is noted that there is a north-south pedestrian path adjacent to the eastern boundary of the site that effectively links Epping Road with Allengrove Crescent. Access is security controlled and limited to residents only. Service vehicles are also able to use this facility via Allengrove Crescent, as required.

The suitability of the proposed pedestrian facilities is discussed in Section 6 of this report.

4.5 Bicycle Facilities

The development plans prepared by SJB Architects indicates that there is a parking for 222 bicycles, with 175 located within basement level 2 and 47 within basement level 3. These facilities are a mix of bicycle storage facilities (cages) and bicycle racks.

The suitability of the bicycle provision is discussed in Section 6 of this report.

4.6 Loading Areas

Loading facilities are proposed within the basement level 1 car park adjacent to the access driveway via Allengrove Crescent. The loading area has been designed for use by service vehicles up to 8.8m (medium rigid vehicles) in length. The layout includes one waste storage facility located adjacent to the loading bay in the south-east corner of the site.

The suitability of the proposed loading arrangements is discussed in Section 7 of this report.

5. Car Parking

5.1 Car Parking Requirements

The car parking requirements for different development types are set out in the City of Ryde DCP (2010). A review of the car parking rates and the floor area schedule results in a DCP parking requirement for the proposed development as summarised in Table 5.1.

Table 5.1: DCP Car Parking Requirements

Apartment type	No.	DCP Parking Rate	Min. Rate	Min. DCP Parking Requirement	Max. Rate	Max. DCP Parking Requirement
Studio	17	0.6 to 1 space/ 2 bedroom dwelling	0.6/unit	11 spaces	1/unit	17 spaces
1-bedroom	75		0.6/unit	45 spaces	1/unit	75 spaces
2-bedroom	77	0.9 to 1.2 spaces/ 2 bedroom dwelling	0.9/unit	70 spaces	1.2/unit	93 spaces
3-bedroom	10	1.4 to 1.6 spaces/ 2 bedroom dwelling	1.4/unit	14 spaces	1.6/unit	16 spaces
Visitor	-	1 visitor space/ 5 dwellings	N/A	36 spaces	N/A	36 spaces
Total				**176 spaces**		**237 spaces**

Based on the above, the proposed development is required to provide between 176 and 237 car parking spaces. The development proposes a total of 218 car parking spaces and therefore complies with the City of Ryde DCP's car parking requirements.

5.2 Car Parking Layout Review

The car park layout has been reviewed against the requirements of the City of Ryde DCP, the Australian Standard for Off Street Car Parking (AS2890.1:2004 and AS2890.6:2009) and the Australian Standard for Off Street Commercial Vehicle Facilities (AS2890.2:2002). This assessment includes a review of the following:

- bay and aisle width
- adjacent structures
- turnaround facilities
- car park circulation and access ramps (grades)
- height clearances
- parking for persons with disabilities.

The details of this review are provided below and indicate that the proposed car parking layout is expected to operate satisfactorily, subject to the adoption of recommendations discussed below and shown graphically at Appendix A.

The Allengrove Crescent site frontage will provide access to the basement car park, loading area and visitor parking via a ramp that has been designed to be in accordance with Australian Standard (AS2890.2:2002) for access by service vehicles (including garbage trucks) up to 8.8m in length. The loading area has been designed to accommodate one service vehicle and up to three courier vehicles/ vans.

The proposed development has been set back adequately to accommodate a 2 metre wide strip for future road widening of Allengrove Crescent should it be required. New kerb and guttering with widening will be provided in consultation with Council together with a pedestrian footpath along the site frontage to Lane Cove Road to match existing facilities. All redundant driveways will be removed together with no parking controls (along the site frontage) and no stopping controls (between the western boundary and Lane Cove Road). It is also noted that, subject to Local Traffic Committee approval, a pedestrian refuge island in Allengrove Crescent at Lane Cove Road would allow for a safer pedestrian environment given the anticipated increase in two-way traffic volumes. Swept paths indicate that road widening would be required to accommodate access by service vehicles, including garbage trucks.

The site access driveway is a minimum 8m wide with swept paths illustrating that vehicles are able to enter/ exit the site independently (including service vehicles) with all vehicles turning left-in and right-out of the site. Access is proposed to be under security control and associated intercom system.

A vehicular ramp of maximum 1:6.5 (15%) with appropriate summit and sag transitions over 2m will provide access to all on-site parking and loading facilities. Vertical clearances for 8.8m medium rigid trucks confirm appropriate design. The ramps to the lower basement levels have been designed to be a minimum 5.5m wide and will provide for two-way traffic movements between the basement car parking levels. The maximum grades for each ramp are 1:4 (25%) with appropriate transitions over 2m. Convex mirrors are provided in areas of limited sight lines, high turnover and/ or structural obstacles.

The basement car park has been designed in accordance with AS2890.1:2004 and provides car parking spaces 2.4m wide by 5.4m long, with a minimum 5.8m wide aisles. Structural columns are located outside the vehicle design template with all spaces capable of providing access by an 85^{th} percentile car. There is a minimum height clearance of 2.2m throughout the basement cark park. Resident parking areas are separated from visitor parking by boom gates, with any blind aisles located within the resident parking areas where turnaround facilities are not required.

6. Sustainable Transport Infrastructure

6.1 Bicycle End-of-Trip Facilities

The *NSW Planning Guidelines for Walking and Cycling* (Department of Infrastructure, Planning and Natural Resources, 2004) aims to assist land use planners and related professionals to improve consideration of walking and cycling in their projects. The guidelines have been designed to provide a walking and cycling focus to the NSW Government's *Integrating Land Use & Transport Planning* policy package. The *Planning Guidelines for Walking and Cycling* contain suggested bicycle parking provision rates for different land use types.

The suggested bicycle parking provision for the development is summarised in Table 6.1.

Table 6.1: Suggested Bicycle Parking Rates

Apartment type	No. of Units	Suggested Parking Rate		Suggested Parking Provision	
		Residents	Visitors	Residents	Visitors
Studio	17	20-30% of units	5-10% of units	4-6	1-2
1- bedroom	75			15-23	4-8
2- bedroom	77			16-23	4-8
3- bedroom	10			2-3	1
Total	**179**			**37-55**	**10-19**

Based on the above, the proposed development is required to provide between 47 and 74 bicycle parking spaces for use by residents and visitors. The development proposes a total of 222 bicycle storage spaces and therefore complies with the suggested rates.

The permeability of the proposed site layout will provide access opportunities for both pedestrians and cyclists along all site frontages. The site boundary structure/ walls have been set back to allow for appropriate footpaths along both Lane Cove Road and Epping Road and to minimise the visual impact.

The extensive network of internal pedestrian facilities will allow easy access along pedestrian desire lines to public transport facilities/ services, including major bus stops along Lane Cove Road and Epping Road, as well as Macquarie Park Railway Station.

It should also be noted that given the close proximity to Macquarie Railway Station (400m north of the site) and in-line with the encouragement of sustainable forms of transport, each apartment will be issued with a one-off yearly rail pass (to/ from the CBD) at the time of sale.

7. Loading Facilities

7.1 Proposed Loading Arrangements

Loading facilities are proposed within the basement level 1 car park in the south-east corner of the site. Access is provided via the Allengrove Crescent access driveway, with the area designed for use by service vehicles up to 8.8m in length. The on-site waste storage facility is located close to the loading area in the south-east corner of the site and, when combined with the loading area dimensions, will allow for easy access for waste collection purposes.

The area also includes capacity for up to three service vehicles (courier vehicles/ vans etc) along the eastern boundary of the site.

7.2 Vehicle Swept Paths

Swept paths of an 8.8m medium rigid vehicle entering the site, reversing into the loading area and exiting the site via Allengrove Crescent in a forward direction are included in this report as Appendix A.

8. Traffic Impact Assessment

8.1 Traffic Generation

8.1.1 Design Rates

Traffic generation estimates for the proposed development have been sourced from the RMS Guide (2002). Having consideration for the size of apartments and their location, Table 8.1 sets out traffic generation estimates for both peak hour and daily periods.

Table 8.1: Estimated Development Traffic Generation

Land Use	Design Generation Rates		Traffic Generation Estimates	
	Peak Hour [1]	Daily	Peak Hour	Daily
Residential (179 apartments)	0.29 vehicle movements/ dwelling	3 vehicle movements/ dwelling	52 vehicle movements/ hour	537 vehicle movements/ day

[1] Adopting a peak to daily ratio of 10%.

Table 8.1 indicates the proposed development could be expected to generate approximately 537 vehicle movements per day and 52 vehicle movements during each respective peak hour on a typical weekday. This represents a minor impact on the surrounding road network.

It should be noted that the RMS generation rate of 0.29 trips per dwelling is representative of a high density residential flat building in a metropolitan subregional centre. The Traffix report presented a conservative approach at the Concept Plan Application stage by assuming a generation rate of 0.4 trips per dwelling. As such, adopting the higher rate results in the proposed development generating up to 72 vehicle movements during each respective peak hour on a typical weekday.

8.2 Distribution and Assignment

The directional distribution and assignment of traffic generated by the proposed development will be influenced by a number of factors, including the:

i configuration of the arterial road network in the immediate vicinity of the site;
ii existing operation of intersections providing access between the local and arterial road network;
iii surrounding employment centres, retail centres and schools in relation to the site;
iv configuration and location of the basement car park access.

Having consideration for the above, for the purposes of estimating vehicle movements, all traffic will approach the site via Lane Cove Road north and exit to the south given that the intersection of Allengrove Crescent/ Lane Cove Road allows for left in/ left out movements only.

In addition, the directional split of traffic (i.e. the ratio between the inbound and outbound traffic movements) has been assumed to be the following:

- AM Peak Hour – Inbound 20% Outbound 80%
- PM Peak Hour – Inbound 80% Outbound 20%.

Based on the above, Allengrove Crescent is likely to accommodate the following increase in traffic volumes during the weekday AM (8:00am-9:00am) and PM (5:00pm-6:00pm) peak hours:

- AM – 10-14 in and 42-58 out
- PM – 42-58 in and 10-14 out.

8.3 Traffic Impact

As detailed in Section 3 and as a result of the Director General's requirements, a Paramics microsimulation model has been prepared by Traffix[2] at the Concept Plan Application stage to assess the impacts of the proposed development on the surrounding road network. The assessment has been undertaken as part of the Macquarie Park Traffic Study and the Macquarie Park LEP to assess the overall impact of developments in the study area on the existing and future road networks. The assessment was undertaken in accordance with the Macquarie Park User Manual.

The results of the microsimulation study returned a minimal variation in queue lengths as a result of the proposed development during both the AM and PM peak periods at the intersection of Epping Road with Wicks Road and Lane Cove Road. It is noted that although some disparity is evident, this was not considered as a result of the proposed development but due to varying flow and route choices within the model over the calculation periods.

It is noted that Concept Approval (MP10_0037) did not approve a set number of apartments or car parking spaces, and this will be determined as part of subsequent Development Application(s) to be submitted to Council. However, for determining or providing a comparative traffic generation, the 154 apartments shown on the indicative plans of the Concept Approval has been adopted. The application seeks approval for 179 apartments, which represents an increase in 25 apartments from the 154 shown on the indicative plans.

Assuming a conservative traffic generation rate (0.4 trips/ dwelling), the traffic generated by the proposed development is not expected to have a detrimental impact on the surrounding road network. The difference between the Concept Approval and the Development Application equates to a total of 10 vehicles (2 inbound, 8 outbound) during the AM peak hour. This represents 1 vehicle every 7.5 minutes exiting the site into Allengrove Crescent and subsequently Lane Cove Road.

As such, the intersection of Lane Cove Road/ Allengrove Crescent will continue operate at a similar level of service as that detailed in the Concept Approval, as the upstream signals allow for breaks in the traffic flow, allowing exiting vehicles safe and reasonably regular access to Lane Cove Road.

[2] Transport and Accessibility Impact Study, Traffix, May 2011

9. Conclusion

Based on the analysis and discussions presented within this report, the following conclusions are made:

i The proposed development is required to provide between 176 and 237 spaces under the City of Ryde DCP (2010).

ii The proposed supply of 218 spaces is consistent with these requirements and is considered to be appropriate.

iii The site is conveniently located for access to public transport services and walking facilities.

iv Walking facilities are well established in the local area and the proposal includes a site design aimed at improving the urban amenity.

v The provision for bicycle facilities meets the *NSW Planning Guidelines for Walking and Cycling* suggested rates with up to 222 bicycle racks/ cages provided within the basement car park.

vi The proposed parking layout is consistent with the dimensional requirements as set out in the Australian Standard for Off Street Car Parking (AS2890.1:2004 and AS2890.6:2009).

vii The provision of loading facilities has been designed to accommodate medium rigid vehicles up to 8.8m in length and is consistent with the requirements of Australian Standard (AS2890.2:2002). Swept path assessment indicates that there is sufficient space for vehicles to enter and exit the site in a forward direction via Allengrove Crescent.

viii The site is expected to generate up to 72 vehicle movements in any peak hour assuming a conservative traffic generation rate of 0.4 vehicle trips per dwelling.

ix The Traffix report assessed the proposed development at the Concept Plan Application stage using a Paramics microsimulation model for a similar development yield and concluded that there is adequate capacity in the surrounding road network to cater for the traffic generated by the proposed development.

x Concept Approval was considered for 154 apartments. In comparison, the proposed development (179 apartments) will result in an additional 1 vehicle departing the site every 7.5 minutes during the AM peak hour.

xi There is adequate capacity in the surrounding road network to cater for the traffic generated by the proposed development.

xii A pedestrian refuge island in Allengrove Crescent at Lane Cove Road would provide an improved pedestrian amenity however road widening is required to accommodate access by service vehicles.

xiii Provision is made for the Allengrove Crescent access driveway to operate safely and efficiently, including for access by service vehicles up to 8.8m in length.

xiv The design considers the future widening of Allengrove Crescent and is appropriate under such a future scenario.

Appendix A

Compliance Review and Swept Path Assessment

RL +73.850
RL +74.150
RL +74.650
RL +75.100
RL +75.740
RL +76.485
RL +77.120
RL +73.550
RL +73.950
RL +74.350
1:20
1:14
5900
41° 15'
44.925
221° 15' 00"
D1.01 2 BED
D1.02 STUDIO
D1.03 STUDIO
D1.04 2 BED
D1.05 1 BED
D1.06 2 BED
D1.07 3 BED
D1.08 3 BED
STUDIO 43.4sqm
2B 79.5sqm
2B 76.5sqm
FFL +75.250
FFL +77.150
RL 73.095
1:16
RL 74.530
1:6.5
CARPARK ENTRY RAMP
PLANT / MANAGERS OFFICE
RL 75.700
RL 75.900
1:10
ACCESSIBLE WC
INTERCOM
SETBACK COLUMN 0.3m FROM FACE OF KERB TO PROVIDE SUITABLE CLEARANCES FOR 8.8m LONG SERVICE VEHICLES
LETTERBOXES
8900
RL +76.300
RL +75.280
RL +76.300
RL +74.360
2m COUNCIL DEDICATION ZONE
MINOR DISCREPANCY ON RLs. RLs SHOULD REFLECT THE RAMP GRADES AND DESIGN
76.20
311° 45'
RL +77.150
RL +77.700
RL +77.800
RL +77.050
6600
SERVICE VEHICLE ENTRY RAMP
No# 11 SINGL BRICK

A L L E N G R O V E C R E S C E N T

CAN NOT CONFIRM RLs ALONG ALLENGROVE CRESCENT

N

PRELIMINARY PLAN

FOR DISCUSSION PURPOSES
ONLY SUBJECT TO CHANGE
WITHOUT NOTIFICATION

No# 2 ALLENGROVE CRES
SINGLE STOREY
BRICK HOUSE

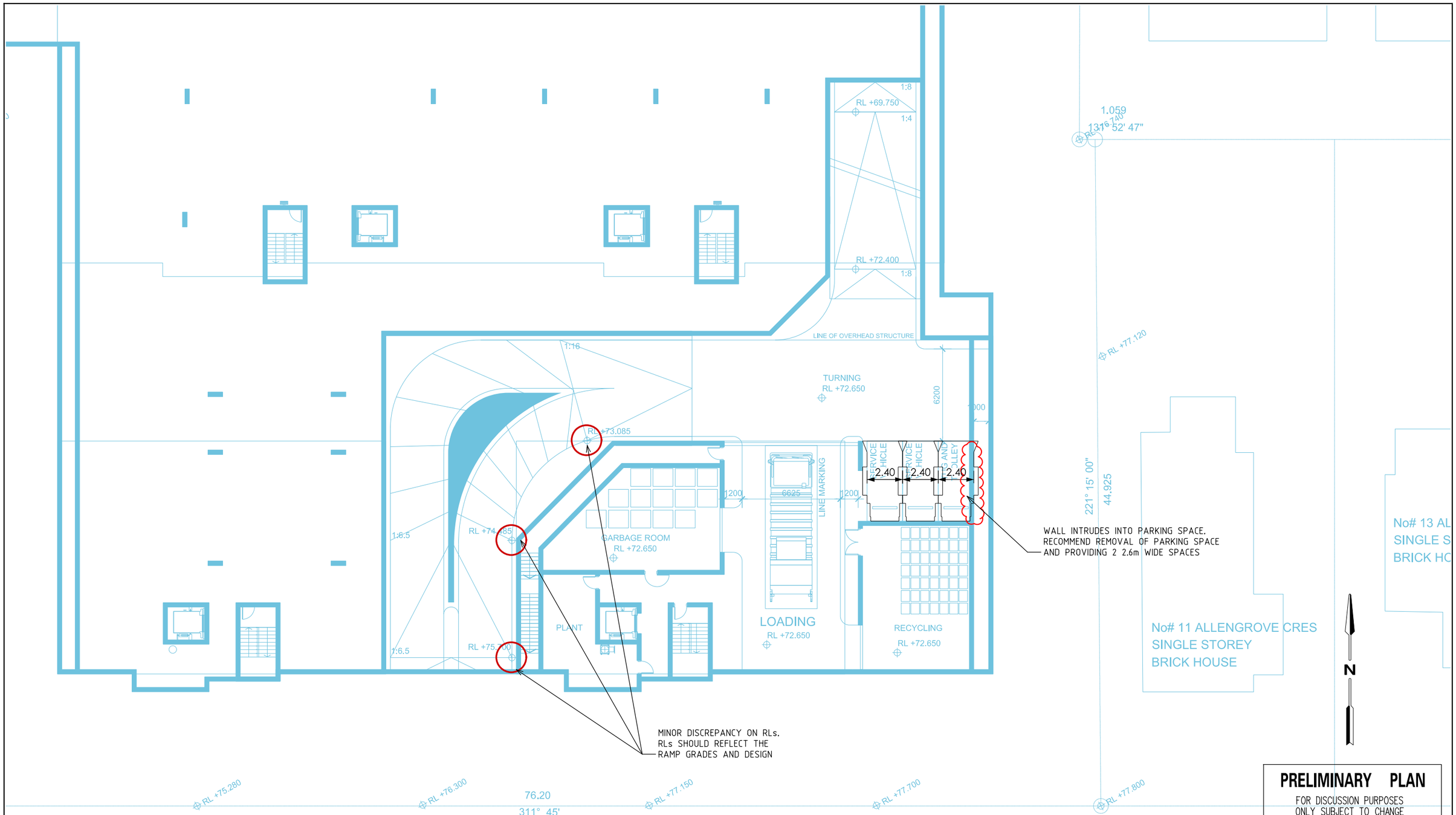
No# 6 ALLENGROVE CRES
SINGLE STOREY
BRICK HOUSE

No# 8 ALLENGROVE CRES
SINGLE STOREY
BRICK HOUSE

GTAconsultants
www.gta.com.au

1-9 ALLENGROVE CRESCENT, NORTH RYDE
CAR PARK COMPLIANCE REVIEW
LEVEL 1
06 FEBRUARY '13
SCALE 1:250 @ A3
13S1248000-03-01-P4
SHEET 01 OF 11

PLOTTED BY : Cameron Ward ON 6/02/2013 AT 12:49:23 PM



PRELIMINARY PLAN

FOR DISCUSSION PURPOSES
ONLY SUBJECT TO CHANGE
WITHOUT NOTIFICATION

ALLENGROVE CRESCENT

GTAconsultants
www.gta.com.au

1-9 ALLENGROVE CRESCENT, NORTH RYDE
CAR PARK COMPLIANCE REVIEW
BASEMENT 1

06 FEBRUARY '13
SCALE 1:250 @ A3
13S1248000-03-02-P4
SHEET 02 OF 11

PLOTTED BY : Cameron Ward ON 6/02/2013 AT 12:49:24 PM

BOLLARDS PROVIDED WITHIN ACCESSIBLE PARKING SPACE SHARED AREA SHOULD BE CENTRALLY LOCATED 0.8m FROM FRONT OF SPACE

123 STANDARD
36 VISITOR
18 ADAPTABLE
1 CARSHARE
147 BIKES / STORES

RECOMMEND RELOCATING VISITOR PARKING SPACES EAST AND WIDENING VEHICLE LANE (AS SHOWN)

POTENTIAL CONFLICT BETWEEN ENTERING AND EXITING VEHICLES

CONFLICT BETWEEN ENTERING AND EXITING VEHICLES AND/ OR STRUCTURE. WIDEN AISLE AT ACCESS CONTROL TO IMPROVE ACCESS

FFL +68.300
FFL +69.500
RL +72.920
RL +69.500
RL +69.750
1:20
1:8
1:4
MIRROR
INTAKE PLENUM
EXHAUST PLENUM
RL +77.120
RL +75.280
RL +76.300
RL +77.150
RL +77.700
1.059
131° 52' 47"
41° 15'
44.925
221° 15' 00"
76.20

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY SUBJECT TO CHANGE WITHOUT NOTIFICATION

GTA consultants
www.gta.com.au

1-9 ALLENGROVE CRESCENT, NORTH RYDE
CAR PARK COMPLIANCE REVIEW
BASEMENT 2
06 FEBRUARY '13
SCALE 1:250 @ A3
13S1248000-03-03-P4
SHEET 03 OF 11

PLOTTED BY : Cameron Ward ON 6/02/2013 AT 12:49:24 PM

BOLLARDS PROVIDED WITHIN ACCESSIBLE PARKING SPACE SHARED AREA SHOULD BE CENTRALLY LOCATED 0.8m FROM FRONT OF SPACE

PEDESTRIAN / BIKE ENTRY

RELOCATE COLUMN TO BE LOCATED OUTSIDE OF THE VEHICLE DESIGN ENVELOPE

FFL +68.300

RAMP 1:40

5800

5600

FFL +69.700

1.2

FFL +69.800

1.9

EXHAUST

EXHAUST FAN ROOM

INTAKE PLENUM

RAINWATER TANK

10100

6825

2.40

3000

JOINS

13S1248000-03-02

V

C/S

1:20

FFL +68.900

FFL +69.500

123 STANDARD
36 VISITOR
18 ADAPTABLE
1 CARSHARE
147 BIKES / STORES

RL +70.840

RL +75.390

RL +75.650

RL +76.140

41°23' 28"

131°43' 10.35

87.62

221° 52'

N

PRELIMINARY PLAN

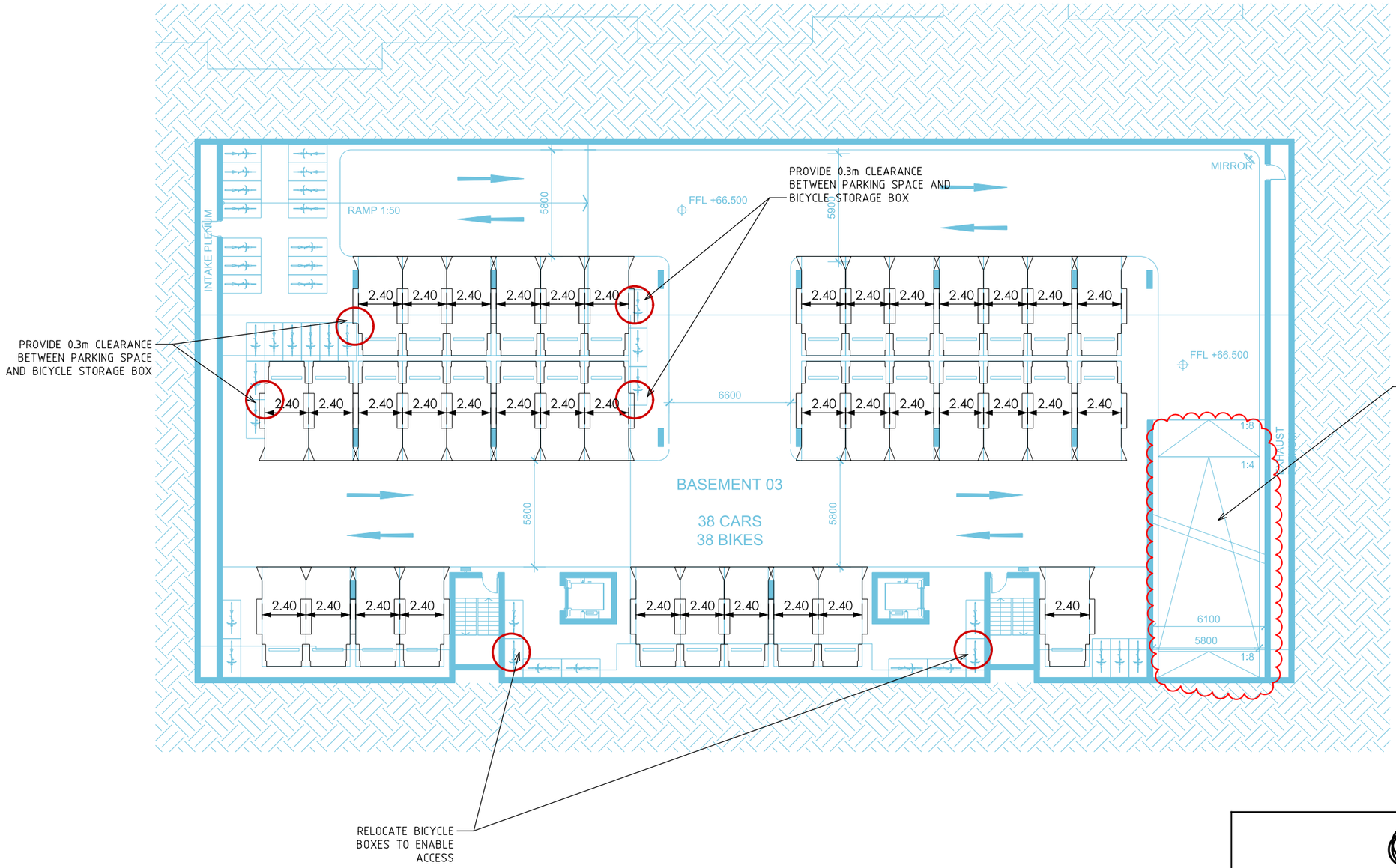
FOR DISCUSSION PURPOSES ONLY SUBJECT TO CHANGE WITHOUT NOTIFICATION

GTAconsultants
www.gta.com.au

1-9 ALLENGROVE CRESCENT, NORTH RYDE
CAR PARK COMPLIANCE REVIEW
BASEMENT 2

06 FEBRUARY '13
SCALE 1:250 @ A3
13S1248000-03-04-P4
SHEET 04 OF 11

PLOTTED BY : Cameron Ward ON 6/02/2013 AT 12:49:25 PM



PRELIMINARY PLAN

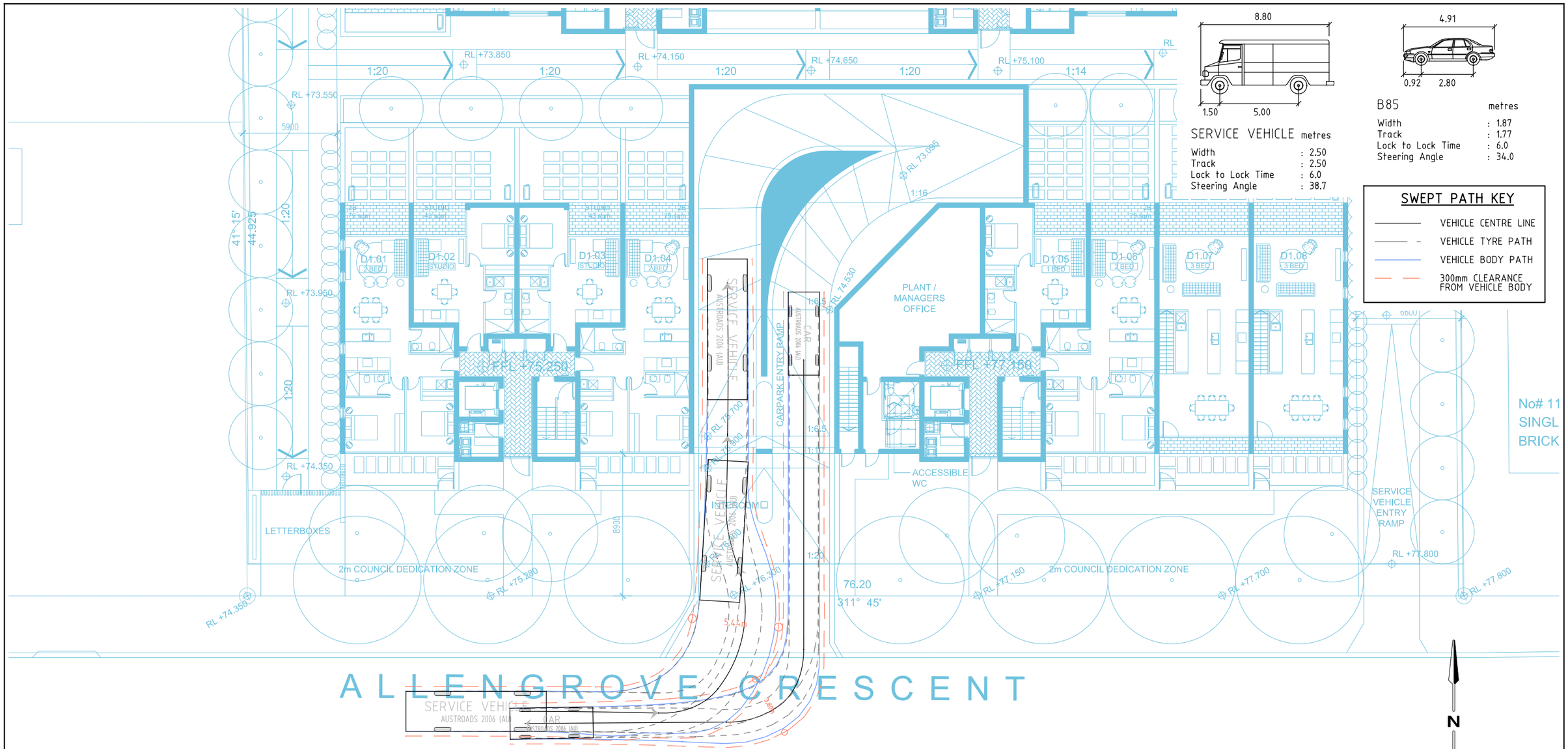
FOR DISCUSSION PURPOSES
ONLY SUBJECT TO CHANGE
WITHOUT NOTIFICATION

GTAconsultants
www.gta.com.au

1-9 ALLENGROVE CRESCENT, NORTH RYDE
CAR PARK COMPLIANCE REVIEW
BASEMENT 3

06 FEBRUARY '13
SCALE 1:250 @ A3
13S1248000-03-05-P4
SHEET 05 OF 11

PLOTTED BY : Cameron Ward ON 6/02/2013 AT 12:49:25 PM



8.80

1.50 5.00

SERVICE VEHICLE metres

Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 38.7

4.91

0.92 2.80

B85 metres

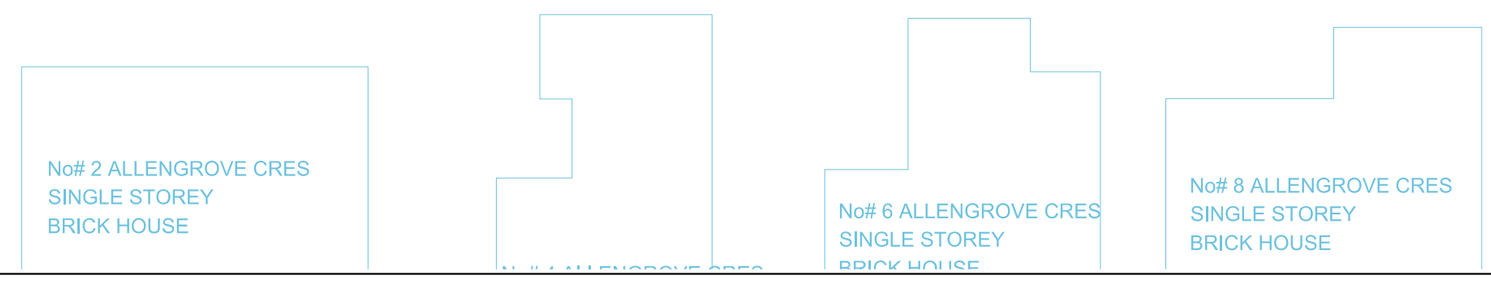
Width	: 1.87
Track	: 1.77
Lock to Lock Time	: 6.0
Steering Angle	: 34.0

SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 300mm CLEARANCE FROM VEHICLE BODY

PRELIMINARY PLAN

FOR DISCUSSION PURPOSES
ONLY SUBJECT TO CHANGE
WITHOUT NOTIFICATION

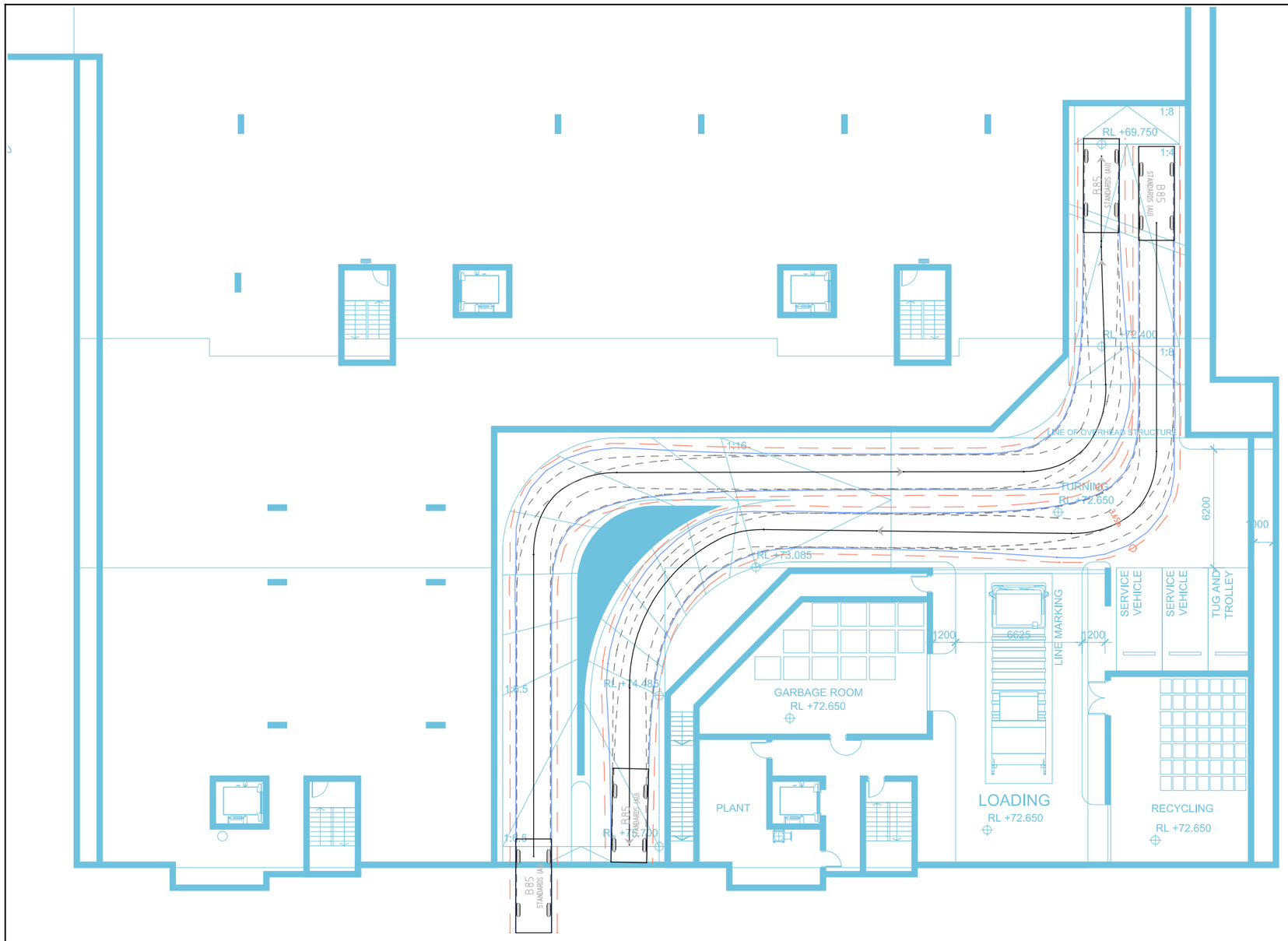


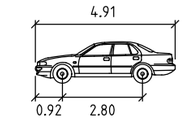
GTAconsultants
www.gta.com.au

1-9 ALLENGROVE CRESCENT, NORTH RYDE
CAR PARK SWEPT PATH ASSESSMENT
LEVEL 1

06 FEBRUARY '13
SCALE 1:250 @ A3
13S1248000-03-06-P4
SHEET 06 OF 11

PLOTTED BY : Cameron Ward ON 6/02/2013 AT 12:49:25 PM





B85 metres

Width	: 1.87
Track	: 1.77
Lock to Lock Time	: 6.0
Steering Angle	: 34.0

SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 300mm CLEARANCE FROM VEHICLE BODY

1.059
131° 52' 4
RL +77.120
221° 15' 00"
44.925

No# 13 AL
SINGLE S
BRICK HC

No# 11 ALLENGROVE CRES
SINGLE STOREY
BRICK HOUSE

N

RL +75.280
RL +76.300
76.20
311° 45'
RL +77.150
RL +77.700
RL +77.800

PRELIMINARY PLAN

FOR DISCUSSION PURPOSES
ONLY SUBJECT TO CHANGE
WITHOUT NOTIFICATION

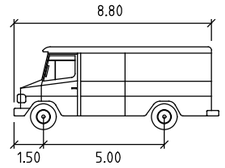
ALLENGROVE CRESCENT

GTAconsultants
www.gta.com.au

1-9 ALLENGROVE CRESCENT, NORTH RYDE
CAR PARK SWEPT PATH ASSESSMENT
BASEMENT 1

06 FEBRUARY '13
SCALE 1:250 @ A3
13S1248000-03-07-P4
SHEET 07 OF 11

PLOTTED BY : Cameron Ward ON 6/02/2013 AT 12:49:26 PM

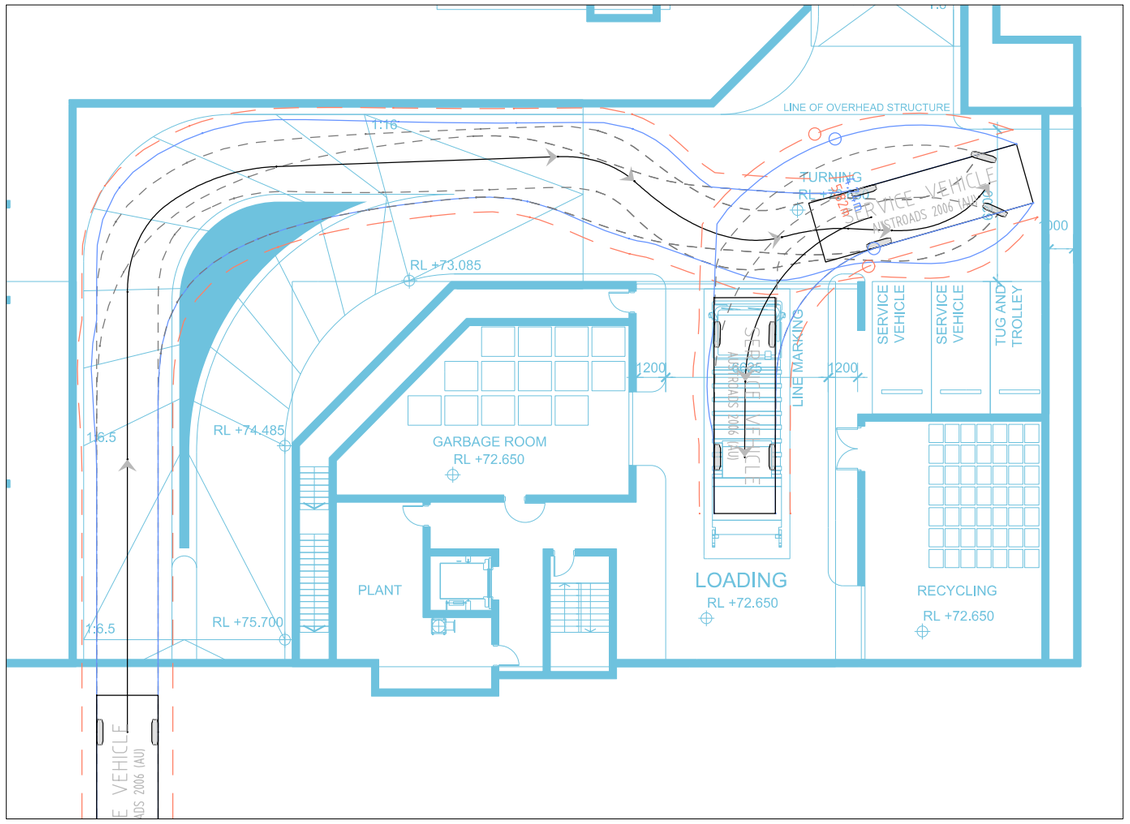


SERVICE VEHICLE metres

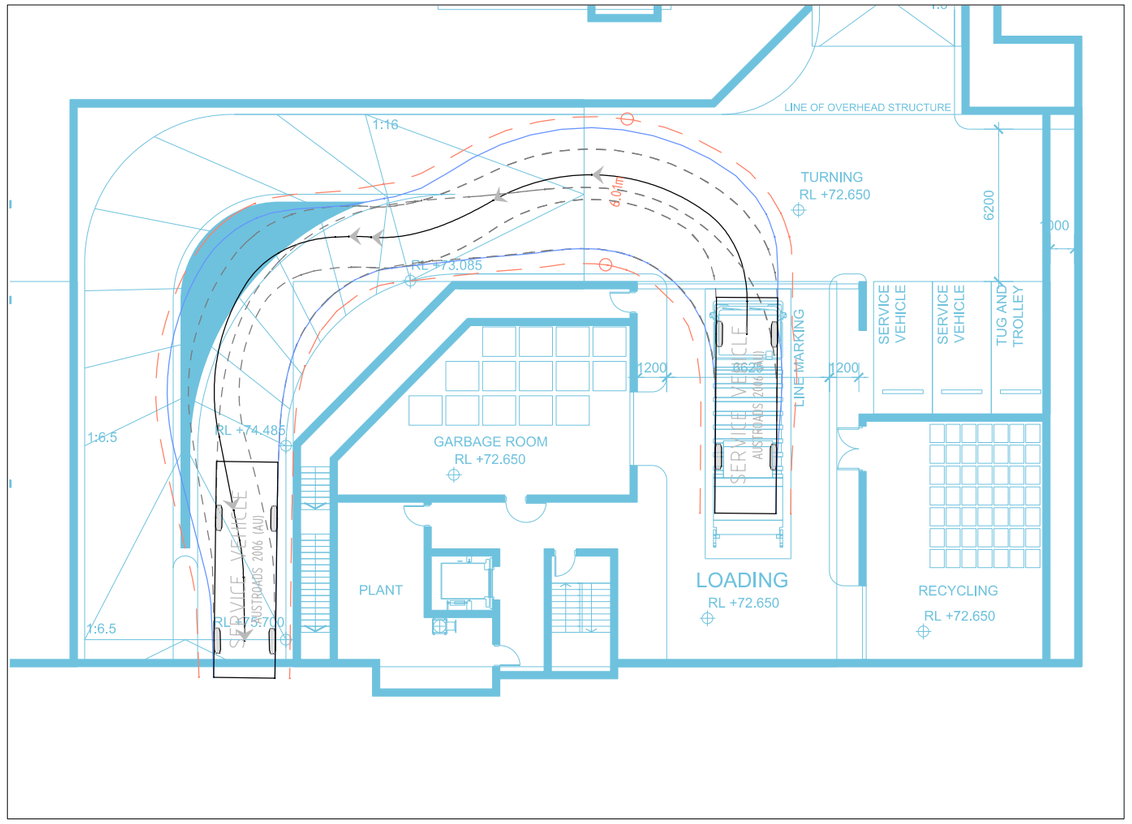
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 38.7

SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 300mm CLEARANCE FROM VEHICLE BODY



INGRESS



EGRESS

N

PRELIMINARY PLAN

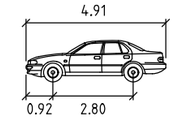
FOR DISCUSSION PURPOSES
ONLY SUBJECT TO CHANGE
WITHOUT NOTIFICATION

GTAconsultants
www.gta.com.au

1-9 ALLENGROVE CRESCENT, NORTH RYDE
CAR PARK SWEPT PATH ASSESSMENT
BASEMENT 1

06 FEBRUARY '13
SCALE 1:250 @ A3
13S1248000-03-08-P4
SHEET 08 OF 11

PLOTTED BY : Cameron Ward ON 6/02/2013 AT 12:49:27 PM



B85

	metres
Width	: 1.87
Track	: 1.77
Lock to Lock Time	: 6.0
Steering Angle	: 34.0

SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 300mm CLEARANCE FROM VEHICLE BODY

123 STANDARD
36 VISITOR
18 ADAPTABLE
1 CARSHARE
147 BIKES / STORES

FFL +68.900
FFL +69.500
RL +69.500
RL +69.750
RL +72.920
RL +77.120
MIRROR
INTAKE PLENUM
EXHAUST PLENUM
C/S
1.059
131° 52' 47"
41° 15' 44.925
221° 15' 00"
76.20

PRELIMINARY PLAN

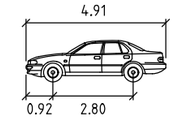
FOR DISCUSSION PURPOSES
ONLY SUBJECT TO CHANGE
WITHOUT NOTIFICATION

GTAconsultants
www.gta.com.au

1-9 ALLENGROVE CRESCENT, NORTH RYDE
CAR PARK SWEPT PATH ASSESSMENT
BASEMENT 2

06 FEBRUARY '13
SCALE 1:250 @ A3
13S1248000-03-09-P4
SHEET 09 OF 11

PLOTTED BY : Cameron Ward ON 6/02/2013 AT 12:49:27 PM



B85 metres

Width	: 1.87
Track	: 1.77
Lock to Lock Time	: 6.0
Steering Angle	: 34.0

SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 300mm CLEARANCE FROM VEHICLE BODY

PRELIMINARY PLAN

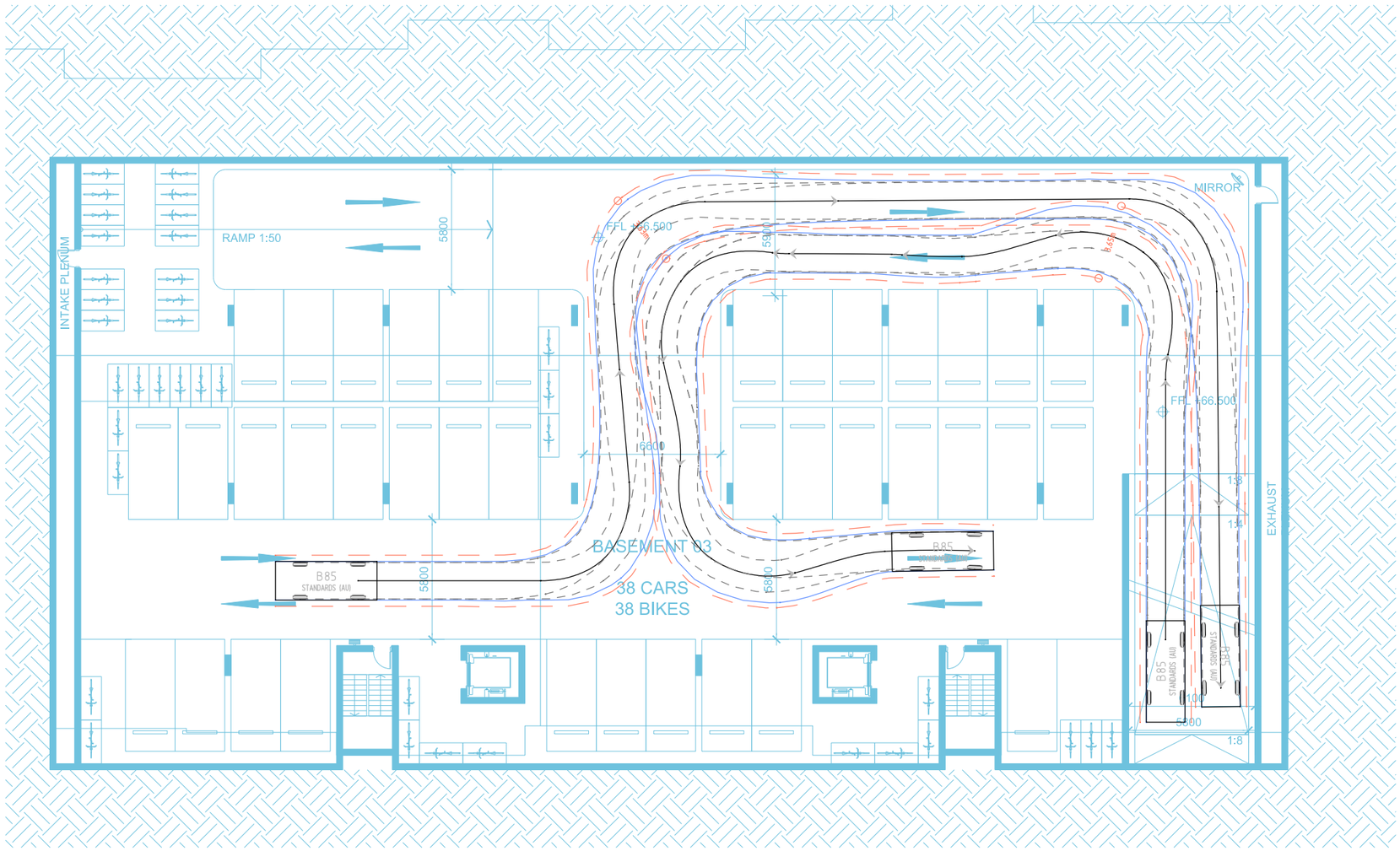
FOR DISCUSSION PURPOSES
ONLY SUBJECT TO CHANGE
WITHOUT NOTIFICATION

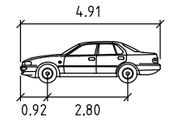
GTAconsultants
www.gta.com.au

1-9 ALLENGROVE CRESCENT, NORTH RYDE
CAR PARK SWEPT PATH ASSESSMENT
BASEMENT 2

06 FEBRUARY '13
SCALE 1:250 @ A3
13S1248000-03-10-P4
SHEET 10 OF 11

PLOTTED BY : Cameron Ward ON 6/02/2013 AT 12:49:27 PM





B85 metres

Width	: 1.87
Track	: 1.77
Lock to Lock Time	: 6.0
Steering Angle	: 34.0

SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 300mm CLEARANCE FROM VEHICLE BODY

N

PRELIMINARY PLAN

FOR DISCUSSION PURPOSES
ONLY SUBJECT TO CHANGE
WITHOUT NOTIFICATION

GTAconsultants
www.gta.com.au

1-9 ALLENGROVE CRESCENT, NORTH RYDE
CAR PARK SWEPT PATH ASSESSMENT
BASEMENT 3

06 FEBRUARY '13
SCALE 1:250 @ A3
13S1248000-03-11-P4
SHEET 11 OF 11

PLOTTED BY : Cameron Ward ON 6/02/2013 AT 12:49:28 PM

Melbourne

A 87 High Street South
PO Box 684
KEW VIC 3101
P +613 9851 9600
F +613 9851 9610
E melbourne@gta.com.au

Canberra

A Unit 4, Level 1, Sparta Building, 55 Woolley Street
PO Box 62
DICKSON ACT 2602
P +612 6263 9400
F +612 6263 9410
E canberra@gta.com.au

Townsville

A Level 1, 25 Sturt Street
PO Box 1064
TOWNSVILLE QLD 4810
P +617 4722 2765
F +617 4722 2761
E townsville@gta.com.au

Sydney

A Level 2, 815 Pacific Highway
CHATSWOOD NSW 2067
PO Box 5254
WEST CHATSWOOD NSW 1515
P +612 8448 1800
F +612 8448 1810
E sydney@gta.com.au

Adelaide

A Suite 4, Level 1, 136 The Parade
PO Box 3421
NORWOOD SA 5067
P +618 8334 3600
F +618 8334 3610
E adelaide@gta.com.au

Brisbane

A Level 3, 527 Gregory Terrace
BOWEN HILLS QLD 4006
PO Box 555
FORTITUDE VALLEY QLD 4006
P +617 3113 5000
F +617 3113 5010
E brisbane@gta.com.au

Gold Coast

A Level 9, Corporate Centre 2
Box 37
1 Corporate Court
BUNDALL QLD 4217
P +617 5510 4800
F +617 5510 4814
E goldcoast@gta.com.au

www.gta.com.au

GTAconsultants