

Proposed Mixed Use Development

402 Macquarie Street, Liverpool

Traffic and Parking Assessment

Ref: 21388
Date: July 2024
Rev: F

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1.0 Introduction

This report has been prepared to accompany a Development Application to Liverpool City Council for a proposed mixed use development, including an accommodation hotel element, at 402 Macquarie Street, Liverpool (Figure 1).

The Liverpool CBD is evolving as a contemporary Regional Centre with significant new residential apartment development due to:

- ❖ the convenient high capacity/frequency public transport services (rail and buses)
- ❖ the available employment, shopping and entertainment facilities along with the nearby educational and hospital/medical services

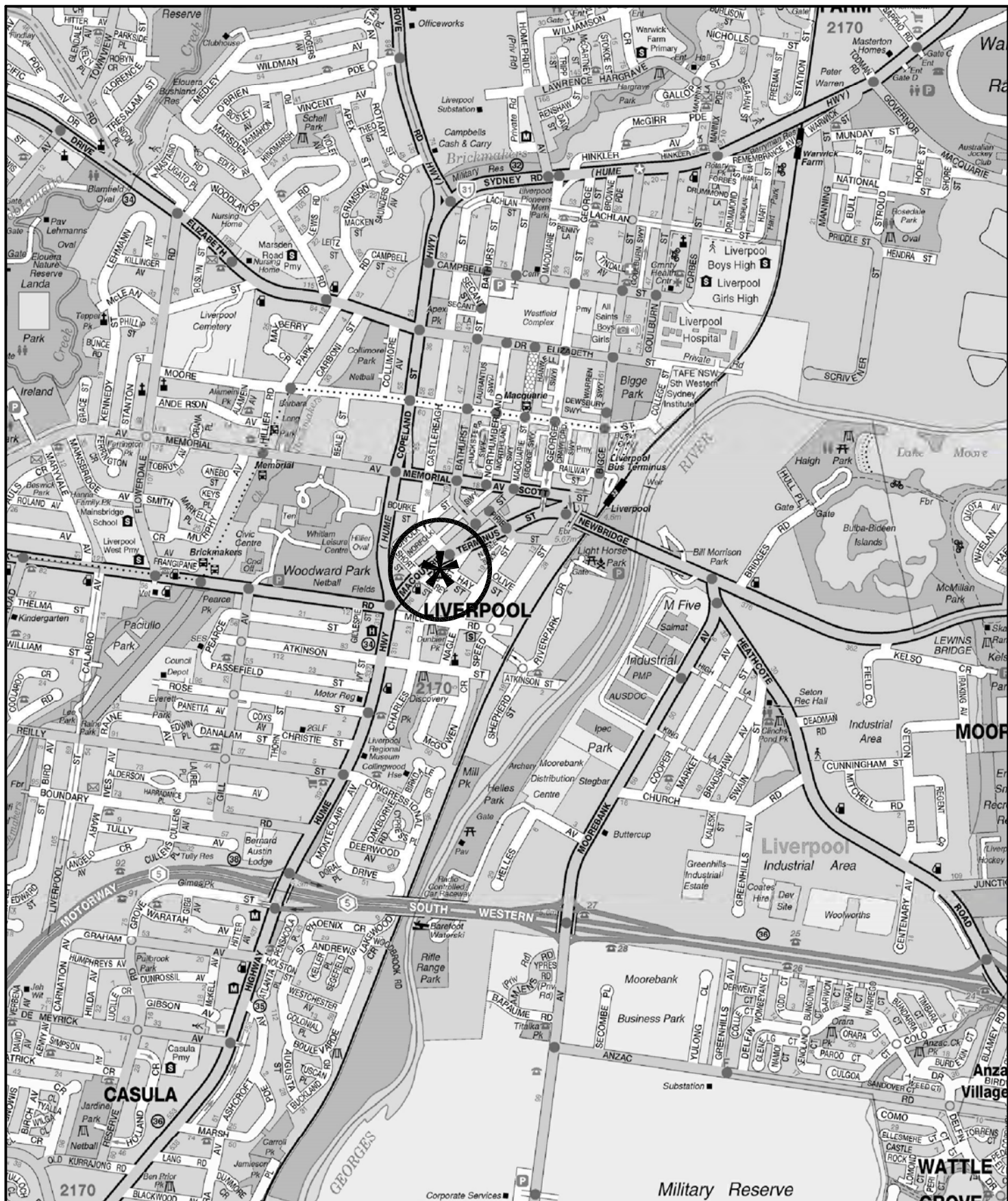
Consent has previously been granted for a mixed use development on the site comprising a hotel, residential apartments, retail tenancy and 5 basement levels of car parking.

The proposed new development scheme comprises:

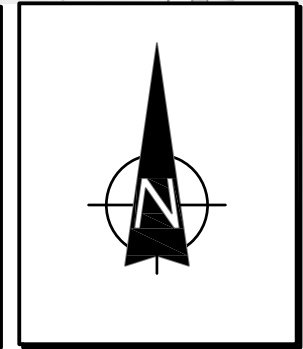
- 31 level building (above ground level)
- 168 residential apartments
- 198 hotel rooms with associated F&B facilities
- Gym
- Basement parking (6 levels)

The purpose of this report is to:

- ❖ describe the site, the previously approved development and the proposed development scheme
- ❖ describe the road network serving the site and the prevailing traffic conditions
- ❖ assess the adequacy of the proposed parking provision
- ❖ assess the potential traffic implications
- ❖ assess the proposed vehicle access, internal circulation and servicing arrangements



LEGEND



LOCATION

FIG 1

2.0 Proposed Development Scheme

2.1 Site, Context and Existing Circumstances

The site (Figure 2) is a consolidation of 4 lots which occupies a total area of 2,292 m² with frontages Macquarie Street and Carey Street located on the southern edge of the Liverpool CBD.

Whilst the site is now cleared and partially excavated, the former uses on the site comprised:

- a retail furniture shop of some 609m² with rear parking
- a motel with 45 units with garage and open parking accessed from Macquarie Street
- a dwelling

The surrounding landuses comprise:

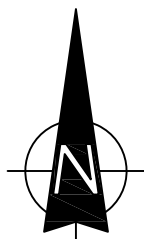
- ❖ a large new residential apartment based mixed use building which adjoins to the east
- ❖ the residential flat buildings fronting Charles Street which adjoin to the south
- ❖ the mixture of retail and commercial buildings extending along Macquarie Street and Terminus Street
- ❖ the Liverpool CBD which extends to the north with the Railway Station located on the eastern side and education and hospital/medical precincts to the north.

2.2 Approved Development

Consent was granted to demolish the remaining structures and complete the excavation of the site for basement car parking. The approved 18-level building comprised:



LEGEND



SITE

FIG 2

Residential Apartments

- 4 x studio apartments
- 12 x one-bedroom apartments
- 63 x two-bedroom apartments
- 21 x three-bedroom apartments

Total: 72 apartments

Hotel 192 rooms with F&B elements

Retail 240m²

Parking was proposed in 5 basement levels along with hotel set-down/pick-up and loading dock areas with vehicle access on the Carey Street frontage.

2.3 Proposed Development

The new development scheme is very similar to its previously approved scheme although it now involves a 31-level building (above ground level) and comprises:

Residential Apartments

- 84 x one-bedroom apartments
- 63 x two-bedroom apartments
- 21 x three-bedroom apartments

Total: 168 apartments

Hotel 198 rooms with F&B elements

Gym 354m²

A total of 205 parking spaces are proposed in 6 basement levels along with hotel set-down/pick-up and loading dock with vehicle access on the Carey Street frontage.

Details of the proposed Development Scheme are provided on the plans prepared by Olsson which accompany the Development Application and are reproduced in part in Appendix A.

3.0 Road Network and Traffic Conditions

3.1 Road Network

The road network which serves the Liverpool City Centre (Figure 3) comprises:

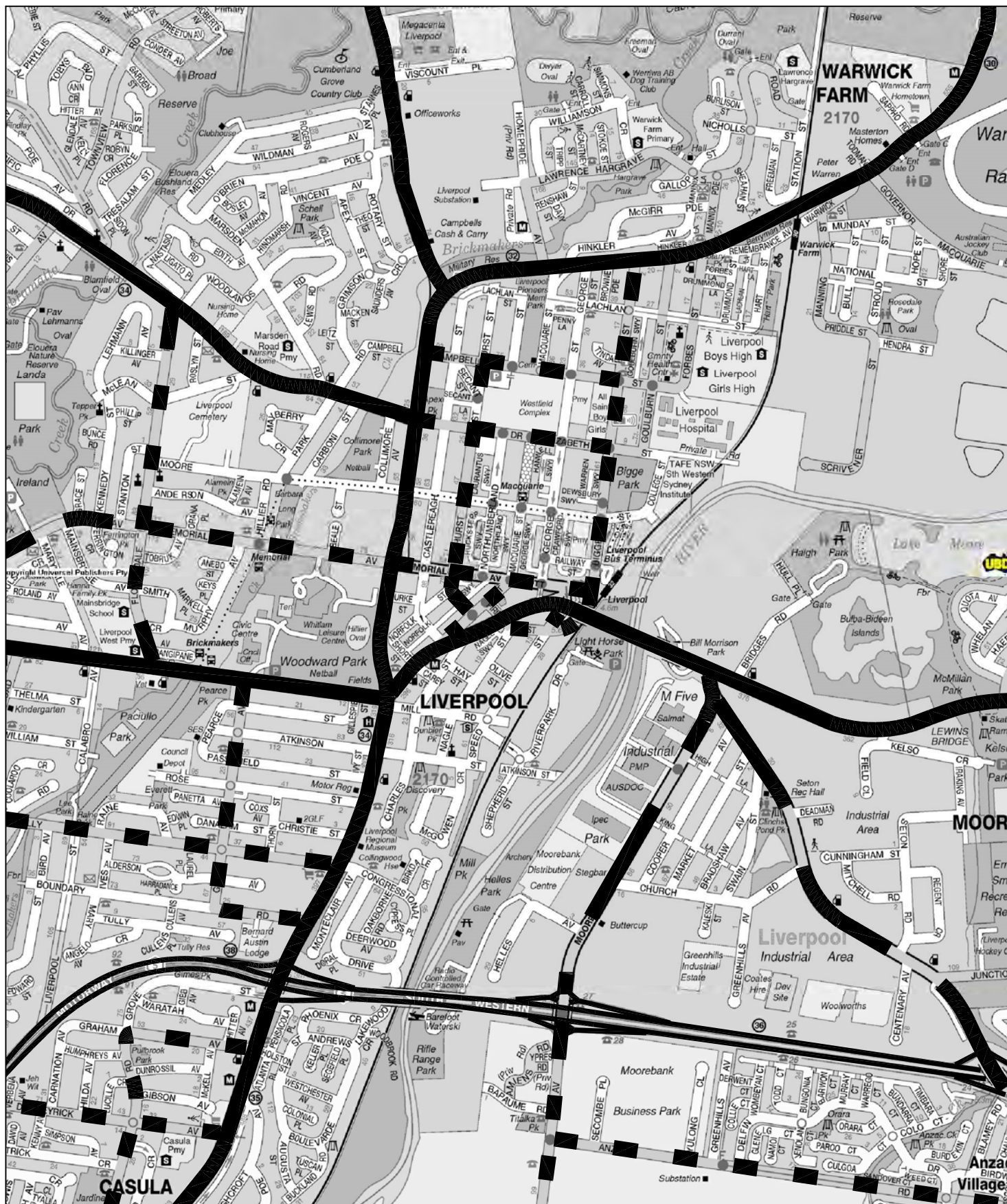
- ❖ the State Road and arterial routes of the Hume Highway running along the northern and western edge of the centre and Macquarie Street/Terminus Street/Newbridge Road running along the southern edge
- ❖ the east-west arterial routes of Hoxton Park Road and Elizabeth Drive extending to the west
- ❖ the “inner ring” collector road system of Bigge Street, Memorial Avenue, Bathurst Street and Campbell Street

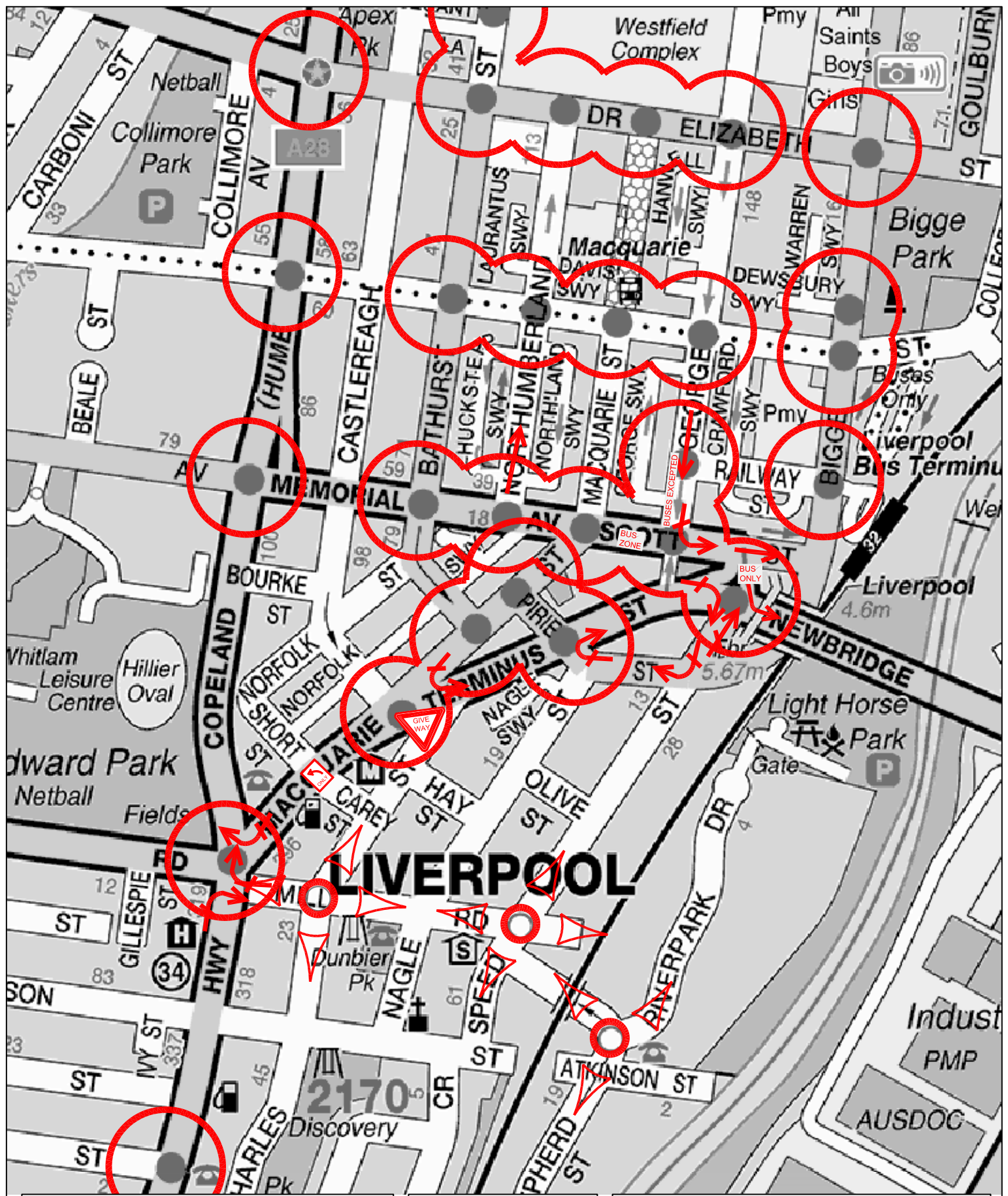
Mill Road, Charles Street and Carey Street are local access roads on the southern side of Macquarie Street/Terminus Street.

3.2 Traffic Controls




The existing traffic controls on the road system in the vicinity of the site (Figure 4) comprise:

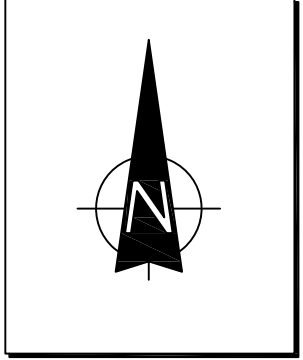
- ❖ the comprehensive network of traffic signals at intersections throughout the Liverpool CBD
- ❖ the traffic control signals located at the Macquarie Street/Terminus Street and Terminus Street/Pirie Street intersections
- ❖ the traffic control signals at the Macquarie Street/Hume Highway/Hoxton Park Road intersection
- ❖ the central median island in Macquarie Street along the site frontage which restricts movements to left-turn IN/OUT of Carey Street and Mill Road





LEGEND

-  TRAFFIC SIGNAL CONTROL
-  ROUNDABOUT
-  RESTRICTED TURNING MOVEMENT



TRAFFIC CONTROLS

FIG 4

- ❖ the peak period parking restrictions along Macquarie Street/Terminus Street
- ❖ the NO PARKING restriction along both sides of Carey Street south of the southern boundary of the site
- ❖ the roundabout at the Carey Street and Mill Road intersection
- ❖ the unrestricted kerbside parking along Mill Road, Carey Street and Charles Street
- ❖ the 50 km/h speed restriction within the local road network and 60kmph on Macquarie Street

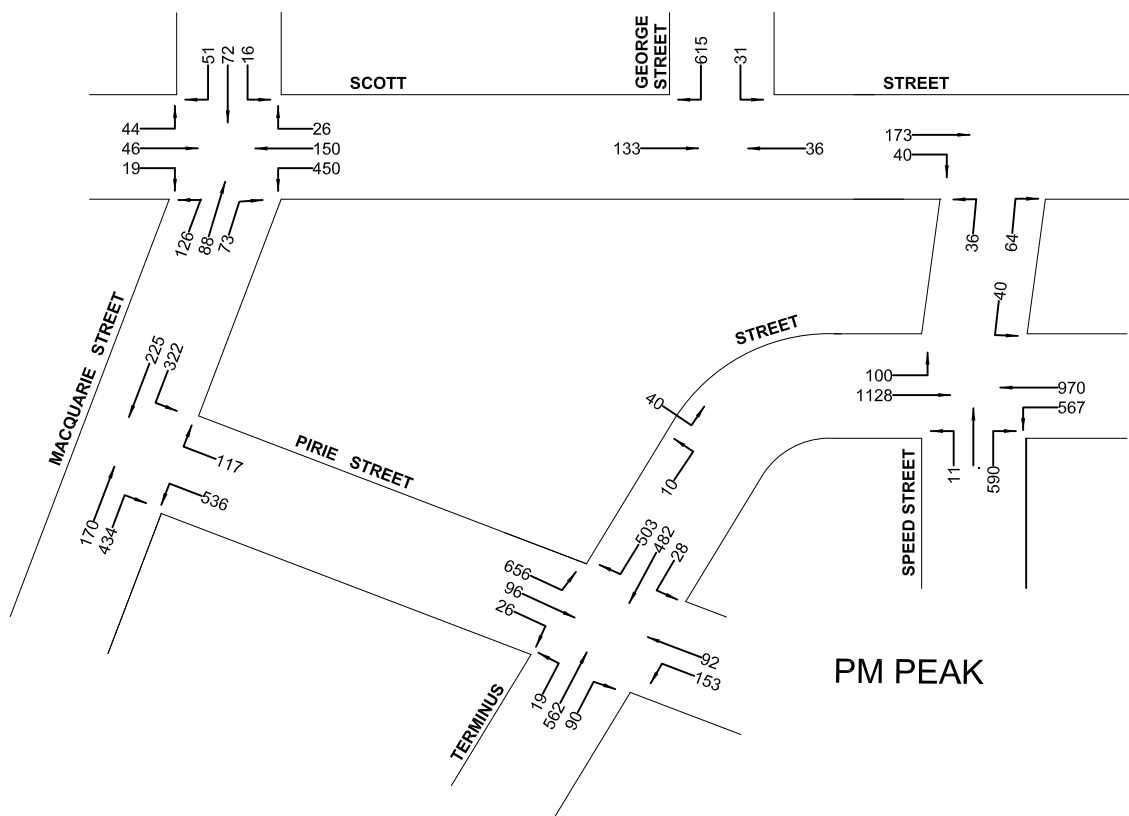
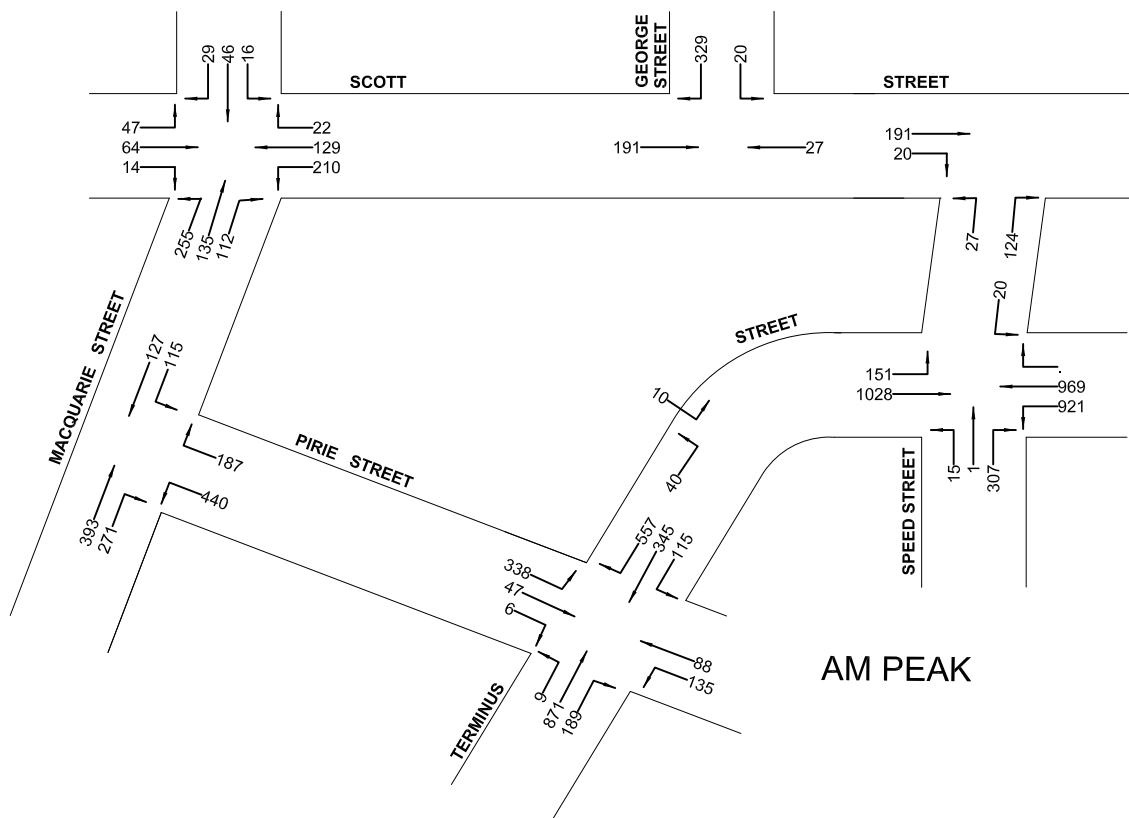
3.3 Traffic Conditions

An indication of the traffic conditions on the road system serving the site is provided by the most recently published Roads and Maritime Services (RMS) traffic data. The data is expressed in Average Annual Daily Traffic (AADT) and is provided as follows:

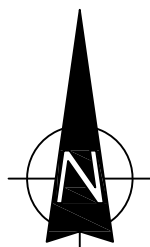
	AADT
Copeland Street, West of Memorial Avenue	72,450
Hoxton Park Road, West of Hume Highway	27,150
Terminus Street, East of Hume Highway	30,222

The traffic movements along Carey Street and Charles Street are quite minor and largely limited to local access movements.

Traffic Surveys have been undertaken at intersections in the vicinity of the site and the AM and PM peak traffic flows shown in Figure 5. Traffic conditions in the area are generally satisfactory although there is some congestion and delays at the principal intersections along the Hume Highway particularly the Hoxton Park Road intersection during the peak periods.



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**EXISTING PEAK
TRAFFIC FLOWS**

FIG 5

3.4 Transport Services

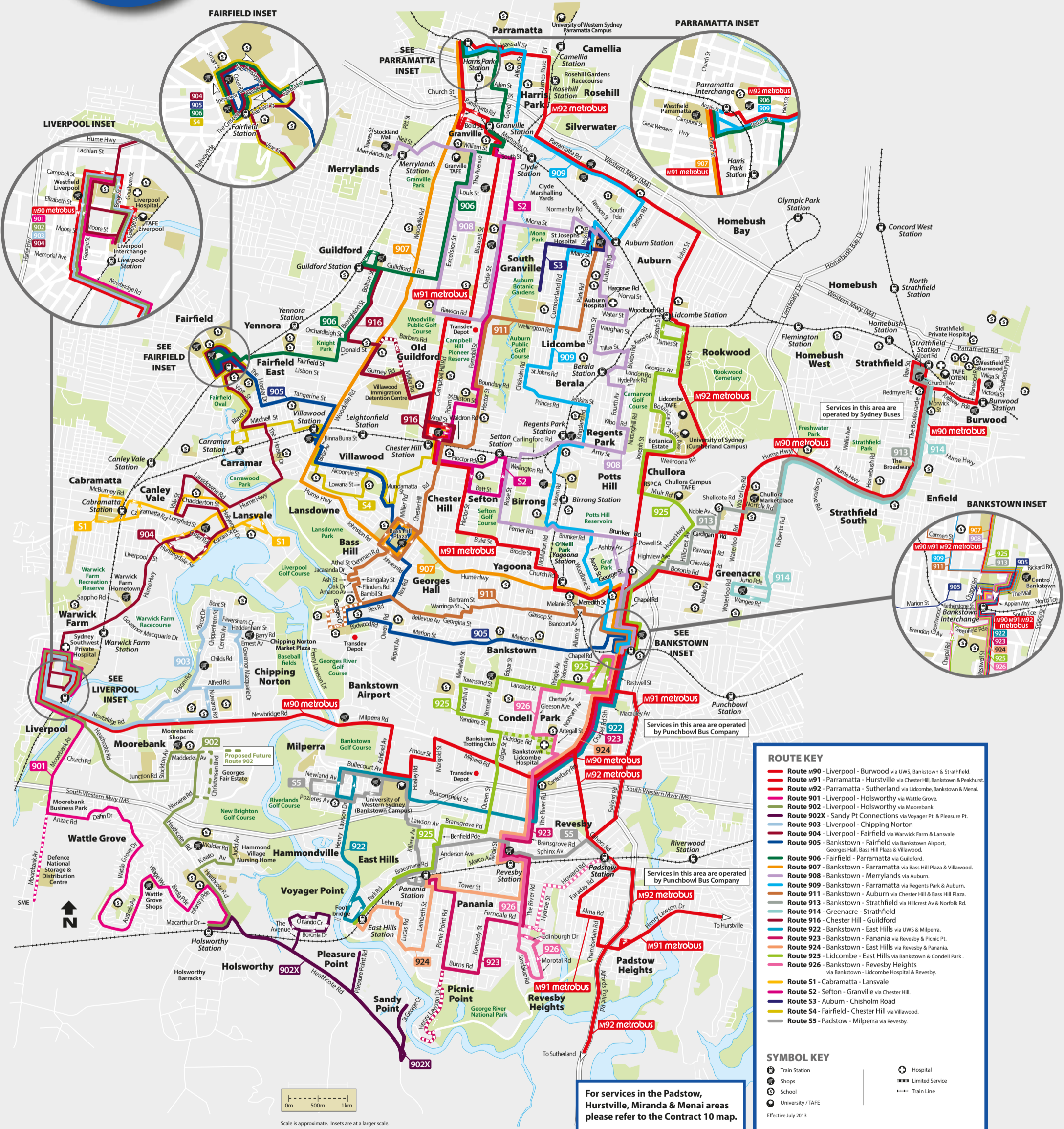
The development site is ideally located in relation to high capacity and frequent public transport services. Liverpool City Centre (CBD) is the transport 'hub' for south-west Sydney comprising extensive railway and bus network connections and the development site is located within easy walking distance to the rail and bus services (see details overleaf).

3.5 Future Circumstances

There are a number of proposed upgrades for the road network serving the southern part of the Liverpool CBD, namely:

- the proposed widening of Terminus Street to provide 3 lanes in each direction plus turning lanes.
- the extension of Bathurst Street through to Terminus Street.
- the provision of grade separation at the Hume Highway, Hoxton Park Road and Macquarie Street intersection

Parramatta-Liverpool-Bankstown Area Bus Services (Region 13)





Parramatta, Bankstown and Liverpool bus network map



NORTH

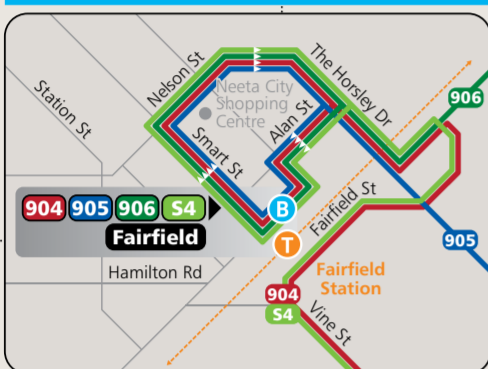


Diagrammatic Map
Not to Scale

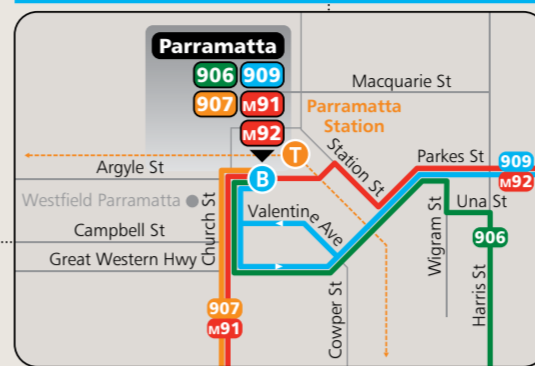
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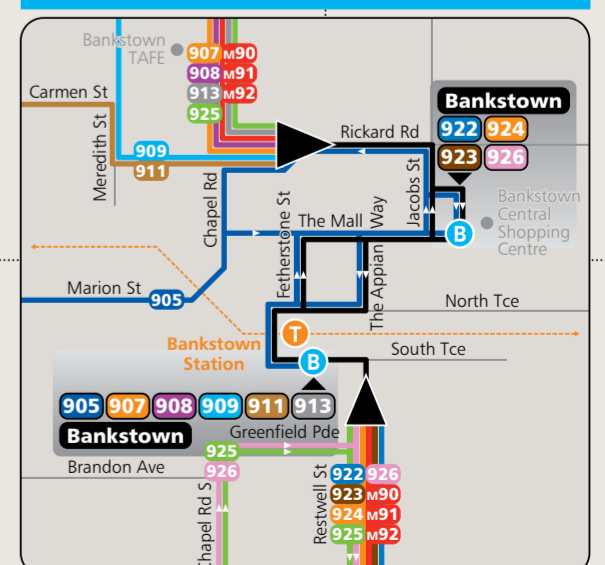
Fairfield Inset



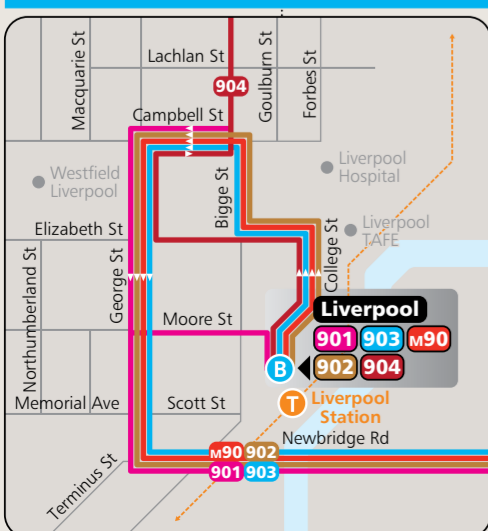
Parramatta Inset



Bankstown Inset



Liverpool Inset*



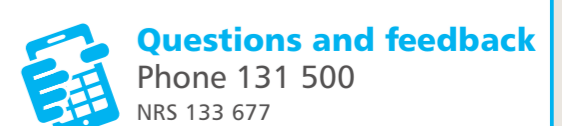
* The lines on the map show the routes of buses departing Liverpool. For buses arriving in Liverpool, please refer to individual timetables.

Key

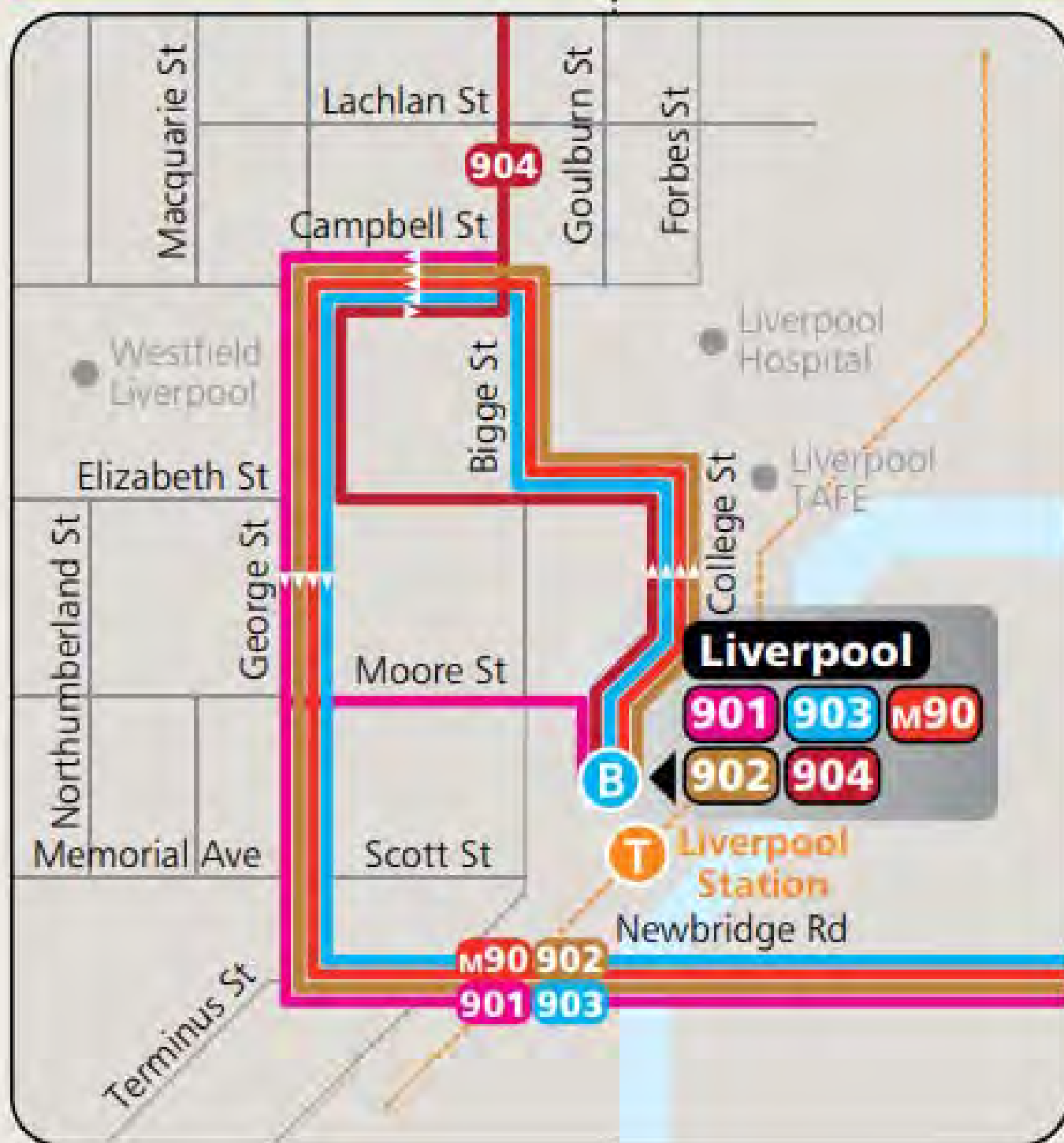
- Bus route
- Occasional journey
- Train line/station
- Bus route number
- Bus terminus

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Liverpool Inset *



4.0 Parking

There are a number of standards that could be applied to derive the appropriate parking provisions for the various elements of this development and there have been numerous precedents to the variation of these standards for nearby developments in the CBD.

The site is within 800m of the Railway Station and it is proposed to provide parking for the various elements will some reference to these standards but at the same time find a balance with actual needs. The proposed provision and the basis for these is as follows:

Residential Apartments (@ ADG rate)

84 x One-Bed @ 0.4 per apt	- 33.6 spaces
63 x Two-Bed @ 0.7 per apt	- 44.1 spaces
21 x Three-Bed @ 1.2 per apt	- 25.2 spaces
Total	103 spaces

Visitors (@ DCP rate)

168 @ 1 per 10 apts	- 17 spaces
Total	120 spaces

Accommodation Hotel

The RTA Development Guidelines specify a parking provision for Accommodation Hotel use (4 star) of 1 space per 4 rooms.

198 rooms @0.25 per room	50 spaces
--------------------------	-----------

Gym

354 m ² @ 1 per 150 m ² (LEP)	2.3 spaces (2)
Total	52 spaces

It is proposed to provide a total of 205 parking spaces including 11 accessible spaces as follows:

Residents	133 spaces
Visitors	17 spaces
Hotel/gym	55 spaces
Total	205 spaces

The DCP also specifies the following:

Bicycles		Motorcycles
Residential		1 space per 20 car spaces
1 per 2 apts or 1 per 4 bedrooms (whichever is greater)	100 spaces	
Visitor Accommodation		
1 per 10 staff plus 1 per 20 rooms	10 spaces	
Retail		
1 per 200m ² plus 2 plus 1 per 100m ²	5 spaces	
Total:	115 spaces	

It is proposed to provide 115 bicycles spaces and 11 motorcycle spaces.

5.0 Traffic

The former uses on the site comprised:

- a retail furniture store of some 600m²
- a motel with 45 units
- a residential dwelling

Assessment of the traffic generation of these uses would indicate the following:

	AM	PM
Retail Store	4 vtpm	10 vtpm
Motel @ 0.2-0.4 vtpm/Unit	9 vtpm	18 vtpm
Residence	0.85 vtpm	0.85 vtpm
Total:	14 vtpm	29 vtpm

The TfNSW guidelines¹ in relation to ‘high density’ residential apartments in a Regional Centre with convenient rail services specify a traffic generation criteria of 0.19 and 0.15 vtpm per unit during the on-street AM and PM peak periods respectively. This is based on survey of existing apartment buildings with an average parking provision of 1.4 spaces per apartment. Application of these rates to the envisaged residential apartment element of the development scheme (168) would indicate a traffic generation during the peak traffic periods of some 32 vtpm in the AM and 25 vtpm in the PM.

The TfNSW guidelines do not provide a traffic generation criteria for accommodation hotels and there will be a “constrained” parking provision in this case (i.e. 51 spaces for 198 rooms). This parking provision would indicate an arrival/departure rate of some 25 vtpm in the peak periods with an additional set-down/pick-up (e.g. taxi) generation of 5vtpm (i.e. total 30 vtpm) being largely departure in AM and arrival in PM.

¹ RMS Technical Direction TDT-2013 (4b)

Application of these factors to the proposed development indicates the following total traffic generation:

	AM		PM	
	IN	OUT	IN	OUT
Residential	6	26	20	5
Hotel	5	25	25	5
Gym	2	-	-	2
Total:	13	51	45	12

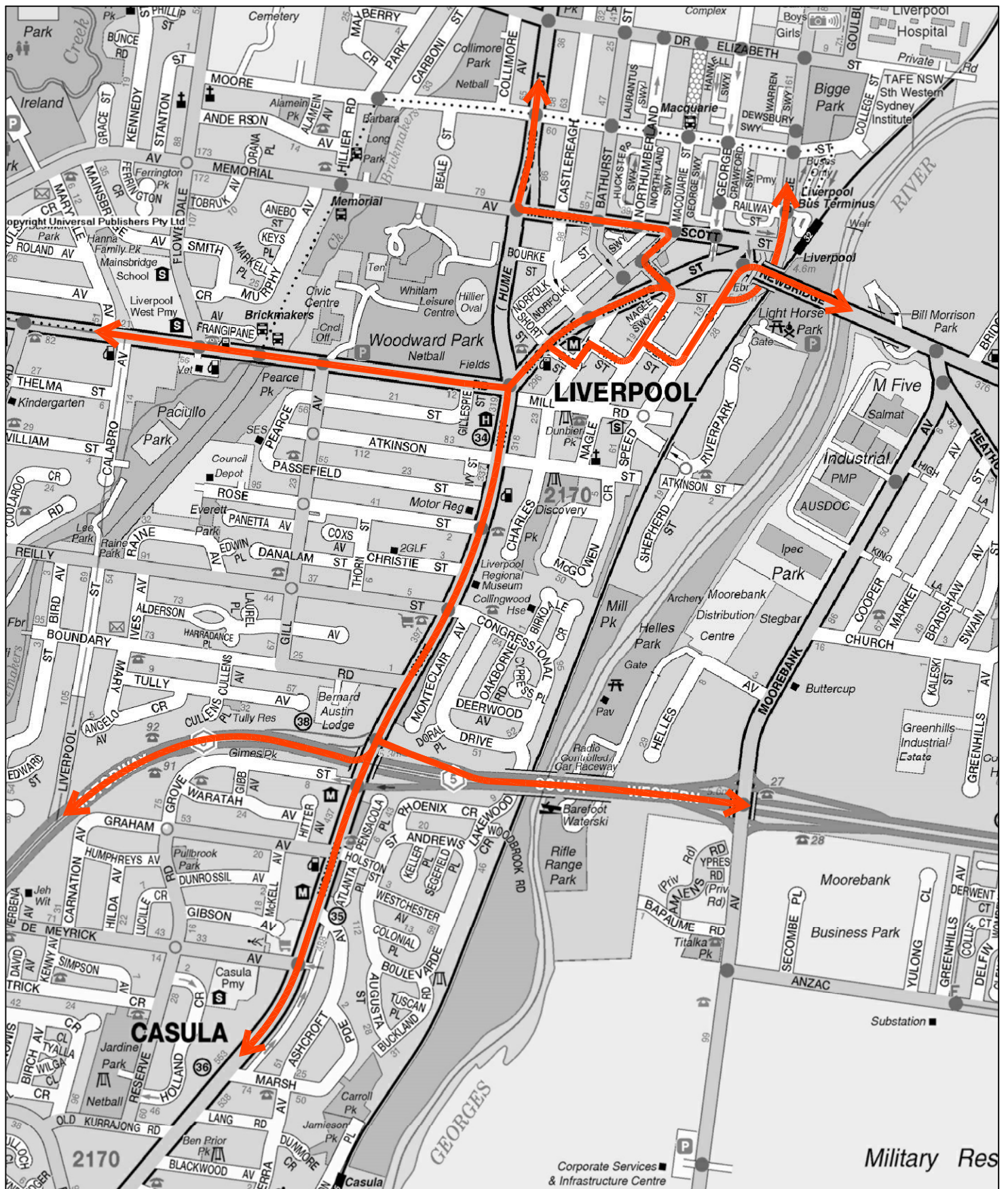
The projected traffic movements consequential to the development will be slightly more than the movements generated by the previously approved development and will have an assessed directional distribution due to the location of the site within the wider road network, as follows:

To / From	Distribution
North (via Hume Highway)	20%
East (via Newbridge Road)	15%
East (via M5)	30%
South (via Hume Highway)	15%
West (via Hume Highway and M5)	20%

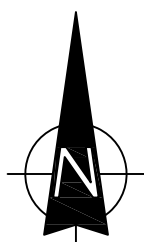
The traffic movements will therefore be widely distributed across the local traffic network as illustrated on Figure 6 which indicates that the minor additional traffic movements generated by the now proposed development will not have any adverse traffic implications.

In relation to the implications for the vehicle access on Carey Street, the assessed total traffic movements on the Carey Street is as follows:

	AM	PM
RT IN	3	12
LT IN	10	33
RT OUT	31	7
LT OUT	20	5
Total:	64 vtp	57 vtp



LEGEND



PROJECTED TRAFFIC DISTRIBUTION

FIG 6

Transport and Traffic Planning Associates

The existing traffic movements along Carey Street are only 22 vtp/h in the AM peak and 28 vtp/h in the PM peak and it is apparent that the development generated traffic movements on Carey Street will not have any adverse traffic implications.

6.0 Access, Internal Circulation & Servicing

6.1 Access

Vehicle access would be provided by a combined ingress/egress driveway on the Carey Street frontage. This access driveway would be located at the southern site boundary where there are excellent sight distances and the design will comply with the requirements of AS2890.1 & 2. However, in order to enable ready access to/from the site, it will be desirable to delete one parking space on the western side of Carey Street opposite the proposed access driveway and change the existing NO PARKING restriction to NO STOPPING (extending northerly to Macquarie Street).

6.2 Circulation

A flexible 2 way access ramp and aisle circulation system is proposed through the carpark levels. The aisles, ramps, parking bays and manoeuvring areas have been designed to accord with the Australian Standards AS2890.1 and 6.

6.3 Servicing

Refuse will be removed by a 9.9m collection truck from the Basement Level loading dock which would also be used for deliveries and service vehicles and there will be a clear headroom of 3.9m in the dock (as per previously approved). Small vehicles (e.g. service personnel) will also be able to use the normal space designated for loading on Basement level 1 as well as the available visitor spaces. Provision will also be made in the basement level internal porte cochere for coach set-down/pick-up for the Hotel as well as provision for taxis etc.

Details of the turning path assessment for the 9.9m rear load and 9.5m side load trucks are provided in Appendix B along with details of the coach turning indicating satisfactory provision within the site.

7.0 Conclusion

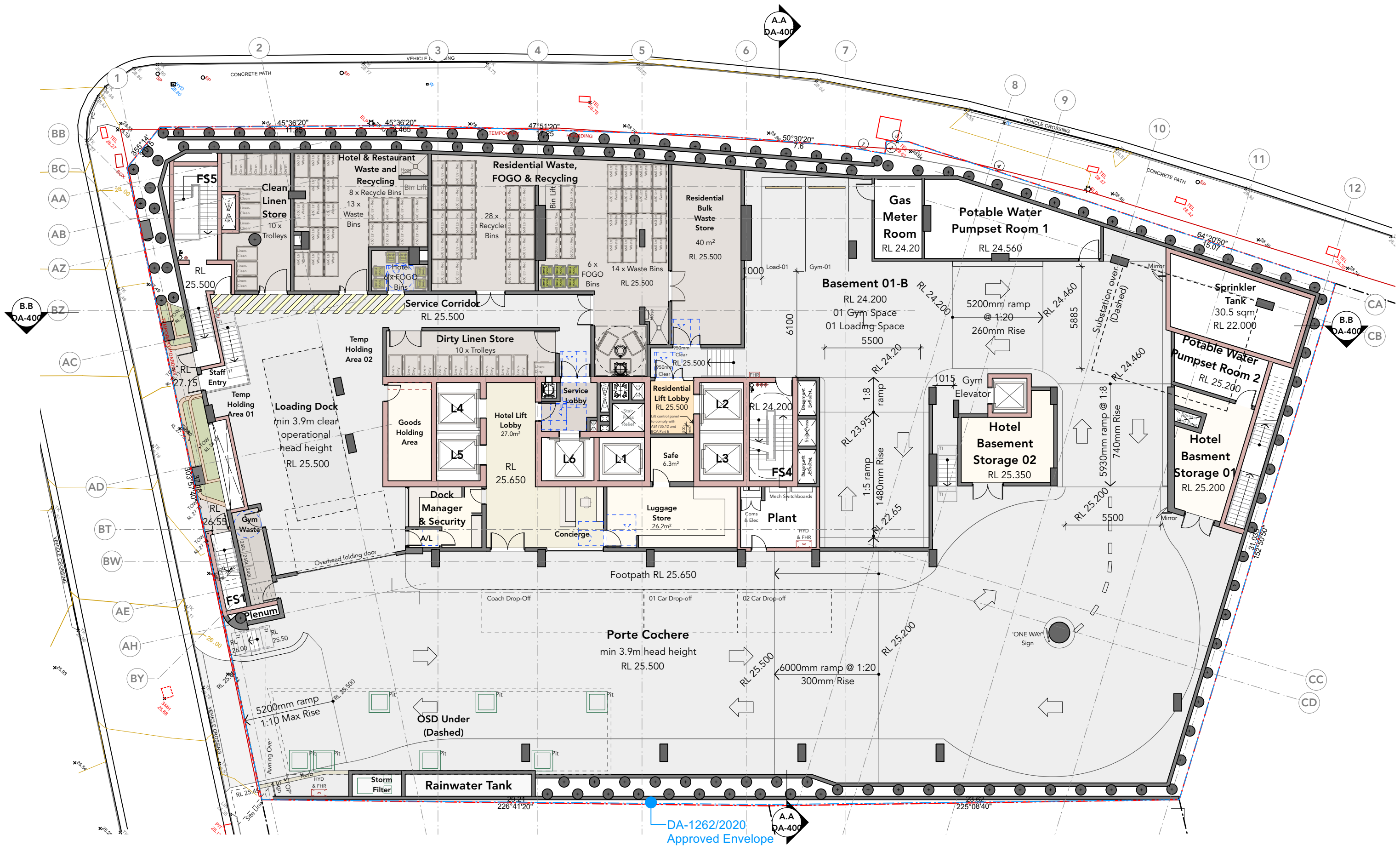
The proposed development scheme reflects Council's strategy for the future of the Liverpool City Centre as a vibrant mixed-use precinct. The proposed development will assist in supporting the excellent public transport services and convenient access to shopping, entertainment and employment as well as health and education facilities.

The assessment provided in this report confirms that:

- ❖ a suitable and appropriate parking provision would be made in relation to the needs of the development
- ❖ the traffic generation of the development would be satisfactorily accommodated on the road system
- ❖ the vehicle access, internal circulation and turning arrangements would be satisfactory and will include provision for coaches and taxis etc.
- ❖ there would not be any unacceptable road capacity, safety or traffic related environmental implications.

Appendix A

Development Plans



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E	31/5/2024	For Coordination
F	21/6/2024	For Coordination
G	1/7/2024	For Coordination

PROJECT
**Macquarie Street
Hotel + Apartments DA 2
Development Application**

CLIENT
Australasian Property Group Pte Ltd

PROJECT ADDRESS
**402 Macquarie Street,
LIVERPOOL NSW 2170**

TITLE
GA Plan- Basement L1

SCALE
1:200

PROJECT NO.
2401

DWG NO.
DA-205

DRAWN
TC

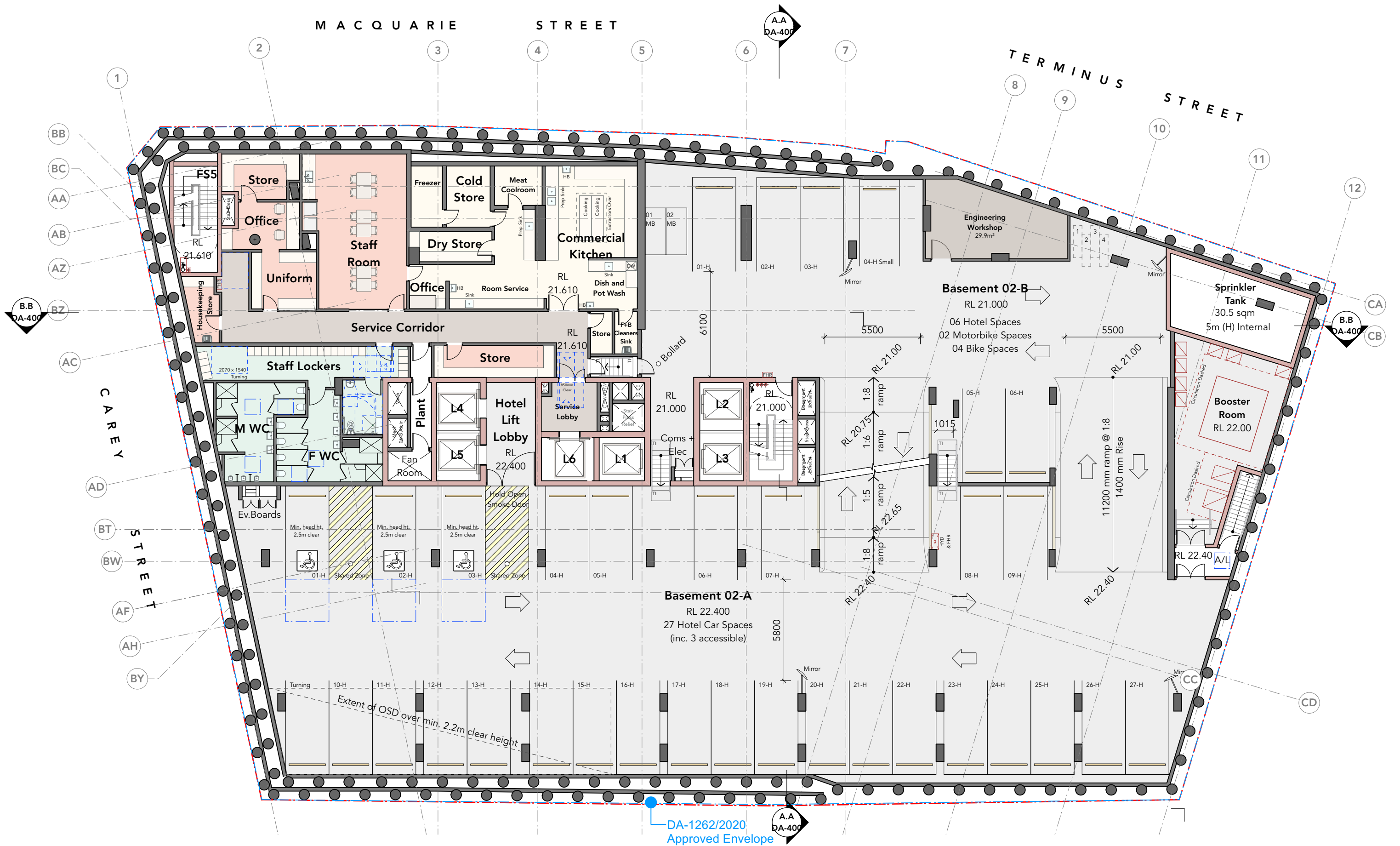
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Macquarie Street
Hotel + Apartments DA 2
Development Application

CLIENT

Australasian Property Group Pte Ltd

PROJECT ADDRESS

402 Macquarie Street,
LIVERPOOL NSW 2170

TITLE

GA Plan- Basement L2

SCALE
1:200

DRAWN
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DATE
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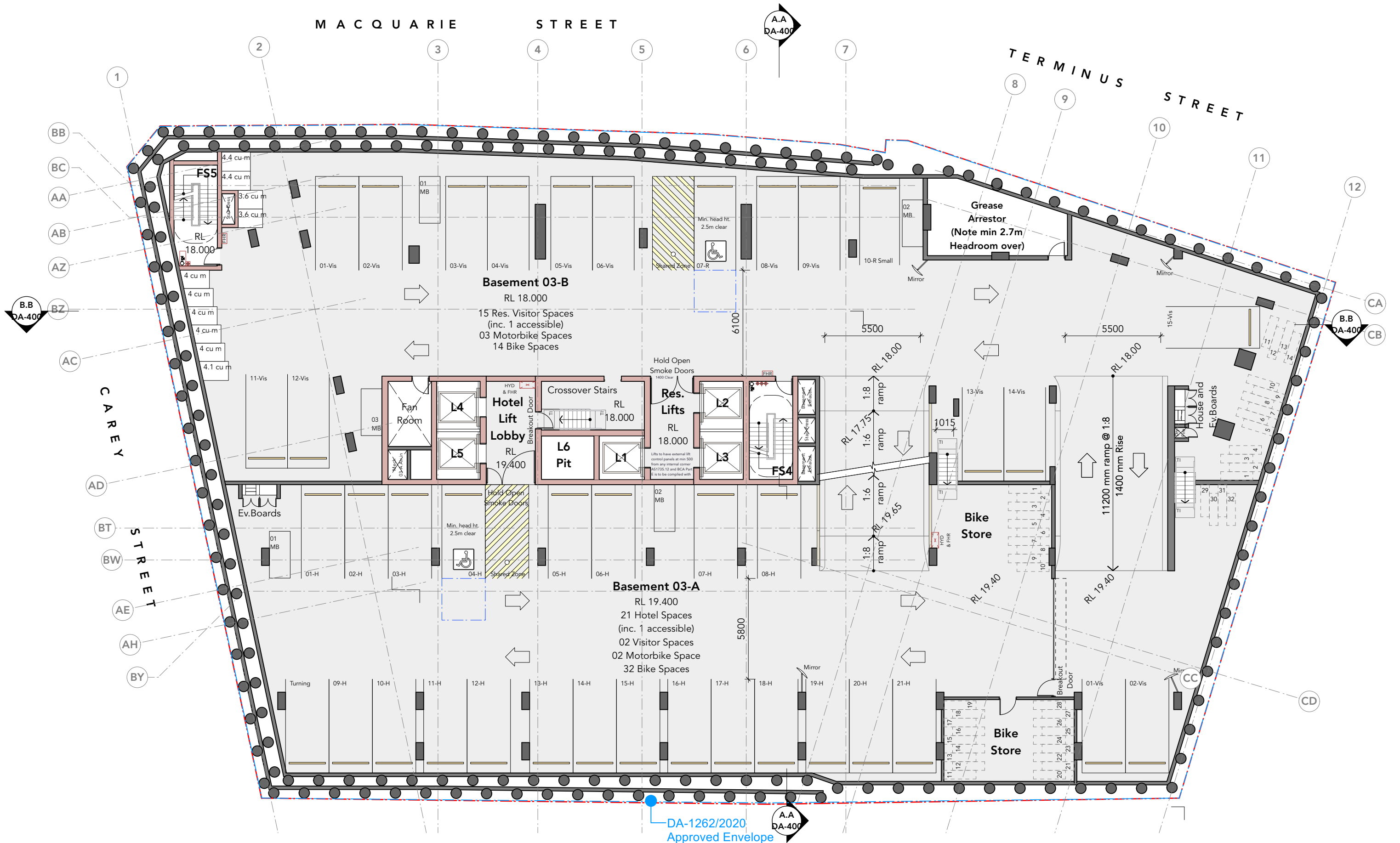
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Development Application**

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PROJECT ADDRESS
**402 Macquarie Street,
LIVERPOOL NSW 2170**

TITLE
GA Plan- Basement L3

SCALE
1:200

PROJECT NO.
2401

DWG NO.
DA-203

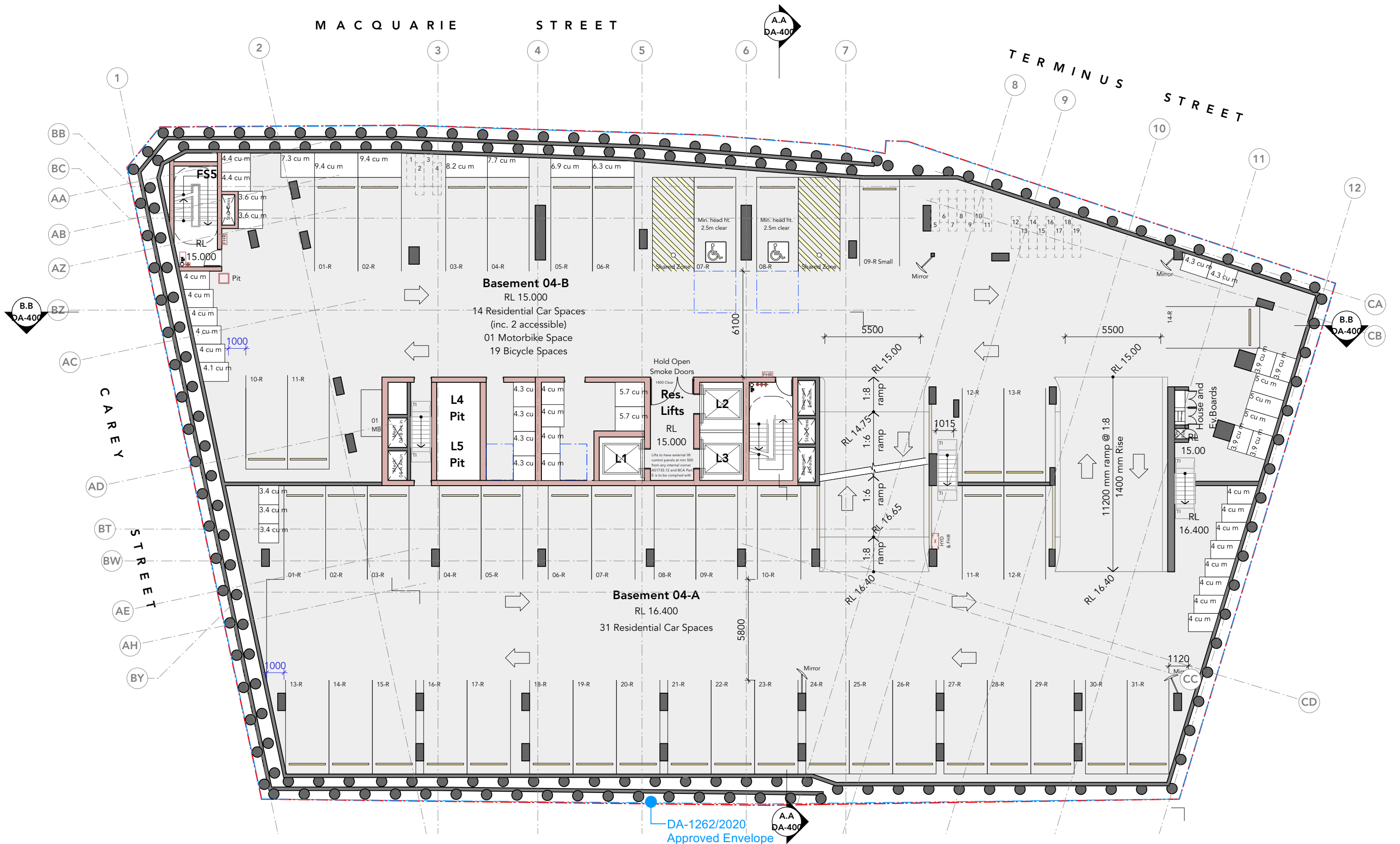
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CLIENT

Australasian Property Group Pte Ltd

PROJECT ADDRESS

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TITLE

GA Plan- Basement L4

SCALE

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PROJECT NO.

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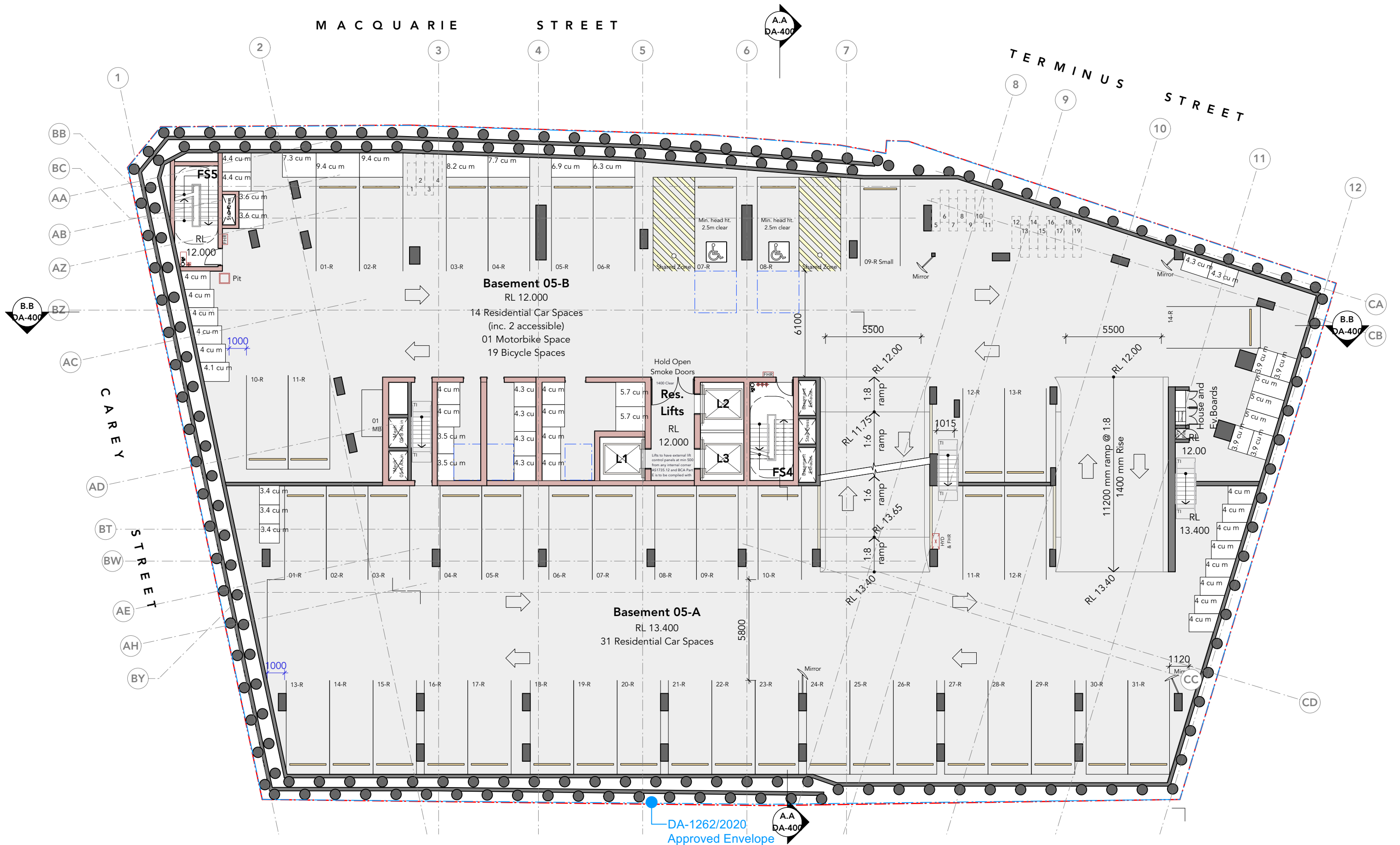
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TITLE
GA Plan- Basement L5

SCALE
1:200

PROJECT NO.
2401

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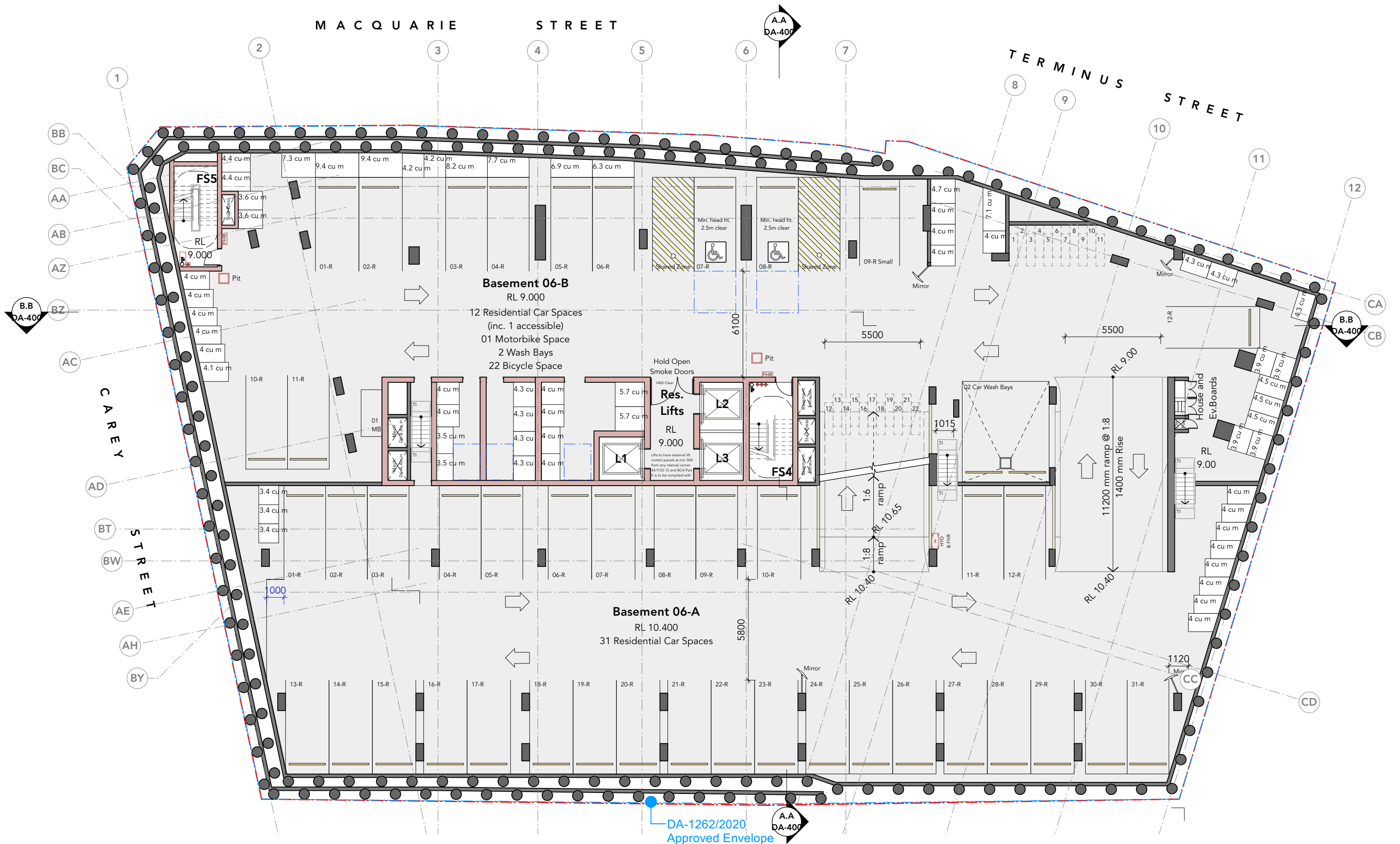
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TITLE

GA Plan- Basement L6

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DA 2

DWG NO.

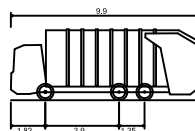
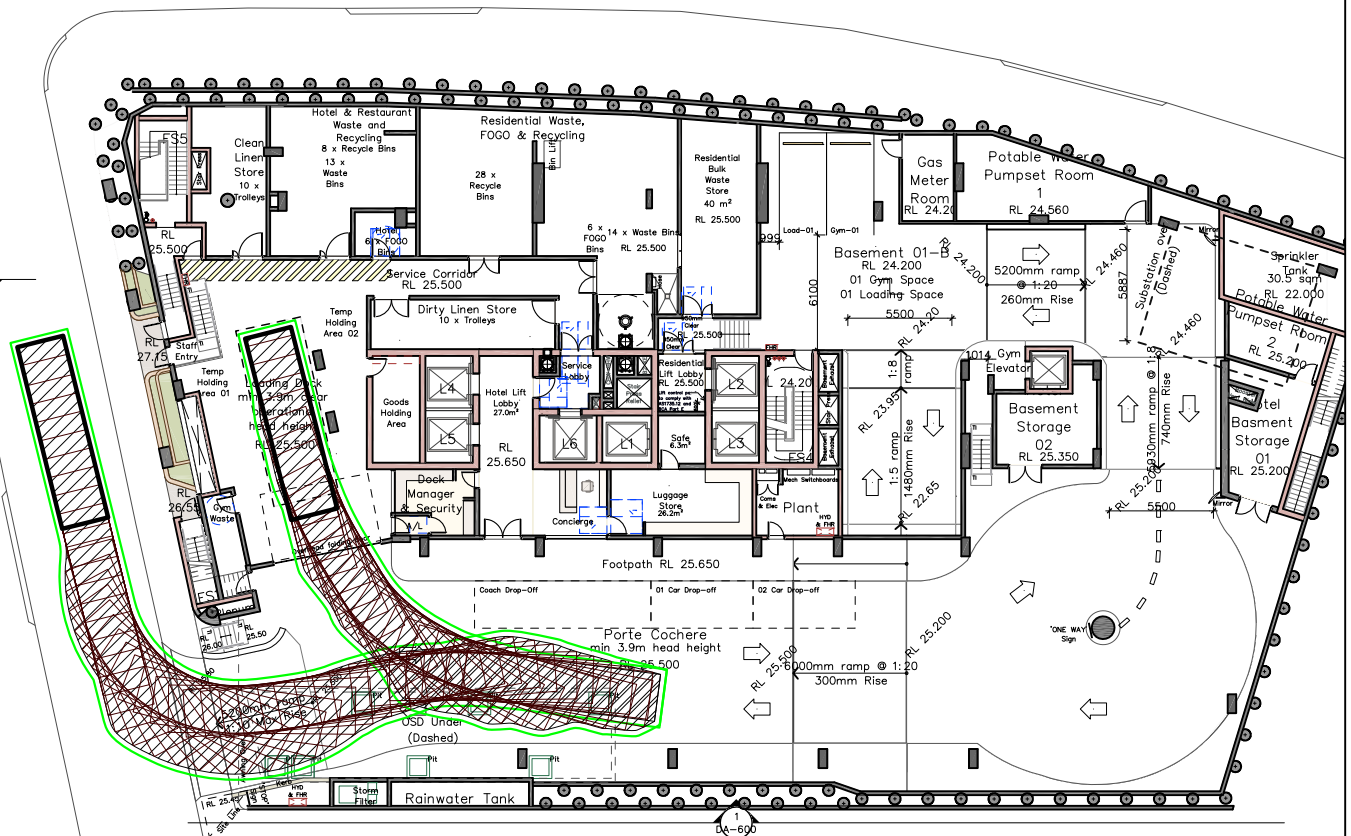
DA-200

REVISION

G

Appendix B

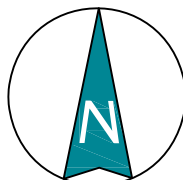
Turning Path Assessment



9.9 REAR LOADER
 Overall Length 9.900m
 Overall Width 2.500m
 Overall Body Height 3.751m
 Min Body Ground Clearance 0.304m
 Track Width 2.500m
 Lock to Lock Time 4.00s
 Wall to Wall Turning Radius 10.500m

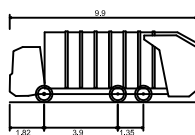
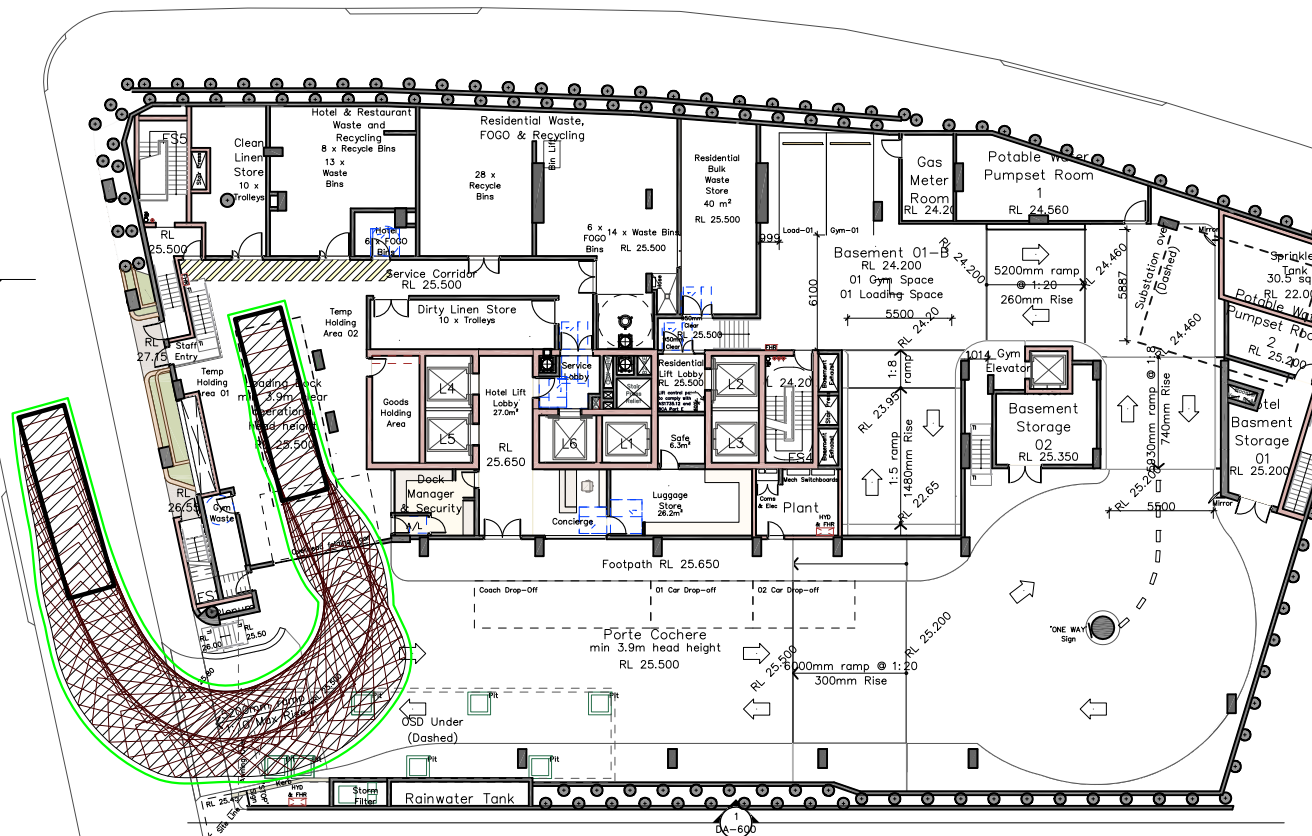
NOTE

This drawing has been prepared using vehicle modelling computer software AutoTrack V5.00a in conjunction with AutoCAD 2013. The vehicle used is based upon vehicle data provided by Austroads and incorporates a reasonable degree of tolerance. However, it is not possible to account for all vehicle types/characteristics and/or driver ability.



SWEPT PATH ANALYSIS OF A 9.9m REAR LOADER REFUSE VEHICLE ENTERING THE SITE

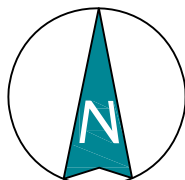
SP 1



9.9 REAR LOADER
 Overall Length 9.900m
 Overall Width 2.500m
 Overall Body Height 3.751m
 Min Body Ground Clearance 0.304m
 Track Width 2.500m
 Lock to Lock Time 4.00s
 Wall to Wall Turning Radius 10.500m

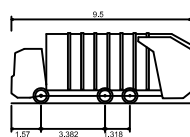
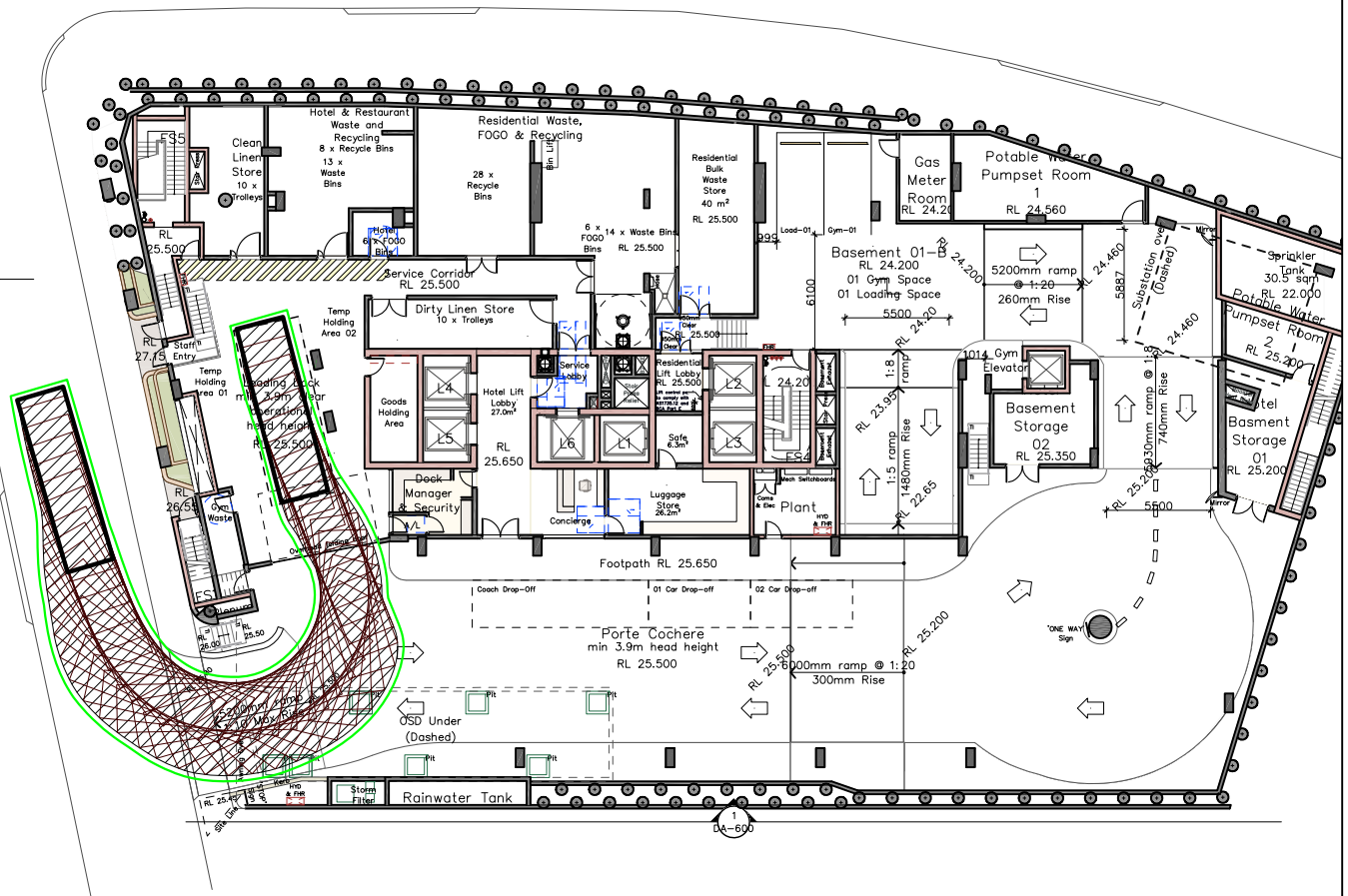
NOTE

This drawing has been prepared using vehicle modelling computer software AutoTrack V5.00a in conjunction with AutoCAD 2013. The vehicle used is based upon vehicle data provided by Austroads and incorporates a reasonable degree of tolerance. However, it is not possible to account for all vehicle types/characteristics and/or driver ability.



SWEPT PATH ANALYSIS OF A 9.9m REAR LOADER REFUSE VEHICLE EXITING THE SITE

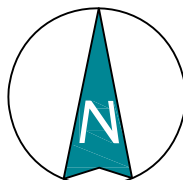
SP 2



9.5m SIDE LOADER
 Overall Length 9.500m
 Overall Width 2.500m
 Overall Body Height 3.716m
 Min Body Ground Clearance 0.269m
 Track Width 2.300m
 Lock to Lock Time 4.00s
 Wall to Wall Turning Radius 11.000m

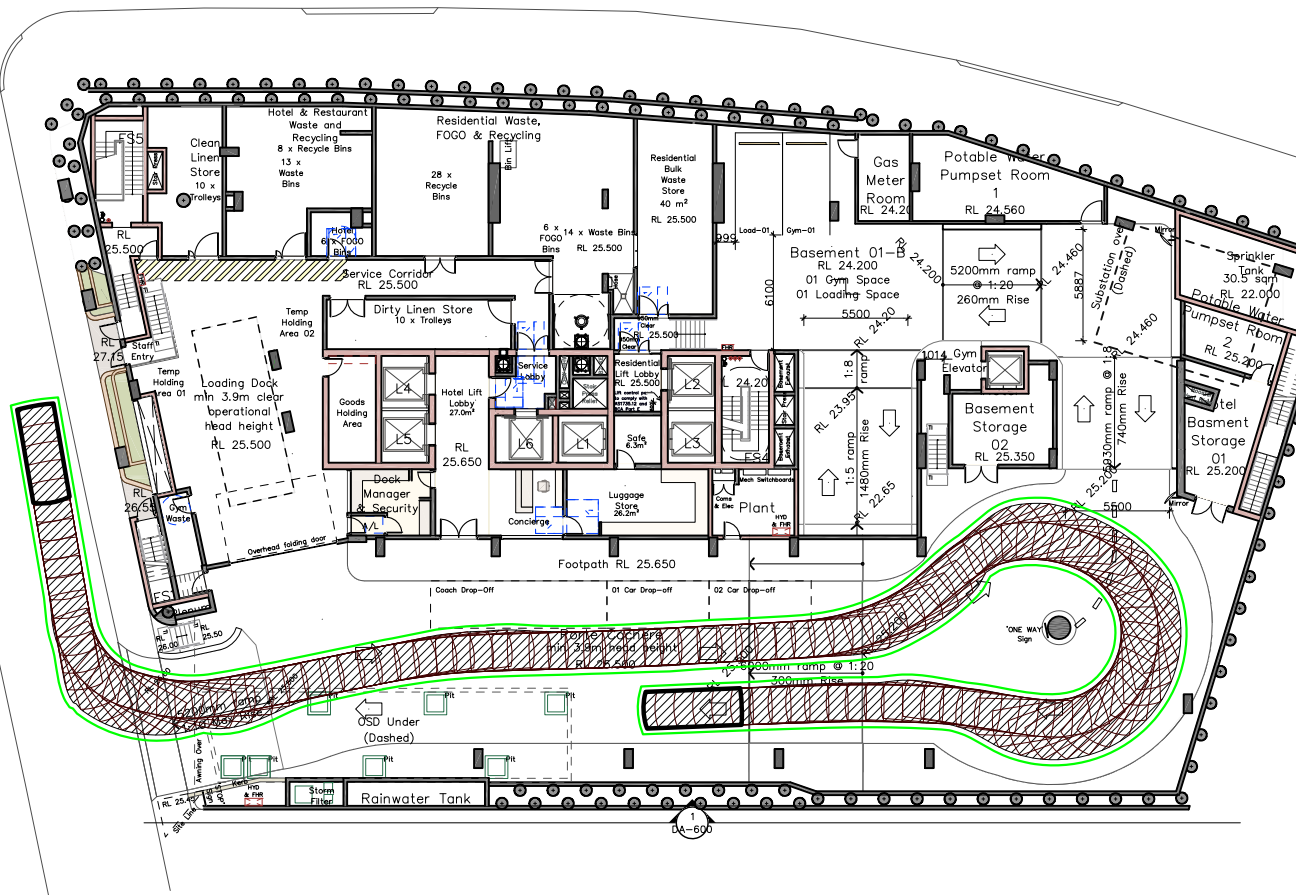
NOTE

This drawing has been prepared using vehicle modelling computer software AutoTrack V5.00a in conjunction with AutoCAD 2013. The vehicle used is based upon vehicle data provided by Austroads and incorporates a reasonable degree of tolerance. However, it is not possible to account for all vehicle types/characteristics and/or driver ability.



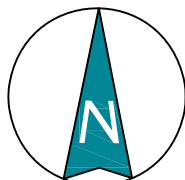
SWEPT PATH ANALYSIS OF A 9.5m SIDE LOADER REFUSE VEHICLE EXITING THE SITE

SP 4



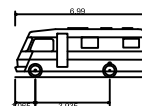
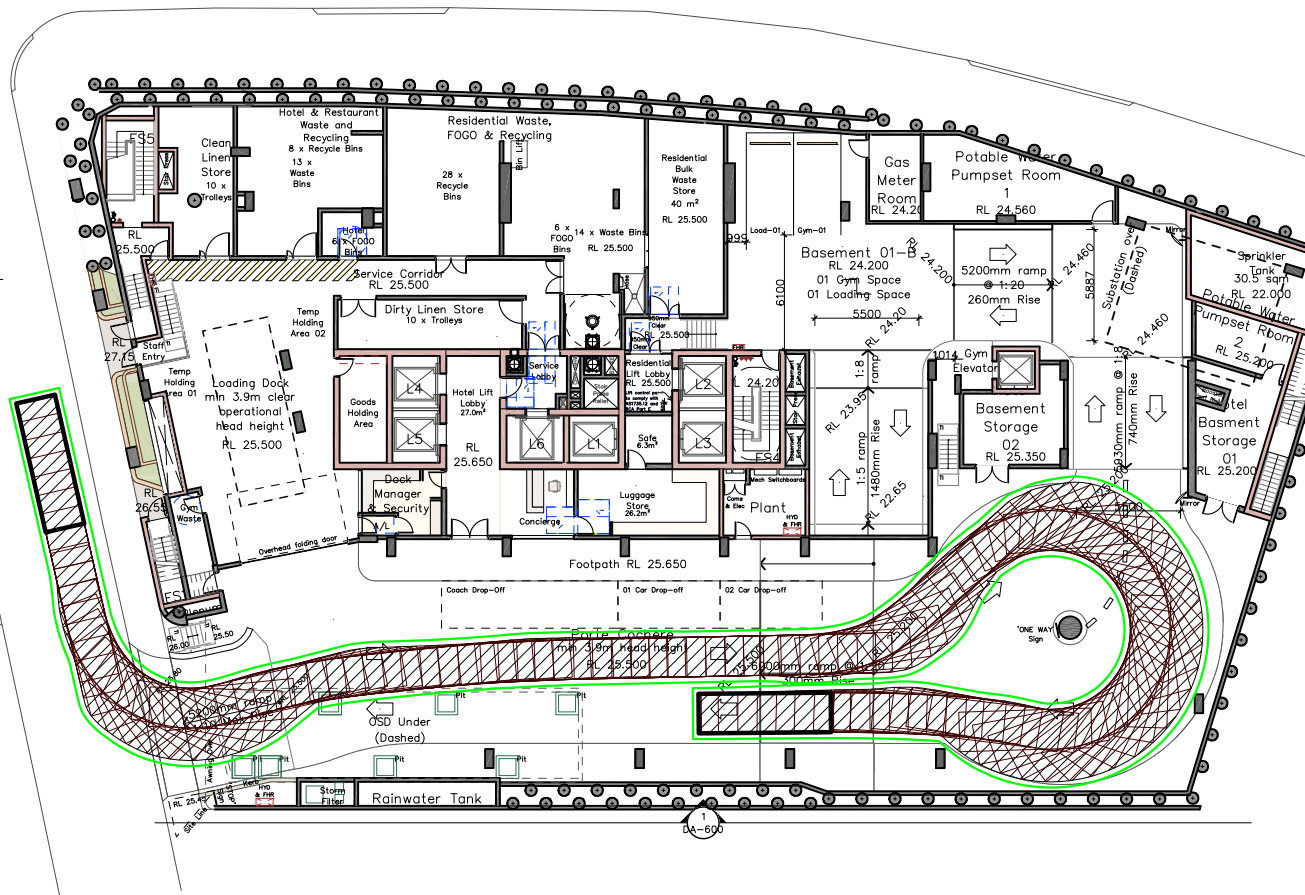
NOTE

This drawing has been prepared using vehicle modelling computer software AutoTrack V5.00a in conjunction with AutoCAD 2013. The vehicle used is based upon vehicle data provided by Austroads and incorporates a reasonable degree of tolerance. However, it is not possible to account for all vehicle types/characteristics and/or driver ability.



**SWEPT PATH ANALYSIS
OF A 99th PERCENTILE
VEHICLE ACCESSING THE SITE**

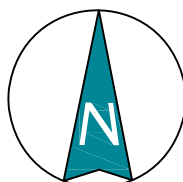
SP 5



TOYOTA COASTER (22 SEATER)
 Overall Length 6.990m
 Overall Width 2.035m
 Overall Body Height 2.600m
 Min Body Ground Clearance 0.300m
 Track Width 2.000m
 Lock to Lock Time 4.00s
 Curb to Curb Turning Radius 7.400m

NOTE

This drawing has been prepared using vehicle modelling computer software AutoTrack V5.00a in conjunction with AutoCAD 2013. The vehicle used is based upon vehicle data provided by Austroads and incorporates a reasonable degree of tolerance. However, it is not possible to account for all vehicle types/characteristics and/or driver ability.



SWEPT PATH ANALYSIS OF A 6.99m (22 SEATER) BUS ACCESSING THE SITE

SP 6

