UPDATED TRAFFIC IMPACT ASSESSMENT

2-18 Station Street, Marrickville

PREPARED FOR:
Emag Apartments Pty Ltd

REFERENCE:
0113r04v02

DATE:
18/01/2021

UPDATED TRAFFIC IMPACT ASSESSMENT

2-18 Station Street, Marrickville

Prepared for: Emag Apartments Pty Ltd

ABN: 98 103 622 279

Reference: 0113r04v02

Date: 18/01/2021

Revision History

VERSION	DATE	PREPARED	REVIEWED	APPROVED	SIGNED
01	12/01/2021	Julius Boncato	Ben Midgley	Ben Midgley	Original Signed
02	18/01/2021	Julius Boncato	Ben Midgley	Ben Midgley	

PDC Consultants

info@pdcconsultants.com.au | www.pdcconsultants.com.au

+61 2 7900 6514 | Level 14, 100 William Street, Woolloomooloo NSW 2011

Table of Contents

List of Figures

List of Tables

Appendices

1. Introduction

1.1. Overview

PDC Consultants has been commissioned by Emag Apartments Pty Ltd to undertake an updated traffic impact assessment of a Development Application (DA) relating to the proposed mixed-use development for the site at 2-18 Station Street, Marrickville. Specifically, the DA proposes the demolition of the existing buildings and construction of a 10-storey mixed-use development consisting of:

- 118 boarding rooms, two (2) manager's room and four (4) communal rooms;
- 259m^2 of commercial gross floor area (GFA);
- Three (3) basement levels accommodating a total of 45 car parking spaces;
- 6.6 metre wide entry / exit driveway onto Station Street.

Having regard for the above, it is evident that development is not of a scale that requires referral of the DA to Transport for New South Wales (TfNSW), under the provisions of the State Environmental Planning Policy (Infrastructure) 2007.

The site is located in the newly formed Inner West local government area (LGA) however, a consolidated Development Control Plan for the Inner West LGA is yet to be announced or adopted. The proposed development has therefore been assessed in accordance with the Marrickville Development Control Plan 2011 and Local Environmental Plan 2011.

1.2. Background

A meeting was held on 15/12/2020 with Inner West Council (Council) to discuss the submitted DA documentation and Council's Further Information Request Letter (Letter) dated 15/12/2020. Several comments were raised relating to a number of aspects of the development including traffic and parking. Accordingly, this updated report has been prepared to address the traffic and parking items raised by Council. **Table 1** lists each of the traffic and parking items as outlined in the Letter and shows where each of these items have been addressed in this report.

Table 1: Council Comments and Reference to the Relevant Section of this Report

<table>
<tr><th>COUNCIL COMMENTS</th><th>RELEVANT SECTION OF THIS REPORT</th></tr>
<tr><td>

13. Engineering Issues

Council's development engineers have raised the following issues:

- The application does not comply with controls C24 and C25 of Part 2.10 Parking Management of the Marrickville DCP 2011. A loading dock must be provided to service the proposed 130 boarding development which includes 266sqm of retail space give the size of the development the loading dock must be designed for a minimum MRV.

</td><td>Section 4.5</td></tr>
<tr><td>

- The collection of waste must also occur from the service area and not from the narrow section of Station Street at the east of the site. Station Street is a one way street that carries a single lane of traffic in a clockwise direction. Loading / unloading activities on this section of Station Street will result the road being blocked with vehicles having to wait behind trucks while loading/unloading activities are taking place. This arrangement is unsatisfactory. Station Street is a busy local road next to a train station with lots of pedestrian activity and vehicles arriving frequently for pick-up and drop-off activities.

</td><td>Section 4.5</td></tr>
<tr><td>

<table>
<tr><th>If Council's waste truck is required to service the site, then the loading dock must be able to accommodate a vehicle of the following dimensions</th><th>Resource Recovery Info</th></tr>
<tr><td>Length</td><td>9.6 metres</td></tr>
<tr><td>Width</td><td>2.5 metres</td></tr>
<tr><td>Height (travel)</td><td>4.5 metres</td></tr>
<tr><td>Weight (loaded)</td><td>26 tonnes</td></tr>
<tr><td>Turning Circle</td><td>26 metres</td></tr>
</table>

</td><td>Section 4.5</td></tr>
<tr><td>

- Swept paths must be provide for the largest truck required to use the site (minimum MRV) detailing that the vehicle is able to manoeuvre around the narrow 90-degree bends in Station Street and the loading dock.

</td><td>Section 4.5</td></tr>
<tr><td>

- Alternatively, as proposed in a previous application to Council, the eastern narrow section of Station Street shall be widened to allow loading activities to be undertaken on the roadway whilst allowing vehicles to pass. This will require the dedication of land from the adjacent property at 1 Leofrene Avenue. I understand that 1 Leofrene Avenue and 2-18 Station Street are still in common ownership.

</td><td>Section 4.5</td></tr>
<tr><td>

- The application does not comply with the car parking provision as required by Control C1 of Part 2.10. of Marrickville DCP 2011. The application is for 130 boarding houses and 1 Manager's room. Based on Table 1 of Part 2.5-Parking Management of DCP 2011, the provision of parking must be at a rate of 0.5 spaces per boarding room plus 1 space per resident employee. Based on these rates, 66 spaces are required. Additionally, 3 spaces will be required for the retail space of 255sqm. Therefore, a total of 69 car spaces is required and only 46 spaces have been provided leaving a shortfall of 23 spaces (shortfall of over 33%). Such a large shortfall is not acceptable.

</td><td>Section 4.1</td></tr>
<tr><td>

- To allow vehicle drivers adequate intervisibility to pedestrians the vehicle ramp at Station Street must be redesigned so that a maximum grade does not exceed 1 in 20 (5%) within 6m of the property boundary as required by Clause 3.3(a) of AS 2890.1-2004 and Control C9 of Marrickville DCP 2011 Part 2.10 Parking Management.

</td><td>Section 7.2.1</td></tr>
<tr><td>

- In accordance with C26 of Part 5 Commercial and Mixed-Use Development of MDCP 2011, street corner sites must dedicated splay corners, as public land, for road widening purposes and to improve sight distance at intersections for both vehicles and pedestrians. This is especially required at the north eastern corner of the site where Station Street narrows to allow for the manoeuvre of heavy vehicles around Station Street. Splays shall be 2m x 2m.

</td><td>This is a matter for the architect to address.</td></tr>
<tr><td>

- It appears some of the balconies and elements of the building encroach the road reserve. The plans shall be amended to removal all encroachments except for the awning which is permitted.

</td><td>This is a matter for the architect to address.</td></tr>
</table>

1.3. Structure of this Report

This report documents the findings of our investigations in relation to the anticipated traffic and parking impacts of the proposed development and should be read in the context of the Statement of Environmental Effects (SEE), prepared separately by Weir Phillips Heritage and Planning. The remainder of this report is structured as follows:

- Section 2: Describes the site and existing traffic and parking conditions in the locality;
- Section 3: Describes the proposed development;
- Section 4: Assesses the parking requirements of the development;
- Section 5: Describes the components of a Green Travel Plan;
- Section 6: Assesses the traffic impacts of the development;
- Section 7: Discusses the proposed access and internal design arrangements;
- Section 8: Presents the overall study conclusions.

1.4. References

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

- Marrickville Local Environmental Plan 2011 (Marrickville LEP 2011);
- Marrickville Development Control Plan 2011 (Marrickville DCP 2011);
- State Environmental Planning Policy (Infrastructure) 2007 (SEPP Infrastructure 2007);
- Disability (Access to Premises -Buildings) Standards 2010 (Disability Standard 2010);
- Australian Standard AS 2890.1-2004, Part 1: Off-Street Car Parking (AS 2890.1);
- Australian Standard AS 2890.3-2015, Part 3: Bicycle Parking Facilities (AS 2890.3);
- Australian Standard AS 2890.6-2009, Part 6: Off-Street Parking for People with Disabilities (AS 2890.6);
- RMS[1] Guide to Traffic Generating Development 2002 (RMS Guide);
- RMS[1] Technical Direction TDT 2013/04a - Guide to Traffic Generating Developments, Updated Traffic Surveys (RMS Guide Update).

[1] Roads and Maritime Services (RMS) has joined with TfNSW, with reference to Roads and Maritime now taken legally to automatically mean TfNSW

2. Existing Conditions

2.1. Location and Site

The site is located at 2-18 Station Street, Marrickville, being situated to the immediate south of Marrickville Railway Station and approximately 7.0 kilometres south-west of the Sydney CBD.

The site is comprised of a single lot, formally identified as Lot 100, DP 1229420. It is irregular in configuration with a total area of approximately 695.2m^2. Station Street has a U-shape configuration such that it wraps around the subject site along its western, northern and eastern boundaries. The western frontage is 23.0 metres in length, the northern frontage is 27.6 metres and the eastern frontage is 27.7 metres. The southern boundary borders a neighbouring mixed-use development, having a length of 27.5 metres.

The site currently accommodates a number of mixed-use buildings which range in height from 1-2 storeys, with no on-site car parking. **Figure 1** and **Figure 2** overleaf provide an appreciation of the site's location in both a broad and local context respectively.

2.2. Road Network

The road hierarchy in the vicinity of the site is shown by **Figure 2**, with the following roads considered noteworthy:

- Illawarra Road: forms part of a TFNSW Secondary Road, MR 2021. Illawarra Road generally runs in a north-south direction intersecting Addison Road in the north and connecting with Homer Street in the south. Near the site, it is subject to 50km/h speed zoning restrictions and accommodates a single of traffic in each direction.

- Schwebel Street: a local road that runs in an east-west direction between Carrington Road in the east and Illawarra Road in the west. It is subject to 50km/hr speed zoning and carries a single lane of traffic in either direction within an undivided carriageway of width 7.0 metres. It generally permits unrestricted parallel parking along the northern kerbside and restricted (2 hour) parallel parking along the southern kerbside.

- Station Street: a local road that runs in both a north-south and east-west direction, in a U-shape configuration, intersecting Schwebel Street to the east and Leofrene Avenue to the west. It carries a single lane of one-way traffic in a clockwise direction. The western section of Station Street accommodates indented parking bays for kiss and ride drop offs, taxi, car and motorcycle parking. Cars and motorcycles are subject to time restricted (1 hour and 2 hour respectively) parking, between the hours of 8:30am-6pm, Monday to Friday and 8:30am-12:30pm on Saturdays. The northern and eastern sections of Station Street are subject 'No Stopping' restrictions along both kerbsides.

Figure 1: Site Plan

Figure 2: Location & Road Hierarchy Plan

2.3. Public & Active Transport

2.3.1. Bus Services

The Integrated Public Transport Service Planning Guidelines, Sydney Metropolitan Area, states that the walking catchment for metropolitan bus services includes all areas within a 400 metre radius of a bus stop. As can be seen from **Figure 3**, the site is situated within 50 metres of bus stops operating along Illawarra Road and accordingly, staff, residents and visitors of the proposed development would also have convenient access to the public bus services. **Table 2** below shows the notable town centres that are accessible via these bus services and the average service headways during peak and off-peak periods.

Table 2: Bus Services

ROUTE NO.	ROUTE (TO / FROM)	ROUTE DECRIPTION	AVERAGE HEADWAY
412	Campsie to City Martin Place	Via Earlwood	Weekdays: 15-20 minutes Weekends: 20-30 minutes on Saturdays & 30 minutes on Sundays
418	Kingsford to Burwood	Via Mascot, Sydenham & Dulwich Hill	Weekdays: 10-20 minutes peak / 20-30 minutes off peak Weekends: 30 minutes
423	Kingsgrove to City Martin Place	Via Earlwood, Marrickville, Enmore, Newtown & Darlington	Weekdays: 5-10 minutes peak / 15 minutes off peak Weekends: 20 minutes
425	Tempe to Dulwich Hill	Via Sydenham Station	Weekdays: 30 minutes peak / 60 minutes off-peak Weekends: 60 minutes on Saturdays & no services on Sundays
426	Dulwich Hill to City Martin Place	Via Marrickville, Enmore, Newtown & Darlington	Weekdays: 15-20 minutes all day Weekends: 20 minutes
L23	Kingsgrove to City Martin Place (Limited Stops)	Via Earlwood, Marrickville, Newtown & Camperdown	Weekdays: 5-16 minutes peak only Weekends: No Services
M30	Sydenham to Taronga Zoo	Via Enmore, Newtown, Darlington, Sydney CBD, Neutral Bay & Mosman	Weekdays: 10 minutes peak / 15 minutes off peak Weekends: 20 minutes
N40	East Hills to City Town Hall	Via Bankstown, Punchbowl, Belmore, Canterbury, Dulwich Hill, Marrickville & Chippendale	Night-ride service

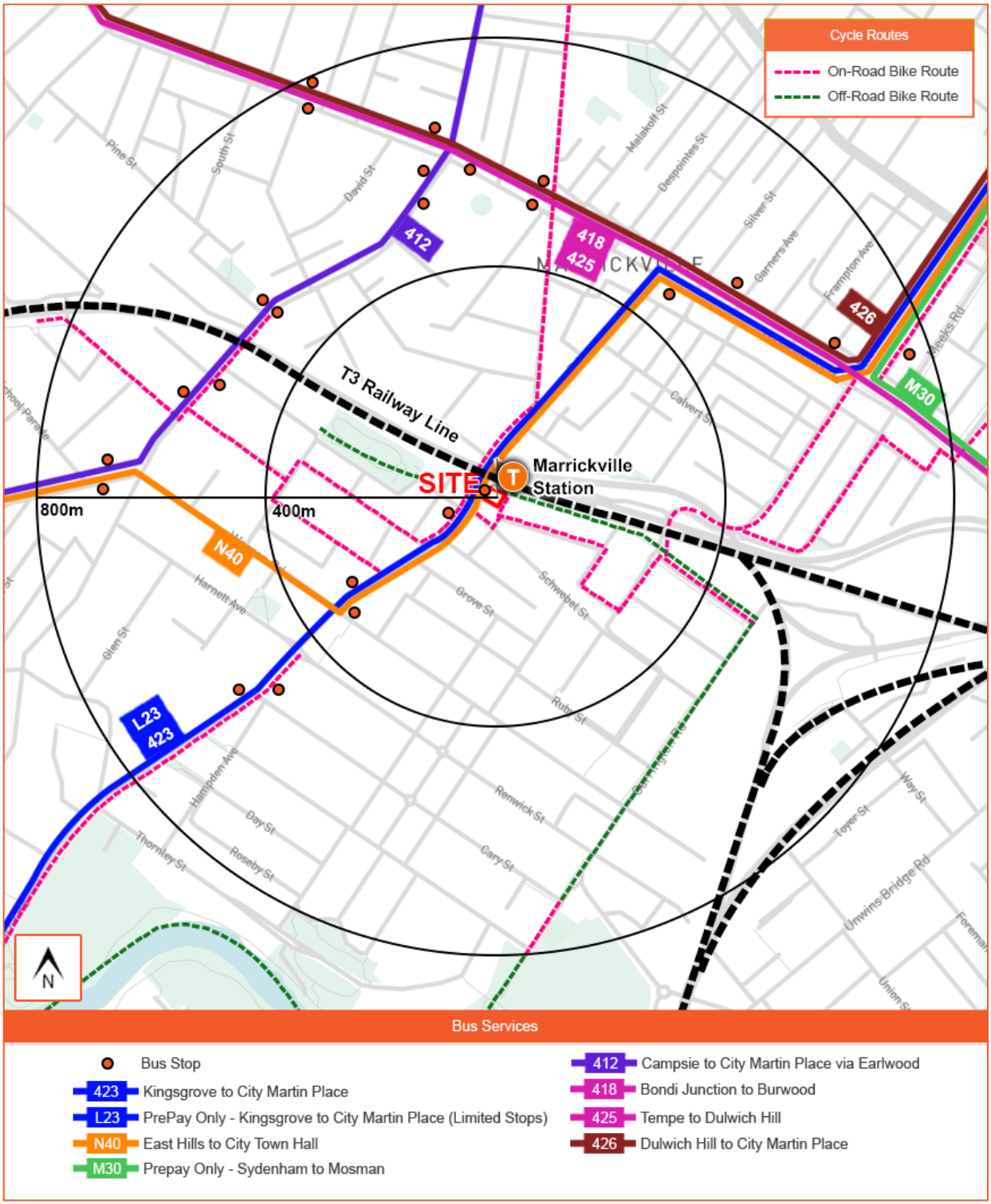


Figure 3: Public & Active Transport Services

2.3.2. Rail Services

The Integrated Public Transport Service Planning Guidelines, Sydney Metropolitan Area, states that the walking catchment for metropolitan railway stations includes all areas within an 800 metre radius of a station. It can be seen from **Figure 3** that Marrickville Railway Station is located to the immediate north of the site and hence, falls well within the typical walking catchment area. Accordingly, staff, residents and visitors of the proposed development would have convenient access the Sydney rail network, as shown by **Figure 4**.

Marrickville Railway Station is serviced by a single railway line, being the T3 Bankstown Line. **Table 3** below shows the notable town centres that are accessible along the T3 Bankstown Line and the average service headways during peak and off-peak periods.

Table 3: Rail Services

RAILWAY LINE	NOTABLE TOWN CENTRES ALONG LINE	AVERAGE HEADWAY
T3 Bankstown Line	Liverpool, Lidcombe, Birrong, Bankstown, Sydenham, Redfern & Sydney CBD	Weekdays: 7-13 minutes peak / 30 minutes off peak Weekends: 30 minutes all day

2.3.3. Metro Services

At the time this report was prepared, the Sydney Metro City & Southwest project was Australia's largest public transport project as Metro Rail is being extended under Sydney Harbour and beyond to the southwest. By 2024, Sydney will have 31 metro railway stations and a 66km standalone metro railway system, revolutionising the way Sydney city travels.

Under the Sydney Metro City & Southwest project the T3 Bankstown Railway Line between Sydenham and Bankstown will be upgraded to Metro standards, which has been categorised as a world class service with faster journeys, more trains and better connections to Sydney's southwest. This upgrade is anticipated to address one of Sydney's biggest rail bottlenecks, providing more reliable journeys for customers all across Sydney, particularly those that currently travel along the T3 Bankstown Railway Line. **Figure 5** overleaf shows the alignment of the Sydney Metro network, particularly noting the Sydney Metro City & Southwest network.

Marrickville Railway Station is one (1) of 11 Railway Stations that will be upgraded to Metro standards. As stated on TfNSW Sydney Metro website, the Sydney Metro City & Southwest network and new Marrickville Metro Station will consist of the following infrastructure improvements and characteristics once completed:

- Two (2) stops between Central and Marrickville and direct route to Sydney CBD;
- Metro train every four (4) minutes in the peak, equating to 15 trains per hour, compared to eight (8) trains per hour during the peak periods at present;
- Substantial improvements on travel times between Marrickville, Sydney CBD and North Sydney, as indicated below in **Table 4.**

Table 4: Comparison of Existing Train Travel Times and Future Metro Travel Times

MARRICKVILLE TO:	EXISTING TRAIN (MINUTES)	FUTURE SYDNEY METRO (MINUTES)	SAVING (MINUTES)
Central	Up to 13	10	Up to 3
Pitt Street (New CBD Station)	Up to 24*	12	Up to 12
Barangaroo (new CBD station)	Up to 38*	16	Up to 22
Victoria Cross (North Sydney)	Up to 36*	19	Up to 17
Chatswood	Up to 47*	25	Up to 22
Macquarie University	Up to 58*	36	Up to 22

**Includes time to interchange and/or walk*

It is clear from the above that the future Metro service will provide substantial travel time savings for patrons, as well as effectively doubling the frequency of peak hours services.

2.3.4. Cycle Network

Figure 3 shows that the site has excellent access to the local bicycle network with an on-road cycle path provided along the eastern section of Station Street that connects to Schwebel Street, south of the site. Additionally, an off-road cycle path is also provided along the northern section of Station Street which runs parallel to T3 Railway Line and connects to the wider bicycle network.

2.4. Existing Traffic Generation

As discussed in Section 2.1 of this report, the site currently accommodates a number of 1-2 storey mixed-use buildings. Whilst no on-site car parking is provided, it is estimated that the existing development generates in the order of 5 vehicle trips / hour (3 in, 2 out) during both the weekday 7-9am (AM) and 4-6pm (PM) peak periods.

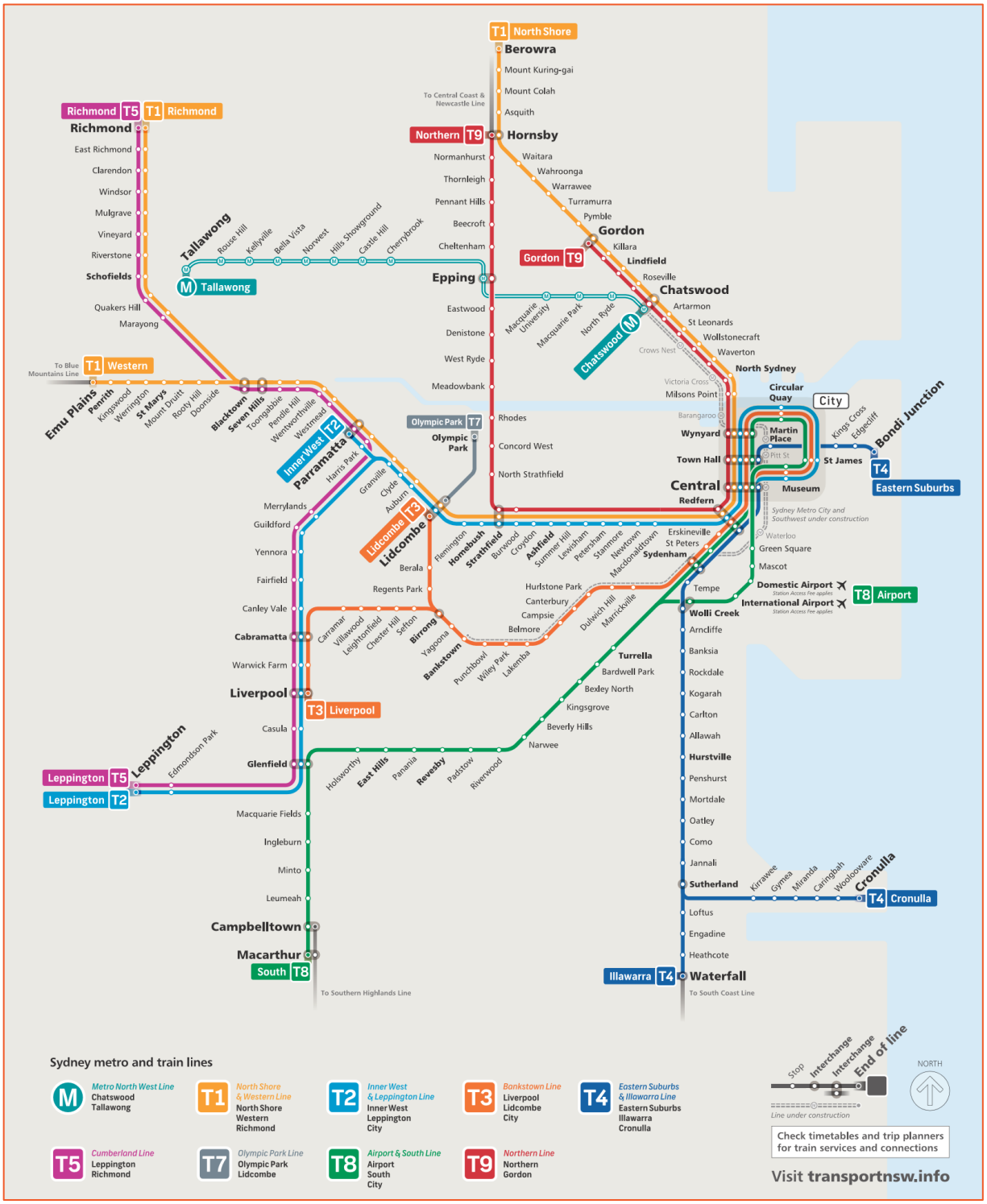


Figure 4: Sydney Trains Rail Network – Suburban

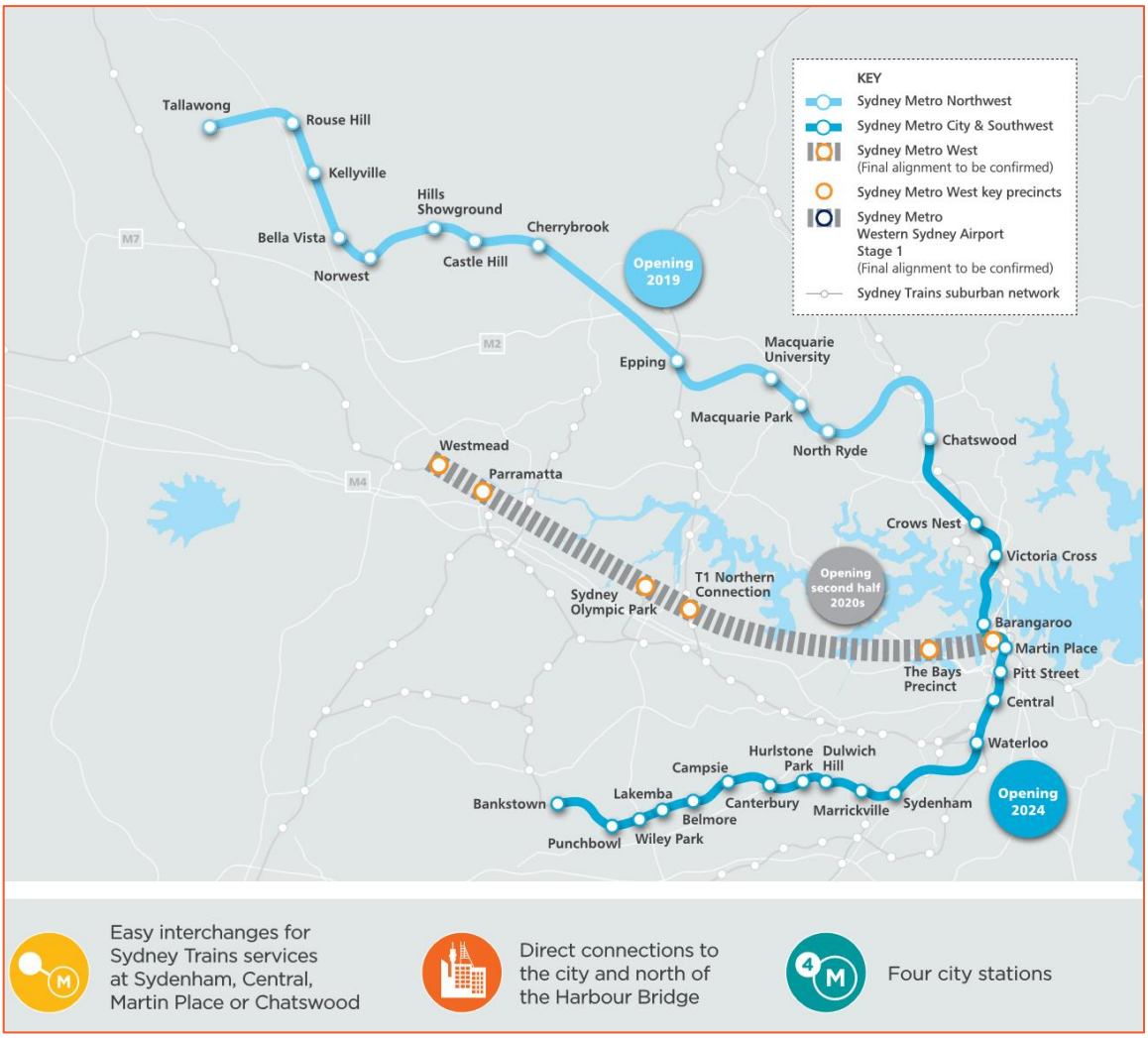


Figure 5: Sydney Metro Line

3. Proposed Development

A detailed description of the proposed development for which approval is now sought, is outlined in the Statement of Environmental Effects prepared separately by Weir Phillips Heritage and Planning. In summary, the subject application relates to the demolition of all existing buildings and construction of a 10-storey mixed-use development consisting of:

- 118 boarding rooms;
- Two (2) manager's room;
- Four (4) communal rooms;
- 259m^2 of commercial GFA;
- Three (3) basement parking levels accommodating the following:
    - 45 car parking spaces including 42 boarding house spaces and three (3) commercial spaces;
    - 26 motorcycle spaces;
    - 28 bicycle spaces;
    - One (1) courier bay;
- 6.6 metre wide entry / exit driveway onto Station Street.

The parking and traffic implications arising from the proposed development are discussed in Sections 4 and 6, respectively. A copy of the relevant amended architectural drawings, prepared by Tier Architects, are also included in Appendix A.

4. Parking Requirements

4.1. Car Parking

4.1.1. Boarding House

Clause 29(2)(e) of the SEPP ARH 2009 outlines the following car parking rates for boarding house developments:

> *(2) A consent authority must not refuse consent to development to which this Division applies on any of the following grounds:*
>
> ***(e) parking***
>
> *if:*
>
> *(i) in the case of development carried out by or on behalf of a social housing provider in an accessible area—at least 0.2 parking spaces are provided for each boarding room, and*
>
> *(ii) in the case of development carried out by or on behalf of a social housing provider not in an accessible area—at least 0.4 parking spaces are provided for each boarding room, and*
>
> *(iia) in the case of development not carried out by or on behalf of a social housing provider—at least 0.5 parking spaces are provided for each boarding room, and*
>
> *(iii) in the case of any development—not more than 1 parking space is provided for each person employed in connection with the development and who is resident on site.*

The application is not being carried out by or on behalf of a social housing provider and accordingly, the parking rates under Clause 29(2)(e)(iia) and Clause 29(2)(e)(iii) of the SEPP ARH 2009 are required to be adopted for the development.

Additionally, Table 1 of the Marrickville DCP 2011– Part 2 stipulates car parking for boarding house developments. **Table 5** below shows the car parking requirement for the boarding house component of the development based on the applicable car parking rates under both the SEPP ARH 2009 and Marrickville DCP 2011.

Table 5: Boarding House Car Parking Requirement & Provision

TYPE	NO.	SEPP PARKING RATE	DCP PARKING RATE	SEPP REQUIREMENT	DCP REQUIREMENT	PARKING PROVISION
Resident	118	0.5 spaces / room	0.5 spaces / room	59	59	42
Manager	2	Max. 1.0 space / manager	1.0 space / manager	0	2	
			TOTAL	***59***	***61***	***42***

It is evident from **Table 5** that the Marrickville DCP 2011 requires the development to provide a total of 61 car parking spaces, whilst the SEPP ARH 2009 requires the development to provide 59 car parking spaces, for the proposed boarding rooms. As per Clause 29(2)(e) of the SEPP ARH 2009, the consent authority is unable to refuse consent to the development on the grounds of car parking if compliance with the SEPP ARH 2009 parking requirement is met. In this regard, it is considered that the minimum requirement for the boarding house component of the development is 59 car parking spaces (not 61 spaces).

In response, the development provides a total of 42 car parking spaces, resulting in a shortfall of 17 car parking spaces against the SEPP ARH 2009. Whilst this level of provision does not strictly satisfy the minimum requirements under the SEPP ARH 2009, it is considered that the provision is acceptable and adequate to accommodate the parking demands of the development in the circumstances for the following reasons:

- The Marrickville DCP 2011 outlines the following justification for developments with reduced levels of car parking:

> *2.10.4 Provision Rates Approach*
>
> *Justification for providing car parking at a rate lower than that specified in this section of the DCP could include:*
>
> 3. *Located adjacent to high-frequency public transport services and/or urban services;*
> 4. *Includes management regimes to minimise car use, such as workplace travel plans or on-site carshare schemes;*
> 6. *Development targeted to demographic sector with low car use/ownership;*
> 9. *Parking for the development is consistent with the aims and objectives of this section of MDCP 2011.*

- The proposed development satisfies each of the items from the Marrickville DCP 2011 as discussed in further detail below:

Public Transport

- As discussed in Section 2.3 of this report, the site benefits from excellent access to public transport services being located immediately adjacent to Marrickville Railway Station and within 400 metres of bus stops located along Illawarra Road. It is therefore expected that the site will operate with reduced car ownership rates and hence, reduced car parking demands.

- As discussed in Section 2.3.4 of this report, under the Sydney Metro City & Southwest project, the T3 Bankstown Railway Line and Marrickville Railway Station will be upgraded to Metro standards. The proposed upgrade is set to open in 2024 with average headway times of four (4) minutes in the peak, equating to 15 trains per hour, compared to eight (8) trains per hour during the peak periods at present. The upgrade of the T3 Bankstown Railway Line will therefore result in more reliable and frequent public transport services for residents and visitors of the proposed development.

- The resident parking rate specified under Clause 29(2)(e)(iia) of the SEPP ARH 2009 is a generic rate that is required to be adopted for all boarding house developments proposed throughout NSW, and does not include any discounts for sites that are well served by public transport services and / or are expected to generate reduced parking demands such as the proposed development.

Green Travel Plan

- As is discussed in further detail in Section 5 of this report, it is recommended that a Green Travel Plan (GTP) be prepared for the development. The GTP shall influence the travel behaviour of residents away from the use of private vehicles towards more efficient modes of transport including active transport such as walking and cycling; public transport such as metro, rail and bus services, and car share services.

Demographic Sector of the Proposed Development

- Section 4.3 of the Marrickville DCP 2011, Part – 4 recognises boarding house developments are associated with the provision of accommodation for low income households. It is therefore expected residents living within boarding house developments are less likely to own a private car, resulting in reduced levels of parking demand.

Bicycle & Motorcycle Parking

- As is discussed in further detail in Sections 4.3 and 4.4 of this report, the development will provide on-site bicycle and motorcycle parking facilities in accordance with the Marrickville DCP 2011 and SEPP ARH 2009. These facilities will complement the on-site car parking to provide a sustainable transport outcome for the site that encourages the use of alternative transport modes and a reduction in the use of private vehicles.

The proposed car parking provision is therefore considered acceptable and will provide a sustainable transport outcome in accordance with the objectives of the Marrickville DCP 2011.

4.1.2. Commercial

The car parking requirement for the commercial component of the development has been assessed in accordance with the Marrickville DCP 2011. **Table 6** below shows the minimum car parking requirement under the applicable 'business premises, retail premises, shops' car parking rate, and the proposed provision in response.

Table 6: Commercial Car Parking Requirement & Provision

TYPE	GFA.	DCP PARKING RATE	DCP REQUIREMENT	PARKING PROVISION
Commercial	259m^2	1.0 space / 100m^2 GFA	3	3
		TOTAL	***3***	***3***

It is evident from **Table 6** that the commercial component of the development requires a minimum of three (3) car parking spaces under application of the Marrickville DCP 2011. In response, three (3) car spaces are provided for the commercial component of the development which complies with the Marrickville DCP 2011 and is considered an acceptable level of provision.

4.2. Accessible Car Parking

Consultation with the Applicant's access consultant has confirmed that the development is required to provide a minimum of three (3) accessible car parking spaces. In response, the development provides three (3) accessible car parking spaces in accordance with the access consultant's requirements, and this is considered an acceptable level of provision.

4.3. Motorcycle Parking

Both the Marrickville DCP 2011 and Clause 30(1)(h) of the SEPP ARH 2009 stipulate minimum motorcycle parking rates. **Table 7** below shows the minimum motorcycle parking requirement for the development and the proposed parking provision in response.

Table 7: Motorcycle Parking Requirement & Provision

TYPE	NO.	SEPP PARKING RATE	DCP PARKING RATE	SEPP REQUIREMENT	DCP REQUIREMENT	PARKING PROVISION
Boarding House	118 rooms / 59 car spaces required under DCP	0.2 spaces / room	5% of car parking spaces required under the Marrickville DCP 2011	24	3	24
Commercial	3 car spaces required under DCP	-	5% of car parking spaces required under the Marrickville DCP 2011	-	0	2
			TOTAL	***24***	***3***	***26***

It is evident from **Table 7** that the boarding house component of the development requires a minimum of 24 motorcycle spaces under the SEPP ARH 2009 and three (3) motorcycle spaces under the Marrickville DCP 2011. The commercial component of the development does not require any motorcycle parking provision under the Marrickville DCP 2011. In response, the development provides a total of 26 motorcycle spaces comprising, 24 spaces for the boarding house and two (2) spaces for the commercial component of the development. This exceeds the requirements of both the SEPP ARH 2009 and Marrickville DCP 2011 and is therefore considered acceptable.

4.4. Bicycle Parking

Both the Marrickville DCP 2011 and Clause 30(1)(h) of the SEPP ARH 2009 stipulate minimum bicycle parking rates. **Table 8** overleaf shows the minimum bicycle parking requirement for the development and the proposed parking provision in response.

Table 8: Bicycle Parking Requirement & Provision

TYPE	NO.	SEPP PARKING RATE	DCP PARKING RATE	SEPP REQUIREMENT	DCP REQUIREMENT	PARKING PROVISION
Boarding House	118 rooms	0.2 spaces / room	0.2 spaces / room for residents and 0.1 spaces / room for visitors	24	36	26
Commercial	259m^2 GFA	-	1 space / 150m^2 GFA for staff and 1 space / 1,000m^2 GFA for customers	-	2	2
			TOTAL	***23***	***38***	***28***

It is evident from **Table 8** that the proposed development requires a minimum of 24 bicycle spaces under the SEPP ARH 2009 and 38 bicycle spaces under the Marrickville DCP 2011. In response, the development provides a total of 28 bicycle spaces within the basement levels comprising of 26 residential bicycle spaces and two (2) commercial bicycle spaces and therefore complies with the requirements of the SEPP ARH 2009 and the commercial component of the Marrickville DCP 2011.

4.5. Service Vehicle Parking & Waste Collection

The service vehicle parking requirement for the proposed development has been assessed in accordance with Clause 2.10.16 of the Marrickville DCP 2011. **Table 9** below shows the minimum service vehicle parking rates applicable to the proposed development.

Table 9: Service Vehicle Parking Requirement & Provision

TYPE	NO. / AREA	DCP PARKING RATE	MINIMUM REQUIREMENT	PARKING PROVISION
Commercial	259m^2 GFA	1 truck space / 4,000m^2 GFA	0	1
		TOTAL	**0**	**1**

**Neither the SEPP ARH 2009 nor the Marrickville DCP 2011 stipulate a service vehicle parking rate for boarding house developments.*

It is evident from **Table 9** that the proposed development is not required to provide any on-site service vehicle spaces under the Marrickville DCP 2011. Notwithstanding, the development provides a single courier bay which can accommodated vehicles with dimensions up to and including a B99 Design Vehicle (i.e. high-top vans and tradesman utes).

This is considered an acceptable level of provision given that the commercial floor space of only 259m^2. Furthermore, the SEPP ARH 2009 and Marrickville DCP 2011 do not provide a service vehicle parking rate for boarding house developments. Notwithstanding, it is noted these 'new-age' boarding house developments such as the proposed development are fully furnished and as such, the demand for large service vehicles is significantly reduced (i.e., reduced demand for large trucks such as removalist vehicles).

Given the moderate scale of the development and site constraints, it is considered appropriate that waste collection occur on-street by private waste contractors. To facilitate this, a bin holding area is provided on Ground Floor, on the eastern side of the site, which will ensure waste collection will be undertaken safely and efficiently.

It is common for private waste contractors to include 6.4-metre-long waste trucks (comparable to a Small Rigid Vehicle) as part of their fleet and as such, the development will utilise these trucks for waste collection. To ensure there is minimal impact on the operation of the one-lane, one-way traffic flow of Station Street and pedestrians travelling to and from Marrickville Railway Station, it is recommended that waste collection be undertaken between the hours of 6:30-7:00am during a typical weekday (or weekend).

Having regard for the above, Council is invited to impose a suitable condition of consent for the development to obtain a formal letter of engagement from a private waste contractor that can operate based on the above conditions (and any other conditions Council may request) prior to issue of any Occupation Certificate.

The proposed service vehicle and waste collection arrangements are considered acceptable and are consistent with numerous other comparable developments in the area.

5. Green Travel Plan

A GTP is a travel demand management tool to promote the use of active and public transport to / from developments. The primary purpose of the GTP is to coordinate a site-wide approach to influence the travel behaviour of residents and visitors away from the use of private vehicles towards more efficient modes of transport including active transport such as walking and cycling; public transport such as metro, train and bus services; and car-pooling and car sharing.

A GTP generally includes a Transport Access Guide, in the form of a map / brochure, illustrating the available modes of transport available including, but not limited to, the following:

- Bus routes, stops and a table of services;
- Rail / Metro stations and a table of services;
- Bicycle network and the location of any on-site bicycle parking facilities;
- Location of on-site car share vehicles/pods and other car share vehicles/pods within the vicinity of the site;
- Relevant transport related mobile phone applications and websites such as TripView, Opal Travel, Uber and OLA.

With regard to the above, the GTP will ensure that staff, residents and visitors are aware of the public transport services and infrastructure within the site's locality and encourage the use of these services for journeys to / from the development.

6. Traffic Impacts

6.1. Trip Generation

6.1.1. Boarding House

Neither of the RMS[1] Guide or RMS[1] Guide Update policies include traffic generation rates for boarding house developments. Reference was therefore made to the high-density residential trip rates outlined in the RMS[1] Guide Update, noting that the traffic generation of the boarding house would be comparable to a high-density residential development given the restrained level of on-site car parking and excellent access to public transport services.

The RMS[1] Guide Update recommends application of a traffic generation rate of 0.19 trips / apartment during the AM peak period and 0.15 trips / apartment during the PM peak period. Application of these trip rates to the 118 boarding rooms proposed, results in the following peak period traffic generation:

- 22 vehicle trips / hour (4 in, 18 out), during the AM peak period;
- 18 vehicle trips / hour (14 in, 4 out), during the PM peak period.

The above assumes a 20% inbound / 80% outbound split during the AM peak period noting that most residents would leave for work in the weekday morning, and vice versa for the weekday PM peak period.

6.1.2. Commercial

The RMS[1] Guide Update recommends application of a peak period traffic generation rate of 1.6 trips / 100m^2 GFA during the AM peak period and 1.2 trips / 100m^2 GFA during the PM peak period, for commercial developments. Application of these rates to the 259m^2 GFA proposed, results in the following peak period traffic generation:

- 4 vehicle trips / hour (3 in, 1 out), during the AM peak period;
- 3 vehicle trips / hour (1 in, 2 out), during the PM peak period.

6.1.3. Combined

The total traffic generation of the proposed development is therefore expected to be in the order of:

- 26 vehicle trips / hour (7 in, 19 out), during the AM peak period;
- 21 vehicle trips / hour (15 in, 6 out), during the PM peak period.

The above is not a net increase in traffic generation, as it does not take into consideration the generation of the existing development. In this regard, the net increase in traffic generation as a result of the proposed development is expected to be as follows:

- 21 vehicle trips / hour (4 in, 17 out), during the AM peak period;
- 16 vehicle trips / hour (12 in, 4 out), during the PM peak period.

6.2. Traffic Distribution & Impacts

As discussed above, the proposed development will result in a net increase in traffic generation of 21 vehicle trips / hour during AM peak period and 16 vehicle trips / hour during the PM peak period. These trips will be distributed to the east and west along Illawarra Road, avoiding additional traffic along residential roads as motorists seek to access Princes Highway and Sydney CBD respectively, and split into both directions due to the inbound and outbound movements.

The above distribution will ensure there is a net increase of no more than 11 vehicle movements in a one hour period along any one section of Illawarra Road. This level of traffic generation is considered a low-level increase and will have negligible impacts on the performance of the external road network including local roads such as Station Street and Schwebel Street.

The traffic impacts of the proposed development are therefore considered acceptable and no external improvements will be required to facilitate the development

7. Design Aspects

7.1. Access

With 45 car parking spaces of User Class 1A, the proposed development requires a Category 1 Driveway under Table 3.1 of AS 2890.1, being a combined entry / exit driveway of width 3.0 metres to 5.5 metres. In response, the development proposes a separated entry / exit driveway onto Station Street, with both the entry and exit lanes having a width of 3.0 metres, separated by a 0.6 metre wide median. This arrangement exceeds the requirements of AS 2890.1.

The proposed arrangements have also been assessed using swept path analysis which confirms compliance with AS 2890.1, and that the proposed access arrangements will operate safely and efficiently. The results of this analysis are included in **Appendix B** for reference.

In summary, the proposed access arrangements are considered acceptable and comply with the relevant requirements of AS 2890.1.

7.2. Internal Design

The proposed internal parking arrangements comply with the relevant requirements of AS 2890.1, AS 2890.3 and AS 2890.6, with the following design aspects considered noteworthy:

7.2.1. Roadway / Ramp

- Due to the longitudinal grade of Station Street, the ramp is required to incorporate somewhat of a 'twist' in that its northern edge will ramp up from the boundary at a grade of 7.5%, the southern edge will ramp down from the boundary at a grade of 4.5% whilst the centreline will have a relatively flat (0%) grade. These arrangements are considered acceptable and deemed to comply with Clause 3.3(a) of AS 2890.1.

- The vehicular ramp from Ground Floor to Basement 1 has a width of 6.6 metres at the property boundary, widening to 8.3 metres through the ramp curve and narrowing to 6.1 metres at the bottom of the ramp. This arrangement will accommodate two-lane, two-way traffic flow as demonstrated by the swept path analysis results included in **Appendix B**, complies with AS 2890.1 and is considered acceptable.

- To assist drivers with sight lines, a convex mirror is proposed at the bend of the Ground Floor to Basement 1 ramp. The mirror will ensure that opposing drivers have adequate sight distance and are able to pass one another, as demonstrated by the swept path results included in **Appendix B.**

- The vehicular ramps from Basement 1 to Basement 2 and from Basement 2 to Basement 3 have a minimum width of 3.5 metres between kerbs, widening to 3.7 metres along the ramp curve. This arrangement will accommodate one-lane, two-way traffic flow, as demonstrated by the swept path analysis results included in **Appendix B**. The one-lane, two-way ramps comply with AS 2890.1 and are considered appropriate in the circumstances given the low traffic generation of the development.

- Due to the one-lane, two-way vehicle ramps between Basement 1 - Basement 3, and constrained intervisibility, the use of traffic signals is required to manage the internal vehicle circulation along the ramps. In this regard, the architectural plans included in **Appendix A** show that traffic signals will be provided at both ends of the Basement 1-Basement 2 and Basement 2-Basement 3 ramps to manage traffic flow and ensure that vehicle movements occur safely and efficiently.

7.2.2. Parking Modules

- All car parking spaces are provided in accordance with the User Class 1A requirements of AS 2890.1, having a minimum space width of 2.4 metres and length of 5.4 metres, with a minimum aisle width of 6.1 metres.

- All accessible car parking spaces are provided with a minimum space width of 2.5 metres and length of 5.4 metres, with a minimum aisle width of 6.1 metres. Additionally, these spaces are located immediately adjacent to a 2.4 metre wide and 5.4 metre long shared area, thereby satisfying the requirements of AS 2890.6.

- All walls / columns are located outside of the space design envelope, as required under Figure 5.2 of AS 2890.1.

- A 1.0 metre blind aisle extension has been provided beyond the last parking spaces, in accordance with Figure 2.3 of AS 2890.1.

7.2.3. Head Heights

- A clear head height of 2.2 metres is required above all traffic circulation and car parking areas in accordance with Clause 5.3.1 of AS 2890.1.

- A minimum clear head height of 2.5 metres is required above the accessible car parking space and shared areas, in accordance with Clause 2.4 of AS 2890.6.

7.2.4. Other Design Aspects

- A 2.5 metre by 2.0 metre visual splay is provided on the egress side of the car park driveway, at the property boundary, in accordance with Figure 3.3 of AS 2890.1. This area is to be kept clear of all vertical obstructions with a height greater than 0.6 metres.

- All bicycle parking spaces are provided as Security Level B facilities, in accordance with AS 2890.3.

- All motorcycle spaces are provided in accordance with Clause 2.4.7 of AS 2890.1.

In summary, the internal parking arrangements have been designed in accordance with AS 2890.1, AS 2890.3 and AS 2890.6. Any minor amendments considered necessary (if any) can be dealt with prior to the release of a Construction Certificate.

7.3. Traffic Signal System

To ensure that vehicle movements along the Basement 1-Basement 2 and Basement 2-Basement 3 ramps are managed safely and efficiently, a traffic signal system will be provided. This will involve the provision of red / green traffic signals (traffic signals) and waiting bays within the basement levels, as shown by the architectural drawings provided as **Appendix A.**

The signals provided on Basement 1 and Basement 2 would be configured in a 'passive green' state such that vehicles entering the site would always be given priority, with a green signal on arrival. This will ensure that entering drivers would (generally) not experience any delays, minimising the potential for any queuing to occur on Basement 1. The only exception to this would be if a driver was to enter Basement 2 or Basement 3 at the same time that a driver was exiting from these levels, which is a low probability event. In this instance, the following would occur:

- The exiting driver would manoeuvre out of their parking space and into one of the exit waiting bays. This would trigger the 'inbound' traffic signals to a 'red' state, such that all signals are now 'red'.
- After a safety delay period of approximately 20 seconds, the 'outbound' traffic signals would change to 'green' and remain in this state for a period of approximately 20 seconds whilst the driver exits the site. During this period the 'inbound' signals would remain 'red'.
- The 'outbound' signals would then revert to 'red'.
- After a safety delay period of approximately 20 seconds, the 'inbound' signals would revert to their passive state, which would display a 'green' signal for inbound vehicles and 'red' signal for outbound vehicles.

It is noted that the times provided above are indicative only and would be confirmed with a signal specialist at Construction Certificate (CC) stage.

Induction loops will be provided within the waiting bays within all basement levels. This would link the waiting bays to the traffic signals for automatic operation of the traffic signal system.

The proposed traffic signal system is considered acceptable for the management of the Basement 1-Basement 2 and Basement 2-Basement 3 ramps. It is also common practice for developments such as that proposed which are provided with one-lane, two-way ramps and generate low traffic volumes during peak periods.

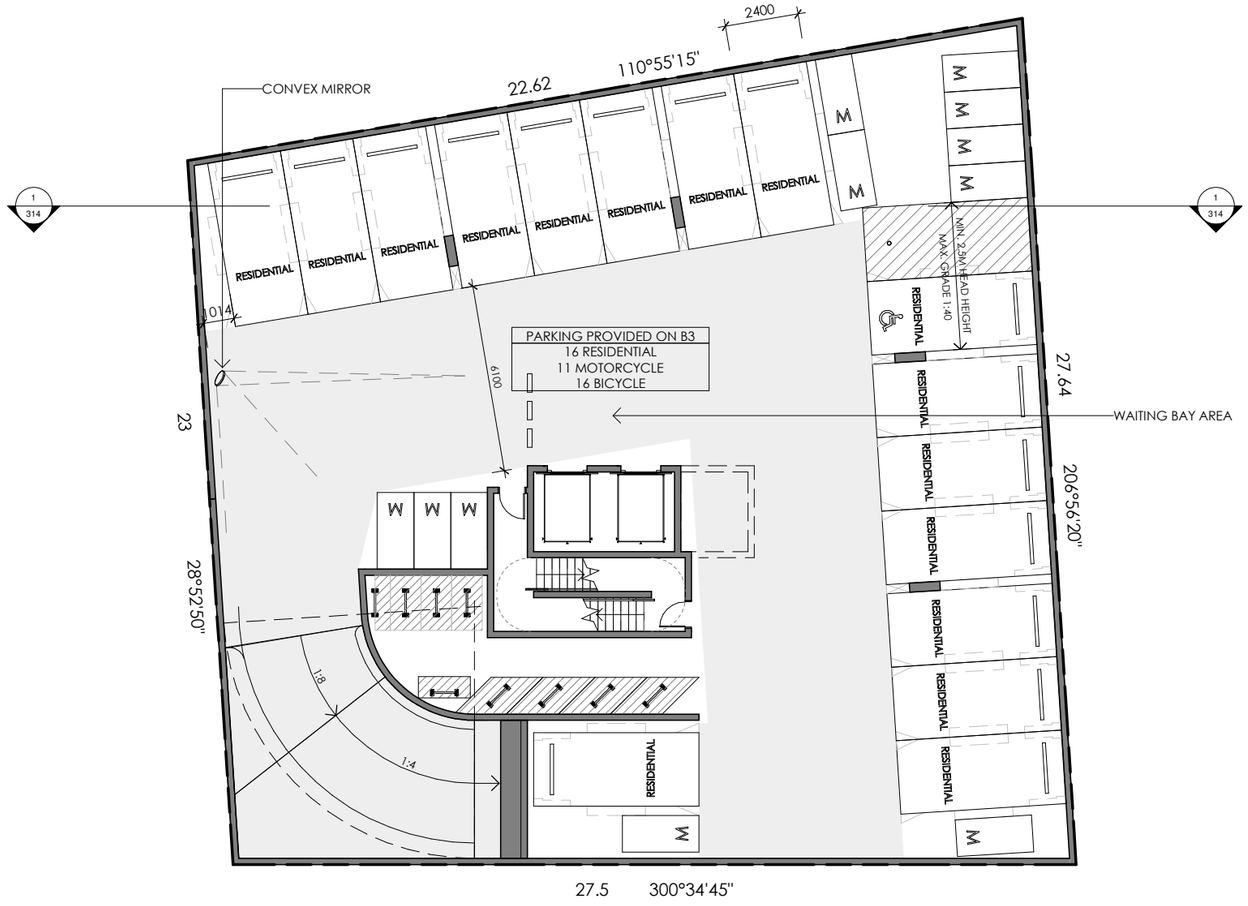
8. Conclusions

In summary:

- PDC Consultants has been commissioned by Emag Apartments Pty Ltd to undertake an updated traffic impact assessment of a Development Application (DA) relating to a proposed mixed-use development at 2-18 Station Street, Marrickville. The DA proposes the demolition of all existing buildings and construction of a 10-storey mixed-use development with the following characteristics:
    - 118 boarding rooms, plus managers' and communal rooms;
    - 259m^2 of commercial GFA;
    - Three (3) basement levels accommodating a total of 45 car parking spaces;
    - A 6.6 metre divided entry / exit driveway onto Station Street;
- The traffic generation assessment confirms that the development will generate a total of 26 vehicle trips / hour during the weekday AM peak period and 21 vehicle trips / hour during the weekday PM peak period. However, once the traffic generation of the existing development is taken into consideration, it is evident that the proposed development would result in a net increase in traffic generation of 21 vehicle trips / hour during the weekday AM peak period and 16 vehicle trips / hour during the weekday PM peak periods. The distribution of the development traffic will result in an increase of no more than 11 vehicle movements along any one (1) section of Illawarra Road which will have negligible impacts on its performance. Accordingly, no external improvements will be required to facilitate the development and the traffic impacts of the proposed development are considered acceptable.
- The proposed boarding house component of the development requires 61 car spaces under the Marrickville DCP 2011 and 59 car spaces under the SEPP ARH 2009, with the latter being the minimum requirement. In response, the boarding house component of the development provides a total of 42 car parking spaces. For the reasons outlined in Section 4.1, the proposed car parking provision is considered to be acceptable.
- The proposed commercial floor space generates a requirement for three (3) car parking spaces under the Marrickville DCP 2011. The development provides three (3) commercial car spaces and therefore complies with the Marrickville DCP 2011.
- The development provides 28 bicycle spaces thereby satisfying the requirements of the SEPP ARH 2009 and the commercial component of the Marrickville DCP. The development also provides 26 motorcycle spaces which complies with both the Marrickville DCP 2011 and the SEPP ARH 2009.
- The proposed access and internal parking arrangements comply with the relevant requirements of AS 2890.1, AS 2890.3 and AS 2890.6.

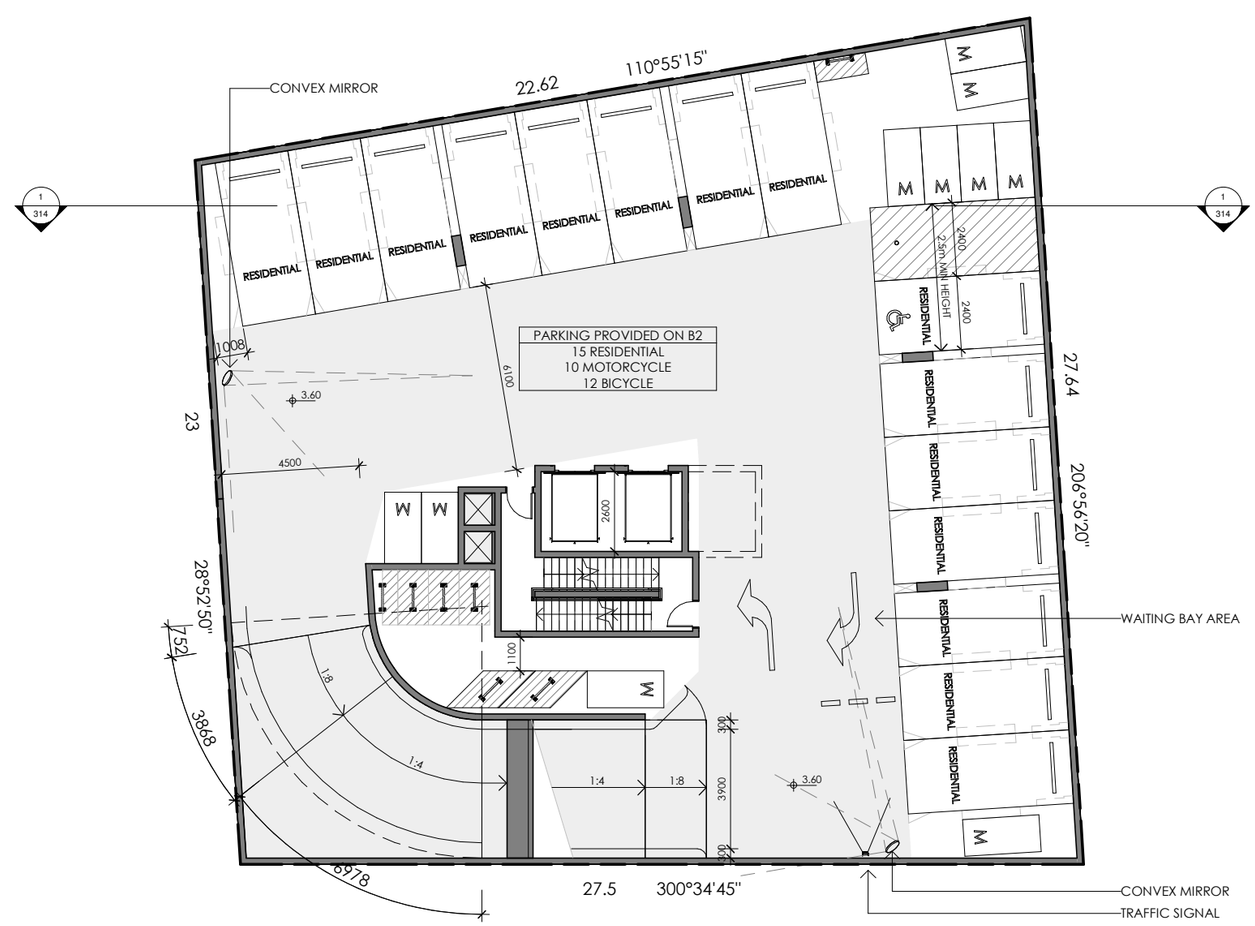
It is therefore concluded that the proposed development is supportable on traffic planning grounds.

Appendix A



1 BASEMENT 3

1 : 200



2 BASEMENT 2

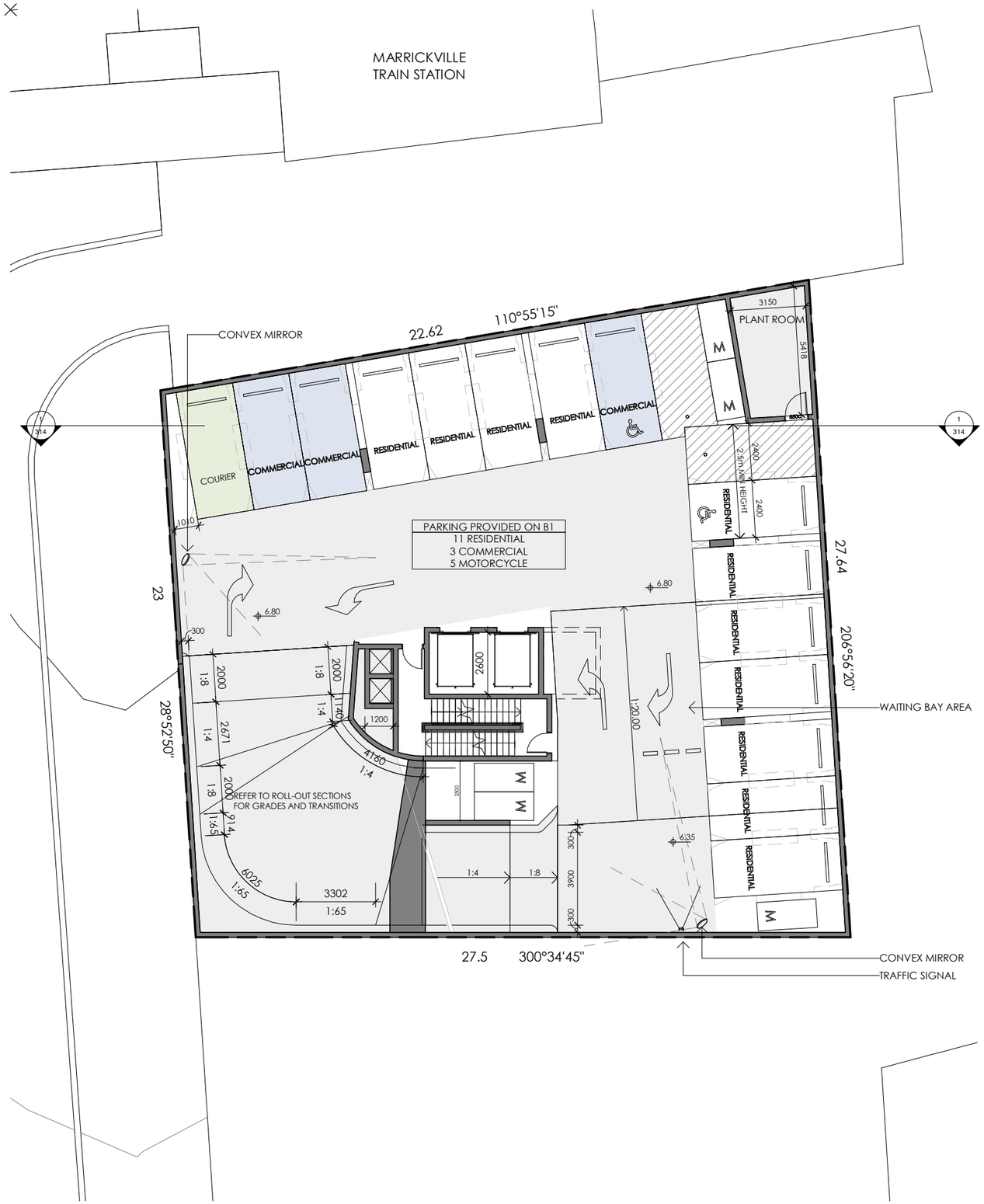
1 : 200

BASEMENTS 2 & 3 FLOOR PLANS

ISSUE	DATE	DESCRIPTION
B	07/01/2021	AMENDED PLANS
A	18/05/2020	DEVELOPMENT APPLICATION

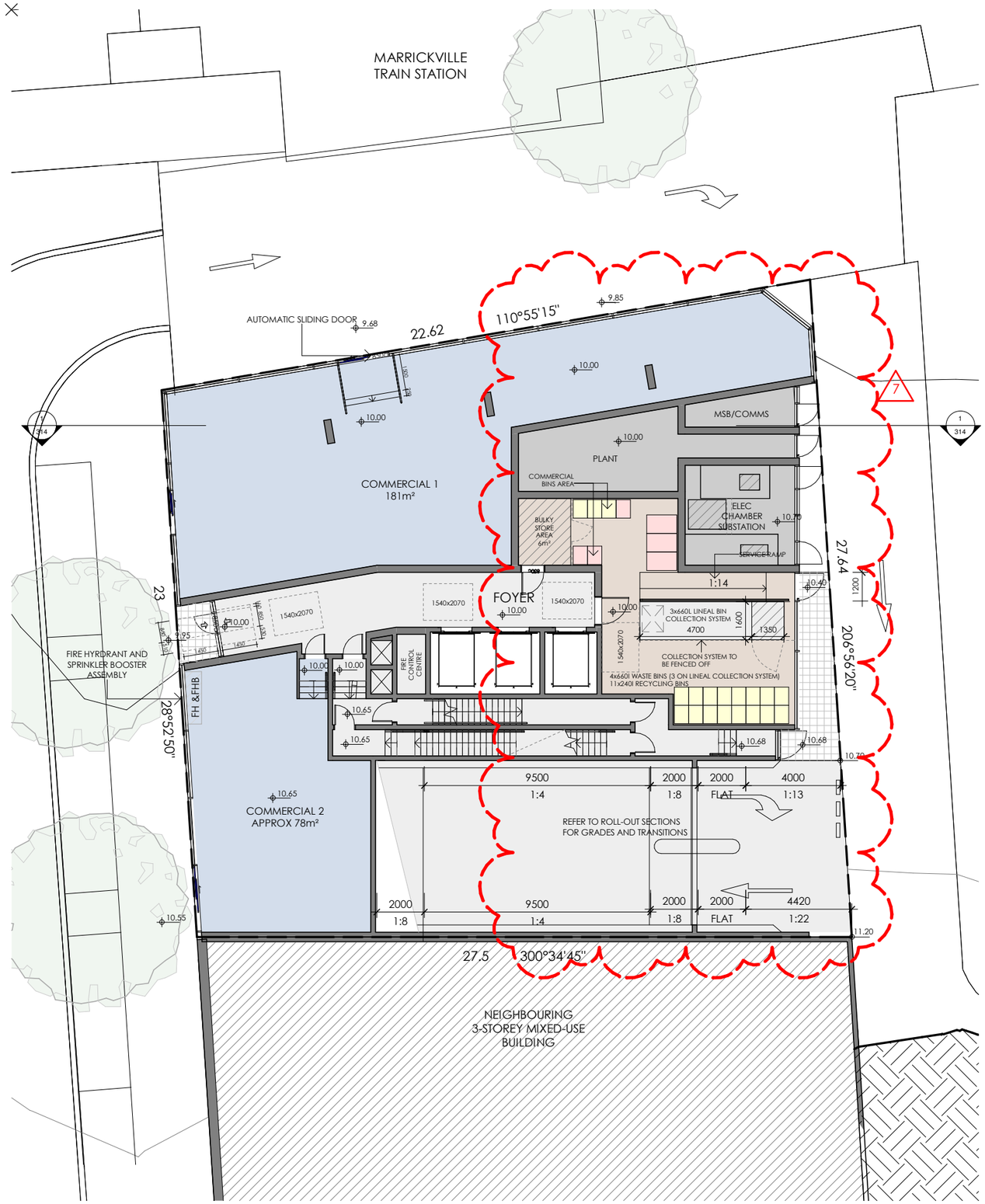
TIER ARCHITECTS

CLIENT	EMAG APARTMENTS	DATE 07/01/2021	SCALE A3 1 : 200
PROJECT	2-18 Station Street MARRICKVILLE	DRAWN PV	CHECKED NN
TITLE	BASEMENTS 2 & 3 FLOOR PLANS	DWG No ---	303



1 BASEMENT 1

1 : 200



2 GROUND

1 : 200

7 - SPLAY ADDED TO NORTH EASTERN CORNER / SUBSTATION MOVED FROM WESTERN ELEVATION TO EASTERN SIDE ALONG WITH OTHER PLANT ROOMS / GARBAGE ROOM INCREASED IN SIZE / MINIMUM 6m TRANSITION TO BASEMENT RAMP

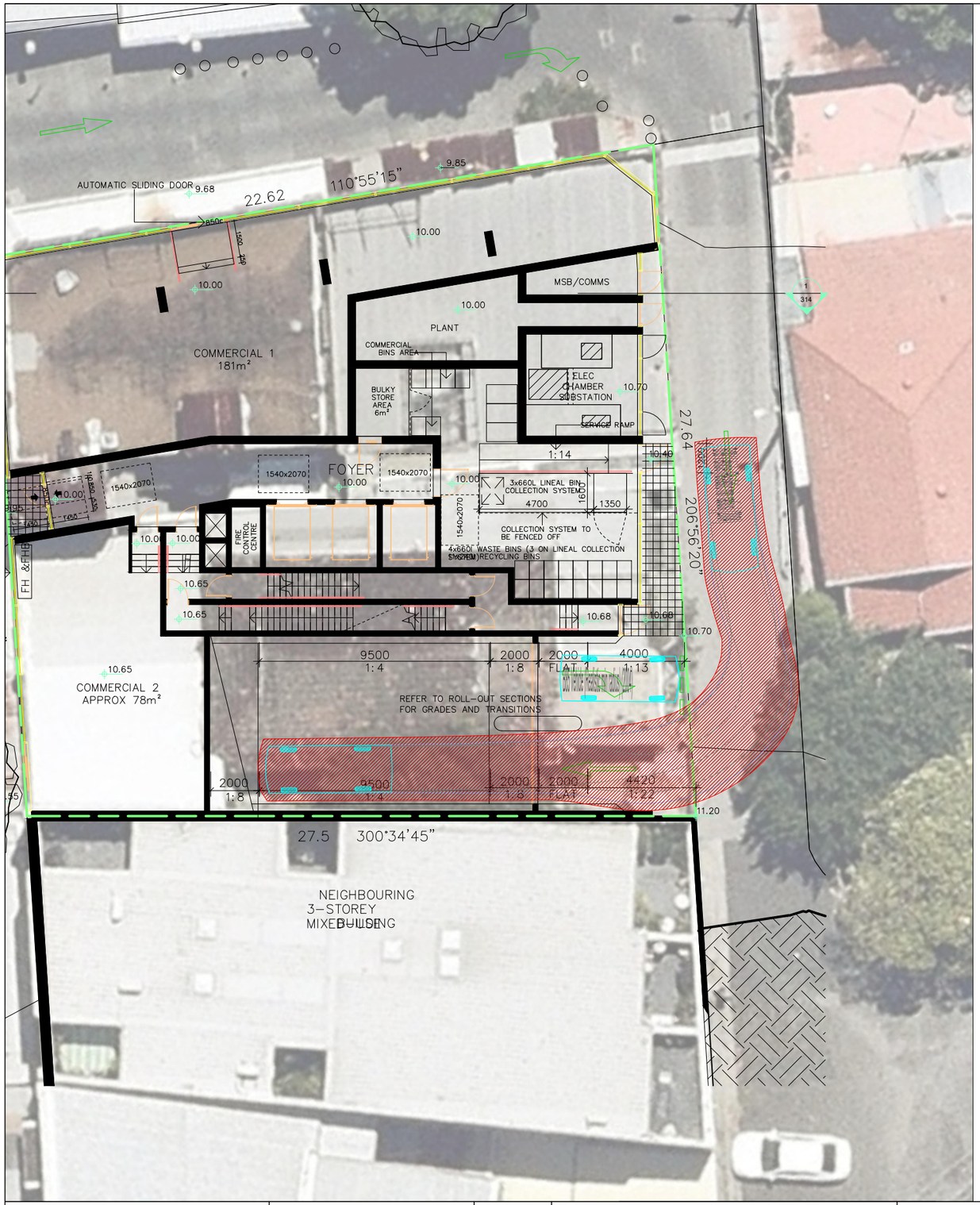
BASEMENT 1 & GROUND FLOOR PLANS

ISSUE	DATE	DESCRIPTION
B	07/01/2021	AMENDED PLANS
A	28/09/2020	DEVELOPMENT APPLICATION

TIER ARCHITECTS

CLIENT	EMAG APARTMENTS	DATE 07/01/2021	SCALE A3 1 : 200
PROJECT	2-18 Station Street MARRICKVILLE	DRAWN PV	CHECKED NN
TITLE	BASEMENT 1 & GROUND FLOOR PLANS	DWG No ---	304

Appendix B



No.	Date	Description

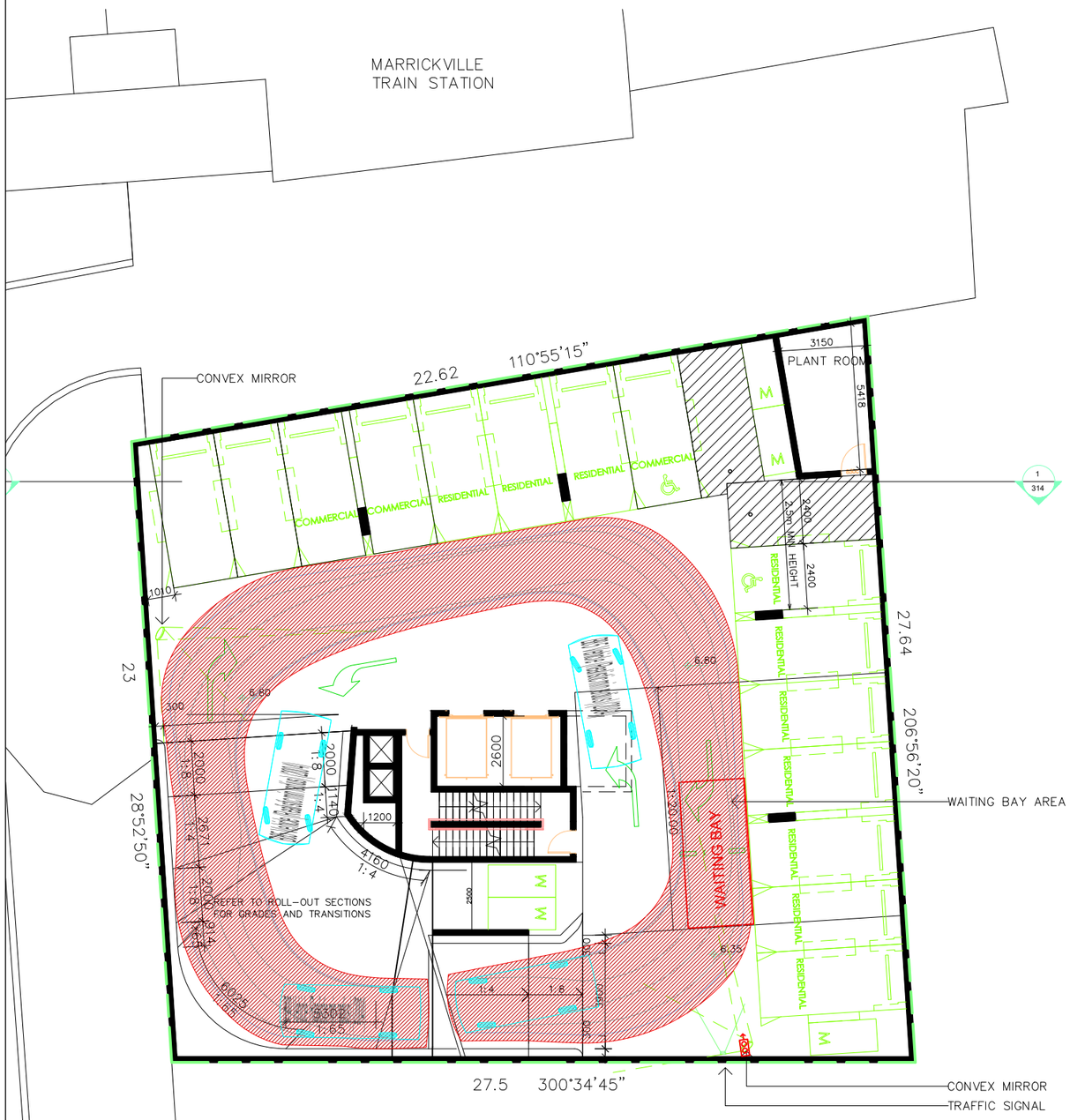
Swept Path Key
- Vehicle Wheel Path
- Vehicle Body Envelope
- 300mm Vehicle Clearance

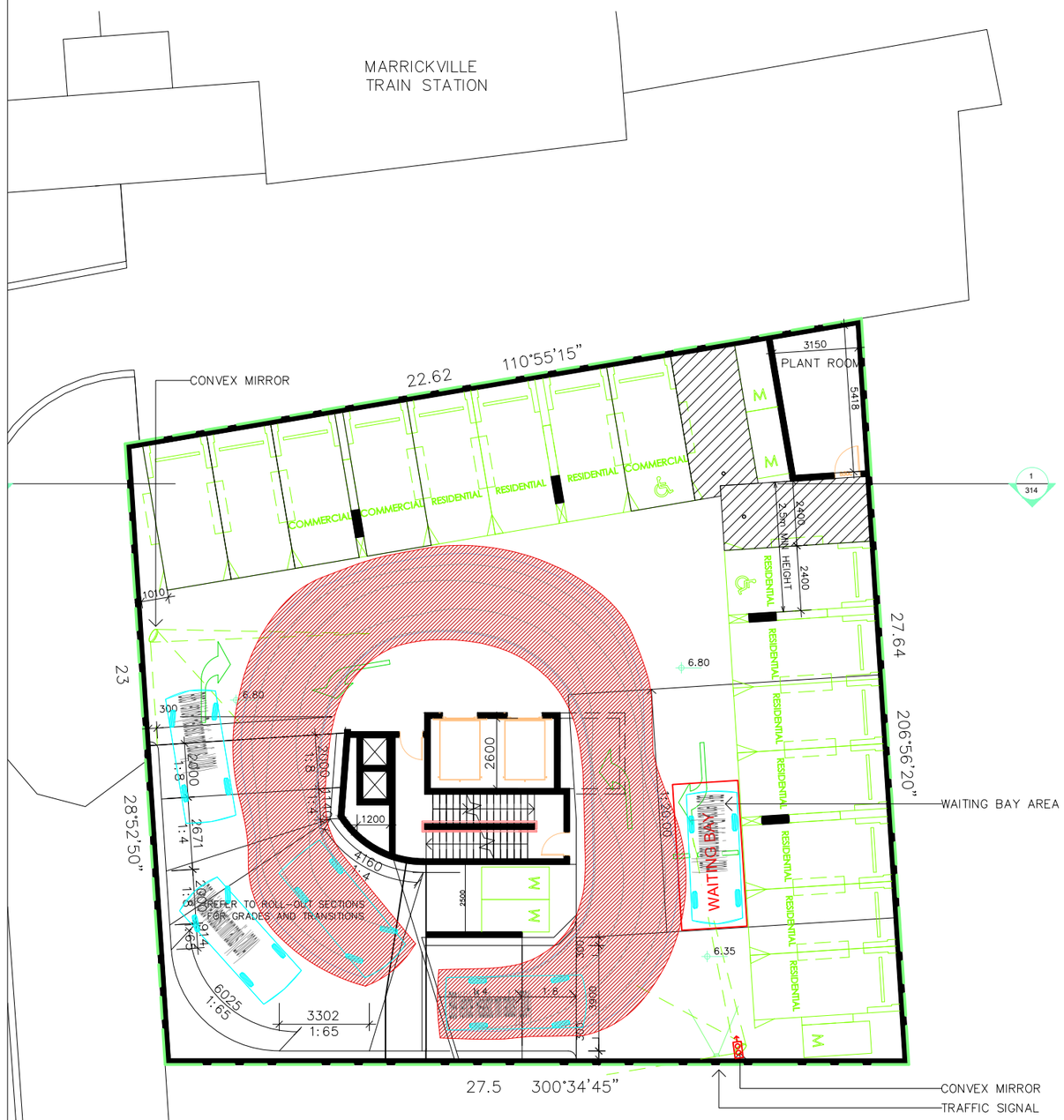
North: N

Drawing Prepared By

PDC Consultants
Suite 202 / 27-39 Abercrombie St
Chippendale NSW 2008
t: +61 2 7900 6514
w: www.pdcconsultants.com.au
ABN: 70 615 064 670

Architect: Tier Architects	Project: 2-18 Station Street Marrickville	Drawing Title: Ground Floor Plan B99 Design Vehicle Swept Path Analysis Site Entry & Exit Movements	Drawing No.: 001 / Revision No.: A
Client: Emag Apartments	Project No: 0113	Sheet Status: NOT FOR CONSTRUCTION	Drawn By: MM / Date: 18/01/2020
			Scale: 1:200 @ A3 (0m 2 4 6 8)





No.	Date	Description

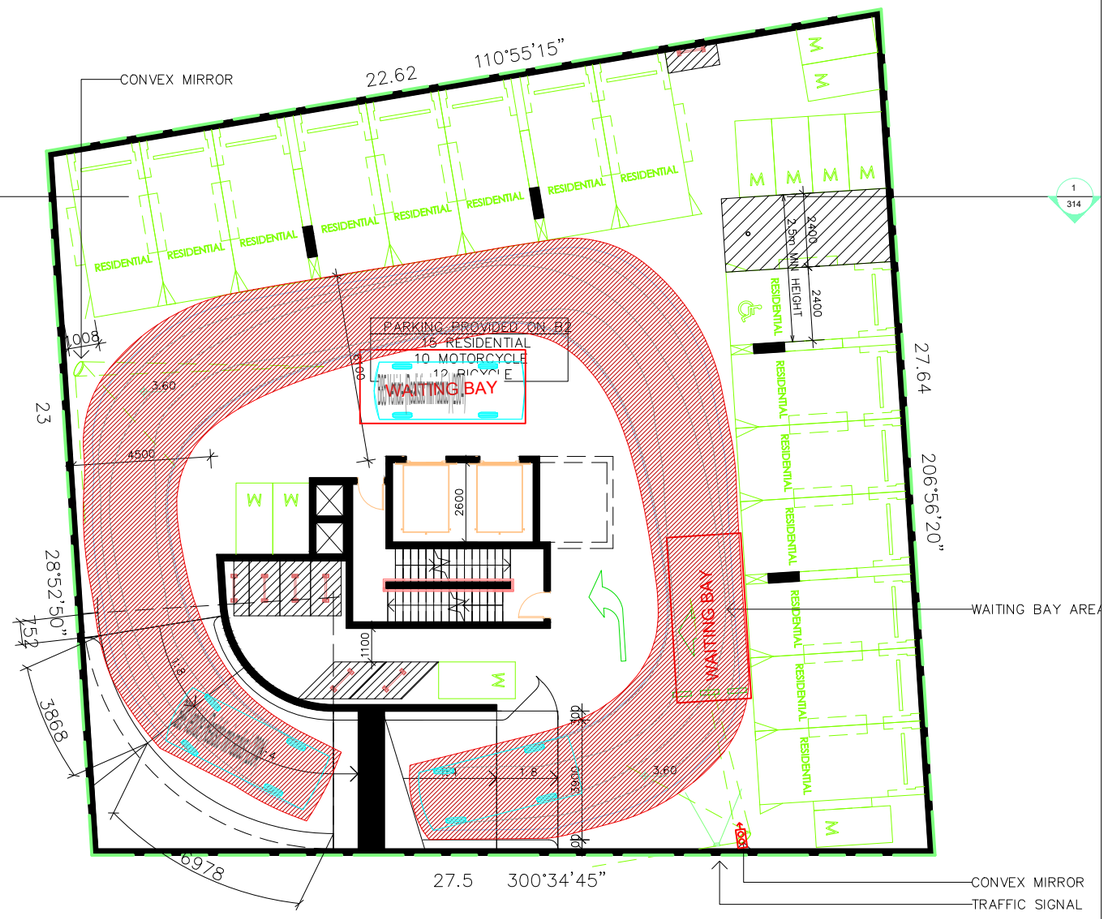
Swept Path Key
- Vehicle Wheel Path
- Vehicle Body Envelope
- 300mm Vehicle Clearance

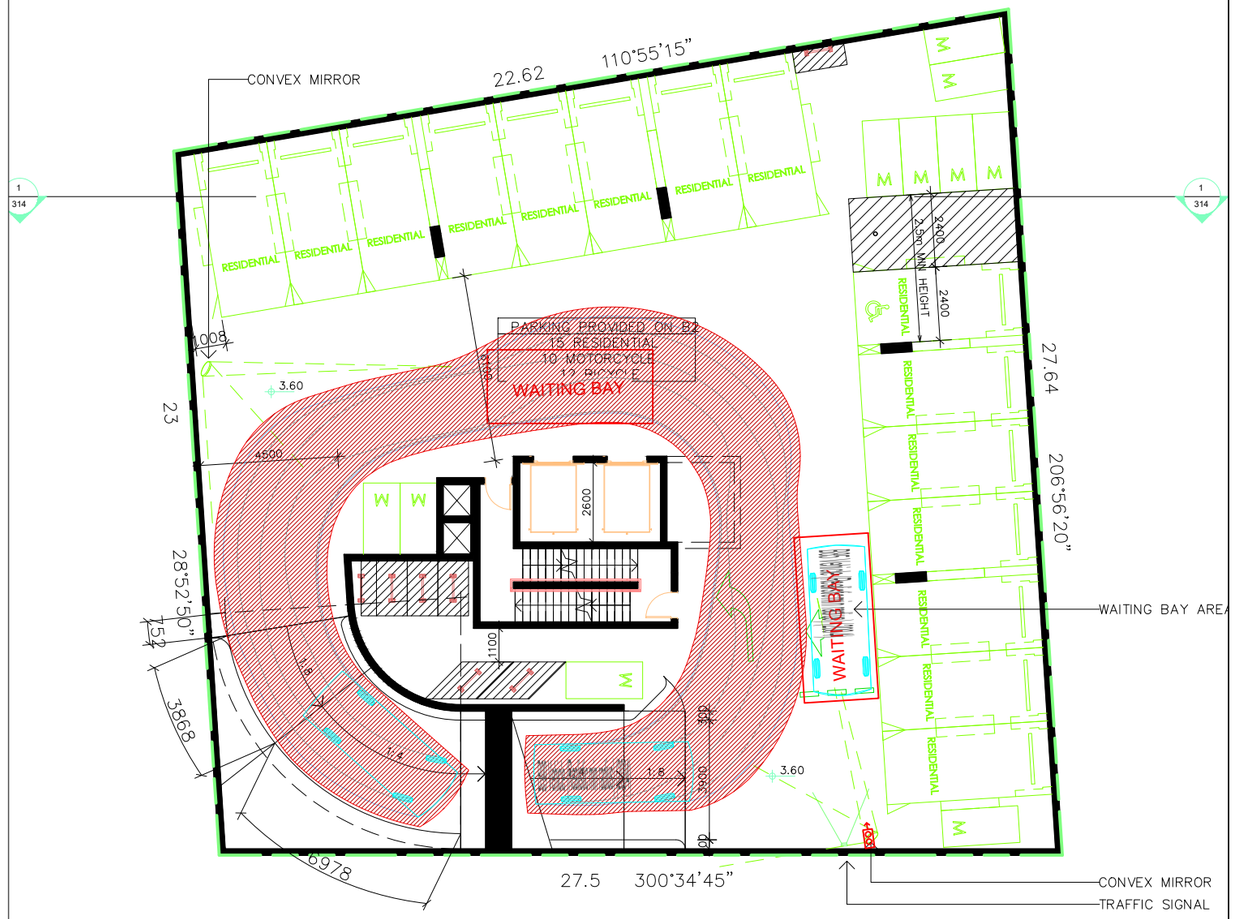
North: N

Drawing Prepared By

PDC Consultants
Suite 202 / 27-39 Abercrombie St
Chippendale NSW 2008
t: +61 2 7900 6514
w: www.pdcconsultants.com.au
ABN: 70 615 064 670

Architect: Tier Architects	Project: 2-18 Station Street Marrickville	Drawing Title: Basement 1 Floor Plan B99 Design Vehicle Swept Path Analysis Entry & Exit Movements	Drawing No.: 002	Revision No.: A
Client: Emag Apartments	Project No: 0113	Sheet Status: NOT FOR CONSTRUCTION	Drawn By: MM	Date: 18/012020
			Scale: 1:200 @ A3 (0m 2 4 6 8)	





No. Date Description	Swept Path Key Vehicle Wheel Path Vehicle Body Envelope 300mm Vehicle Clearance	North N	Drawing Prepared By PDC Consultants Suite 202 / 27-39 Abercrombie St Chippendale NSW 2008 t: +61 2 7900 6514 w: www.pdcconsultants.com.au ABN: 70 615 064 670	Architect Tier Architects	Project 2-18 Station Street Marrickville	Drawing Title Basement 2 Floor Plan B99 Design Vehicle Swept Path Analysis Entry & Exit Movements	Drawing No. 003 Revision No. A Drawn By MM Date 18/01/2020
				Client Emag Apartments	Project No 0113	Sheet Status NOT FOR CONSTRUCTION	Scale 1:200 @ A3 0m 2 4 6 8

PDC CONSULTANTS
+61 2 7900 6514 | pdcconsultants.com.au