TRAFFIX
TRAFFIC AND TRANSPORT PLANNERS

TRAFFIC IMPACT ASSESSMENT

Planning Proposal for Mixed Use Development
232-240 Elizabeth Street, Surry Hills NSW 2010

Reference: 21.338r01v08
Date: January 2024

Suite 2.08, 50 Holt St
Surry Hills, NSW 2010

t: (02) 8324 8700
w: www.traffix.com.au

DOCUMENT VERIFICATION

Job Number	21.338			
Project	232-240 Elizabeth Street, Surry Hills NSW 2010			
Client	**Stasia Holdings Pty. Limited**			
Revision	**Date**	**Prepared By**	**Checked By**	**Signed**
v08	18/01/2024	Hayden Dimitrovski	Hayden Dimitrovski	

TRAFFIX

CONTENTS

1. INTRODUCTION

TRAFFIX has been commissioned by Stasia Holdings Pty Limited to undertake a Traffic Impact Assessment (TIA) in support of a Planning Proposal relating to a mixed use development at 232-240 Elizabeth Street, Surry Hills. For the purposes of the planning proposal, an indicative development concept has been formulated comprising 5,846m^2 of commercial gross floor area (GFA) and 452m^2 of ground floor retail GFA. The development is located within the Council of The City of Sydney Local Government Area (LGA) and has been assessed under that Council's controls.

This report documents the findings of our investigations and should be read in the context of the Planning Proposal Justification Report prepared separately. The development is a minor development and does not require referral to Transport for NSW (TfNSW) under Schedule 3 Chapter 2 of the State Environmental Planning Policy (Transport and Infrastructure) 2021.

The report is structured as follows:

- Section 2: Describes the site and its location
- Section 3: Documents existing traffic conditions
- Section 4: Describes the concept development
- Section 5: Assesses the parking requirements
- Section 6: Assesses traffic impacts
- Section 7: Discusses access and internal design aspects
- Section 8: Presents the overall study conclusions

2. LOCATION AND SITE

The subject site is known as 232-240 Elizabeth Street, Surry Hills and is located on the eastern side of Elizabeth Street, approximately 205 metres north of Eddy Avenue. It is also located about 300 metres northeast of Central Railway Station and 1.5 kilometres south of Sydney Central Business District (CBD).

The site has a total site area of 905.6m^2 and consists of existing mixed use developments. It has a western boundary measuring 30 metres to Elizabeth Street and a southern frontage of 35 metres to Reservoir Street. It is bounded to the north and east, boundaries to neighbouring mixed use developments.

Vehicular access to the site is currently provided via Foster Lane on the northern boundary of the site.

A Location Plan is presented in **Figure 1**, with a Site Plan presented in **Figure 2** which provides an appreciation of the general character of roads and other key attributes in proximity to the site.

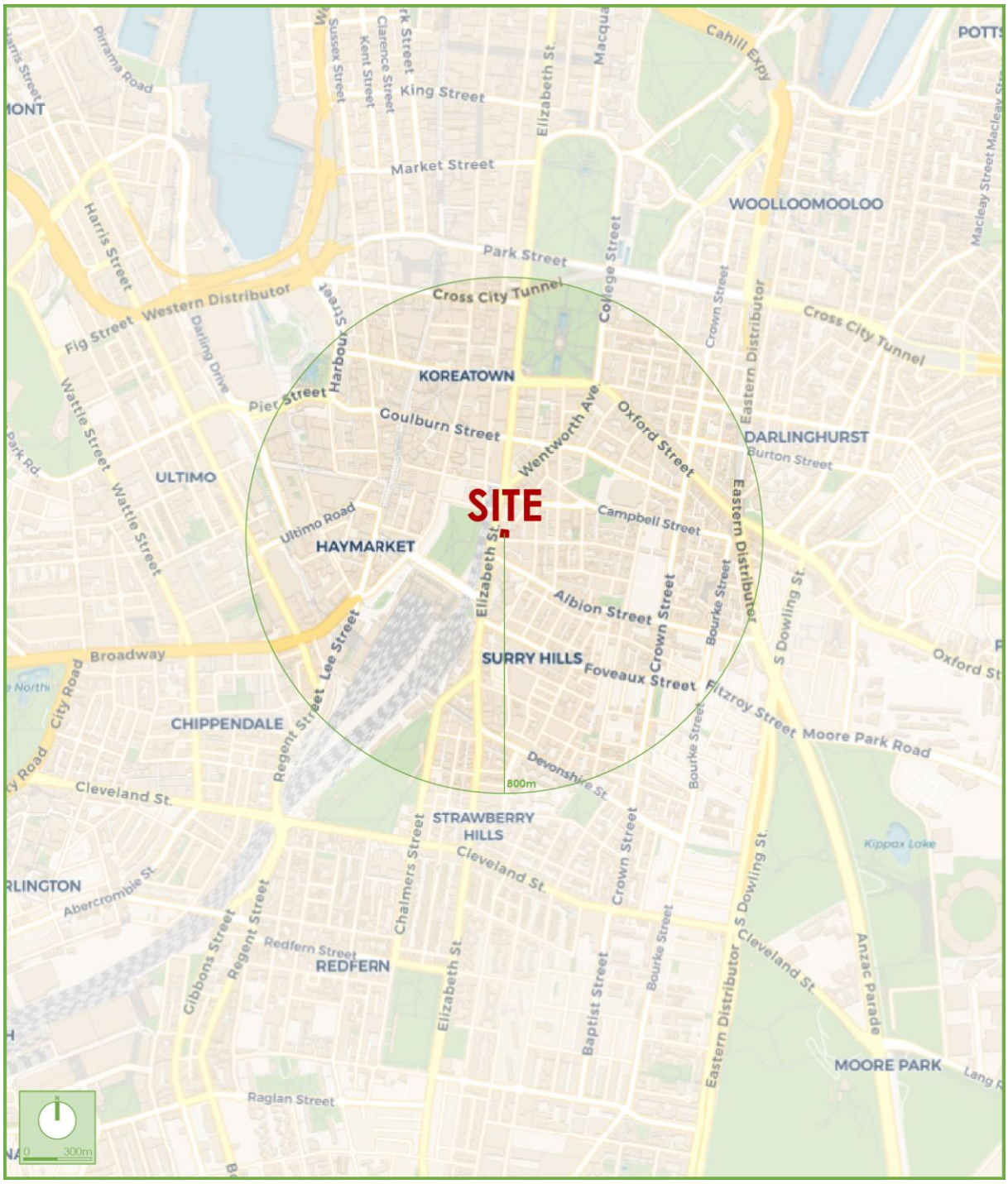


Figure 1: Location Plan

Figure 2: Site Plan

3. EXISTING TRAFFIC CONDITIONS

3.1 Road Network

The road hierarchy in the vicinity of the site is shown in **Figure 3** with the following roads of particular interest:

- Elizabeth Street: is an Unclassified Regional Road (7083) that traverses north-south between Chifley Square in the north and Joynton Avenue in the south. It is an unclassified regional road between King Street and Cleveland Street . Within the vicinity of the site, Elizabeth Street is subject to a speed zoning of 40km/hr as part of a High Pedestrian Activity Area. It accommodates four lanes (4) lanes of traffic northbound and three (3) lanes of traffic southbound with dedicated kerbside bus lanes in both direction from 6:00am to 10:00am and 3:00pm to 8:00pm. Elizabeth Street generally does not permit on-street parking on both sides .
- Reservoir Street: is a local road that traverses east-west, between a dead end east of its intersection with Reservoir Lane and Elizabeth Street in the west. Within the vicinity of the site, Reservoir Street is subject to 40km/h speed zoning, accommodates a single lane of traffic in each direction and permits time restricted and ticketed parking on both sides.
- Foster Lane: is a local laneway that traverses north-south, between Foster Street in the north and a dead end in the south. It is subject to 40km/h speed zoning, accommodates a single lane of traffic in both directions. Foster Lane does not permit on-street parking on either side.

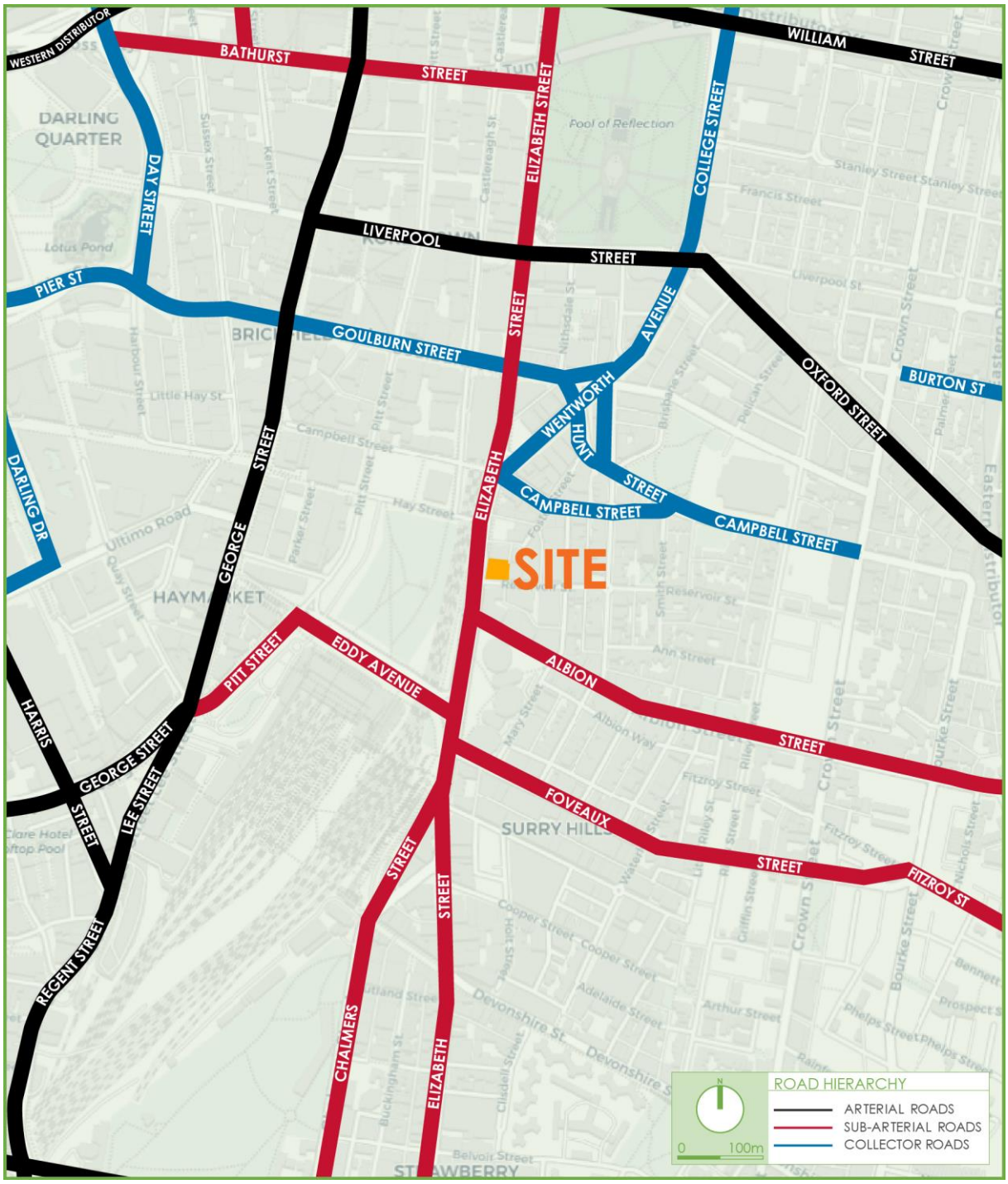


Figure 3: Road Hierarchy

3.2 Public Transport

The existing public transport services that operate in the locality are presented in **Figure 4** and **Figure 5** and are summarised as follows:

3.2.1 Bus Services

The subject site is within optimal walking distance (400 metres) of several bus services. These services and destinations are summarised in **Table 1** below:

Table 1 – Bus Routes and Services

No.	Route	No.	Route
304	City Circular Quay to Green Square	426	Dulwich Hill to City Martin Place
308	Marrickville Metro to Central Eddy Ave (Loop Service)	428	Canterbury to City Martin Place
310	Botany to Central Railway Square	428X	Canterbury to City Martin Place
311	Central Belmore Park to City Millers Point	430	Sydenham to City Martin Place
320	Green Square to Gore Hill	431	Glebe Point to City Martin Place
339	Clovelly to Central Belmore Park	433	Balmain Gladstone to City Martin Place
343	Kingsford to City Circular Quay	438X	Abbotsford to City Martin Place
373	Coogee to City Museum (Loop Service)	480	Strathfield to Central Pitt Street
374	Coogee to Central Belmore Park	483	Strathfield to Central Pitt Street
412	Campsie to City Martin Place (Express)	470	Lilyfield to City Martin Place
413	Campsie to Central Pitt Street	461X	Burwood to City Domain (Express)
422	Kogarah to Central Pitt Street	440	Bondi Junction to Rozelle
423	Kingsgrove to City Martin Place	501	Parramatta to Central Pitt Street
423X	Kingsgrove to City Martin Place (Express)		

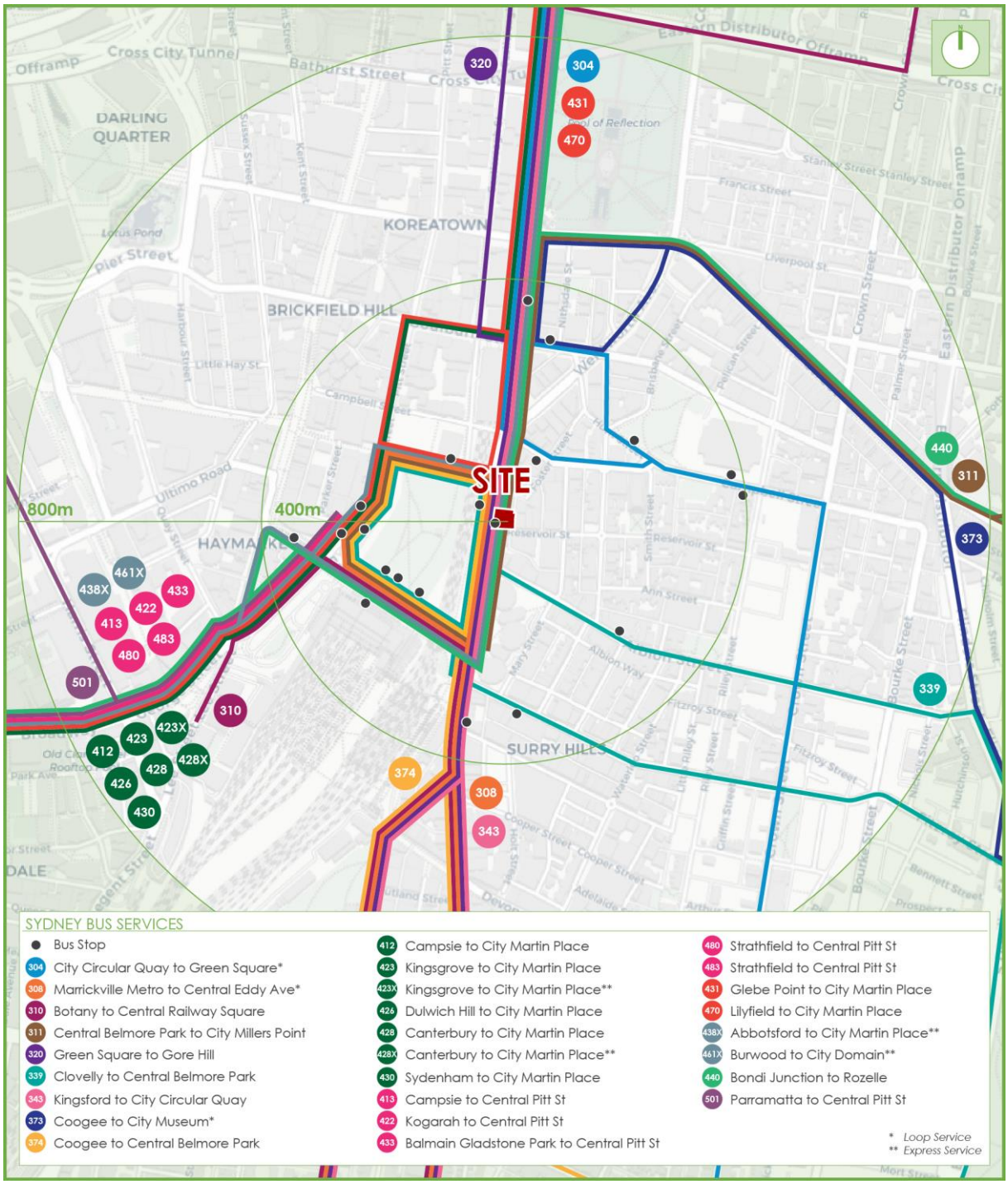


Figure 4: Bus Services

3.2.2 Railway Services

The site is also conveniently situated approximately 300 metres from Central Railway Station. This railway station provides services to the routes outlined in **Table 2** below

Table 2 – Central Railway Station Existing Services and Routes

Train Line	Routes	Train Line	Routes
CCN	Central Coast and Newcastle Line	T1	North Shore and Western Line
SHL	Southern Highlands Line	T2	Inner West and Leppington Line
SCO	South Coast Line	T3	Bankstown Line
BML	Blue Mountains Line	T4	Eastern Suburbs and Illawarra Line
Regional NSW	North Coast NSW	T7	Olympic Park Line
	Northwest NSW	T8	Airport Line
	Southern NSW	T9	Northern Line
	Western NSW		

Additionally, the site is also located within 600 metres of Museum Railway Station which provides access to the T2 Inner West and Leppington Line, T3 Bankstown Line and T8 Airport and South Line.

3.2.3 Light Rail Services

In addition, the site is within 800 metres of several light rail stations along the L1 Dulwich Hill Line, L2 Ranwick Line and L3 Kingsford Line. The L1 Dulwich Hill Line provides services to 23 stations between Central and Dulwich Hill. The stations for this line within 800 metres of the site are outlined below:

- Central Light Rail Stop; and
- Capitol Square Light Rail Stop.

The L2 Ranwick and L3 Kingsford Lines features a total of 19 stations between Circular Quay, Kingsford and Randwick. The stations for this line within 800 metres of the site are outlined below:

- Haymarket Light Rail Stop; and
- Central Station Chalmers Street Light Rail Stop;

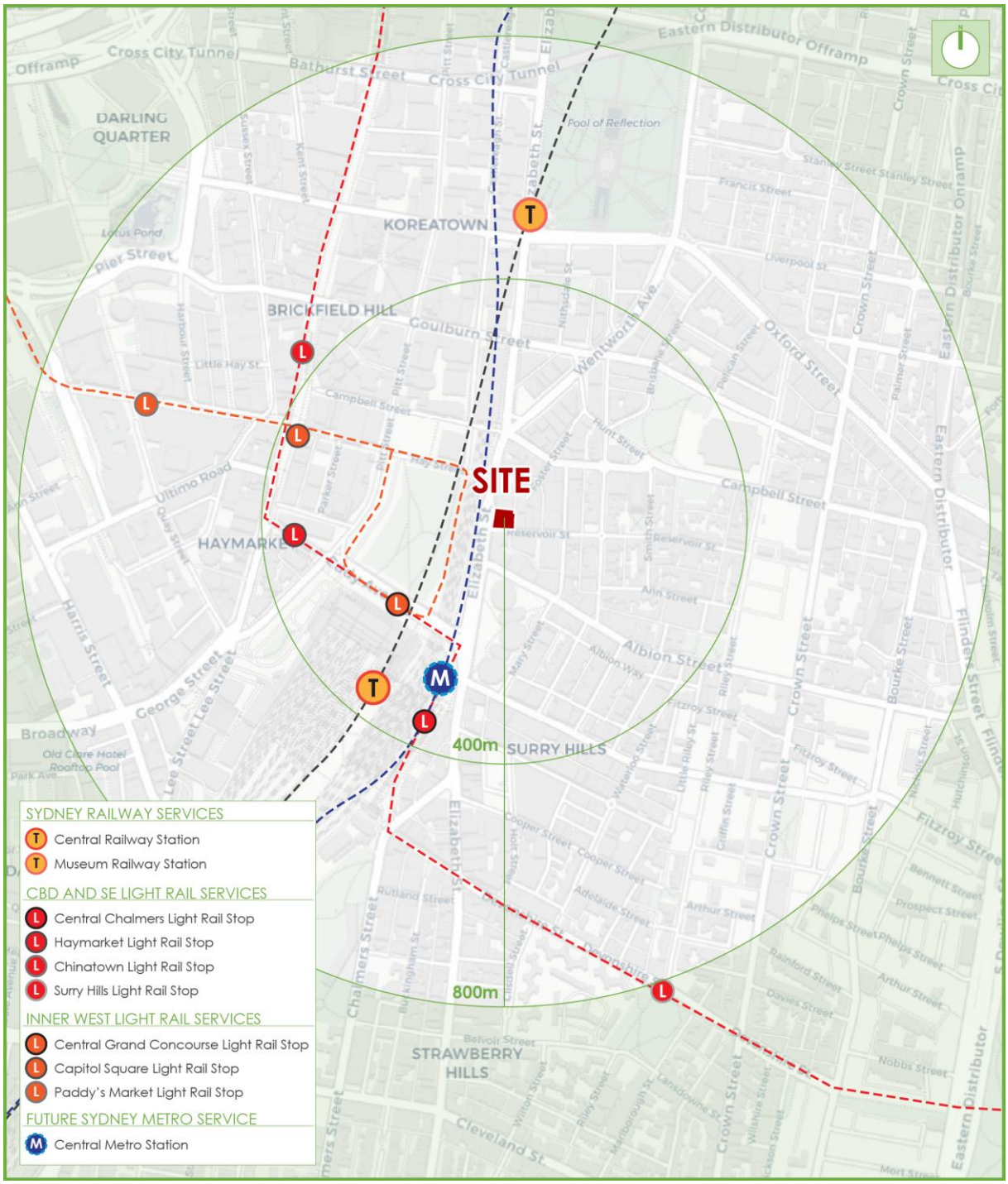


Figure 5: Rail Services

The above bus, train and light rail services also provide connection to the wider public transport network. Further information regarding bus and train frequencies is available from the Transport for NSW information website: **https://www.transportnsw.info**.

3.3 Walking and Cycling

3.3.1 Walking Facilities

The site is ideally placed with several pedestrian facilities available in the locality. There are existing pedestrian footpaths surrounding the site, with footpaths provided along both sides of Elizabeth Street and Reservoir Street. The signalised intersection of Elizabeth Street and Albion Street provides signalised pedestrian crossings at two (2) of its legs and the intersection of Elizabeth Street and Reservoir Street provides a pedestrian crossing, providing pedestrians safe and efficient connections to the wider footpath network.

3.3.2 Cycling Infrastructure

The site is also located within proximity to separated bicycle lanes, off-road shared paths and bicycle friendly roads available throughout the area. These cycleways can be used concurrently with other bicycle routes to provide connections to various areas around Sydney. The existing cycling facilities are presented in Figure 6, with the cycleways summarised as follows:

- Separated Bicycle Lanes: Sections of Elizabeth Street, Campbell Street and Bourke Street accommodate separated bicycle lanes. These routes provide access to areas towards Haymarket, Darling Harbour, and Sydney CBD.
- Low Traffic On-road Routes: Campbell Street, Commonwealth Street, Riley Street and Crown Street accommodate low-traffic on road routes. These routes provide access to areas such as Surry Hills, Sydney CBD and Darlinghurst.
- Off-Road Shared Paths: Sections of Elizabeth Street, Pitt Street and Belmore Park accommodate off-road shared paths for bicycles. These routes provide access to areas towards Pyrmont and Darling Harbour.

- Wayfinding Signage Routes: Castlereagh Street, Campbell Street and Liverpool Street accommodate routes with wayfinding signage. These routes provide access to areas such as Ultimo and the Sydney CBD.

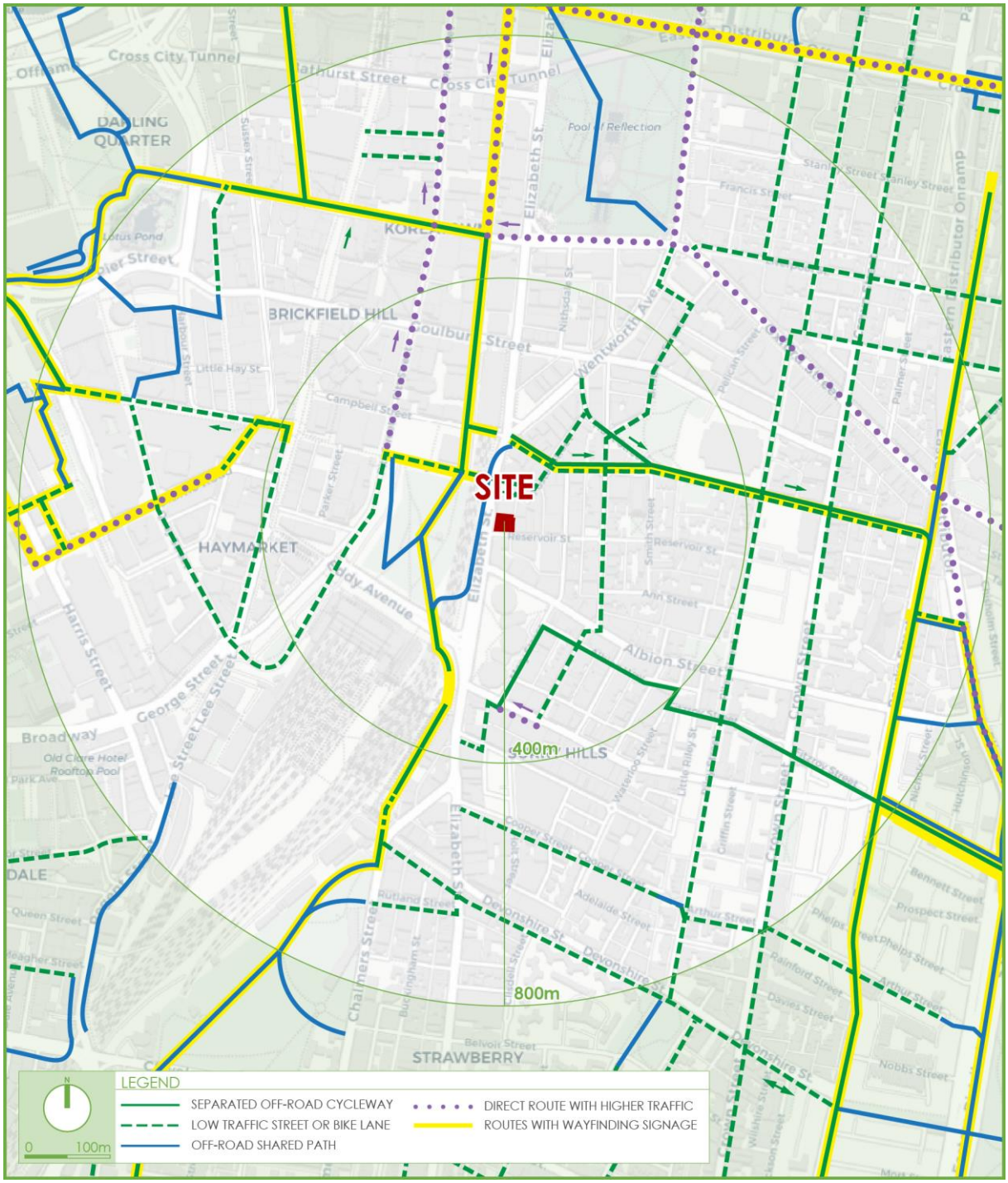


Figure 6: Existing Cycleways in the Locality

4. DESCRIPTION OF CONCEPT DEVELOPMENT

A detailed description of the concept development adopted for the purpose of assessing the planning Proposal impacts is provided in the Planning Proposal Justification Report prepared separately. In summary, the concept development is a mixed use development comprising of the following components:

- Demolition of existing buildings on site.
- Construction of a 10 - storey mixed use development providing 6,298 m^2 of gross floor area (GFA) comprising of:
  - 452 m^2 of ground floor retail GFA; and,
  - 5,846 m^2 of commercial GFA.
- The provision of three (3) basement levels consisting of:
  - A loading dock and end of trip facilities on B1; and,
  - 18 car parking spaces across B2 and B3 including two accessible parking spaces.
- The provision of a new access driveway from Reservoir Street located on the southern frontage.
- A through site link along the eastern boundary providing a pedestrian connection between Foster Lane and Reservoir Street.

The parking and traffic impacts arising from the development are discussed in **Section 5** and **Section 6**. Reference should be made to the plans submitted separately to Council which are presented at reduced scale in **Appendix A**.

It is emphasised that further analysis will be provided at development application stage, based on a confirmed development yield.

5. PARKING REQUIREMENTS

5.1 Car Parking

The Sydney Local Environmental Plan (LEP) 2012 provides car parking rates for developments located within the City of Sydney LGA. The parking requirement for the additional commercial and retail component of the concept development is assessed below:

The site falls within Category D under the Public Transport Accessibility map of the Sydney LEP. The maximum parking requirements for the development are shown in **Table 1** below

Table 1: LEP Parking Rates and Provision

Type	Rooms/GFA	Maximum Parking Rate	Maximum Parking Provision[1*]
Commercial	5,846m²	$M = \frac{(G \times A)}{(50 \times T)}$	16.8
Retail	452m²	$M = \frac{(G \times A)}{(50 \times T)}$	1.3
		Totals	**18**

M= Maximum no. of car parking spaces, G = Commercial space (5,888m²), A = Site area (905.6m²),
T = Total gross floor area of all buildings on the site (6,298m²)

It is evident from Table 1 that the concept development is permitted to provide a maximum of 18 parking spaces under the LEP. The development currently provides 18 car parking spaces consisting of 17 commercial car space and one (1) retail car parking. Therefore, the concept development complies with the maximum requirements of the LEP and is considered acceptable.

5.2 Accessible Parking

The Building Code of Australia (2010) provides accessible parking rates for the concept development. The commercial and retail components are identified as Class 5 and Class 6 in the BCA respectively and are subject to the following accessible parking rates:

- Class 5 -1 space for every 100 carparking spaces or part thereof.
- Class 6 -1 space for every 50 carparking spaces or part thereof.

The development therefore requires one (1) accessible space for commercial use and one (1) for retail use. In response, the development proposes two (2) accessible car parking spaces with one to be allocated to the commercial use and one to the retail use in accordance with BCA requirements.

5.3 Bicycle Parking

The City of Sydney DCP Section 3.11.3 provides the minimum bicycle parking rates and provisions for residential and retail developments. These rates and provisions are summarised in **Table 2** below:

Table 2 – DCP Minimum Bicycle Parking Rate and Provisions

Type	Number of Dwellings	DCP Minimum Bicycle Parking Rate	Parking Required*
Commercial – Office Premises			
Employees	5,846m²	1 space per 150m² GFA	39
Visitors		1 space per 400m² GFA	15
Retail			
Employees	452m²	1 space per 250m² GFA	2
Visitors		2 plus 1 space per 100m² over 100m² GFA	6
		Totals	**62**

Accordingly, the bicycle parking required under the DCP is a total of 62 spaces. The 21 visitor spaces are to be provided on the ground floor near a main entrance. For the 41 employee bicycle spaces, a total of six (6) shower and change cubicles and 41 personal lockers are to be provided. An area on Basement 1 has been allocated for bicycle parking and end of trip facilities which will be further detailed as part the Development Application.

5.4 Motorcycle Parking

The Council DCP requires that in all buildings that provide onsite parking, one (1) motorcycle parking space for every 12 car parking spaces is to be provided as separate parking for motorcycles. Therefore, for a provision of 18 spaces the development is required to provide

two (2) motorcycle parking spaces. In response the development provides two (2) space within the basement car park in accordance with Council's requirement.

5.5 Waste Collection

General servicing and private waste collection is to be conducted on Basement 1 accessed via the dedicated service vehicle lift for vehicles up to the 6.4m long small rigid vehicle (SRV) and the turntable with four loading spaces provided. Two (2) spaces allow for the SRV and the other two (2) spaces allow for the B99 vehicle. This arrangement is considered appropriate and supportable given the low frequency of waste collection and the nature of the concept development.

6. TRAFFIC AND TRANSPORT IMPACTS

6.1 Existing Site Generation

The site currently consists of ground floor retail, commercial and backpacker accommodation uses. As vehicular access is provided from Foster Lane to the rear of the site with only servicing and minimal parking provided to the site it has been assumed the existing site generates no vehicular traffic as a conservative assessment.

6.2 Development Trip Generation

The concept development includes commercial and retail components and would be classified as a mixed-use development. As such, each use has been assessed individually to determine the combined traffic generation of the concept development.

6.2.1 Commercial

The TDT 2013/04a conducted surveys of several office block development around Sydney to determine the traffic generation rate for these developments. However, most of these developments provided significantly more parking compared to the concept development. For office block developments that are within the Sydney CBD region the most similar development surveyed is the North Sydney office block, which was determined to have hourly trip generation rates as follows:

- 0.17 vehicle trips per 100m^2 GFA during the AM peak period and
- 0.14 vehicle trips per 100m^2 GFA during the PM peak period.

Application of these rates to the 5,846m^2 of commercial GFA and adopting an 80/20 split results in the following trip generation:

- 10 vehicle trip per hour during the morning peak period (8 in, 2 out); and,
- 8 vehicle trip per hour during the evening peak period (2 in, 6 out).

6.2.2 Retail

For the retail component of the concept development, as only one (1) car parking space is provided, this will be for staff only and is assumed to generate the following:

- 1 vehicle trip per hour during the morning peak period (1 in, 0 out); and,
- 1 vehicle trip per hour during the evening peak period (0 in, 1 out).

6.2.3 Combined Traffic Generation

The combined traffic generation of the concept development is therefore as follows:

- 11 vehicle trip per hour during the morning peak period (9 in, 2 out); and,
- 9 vehicle trip per hour during the evening peak period (2 in, 7 out).

6.3 Net Traffic Impacts

The additional vehicle trips associated with the concept development equates to less than one vehicle every five (5)-minutes during both peak periods. As such, the traffic generation associated with the concept development will have a negligible impact on the surrounding road network. Therefore, the development is considered supportable from a traffic planning perspective and no external network improvements are required.

7. ACCESS AND INTERNAL DESIGN ASPECTS

7.1 Site Vehicular Access

The development proposes a total of 18 car parking spaces and two (2) motorcycle spaces with access to Reservoir Street, a local road. It will therefore require a Category 1 driveway under AS2890.1 (2004), being a combined entry and exit width of 3.0 to 5.5-metres. In response, a 4.8m wide driveway access has been provided at the property boundary, meeting the requirements of AS 2890.1 (2004).

A queuing analysis, provided in **Appendix B**, has been conducted for the car lift to access the basement car park on Basement Levels 2 and 3 to ensure the 98th percentile queue is accommodated within the site as required under AS 2890.1 (2004). The queuing analysis determined a single waiting bay is required in front of the lift to accommodate the 98th percentile queue. Swept path analysis provided in **Appendix C** demonstrates that a waiting can be provided on Ground Floor at the vehicular access. Therefore, the development accommodates all queuing on site in accordance with the requirements of AS 2890.1 (2004).

7.2 Internal Design

The internal car park complies with the requirements of AS 2890.1 (2004), AS 2890.2 (2018) and AS 2890.6 (2009), and the following characteristics are noteworthy:

7.2.1 Parking Modules

- All standard car parking spaces have been designed in accordance with User Class 1A being for residential parking. These spaces are provided with a minimum space length of 5.4m, a minimum width of 2.4m and a minimum aisle width of 5.8m.
- All spaces located adjacent to obstructions of greater than 150mm in height are provided with an additional width of 300mm.
- Two (2) accessible parking spaces have been designed in accordance with AS 2890.6 (2009), being 2.4m wide and 5.4m long, and situated immediately adjacent to a dedicated shared area.
- The turning bay opposite the car lift allows vehicles to enter the aisle in a forward direction in a maximum of one reverse manoeuvre.

7.2.2 Loading Bay

- The turntable on Basement 1 provides sufficient area for loading to occur and allows services to enter and exit the site in a forward direction.

7.2.3 Clear Head Heights

- A minimum clear head height of 2.2m is provided for all areas within the basement car park as required by AS 2890.1 (2004).
- A minimum clear head height of 2.5m is to be provided above all accessible spaces in accordance with AS 2890.6 (2009).

7.2.4 Other Considerations

- Pedestrian visual splay has been provided at the access driveway for egressing vehicles in accordance with **Figure 3.3** of AS 2890.1 (2004).
- Swept path analysis of critical vehicle movements is presented in **Appendix C**.

7.3 Summary

In summary, the internal configuration of the basement car park has been designed in accordance with AS 2890.1 (2004), AS 2890.2 (2018) and AS 2890.6 (2009). A development application will be required for any future development at the site which will incorporate a more detailed assessment of the car park design.

8. CONCLUSIONS

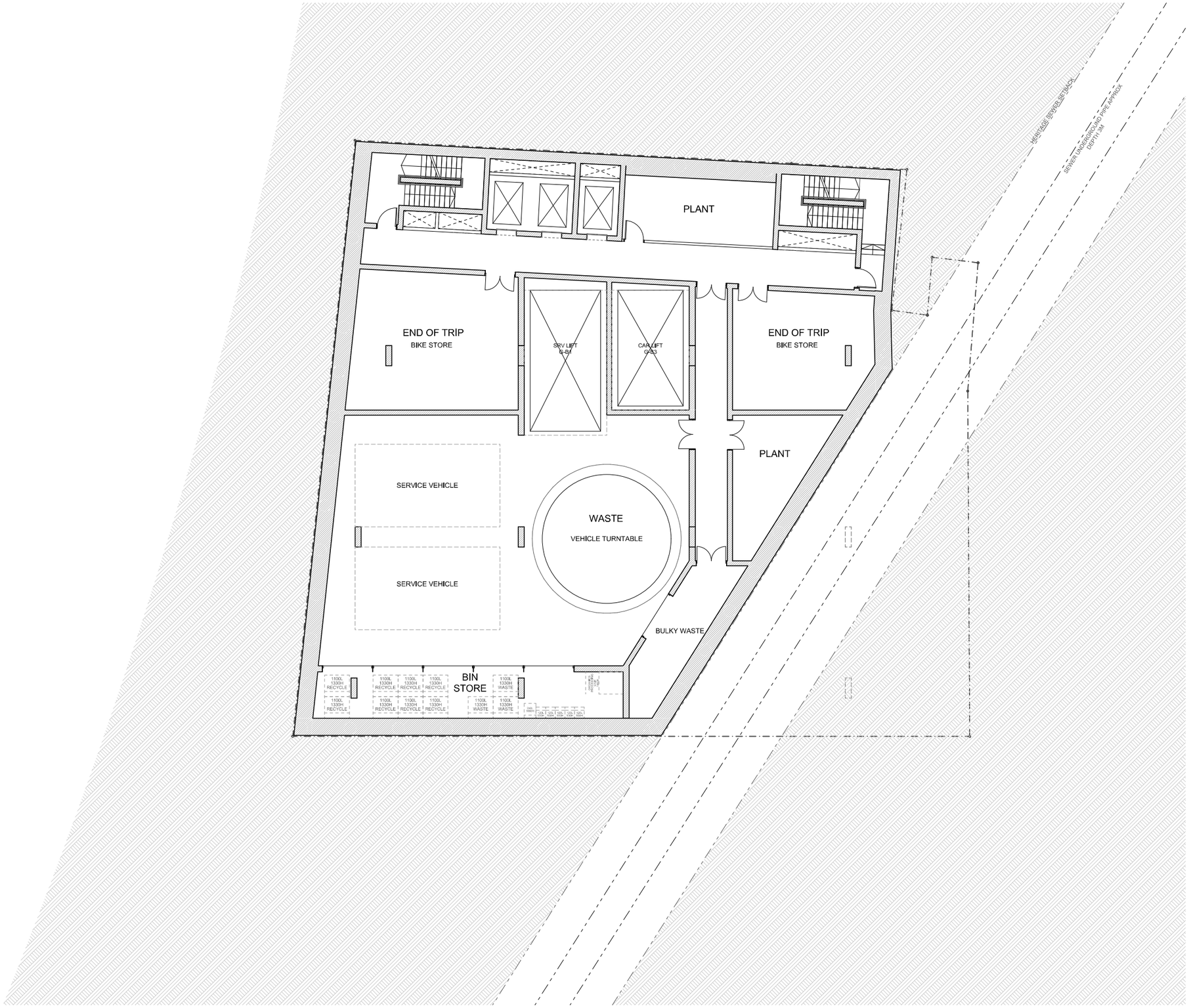
In summary:

- The planning proposal seeks to amend the Sydney LEP 2012 and Sydney DCP 2012 such that the site could accommodate a development consistent with the indicative concept design at 232-240 Elizabeth Street, Surry Hills, that could potentially comprise 5,846m^2 of commercial GFA and 452m^2 of retail GFA and three levels of basement car parking accommodating a loading dock and 18 car parking spaces.
- The subject site has excellent connections to the public transport network with reliable access to regular bus and rail services. These, along with existing pedestrian and cycle links, ensure the site is ideally situated for a mixed-use development as it provides a good opportunity to encourage future tenants / visitors to use sustainable transport modes.
- The indicative concept design provides 18 parking spaces, including 17 commercial parking spaces and one (1) retail parking space, which complies with the maximum provision of the Sydney LEP. As such, all normal parking demands will be readily accommodated on-site.
- The traffic generation arising from the development has been assessed as a net increase over existing conditions and equates to an additional 11 vehicle trips per hour during the weekday morning peak period, and nine (9) vehicle trips per hour during the weekday evening peak period. As such, no external improvements are required to facilitate the indicative concept design. The traffic impacts of the development are therefore considered acceptable.
- The basement car park has been assessed to generally comply with the requirements of AS 2890.1 (2004), AS 2890.2 (2018) and AS 2890.6 (2009), thereby ensuring safe and efficient operation.

This Traffic Impact Assessment therefore demonstrates that the planning proposal is supportable on traffic planning grounds. TRAFFIX anticipates an ongoing involvement during the development approval process.

APPENDIX A

Reduced Plans



1 BASEMENT 1
1:100

This drawing is to be read in conjunction with all relevant project documentation (incl. written architectural specifications) and all specialist consultant documentation incl. but not limited to structural, mechanical, electrical, and hydraulic engineering documentation.
Do not scale from this drawing. Only figured dimensions shall be used.
Report any discrepancy between this drawing and other project documentation immediately to the architect for clarification prior to commencement of related work on site.
All sizes of structural components that are shown on these architectural documents are for reference only. Refer to structural engineer's drawings for structural dimensions and architectural drawings for concrete set out dimensions.
Shop drawings are to be completed for all metalwork, joinery and specified trade items and reviewed by the architect (and structural engineer where required) prior to fabrication.
Refer to the 'Architectural Drawing Notes Page' for further notation.

DRAWING ORIGINAL SIZE: A1

Issue	Date	Description
PB	22/03/2023	Information
P7	22/11/2022	Consultant Issue
P6	9/11/2022	Consultant Issue
P5	2/11/2022	Client Issue
P4	19/10/2022	Consultant Issue
03	17/10/2022	Consultant Issue
02	10/10/2022	Client Review

N

Project: 232-240 Elizabeth Street, Surry Hills
Site: 232-240 Elizabeth Street, Sydney NSW
Client: STASIA PTY LIMITED

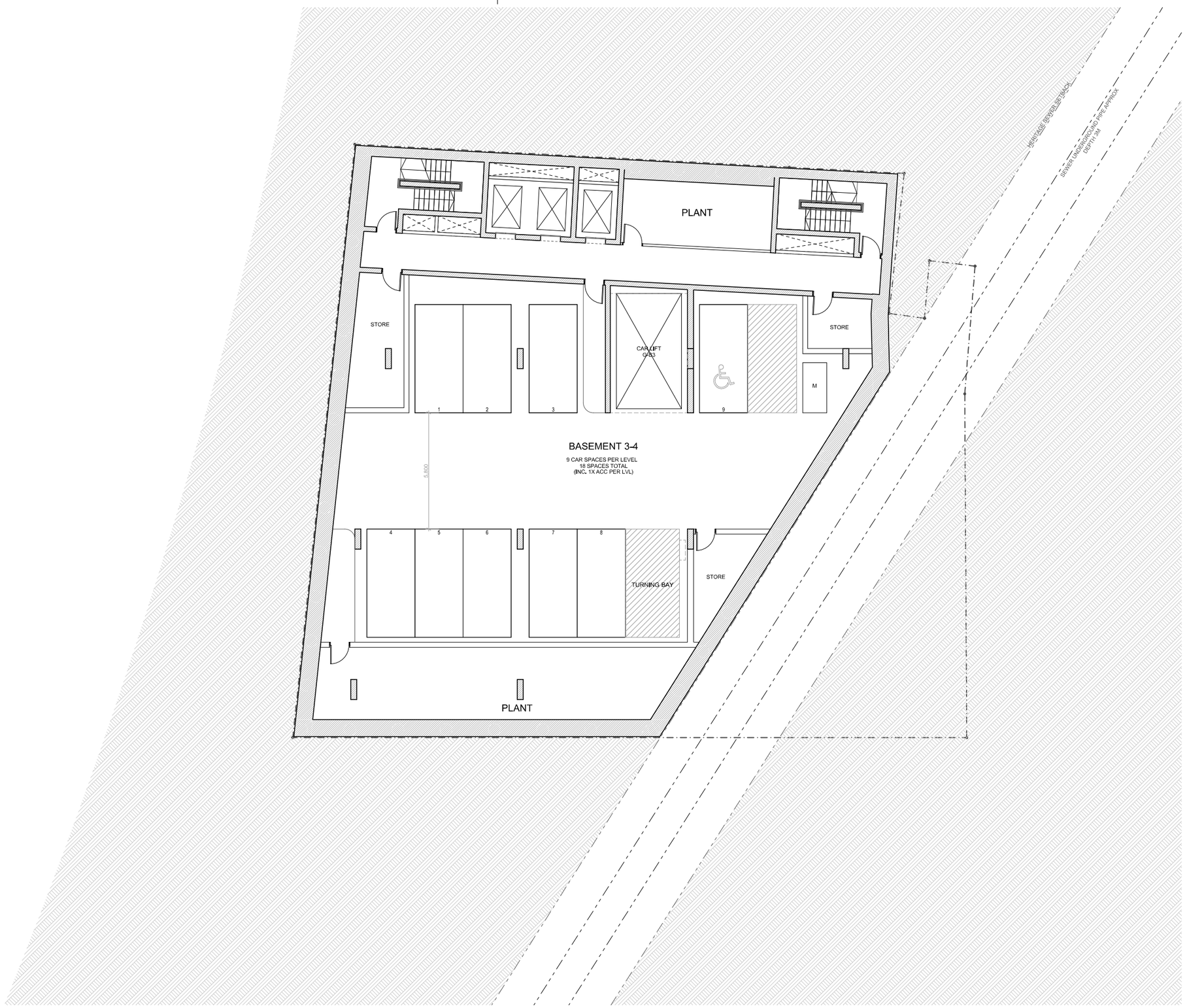
Scale:	Drawn By:	Checked 1:	Checked 2:	Approved:
1:100 @ A1	PB LE	LE		

Architect:
Candalepas Associates
Registration No. NSW 5773
Registration No. VIC 17978
Registration No. WA 2405
Registration No. ACT 2603
Registration No. QLD 5463
309 Sussex Street, Sydney NSW 2000
info@candalepas.com.au
T: 02 9283 7755 F: 02 9283 7477

PRELIMINARY
NOT FOR CONSTRUCTION - DESIGN INTENT ONLY

Drawing:	Job Number:
BASEMENT 1	5968
Drawing Number:	Issue:
PP 1003	P8

Print Date: Wednesday, 22 March 2023 2:59 PM



1 BASEMENT 3
1:100

This drawing is to be read in conjunction with all relevant project documentation (incl. written architectural specifications) and all specialist consultant documentation incl. but not limited to structural, mechanical, electrical, and hydraulic engineering documentation.
Do not scale from this drawing. Only figured dimensions shall be used.
Report any discrepancy between this drawing and other project documentation immediately to the architect for clarification prior to commencement of related work on site.
All sizes of structural components that are shown on these architectural documents are for reference only. Refer to structural engineer's drawings for structural dimensions and architectural drawings for concrete set out dimensions.
Shop drawings are to be completed for all metalwork, joinery and specified trade items and reviewed by the architect (and structural engineer where required) prior to fabrication.
Refer to the 'Architectural Drawing Notes Page' for further notation.

DRAWING ORIGINAL SIZE: A1

Issue	Date	Description
P8	22/03/2023	Information
P7	22/11/2022	Consultant Issue
P6	9/11/2022	Consultant Issue
P5	2/11/2022	Client Issue
P4	19/10/2022	Consultant Issue
03	17/10/2022	Consultant Issue
02	10/10/2022	Client Review

N

Project: 232-240 Elizabeth Street, Surry Hills
Site: 232-240 Elizabeth Street, Sydney NSW
Client: STASIA PTY LIMITED

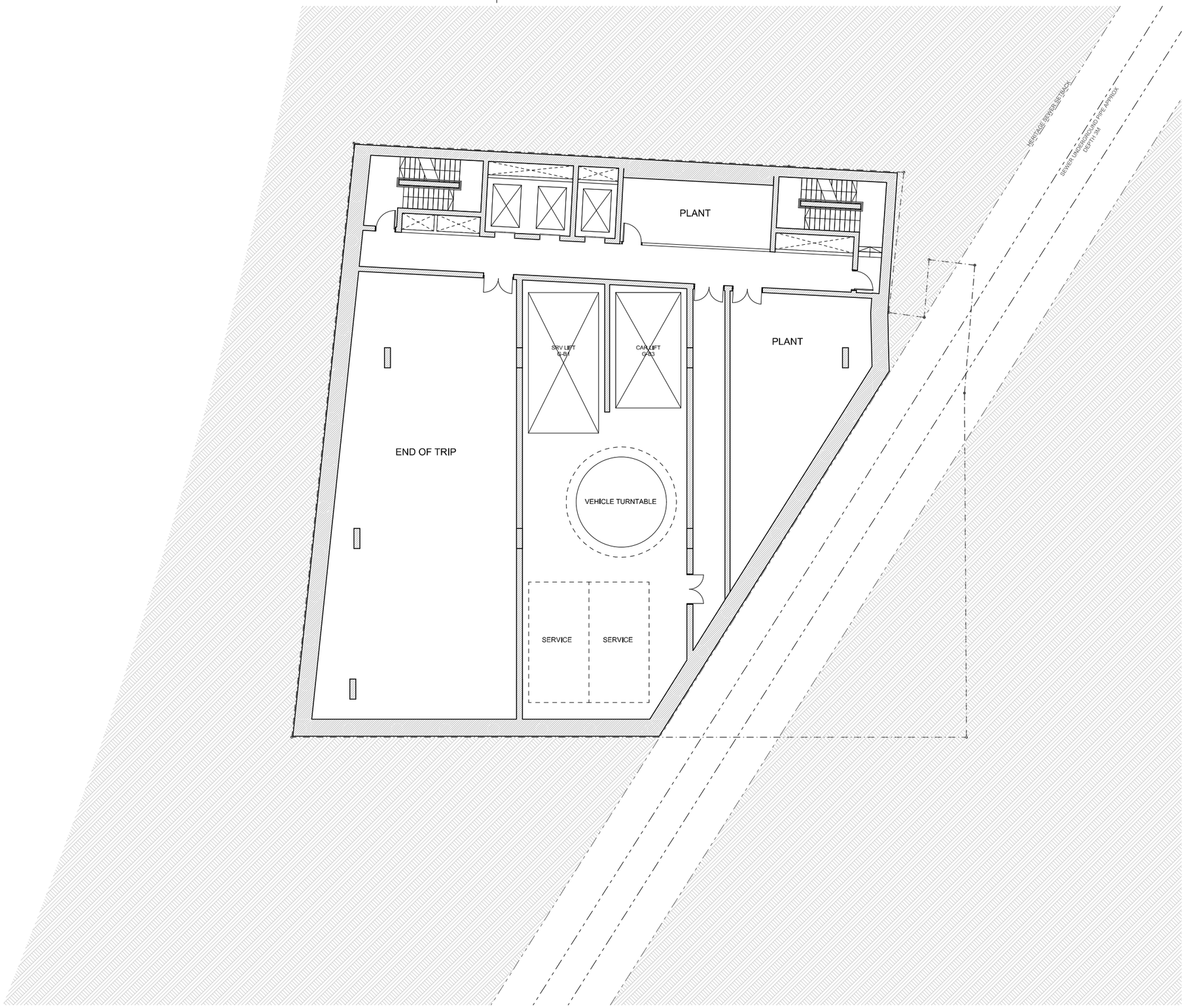
Scale:	Drawn By:	Checked 1:	Checked 2:	Approved:
1:100 @ A1	PB LE	LE		

Architect:
Candalepas Associates
Registration No. NSW 5773
Registration No. VIC 17978
Registration No. WA 2405
Registration No. ACT 2603
Registration No. QLD 5463
309 Sussex Street, Sydney NSW 2000
info@candalepas.com.au
T: 02 9283 7755 F: 02 9283 7477

PRELIMINARY
NOT FOR CONSTRUCTION - DESIGN INTENT ONLY

Drawing:	Job Number:
BASEMENT 3	5968
Drawing Number:	Issue:
PP 1001	P8

Print Date: Wednesday, 22 March 2023 2:50 PM



1 BASEMENT 2
1:100

This drawing is to be read in conjunction with all relevant project documentation (incl. written architectural specifications) and all specialist consultant documentation incl. but not limited to structural, mechanical, electrical, and hydraulic engineering documentation.
Do not scale from this drawing. Only figured dimensions shall be used.
Report any discrepancy between this drawing and other project documentation immediately to the architect for clarification prior to commencement of related work on site.
All sizes of structural components that are shown on these architectural documents are for reference only. Refer to structural engineer's drawings for structural dimensions and architectural drawings for concrete set out dimensions.
Shop drawings are to be completed for all metalwork, joinery and specified trade items and reviewed by the architect (and structural engineer where required) prior to fabrication.
Refer to the 'Architectural Drawing Notes Page' for further notation.

DRAWING ORIGINAL SIZE: A1

Issue	Date	Description
PB	22/03/2023	Information
P7	22/11/2022	Consultant Issue
P6	9/11/2022	Consultant Issue
P5	2/11/2022	Client Issue
P4	19/10/2022	Consultant Issue
03	17/10/2022	Consultant Issue
02	10/10/2022	Client Review

N

Project:
232-240 Elizabeth Street, Surry Hills
Site:
232-240 Elizabeth Street, Sydney NSW
Client:
STASIA PTY LIMITED

Scale:	Drawn By:	Checked 1:	Checked 2:	Approved:
1:100 @ A1	PB LE	LE		

Architect:
Candalepas Associates
Registration No. NSW 5773
Registration No. VIC 17978
Registration No. WA 2405
Registration No. ACT 2603
Registration No. QLD 5463
309 Sussex Street, Sydney NSW 2000
info@candalepas.com.au
T: 02 9283 7755 F: 02 9283 7477

PRELIMINARY
NOT FOR CONSTRUCTION - DESIGN INTENT ONLY

Drawing:	Job Number:
BASEMENT 2	5968
Drawing Number:	Issue:
PP 1002	P8

Print Date: Wednesday, 22 March 2023 2:30:39 PM

APPENDIX B

Queuing Analysis

21.338 - 232-240 Elizabeth Street, Surry Hills - Queuing Calculations

Average Travel Distance			
Basement Level	No Cars/ Motorcycles	Assumed Vert Distance from G (m)	Weighted Distance Factor
G	0	0	0
B2	10	7.2	72
B3	10	10.2	102
Total	20		174
		Average	8.7

Vehicle Arrivals (veh/hr)	8
Travel Speed (m/sec)	0.3
Load & Exit Time (sec) (assumed)	10
Door Opening Time (sec) (assumed)	10
Average Travel Time (sec)	29
Total Average Time (sec)	98

Queuing Theory Factors		
average arrival rate (r)	8.00	*r=(veh/hr)
average service rate (s)	36.73	*s=3600/(Total Average Time)
utilisation factor (p)	0.21778	*p=r/s
mean queue (E(m))	0.06063	*E(m)=(p/(1-p))-p

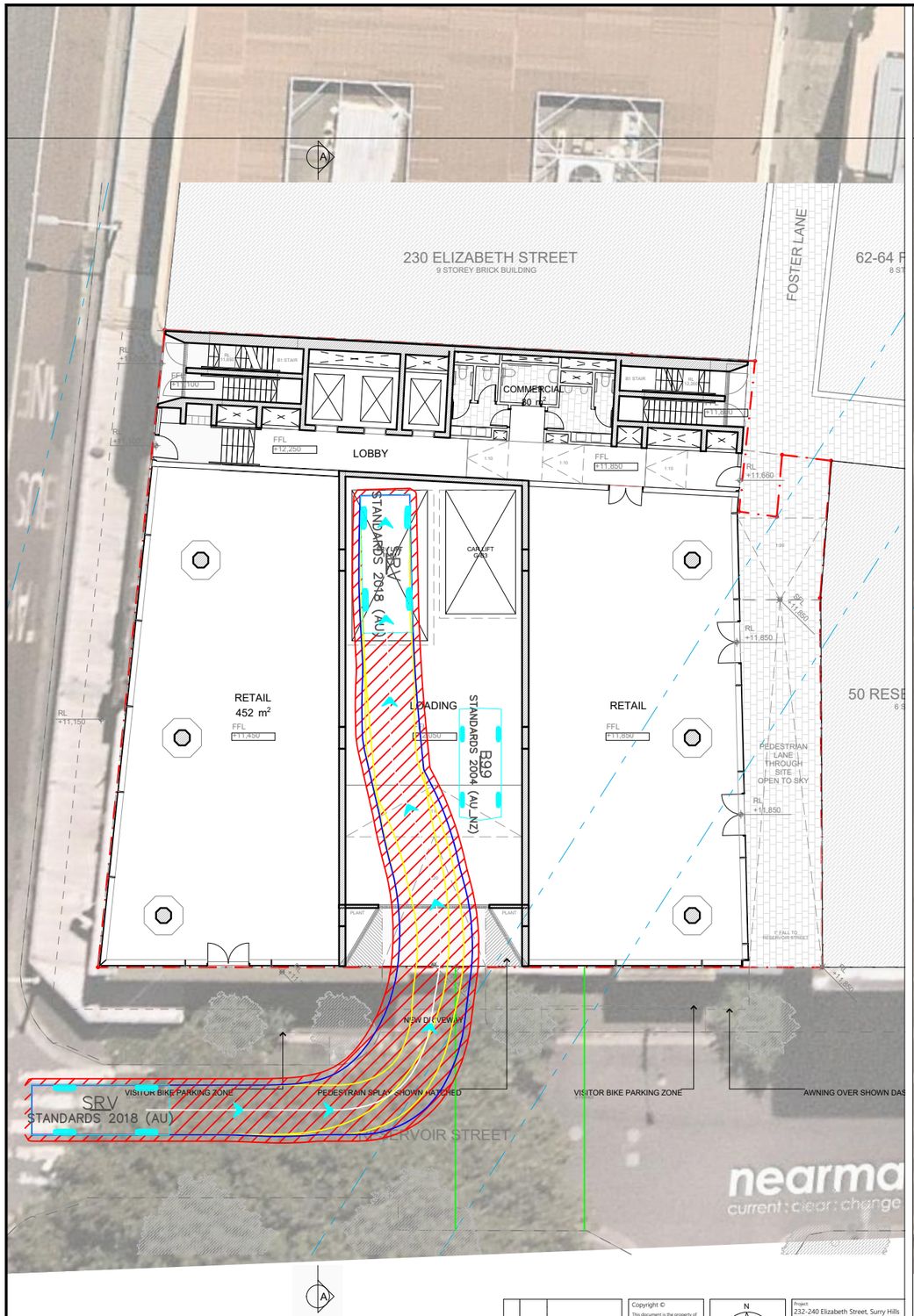
Probability of Vehicles in System (P(n))		*P(n)=(1-p)p^n
No. Vehicles in System (n)	Probability (%)	Percentile Queue (Require min. 98% under AS2890.1)
0	78.2%	78.2%
1	17.0%	95.3%
2	3.7%	99.0%
3	0.8%	99.8%
4	0.2%	100.0%

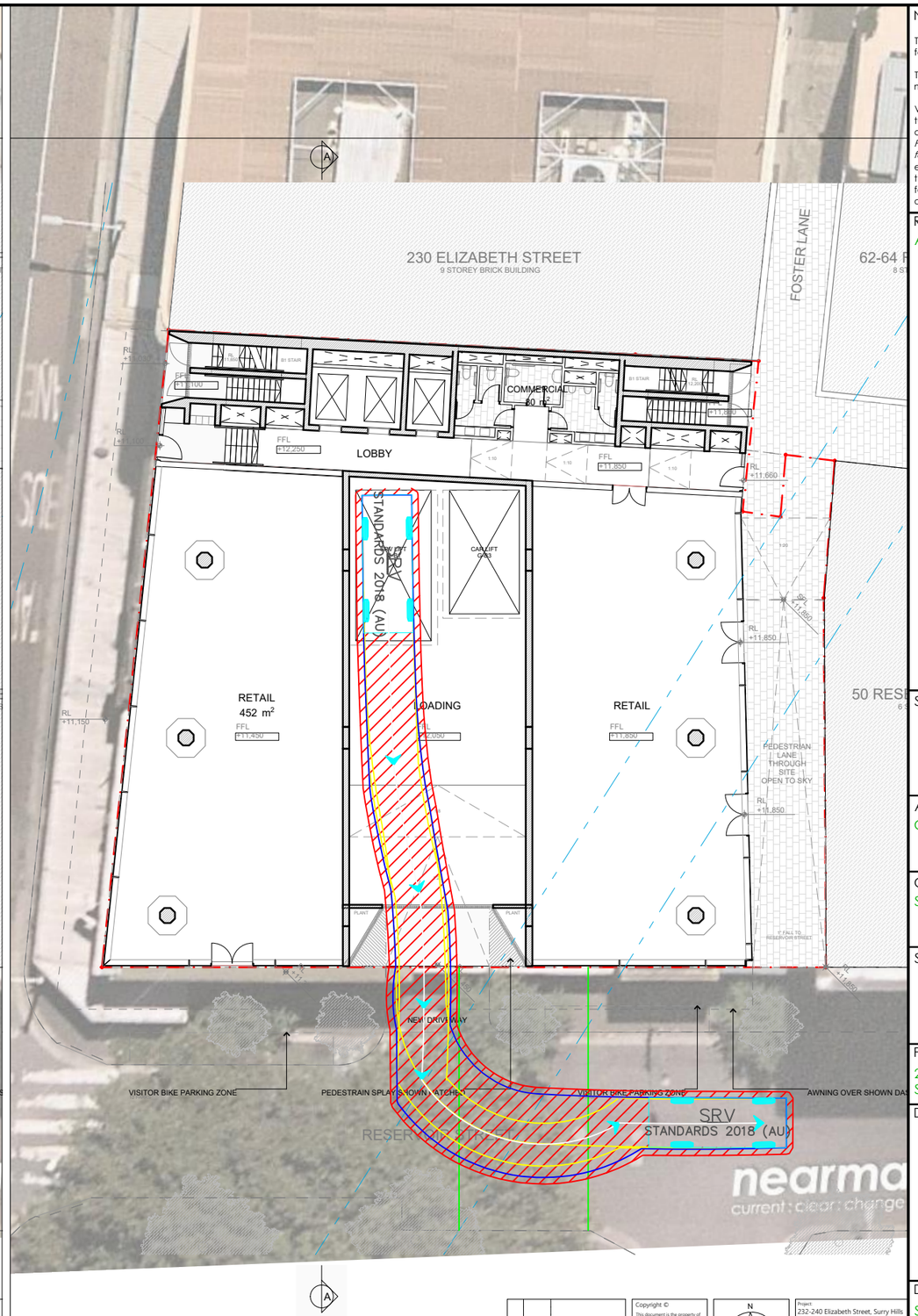
Vehicle Arrivals: TRAFFIX Traffic Impact Assessment (ref: 21.338r01v01) states the total traffic generation of the development will be 10 veh/hr during morning peak period
The critical peak for on-street queuing is in the morning,which is expected to result in the order of 8 vehicle arrivals, when an 80/20 split is adopted.

Results: The results of the queuing analysis demonstrates that with two (2) basement levels of car parking (incl. 18 car spaces and two (2) motorcycle spaces) the development is required to accommodate a total of 2 vehicles in the system (1 in the lift & 1 vehicle queuing) in order to accommodate the 98th percentile queue, as required under Clause 3.5 of AS 2890.1 (2004).
Hence, the development requires a minimum of 1 waiting bay to be provided at the access driveway

APPENDIX C

Swept Path Analysis





Notes:

This drawing is prepared for information purposes only. It is not to be used for construction.

TRAFFIX is responsible for vehicle swept path diagrams and/or drawing mark-ups only. Base drawing prepared by others.

Vehicle swept path diagrams prepared using computer generated turning path software and associated CAD drawing platforms. Vehicle data based upon relevant Australian Standards *(AS/NZS 2890.1:2004 Parking facilities - Off-street car parking,* and/or *AS2890.2:2002 Parking facilities - Off-street commercial vehicle facilities*). These standards embody a degree of tolerance, however the vehicle characteristics in these standards represent a suitable design vehicle and do not account for all variations in vehicle dimensions / specifications and/or driver ability or behaviour.

Rev.	Revision Note	By.	Date
A	Swept Path Analysis	HD	09-11-22

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Candalepas Associates

Client
STASIA Pty Ltd

Scale / Plan Orientation

0 2.5 5 7.5 10m

1:250 @ A3

Project Description
232-240 Elizabeth Street
SURRY HILLS NSW 2010

Drawing Prepared By

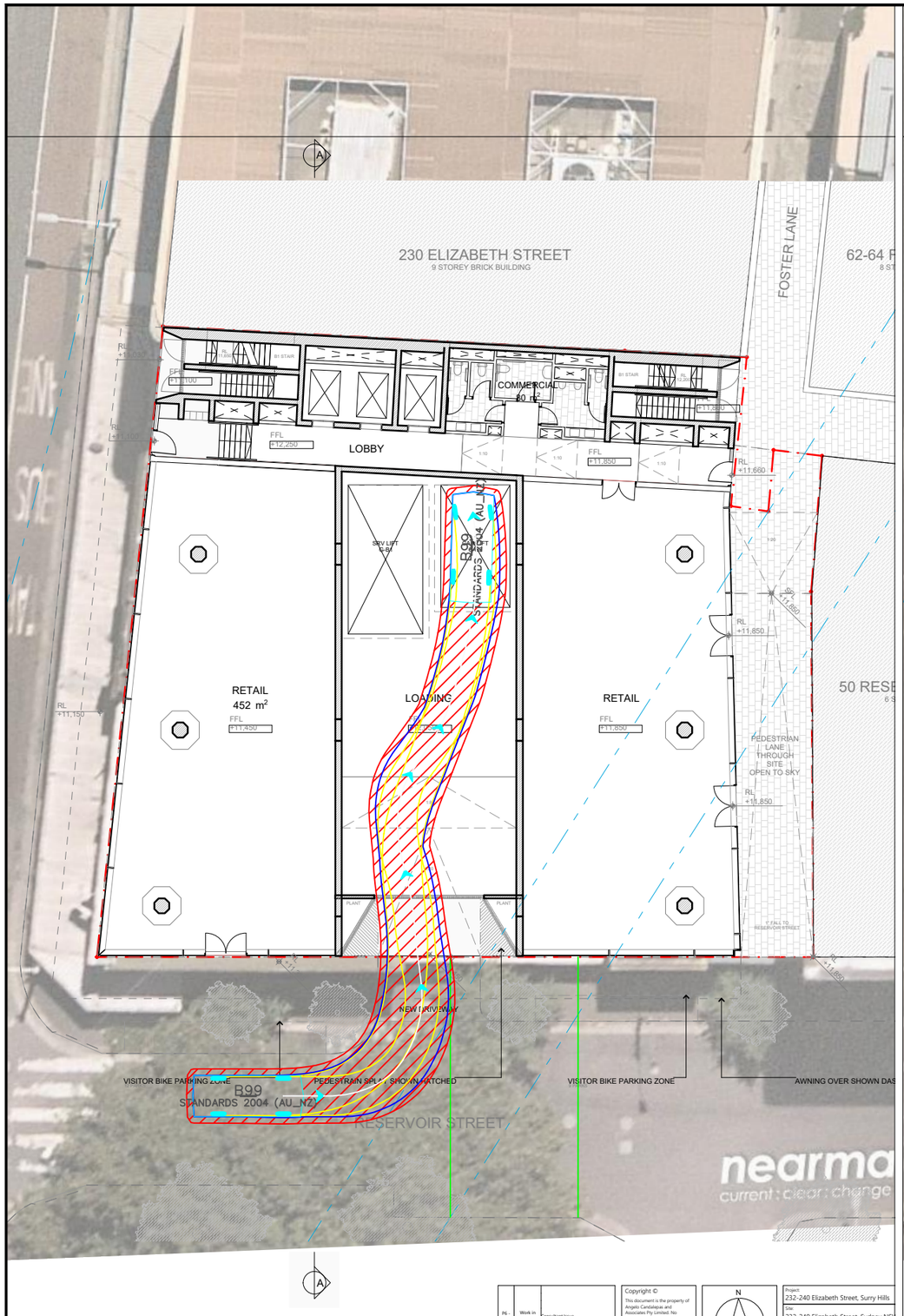
TRAFFIX
TRAFFIC AND TRANSPORT PLANNERS
Suite 2.08, 50 Holt Street
Surry Hills, NSW 2010
PO Box 1124
Strawberry Hills, NSW 2012
t: +61 2 8324 8700
f: +61 2 9830 4481
w: www.traffix.com.au

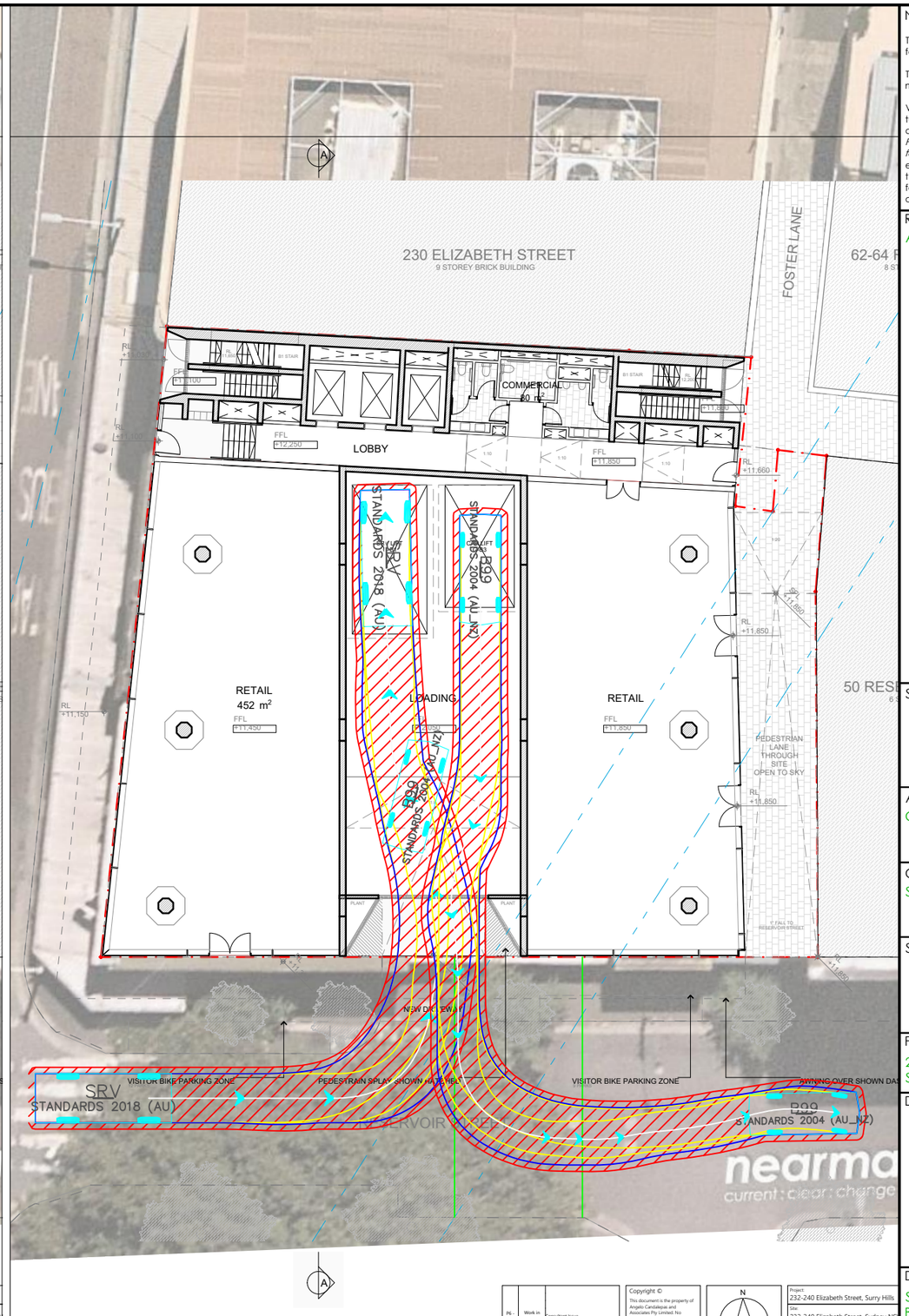
Drawing Title
Swept Path Analysis
6.4m Small Rigid Vehicle
Ground Floor
Left: Entry Movement Right: Exit Movement

Drawn:	Checked:	Date:
HD	-	09-11-22

21.338d05v01 TRAFFIX [230322 Plans] Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
21.338	PP	TX.01	A





Notes:

This drawing is prepared for information purposes only. It is not to be used for construction.

TRAFFIX is responsible for vehicle swept path diagrams and/or drawing mark-ups only. Base drawing prepared by others.

Vehicle swept path diagrams prepared using computer generated turning path software and associated CAD drawing platforms. Vehicle data based upon relevant Australian Standards *(AS/NZS 2890.1:2004 Parking facilities - Off-street car parking,* and/or *AS2890.2:2002 Parking facilities - Off-street commercial vehicle facilities*). These standards embody a degree of tolerance, however the vehicle characteristics in these standards represent a suitable design vehicle and do not account for all variations in vehicle dimensions / specifications and/or driver ability or behaviour.

Rev.	Revision Note	By.	Date
A	Swept Path Analysis	HD	09-11-22

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Candalepas Associates

Client
STASIA Pty Ltd

Scale / Plan Orientation

0 2.5 5 7.5 10m

1:250 @ A3

Project Description
232-240 Elizabeth Street
SURRY HILLS NSW 2010

Drawing Prepared By

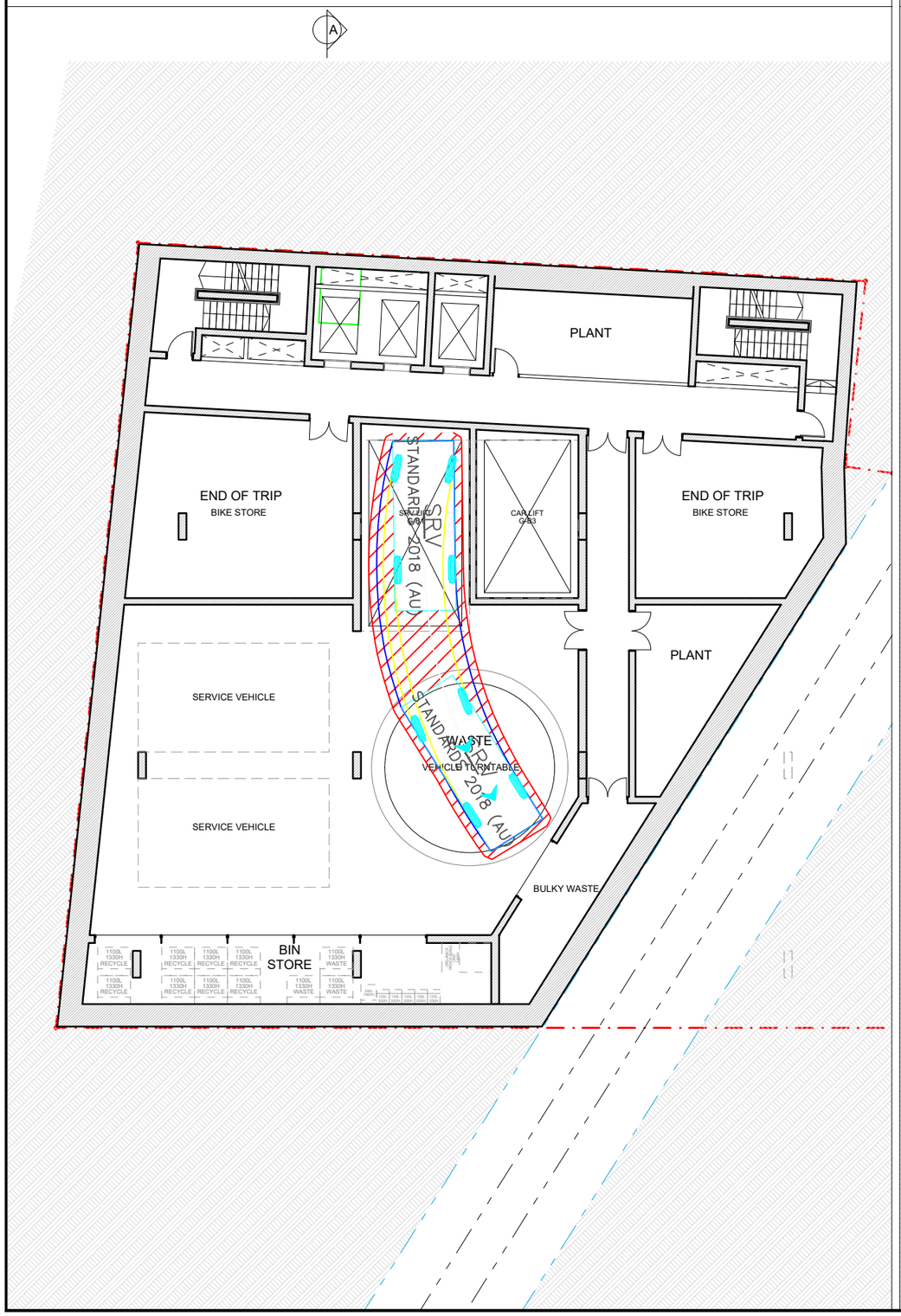
TRAFFIX
TRAFFIC AND TRANSPORT PLANNERS
Suite 2.08, 50 Holt Street
Surry Hills, NSW 2010
PO Box 1124
Strawberry Hills, NSW 2012
t: +61 2 8324 8700
f: +61 2 9830 4481
w: www.traffix.com.au

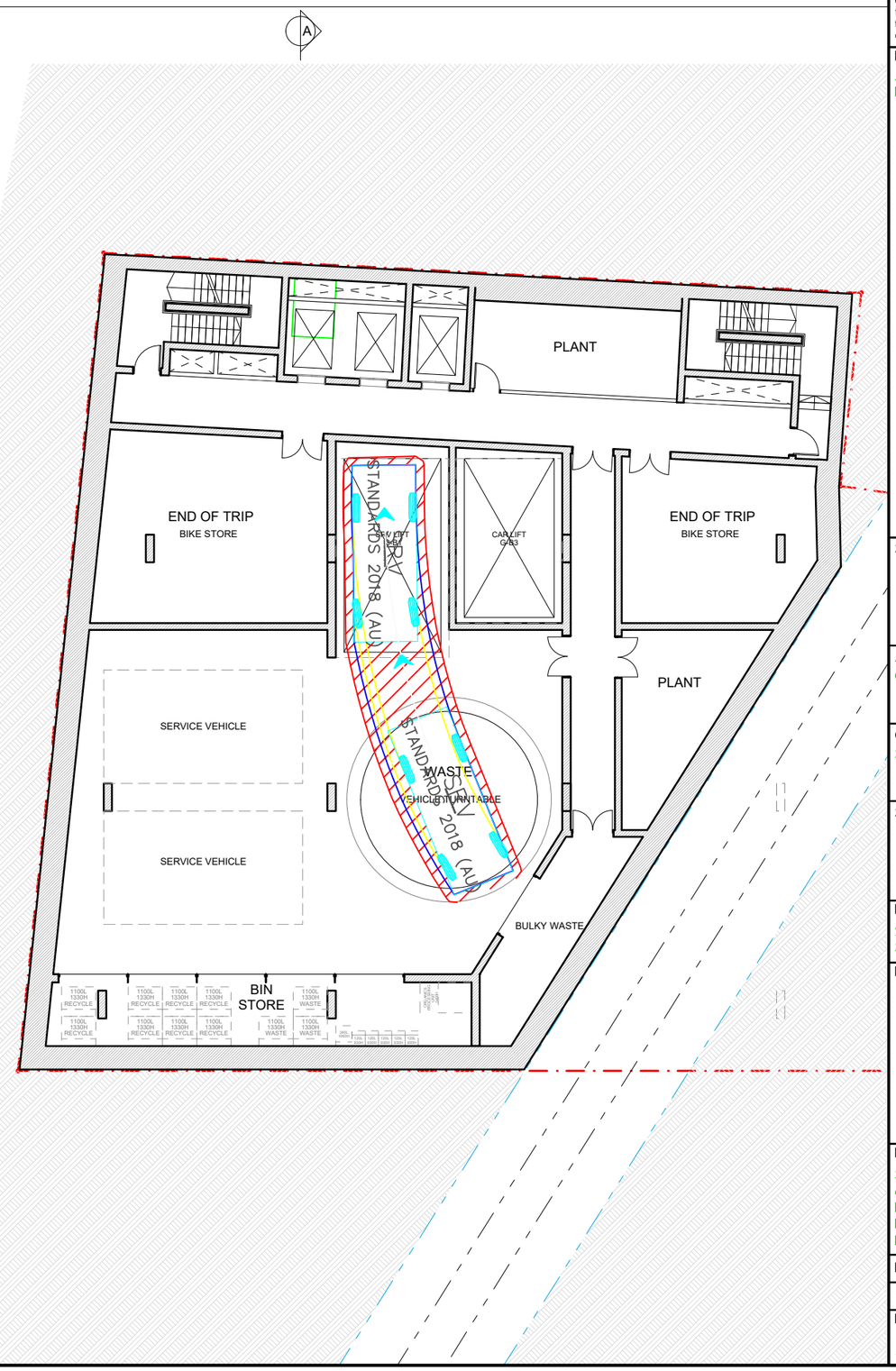
Drawing Title
Swept Path Analysis
B99 Vehicle
Ground Floor
Left: Entry Movement Right: Exit Movement

Drawn:	Checked:	Date:
HD	-	09-11-22

21.338d05v01 TRAFFIX [230322 Plans] Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
21.338	PP	TX.02	A





Notes:

This drawing is prepared for information purposes only. It is not to be used for construction.

TRAFFIX is responsible for vehicle swept path diagrams and/or drawing mark-ups only. Base drawing prepared by others.

Vehicle swept path diagrams prepared using computer generated turning path software and associated CAD drawing platforms. Vehicle data based upon relevant Australian Standards *(AS/NZS 2890.1:2004 Parking facilities - Off-street car parking,* and/or *AS2890.2:2002 Parking facilities - Off-street commercial vehicle facilities*). These standards embody a degree of tolerance, however the vehicle characteristics in these standards represent a suitable design vehicle and do not account for all variations in vehicle dimensions / specifications and/or driver ability or behaviour.

Rev.	Revision Note	By.	Date
A	Swept Path Analysis	HD	09-11-22
B	Updated Plans	HD	24-02-23

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Candalepas Associates

Client
STASIA Pty Ltd

Scale / Plan Orientation

0 2 4 6 8m
1:200 @ A3

Project Description
232-240 Elizabeth Street
SURRY HILLS NSW 2010

Drawing Prepared By

TRAFFIX
TRAFFIC AND TRANSPORT PLANNERS
Suite 2.08, 50 Holt Street
Surry Hills, NSW 2010
PO Box 1124
Strawberry Hills, NSW 2012
t: +61 2 8324 8700
f: +61 2 9830 4481
w: www.traffix.com.au

Drawing Title
Swept Path Analysis
6.4m Small Rigid Vehicle
Basement 1
Left: Basement Entry Movement
Right: Basement Exit Movement

Drawn:	Checked:	Date:
HD	-	09-11-22

21.338d05v01 TRAFFIX [230322 Plans] Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
21.338	PP	TX.03	A

Notes:

This drawing is prepared for information purposes only. It is not to be used for construction.

TRAFFIX is responsible for vehicle swept path diagrams and/or drawing mark-ups only. Base drawing prepared by others.

Vehicle swept path diagrams prepared using computer generated turning path software and associated CAD drawing platforms. Vehicle data based upon relevant Australian Standards *(AS/NZS 2890.1:2004 Parking facilities - Off-street car parking,* and/or *AS2890.2:2002 Parking facilities - Off-street commercial vehicle facilities*). These standards embody a degree of tolerance, however the vehicle characteristics in these standards represent a suitable design vehicle and do not account for all variations in vehicle dimensions / specifications and/or driver ability or behaviour.

Rev.	Revision Note	By.	Date
A	Swept Path Analysis	HD	09-11-22
B	Updated Plans	HD	24-03-23

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Candalepas Associates

Client
STASIA Pty Ltd

Scale / Plan Orientation

Project Description
232-240 Elizabeth Street
SURRY HILLS NSW 2010

Drawing Prepared By

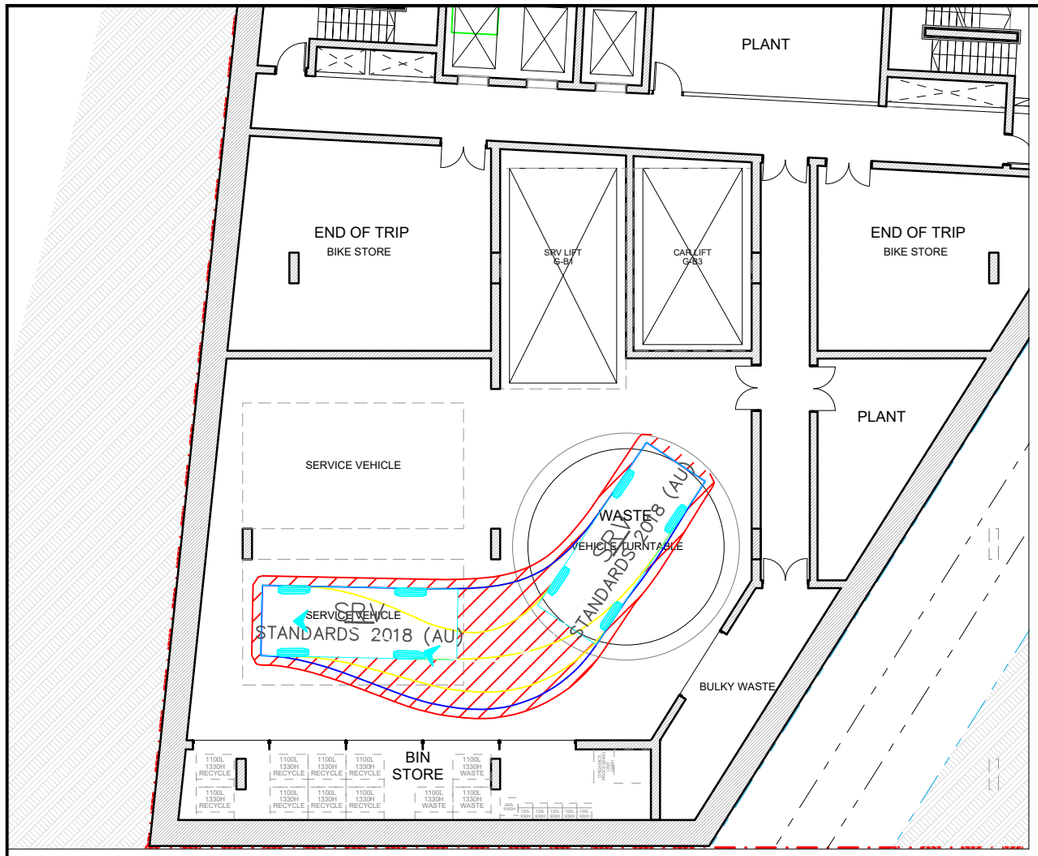
TRAFFIX
TRAFFIC AND TRANSPORT PLANNERS
Suite 2.08, 50 Holt Street
Surry Hills, NSW 2010
PO Box 1124
Strawberry Hills, NSW 2012
t: +61 2 8324 8700
f: +61 2 9830 4481
w: www.traffix.com.au

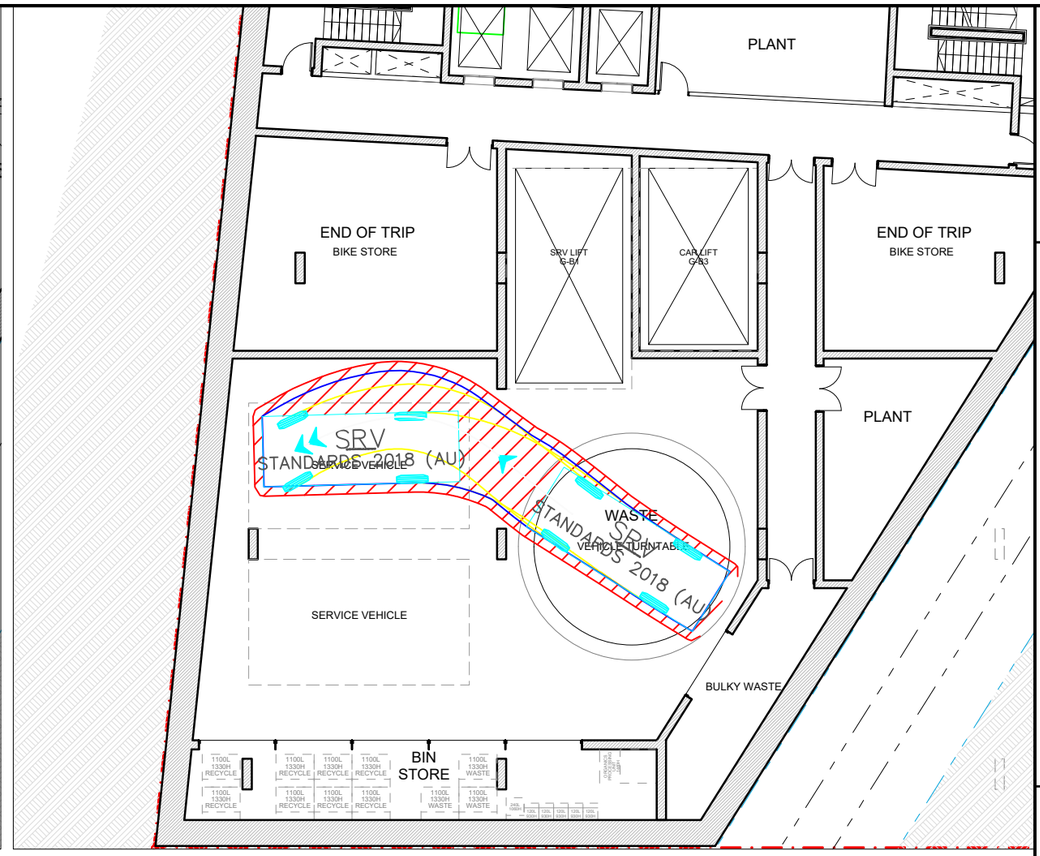
Drawing Title
Swept Path Analysis
Basement 2 - 6.4m long Small Rigid Vehicle
Left: Entry Movement
Middle: Drive on to Turntable
Right: Exit Movement

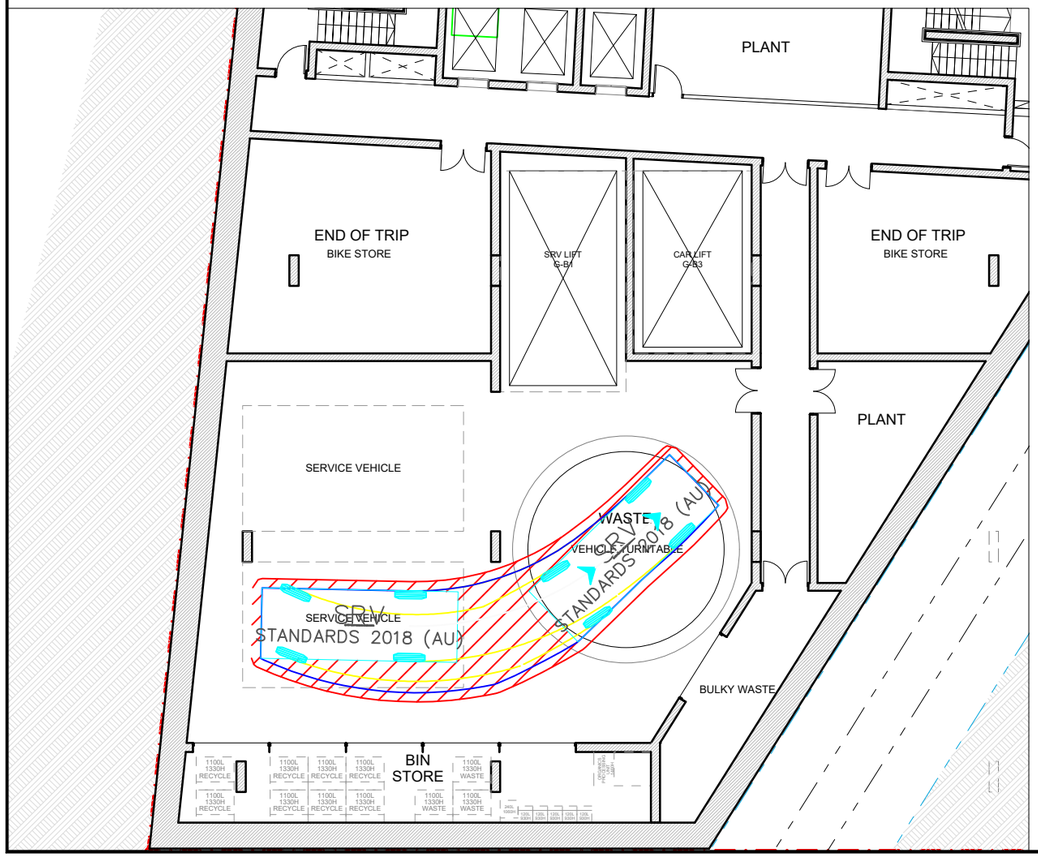
Drawn:	Checked:	Date:
HD	-	09-11-22

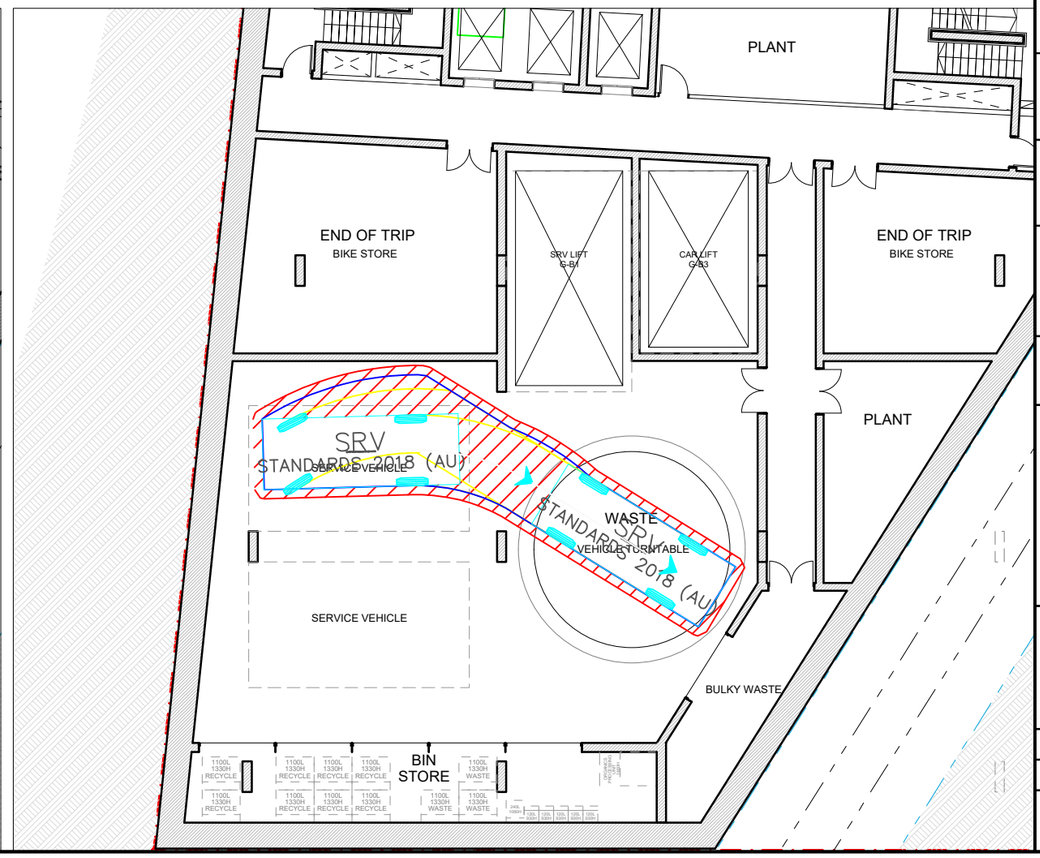
21.338d05v01 TRAFFIX [230322 Plans] Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
21.338	PP	TX.04	A









Notes:

This drawing is prepared for information purposes only. It is not to be used for construction.

TRAFFIX is responsible for vehicle swept path diagrams and/or drawing mark-ups only. Base drawing prepared by others.

Vehicle swept path diagrams prepared using computer generated turning path software and associated CAD drawing platforms. Vehicle data based upon relevant Australian Standards *(AS/NZS 2890.1:2004 Parking facilities - Off-street car parking,* and/or *AS2890.2:2002 Parking facilities - Off-street commercial vehicle facilities*). These standards embody a degree of tolerance, however the vehicle characteristics in these standards represent a suitable design vehicle and do not account for all variations in vehicle dimensions / specifications and/or driver ability or behaviour.

Rev.	Revision Note	By.	Date
A	Swept Path Analysis	HD	24-03-23

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Candalepas Associates

Client
STASIA Pty Ltd

Scale / Plan Orientation

0 2 4 6 8m
1:200 @ A3

Project Description
232-240 Elizabeth Street
SURRY HILLS NSW 2010

Drawing Prepared By

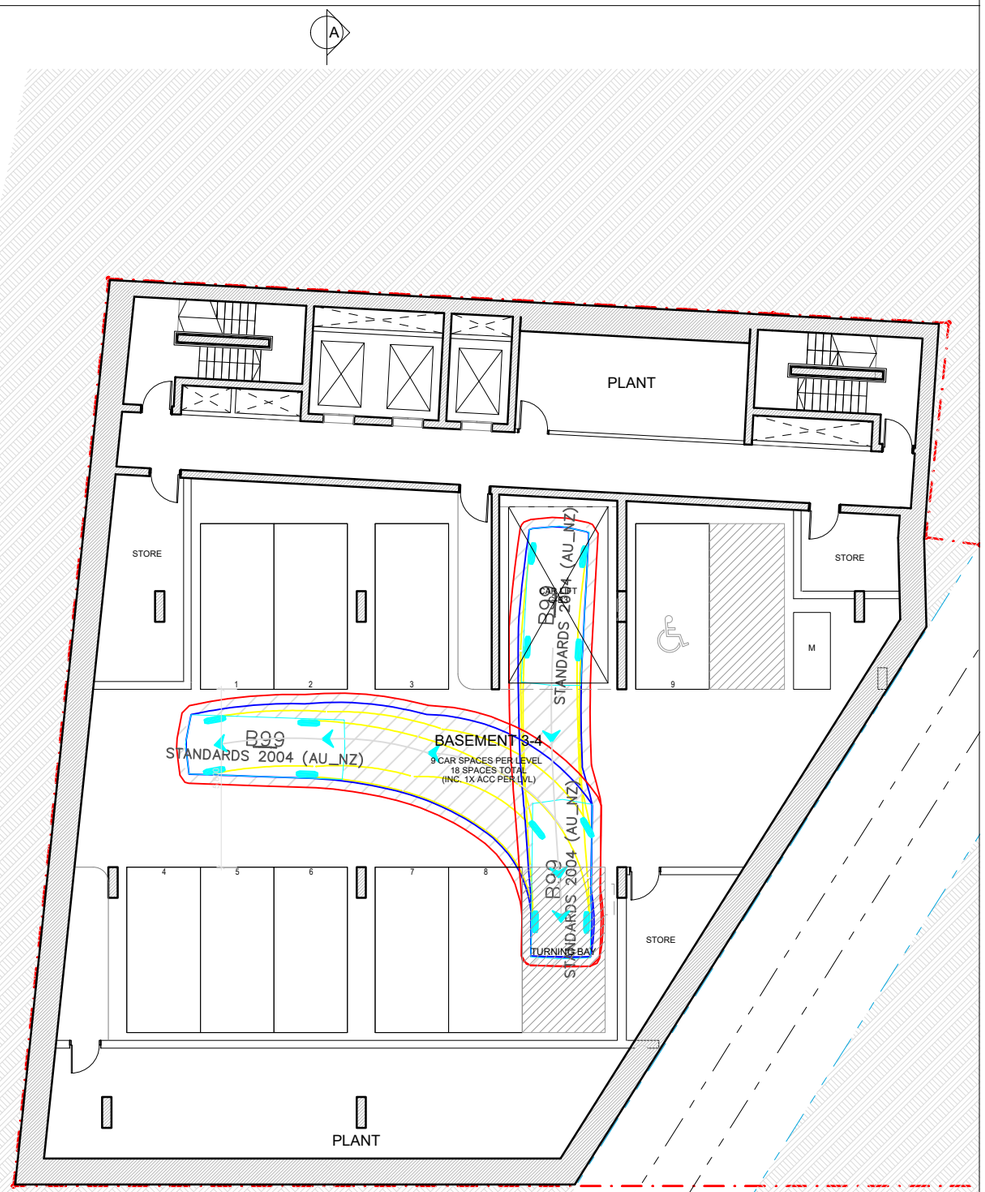
TRAFFIX
TRAFFIC AND TRANSPORT PLANNERS
Suite 2.08, 50 Holt Street
Surry Hills, NSW 2010
PO Box 1124
Strawberry Hills, NSW 2012
t: +61 2 8324 8700
f: +61 2 9830 4481
w: www.traffix.com.au

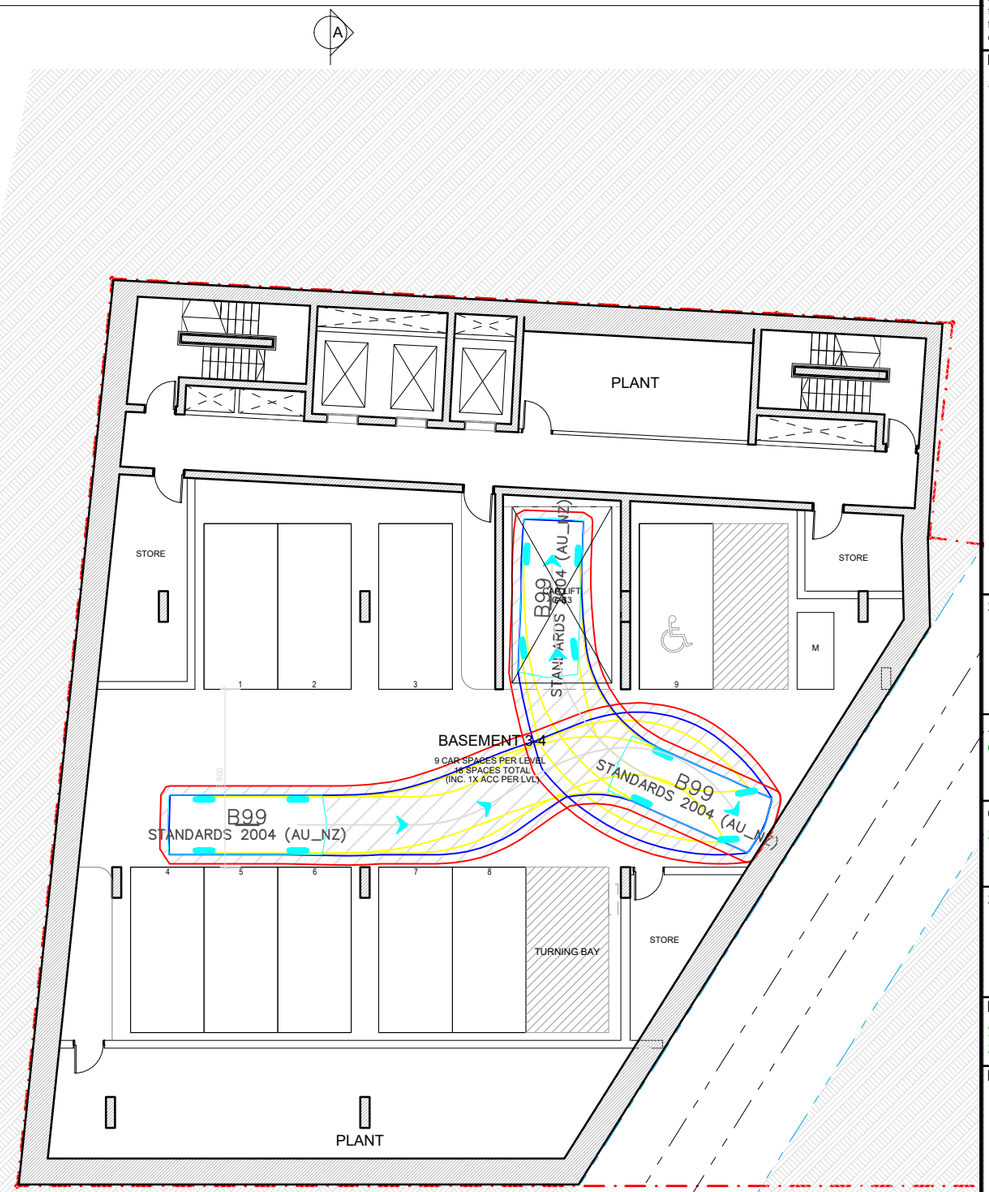
Drawing Title
Basement 1 - 6.4m Small Rigid Vehicle
Left Top: Space 1 Entry Movement
Left Bottom: Space 1 Exit Movement
Right Top: Space 2 Entry Movement
Right Bottom: Space 2 Exit Movement

Drawn:	Checked:	Date:
HD	-	24-03-23

21.338d05v01 TRAFFIX [230322 Plans] Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
21.338	PP	TX.05	A





Notes:

This drawing is prepared for information purposes only. It is not to be used for construction.

TRAFFIX is responsible for vehicle swept path diagrams and/or drawing mark-ups only. Base drawing prepared by others.

Vehicle swept path diagrams prepared using computer generated turning path software and associated CAD drawing platforms. Vehicle data based upon relevant Australian Standards *(AS/NZS 2890.1:2004 Parking facilities - Off-street car parking,* and/or *AS2890.2:2002 Parking facilities - Off-street commercial vehicle facilities*). These standards embody a degree of tolerance, however the vehicle characteristics in these standards represent a suitable design vehicle and do not account for all variations in vehicle dimensions / specifications and/or driver ability or behaviour.

Rev.	Revision Note	By.	Date
A	Swept Path Analysis	HD	24-03-23

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect
Candalepas Associates

Client
STASIA Pty Ltd

Scale / Plan Orientation

0 2 4 6 8m
1:200 @ A3

Project Description
232-240 Elizabeth Street
SURRY HILLS NSW 2010

Drawing Prepared By

TRAFFIX
TRAFFIC AND TRANSPORT PLANNERS
Suite 2.08, 50 Holt Street
Surry Hills, NSW 2010
PO Box 1124
Strawberry Hills, NSW 2012
t: +61 2 8324 8700
f: +61 2 9830 4481
w: www.traffix.com.au

Drawing Title
Swept Path Analysis
B99 Vehicle
Basement 3 and 4
Left: Basement Entry Movement
Right: Basement Exit Movement

Drawn:	Checked:	Date:
HD	-	24-03-23

21.338d05v01 TRAFFIX [230322 Plans] Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
21.338	PP	TX.06	A