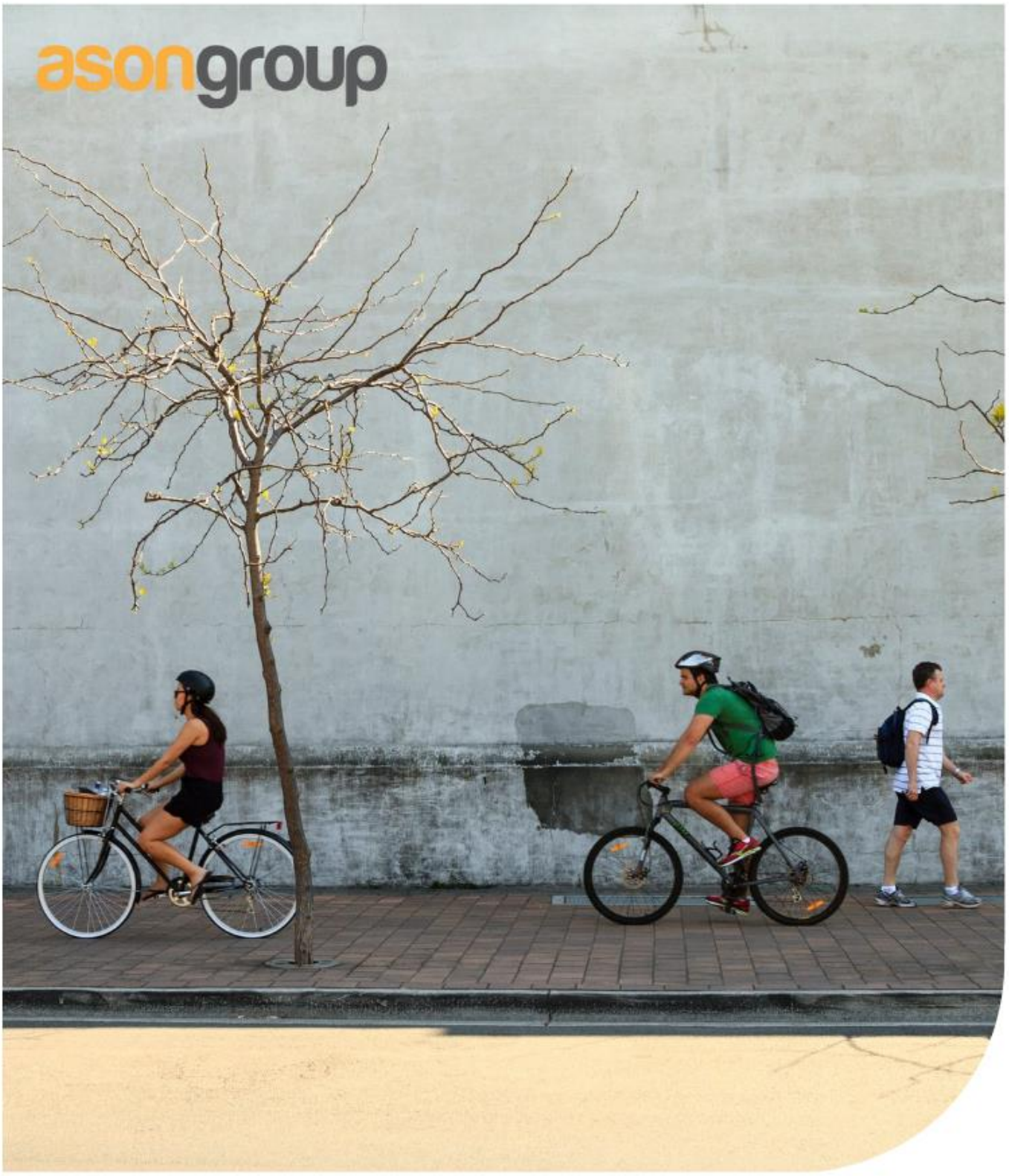

Transport Assessment

State Significant Development Application

600-660 Elizabeth Street, Redfern

24/07/2024
Ref: P2434r07

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Revision History

Revision No.	Date	Details	Author	Approved by
1	08/04/2024	Draft	A. Shrestha, A. Tan	R. Hazell
2	03/05/2024	Final – updated	A. Tan	R. Hazell
3	24/05/2024	Final – updated to include changed area schedules	A. Tan	R. Hazell
4	28/04/2024	Final – updated to include minor modifications	A. Tan	R. Hazell
5	12/06/2024	Final to include minor architectural plan updates	A. Tan	R. Hazell
6	20/06/2024	Final to include minor architectural plan updates	A. Tan	R. Hazell
7	24/07/2024	Final to include minor amendments	A. Tan	R. Hazell

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APPENDICES

Appendix A. SIDRA Outputs

Appendix B. Vehicle Swept Paths

1 Introduction

1.1 Overview

This report accompanies a detailed State Significant Development Application (SSDA) that seeks approval for a mixed-use development at 600-660 Elizabeth Street, Redfern (Redfern Place). The development proposes four buildings comprising community facilities, commercial/ office, affordable/ social/ specialist disability housing apartments and new public links and landscaping.

The project site comprises Lot 1 in DP 1249145 and covers an area of approximately 10,850m^2. Part of the site currently accommodates the existing Police Citizens Youth Club (PCYC) (to be demolished and replaced). The remaining portion of the site is vacant with remnant vegetation.

The SSDA seeks approval for redevelopment of the site, including:

- Demolition of existing buildings.
- Tree removal.
- Bulk earthworks including excavation.
- Construction of a community facility building known as Building S1.
- Construction of two residential flat buildings (known as Buildings S2 and S3) up to 14 and 10 storeys respectively, for social and affordable housing.
- Construction of a five-storey mixed use building (known as Building S4) comprising commercial uses on the ground level and social and specialist disability support accommodation housing above.
- Construction of one basement level below Buildings S2, S3 and part of S4 with vehicle access from Kettle Street.
- Site-wide landscaping and public domain works including north-south and east-west pedestrian through-site link.

For a detailed project description refer to the Environmental Impact Statement prepared by Ethos Urban

This report details the extent of the proposal and assesses the existing transport environment together with describing the impact of the proposed development on the surrounding transport network. The assessment was completed under the requirements of the Department of Planning, Housing and Infrastructure, with City of Sydney and relevant State agency consultation key.

1.2 Secretary's Environmental Assessment Requirements

This transport assessment responds to all traffic and transport matters outlined within the Secretary's Environmental Assessment Requirements (SEARs) issued on 16 December 2022 as it relates to SSD-51274973. The traffic and transport related SEARs are outlined in **Table 1**.

TABLE 1: SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS

Requirement	Reference
10. Traffic, Transport and Accessibility	
Provide a transport and accessibility impact assessment, which includes:	
an analysis of the existing transport network, including the road hierarchy and any pedestrian, bicycle or public transport infrastructure, current daily and peak hour vehicle movements, and existing performance levels of nearby intersections.	**Section 2** **Appendix A**
details of the proposed development, including pedestrian and vehicular access arrangements (including swept path analysis of the largest vehicle and height clearances), parking arrangements and rates (including bicycle and end-of-trip facilities), drop-off/pick-up-zone(s) and bus bays (if applicable), and provisions for servicing and loading/unloading.	**Section 4** **Appendix B**
analysis of the impacts of the proposed development during construction and operation (including justification for the methodology used), including predicted modal split, a forecast of additional daily and peak hour multimodal network flows as a result of the development (using industry standard modelling), identification of potential traffic impacts on road capacity, intersection performance and road safety (including pedestrian and cyclist conflict) and any cumulative impact from surrounding approved developments.	**Section 7** **Section 8**
measures to mitigate any traffic impacts, including details of any new or upgraded infrastructure to achieve acceptable performance and safety, and the timing, viability and mechanisms of delivery (including proposed arrangements with local councils or government agencies) of any infrastructure improvements in accordance with relevant standards.	**Section 7**
proposals to promote sustainable travel choices for employees, residents, guests and visitors, such as connections into existing walking and cycling networks, minimising car parking provision, encouraging car share and public transport, providing adequate bicycle parking and high-quality end-of-trip facilities, and implementing a Green Travel Plan.	**Section 8**
Provide a Construction Traffic Management Plan detailing predicted construction vehicle routes, access and parking arrangements, coordination with other construction occurring in the area, and how impacts on existing traffic, pedestrian and bicycle networks would be managed and mitigated.	**Section 8**

1.3 Purpose of this Report

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

- existing pedestrian and transport conditions surrounding the site
- suitability of the proposed parking in terms of supply (quantum) and layout
- service vehicle requirements
- pedestrian and bicycle requirements
- the traffic generating characteristics of the proposed development
- suitability of the proposed access arrangements and pedestrian through site links
- the transport impact of the development proposal on the surrounding road network.

1.4 Key References

In preparing this transport assessment, Ason Group has referenced key planning documents and transport standards and guidelines, including but not limited to:

- Sydney Local Environmental Plan 2012 (LEP 2012).
- Sydney Development Control Plan 2012 (DCP 2012).
- Design Guide 600-660 Elizabeth Street, Redfern October 2023
- Liveable Green Network Strategy, 30 May 2011, City of Sydney.
- Transport for New South Wales, Guide to Traffic Generating Developments 2002.
- Transport for New South Wales, Guide to Traffic Generation Developments Updated Traffic Surveys 2013/04a 2013 (TD2013/04a).
- Australian Standard 2890.1:2004: Parking Facilities – Off-Street Car Parking.
- Australian Standard 2890.2:2018: Parking Facilities – Off-Street Commercial Vehicle Facilities.
- Australian Standard 2890.3:2015: Parking Facilities – Bicycle Parking.
- Australian Standard 2890.6:2022: Parking Facilities – Off-Street Parking for People with Disabilities.
- Architectural plans for the proposed development prepared by Hayball, Silvester Fuller and Architecture AND, including:
  - Hayball, Basement Plan, A02.00, dated 19 June 2024.
  - Hayball, Masterplan, A02.01, dated 19 June 2024.
  - Silvester Fuller, GA Plan - Ground, S2.A02.01, dated 19 June 2024.
  - Silvester Fuller, Section - A, S2.A06.11, dated 19 June 2024.
- Other documents as referenced in this report.

2 Existing Conditions

2.1 Site Location

Redfern Place is legally known as Lot 1 in DP1249145. It is bound by Kettle Street to the north, Phillip Street to the south, Walker Street to the east and Elizabeth Street to the west. The southern portion of the site is occupied by a PCYC with the remaining land mostly vacant. The location of the site and the local context is shown in **Figure 1.**

Vehicle access to PCYC is on Phillip Street along the southern boundary with less than 10 informal at-grade spaces available for use by approved users, including for the PCYC minibus. The larger northern portion of the site is secured with fencing with no vehicle access nor pedestrian thoroughfare provided. Redfern Park and Redfern Oval are located opposite the site on the western side of Elizabeth Street with a combination of medium and high-density residential dwellings surrounding the site. Commercial and retail land uses front Elizabeth Street closer to Cleveland Street with the commercial corridor along Cleveland Street dominating the environment further to the north.

Source: Nearmap aerial imagery

Figure 1: Site Location

2.2 Road Network

The road hierarchy surrounding the site is detailed in **Table 2.** Cleveland Street is a state road and the key east-west road corridor through Redfern and Surry Hills on the periphery of the CBD. It provides two traffic lanes in each direction with no kerbside parking permitted.

Elizabeth Street is a regional road and when combined with Redfern Street and Chalmers Street is the key north-south road through Redfern. North of Redfern Street, it provides three to four southbound only traffic lanes with a combination of angled and parallel parking permitted along some sections. It provides for two-way traffic flows south of Redfern Street with two traffic lanes and one parking lane in each direction. No

parking restrictions are in place for the southbound carriageway (along the site frontage) during the weekday morning and afternoon peak periods (7-9am and 2-6pm). South of Phillip Street, it generally provides for one traffic lane and one parking lane in each direction with additional capacity at key intersections.

Phillip Street functions as a collector road along the southern boundary of the site with one traffic lane and one parking lane in each direction. Additional capacity is provided at key intersections, including the traffic signals at Elizabeth Street.

All local roads in the vicinity of the site, including Kettle Street and Walker Street provide one traffic lane and one parking lane in each direction. Walker Street provides for parallel parking along the western kerb (adjacent to the site) with angled parking on the eastern kerb with unrestricted parking along its length. Kettle Street is similar with mostly unrestricted parallel parking. Parking demand is generally high on account of mostly no restrictions. The key streets are shown in **Figure 2** to **Figure 5**.

Some sections of time restricted parking are also provided near the site, including 4P parking along Elizabeth Street, with 2P parking on the northern side of Kettle Street west of Walker Street and on Morehead Street north of Phillip Street.

TABLE 2: ROAD HIERARCHY

Road Name	Road Classification	Posted speed limit
Cleveland Street	State road	50 km/h
Elizabeth Street	Regional road	50 km/h
Redfern Street	Regional / Collector road	40 km/h
Phillip Street	Collector road	40-50 km/h
Walker Street	Local roads	50 km/h
Kettle Street		
Morehead Street		

Source: Google Streetview (all images)

Figure 2: Phillip Street (looking east)

Figure 3: Elizabeth Street (looking south)

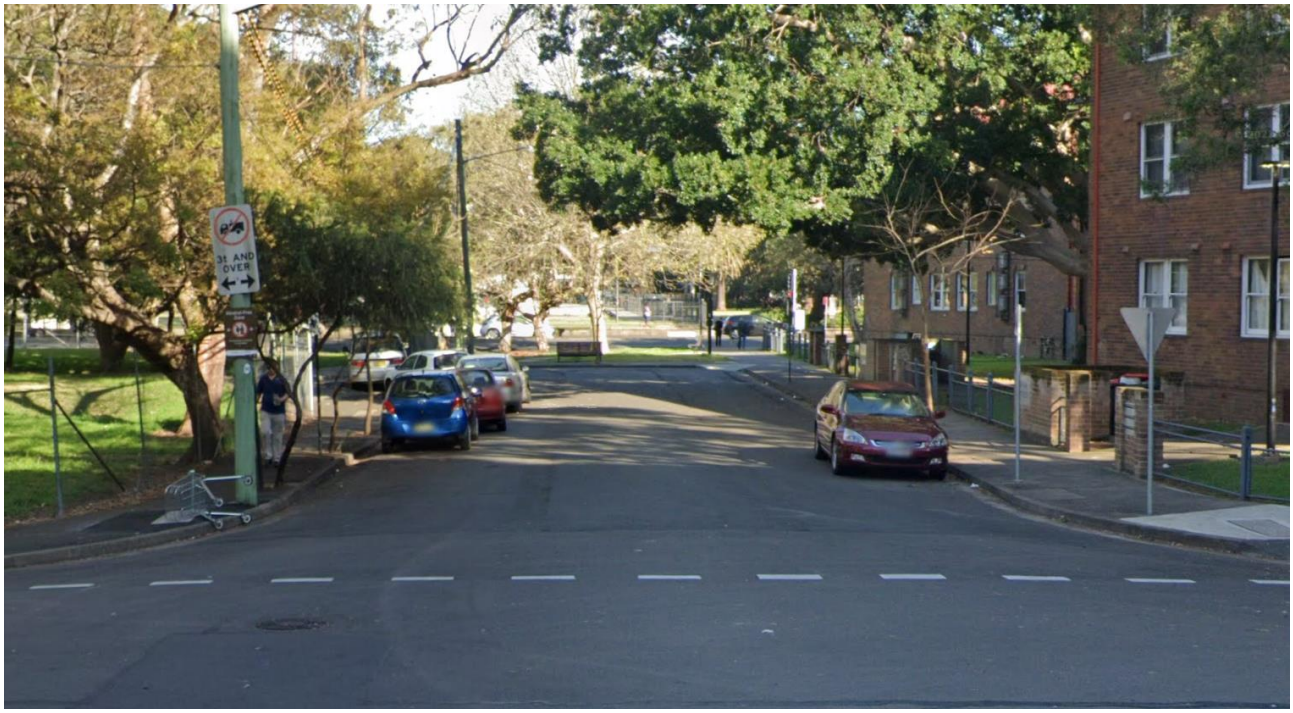


Figure 4: Kettle Street (looking west)

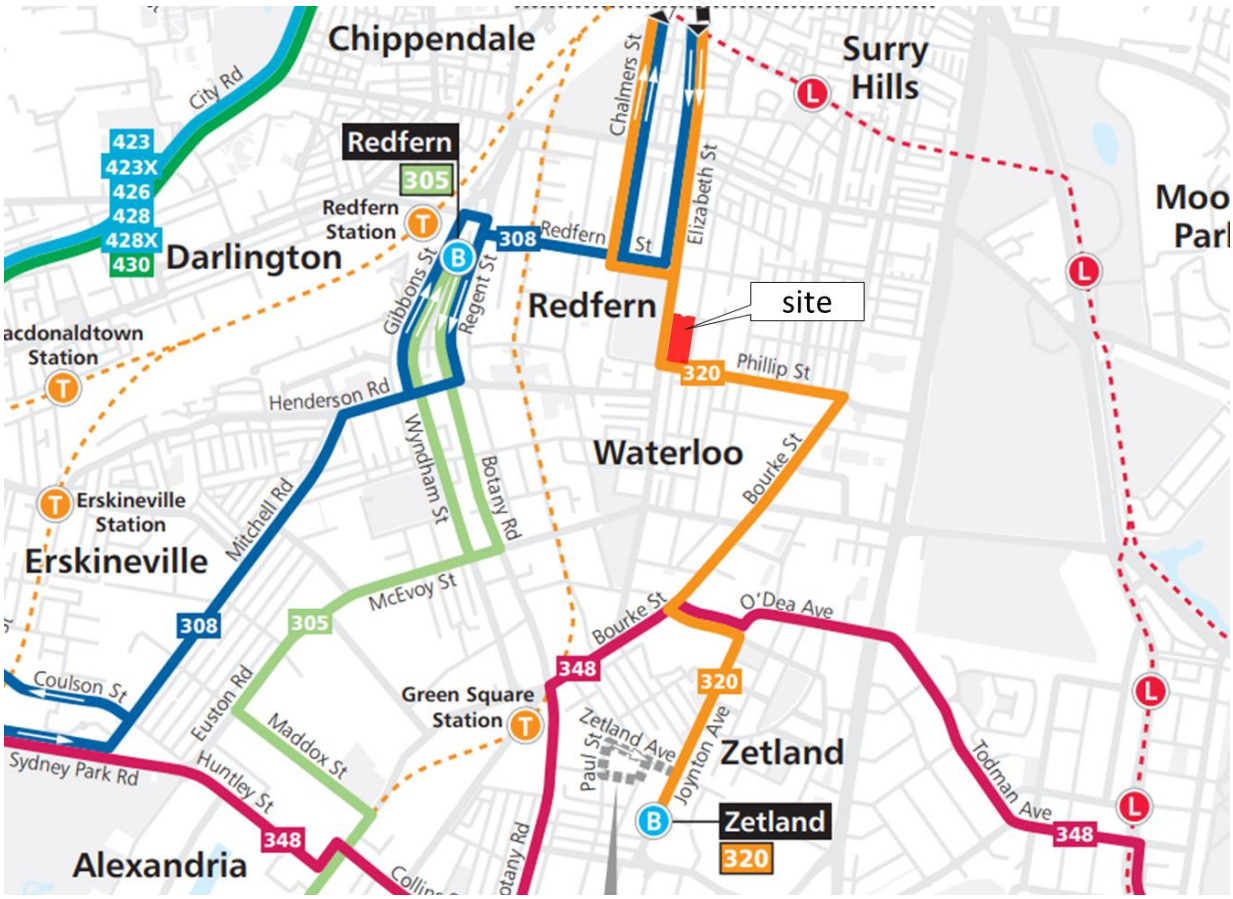
Figure 5: Walker Street (looking north)

2.3 Public Transport

2.3.1 Bus Services

TfNSW Guidelines state that bus services influence the travel mode choice associated with sites within 400 metres, or a 5-minute walk of a bus stop. In this regard, there are several bus stops near the site, including stops along the Elizabeth Street and Phillip Street site frontages and on Redfern Street within a short walk.

The key bus routes in the local area are shown in **Figure 6** with a breakdown included in **Table 3**.



Source: [Inner west network map]

Figure 6: Existing Bus Services

TABLE 3: EXISTING BUS SERVICES

Route No.	Route	Route Description	Average Service Frequency
308	Marrickville Metro to Central Eddy Ave (Loop Service)	Marrickville, St Peters, Alexandria, Eveleigh, Redfern, Strawberry Hills and Haymarket	32 services per day (4 in AM peak and 3 in PM peak)
310	Botany to Central Railway Square	Botany, Mascot, Alexandria, Beaconsfield, Eveleigh, Redfern, Surry Hills and Central Station (Sydney)	10 services per day (no services in AM peak and 3 in PM peak)
320	Green Square to Gore Hill	Zetland, Waterloo, Redfern, Surry Hills, Sydney, Haymarket, North Sydney, Waverton, Wollstonecraft, Crows Nest, St Leonards, Greenwich and Artarmon	59 services per day (6 each in AM and PM peaks)
343	Kingsford to Circular Quay	Daceyville, Kingsford, Eastlakes, Rosebery, Zetland, Waterloo, Redfern, Surry Hills, Haymarket and Circular Quay (Sydney)	88 services per day (12 in AM peak and 7 in PM peak)
355	Marrickville Metro to Bondi Junction	Marrickville, Enmore, Newtown, Erskineville, Waterloo, Redfern, Moore Park and Bondi Junction	27 services per day (2 each in AM and PM peaks)
392	Little Bay to Redfern	Little Bay, Phillip Bay, Chifley, Matraville, Hillsdale, Eastgardens, Pagewood, Daceyville, Kingsford, Kensington, Zetland, Waterloo, Alexandria, Eveleigh and Redfern	38 services per day (4 in AM peak and 3 in PM peak)

2.3.2 Train Services

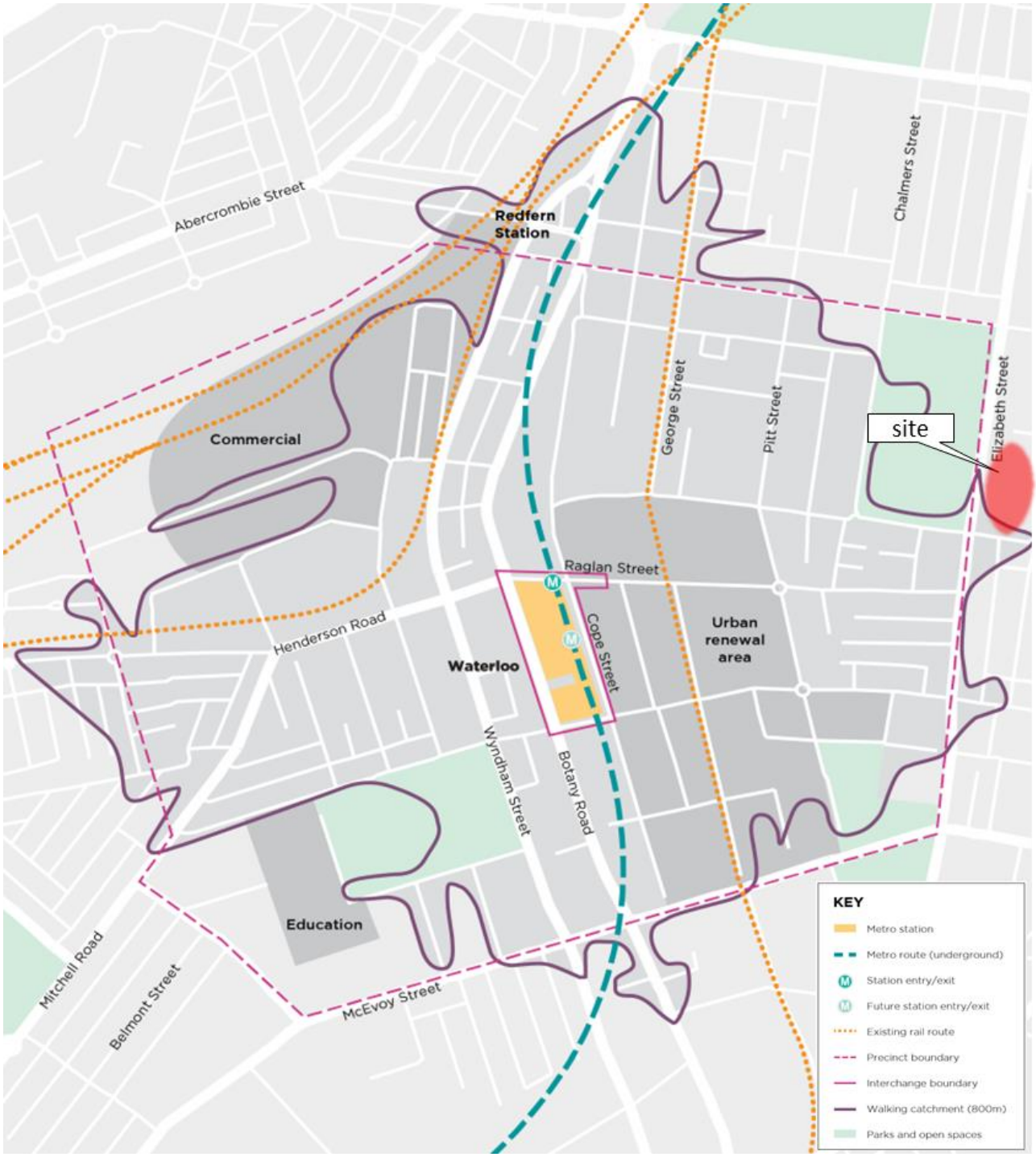
TfNSW Guidelines state that train services influence the travel mode choice of areas within 800 metres (10-minute walk) of a train station. While the site is marginally outside this practical catchment, it remains within an easy 850 metre walk via Redfern Park and Redfern Street. A combination of bus and rail services also ensure good connectivity, with the closest Redfern Street bus stop within a 200-metre walk being serviced by bus routes 308 and 310 (with frequencies of around 10 minutes during peak periods).

Redfern Station is a major train station with 12 platforms servicing ten train lines. Four bus services also connect with the station to ensure easy transition between transport modes. It is expected that Redfern Station would be regularly used by future residents, their visitors and PCYC users. The combination of bus and rail services, with the station connecting with the broader Sydney Trains network ensures convenient and quality high frequency transport services close to the site.

2.3.3 Sydney Metro City and Southwest

Sydney Metro Stage 2 is planned to commence services in mid-2024, with the new line to extend from the existing Metro services at Chatswood Interchange and extend south through North Sydney, under Sydney Harbour through the CBD, Central Station and via the existing T2 Inner West and Leppington Line to Sydenham Station. Subsequent connections via the existing line to Bankstown station will follow. Once operational, these services will facilitate further capacity on the heavy rail network and ensure growth along the key growth corridors.

As part of this, a new metro station is being delivered on Botany Road south of Raglan Street in Waterloo. Waterloo Metro Station will be within an 800 metre walk of the site with high frequency turn-up and go services allowing users to travel to Central Station in two minutes and Martin Place in six minutes.



Source: sydneymetro.info/

Figure 7: Waterloo Metro local context and walking catchment

2.3.4 Sydney Light Rail

The Randwick and Kingsford light rail lines connect Central and Sydney CBD with Randwick via Surry Hills and Moore Park with frequencies of 3 to 5 minutes across the day.

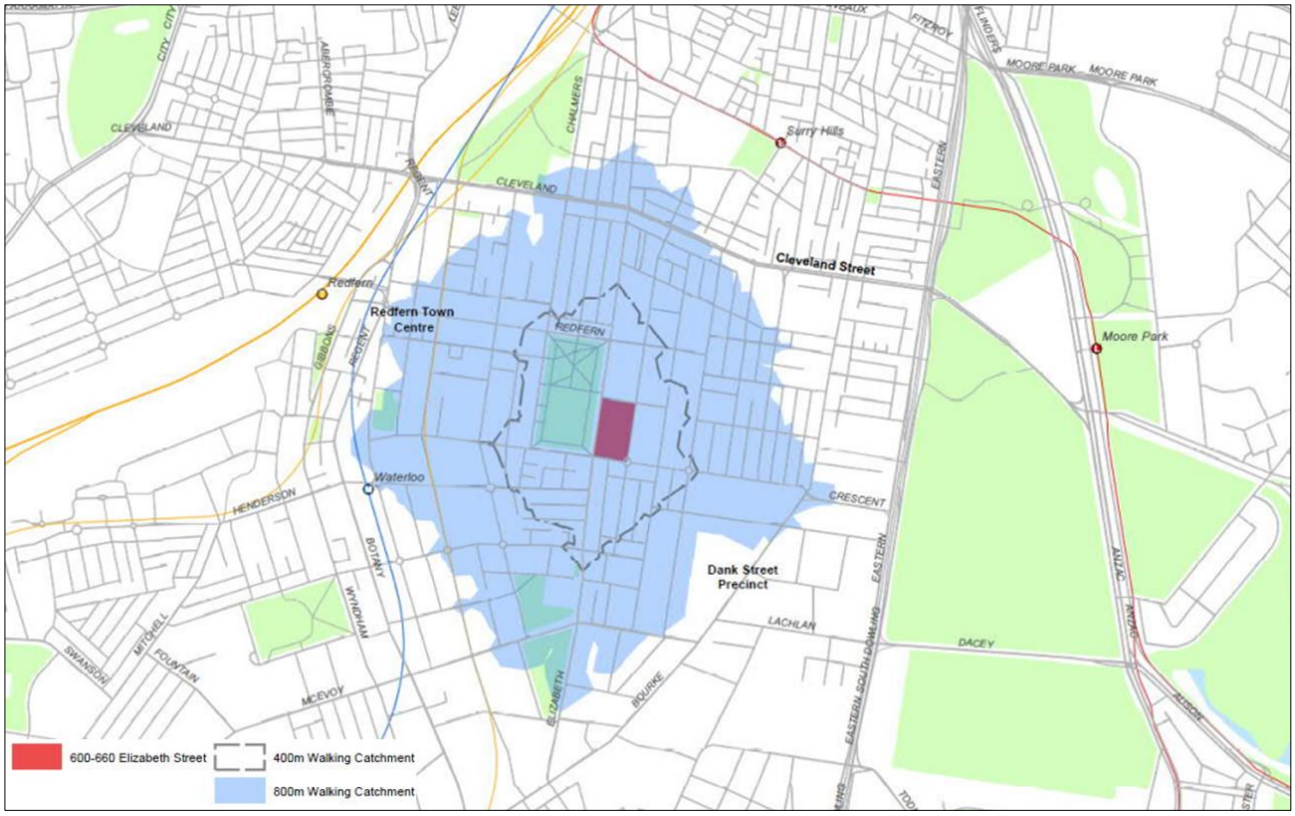
The closest light rail stop is located on Devonshire Street north of the site and while outside the 800-metre catchment, does provide another public transport option for the site and further diversifies transport options for the area, and the catchment areas that can be realistically reached in the regional area.

2.3.5 Existing Pedestrian Accessibility

The local area is afforded established and well-connected pedestrian infrastructure throughout, with footpaths generally provided on both sides of all local area streets, with several paths of travel also traversing Redfern Park.

The mid-block signalised pedestrian crossing on Elizabeth Street is aligned with Kettle Street along the site's northern boundary. All signalised intersections in the vicinity provide signalised pedestrian crossings on all legs and in combination ensure quality pedestrian infrastructure and safety throughout. The 800-metre walking catchment is shown in **Figure 8**.

This pedestrian infrastructure ensures secure and consistent connections to a range of public transport services and ensures logical paths of travel for a range of users for a variety of purposes.

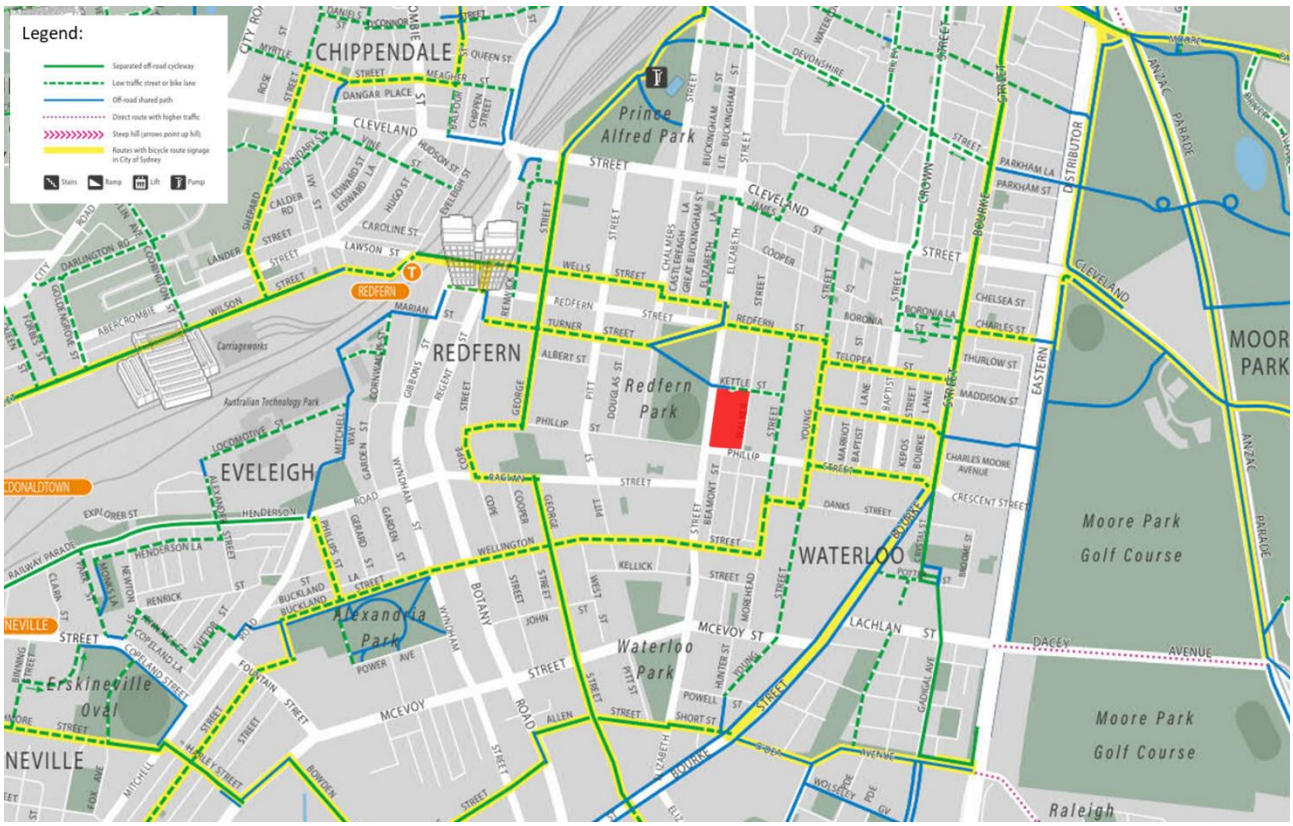


Source: Jacobs, traffic impact assessment report, 26 February 2020

Figure 8: 800m walking catchment

2.3.6 Existing Cycle Routes

The local area is afforded access to a range of established cycling facilities by way of a range of on-road and off-road routes. The City of Sydney cycling map is shown in **Figure 9** and confirms these connections noting that Kettle Street is a designated cycle route and allows for direct connections to Redfern Station (through Redfern Park if preferred), Moore Park, Surry Hills and several other key local and regional destinations.



Source: cityofsydney.nsw.gov.au/lists-maps

Figure 9: Existing bicycle facilities

2.4 Existing Travel Modes

The existing travel patterns of residents and workers within the surrounding locality was surveyed within the 2016 Census, with the Australian Bureau of Statistics making the Journey to Work (JTW) data available.

The 2021 data is generally not considered fit for use in terms of travel behaviour given the significant 'work from home' activity at the time of COVID-19 lockdowns at the time. In this regard, **Table 4** shows the breakdown of travel mode for people living in the Redfern and Chippendale Statistical Area Level 2. This indicates that a high proportion of residents (about 76 per cent) used public or active transport for their daily journey to work in 2016.

TABLE 4: EXISTING MODE SHARE – TRAVEL FROM REDFERN (2016)

Travel Mode	Mode Share
Car Driver	20%
Car Passenger	2%
Train	33%
Bus	14%
Bicycle	5%
Walk	24%

Table 5 also shows the breakdown of the key travel modes for people working within Redfern (specifically Destination Zone 113350001 / TZ 213, TZ 219) which suggests that approximately 53 per cent of employees use public or active transport for their journey to work.

TABLE 5: EXISTING MODE SHARE – TRAVEL TO REDFERN (2016)

Travel Mode	Mode Share
Car Driver	41%
Car Passenger	4%
Train	36%
Bus	4%
Bicycle	4%
Walk	9%

2.5 Existing Traffic Volumes

Traffic volume surveys were completed in early December 2023 to determine the existing traffic flows on the surrounding road network. This is important to understand the local area traffic volumes and to ensure consistency with previous site assessments and stakeholder commentary. The proposal strives to limit private vehicle travel by way of low parking provision with the inner-city location lending itself to natural public and active travel use, consistent with existing travel habits of the area.

To ensure a robust assessment, the following intersections have been surveyed noting that the proposal is unlikely to noticeably impact any single intersection operation, as discussed throughout this report.

- Elizabeth Street/ Cleveland Street
- Elizabeth Street/ Redfern Street
- Elizabeth Street/ Phillip Street
- Morehead Street/ Phillip Street
- Cleveland Street/ Walker Street/ Wilton Street.

The intersection survey data indicates an overall peak between 8:00am and 9:00am and between 5:00pm and 6:00pm during the weekday morning and afternoon peak periods. These peak hour traffic volumes are shown in **Figure 10**. The local area priority-controlled intersections all have low-moderate volumes and operate well with no material delay for any movement.

Tube counts were also completed on Walker Street immediately north of Kettle Street near the site. These mid-block two-way traffic volumes are important to ensure an understanding of the nominal relative net change in traffic volumes along the local streets surrounding the site. Walker Street would be commonly used (for much of the site generated traffic) on approach and departure. These details are also discussed as part of the traffic related impacts associated with the proposal.

Figure 10: Weekday AM & PM peak hour traffic volumes

2.6 Existing Intersection Operation

The commonly used measure of intersection operation, as defined by TfNSW is vehicle delay. SIDRA determines the average delay that vehicles encounter and measures the level of service (LOS) from LOS A (good operation) through to LOS F (noticeable delay with upgrades necessary).

Baseline traffic modelling has been completed to assess the existing operation of the study intersections. SIDRA Network modelling indicates that all intersections generally operate well, with satisfactory levels of

service across the network. The SIDRA results are summarised in **Table 6** and SIDRA outputs are provided in **Appendix A**.

TABLE 6: EXISTING INTERSECTION OPERATION

Intersection	Peak	Degree of Saturation (DOS)	Average Delay (sec)	95th Back of Queue (m)	Level of Service (LOS)
Elizabeth Street/ Cleveland Street	AM	0.772	21.3	250.5	B
	PM	0.905	44.0	287.3	D
Elizabeth Street/ Redfern Street	AM	0.430	25.6	103.5	B
	PM	0.470	28.2	104.1	B
Elizabeth Street/ Phillip Street	AM	0.594	20.7	150.9	B
	PM	0.717	21.5	230.0	B
Morehead Street/ Phillip Street	AM	0.252	15.7	49.5	B
	PM	0.241	11.1	38.6	A
Cleveland St/ Walker St/ Wilton St	AM	0.446	7.3	87.3	A
	PM	0.467	7.6	91.9	A

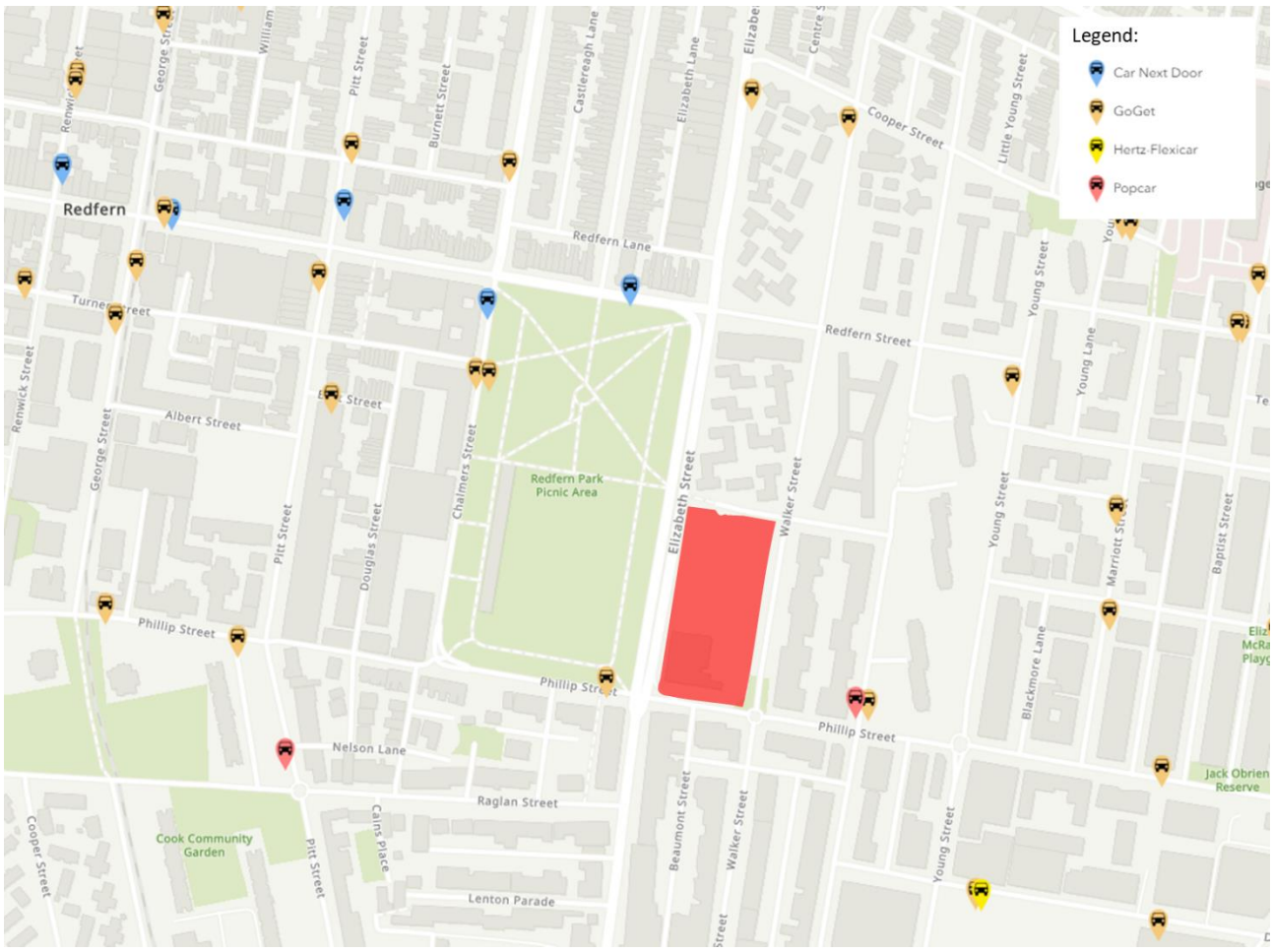
The Elizabeth Street/ Cleveland Street signalised intersection operates at LOS B in the AM peak hour, declining to LOS D in the PM peak hour. This is mostly attributed to peak period demand along these two key road corridors and generally expected in such key locations on the periphery of the CBD during weekday peak hours. Other intersections generally operate at an overall LOS A/B in both peak periods.

Overall, the surrounding road network, while carrying relatively high traffic volumes along Elizabeth Street and Cleveland Street in particular, retains spare capacity for the critical movements at the key study intersections.

2.7 Car Share

There are currently several car share ‘pods’ within walking distance of the site. There are approximately 10 car share pods within 400 metres radius from the site. The location of different car share pods (operated by different companies) is shown in **Figure 11**.

The closest car share spaces are on Phillip Street with each of the three spaces within 50-100 metres of the site.



Source: [Car share locations in City of Sydney]

Figure 11: Existing car share locations

3 Strategic Context

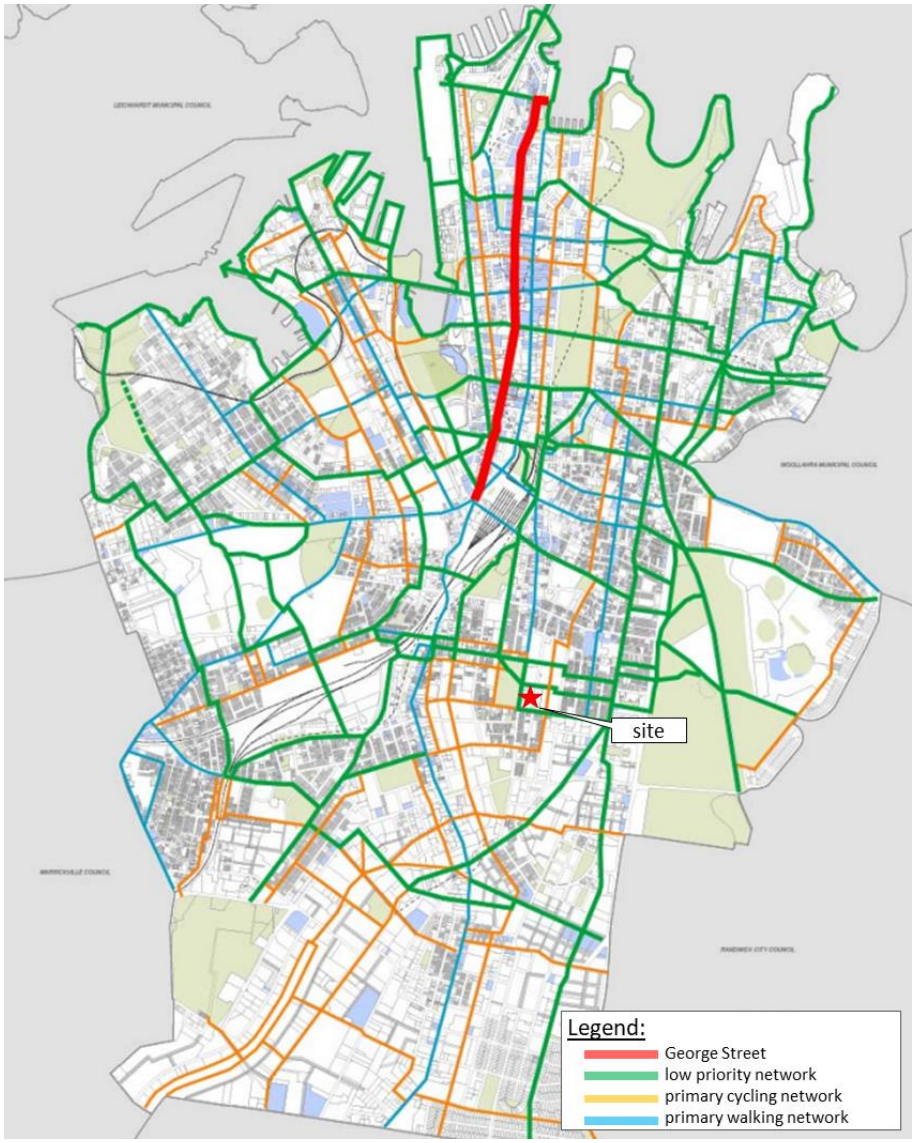
3.1 Liveable Green Network strategy

The liveable Green Network stands as a crucial concept within Sustainable Sydney 2030, striving to deliver a connected pedestrian and cycle network. This strategy aims to deliver Targets 7, 8 and 9 of Sustainable Sydney 2030 listed below.

- Target 7 – By 2030, at least 10 per cent of City trips will be made by bicycle and 50 per cent by pedestrian movement.
- Target 8 – By 2030, every resident will be within a 10 minute (800m) walk to fresh food markets, childcare, health services and leisure, social, learning and cultural infrastructure.
- Target 9 – By 2030, every resident in the City of Sydney will be within a three-minute walk (250m) of continuous green links that connect to Harbour Foreshore, Harbour Parklands, Moore or Centennial or Sydney Parks.

The site is located within City Wide Network, offering east and direct access to significant destinations throughout the City and Inner Sydney. **Figure 12** illustrates the primary connections of the City-Wide Network. City of Sydney has indicated that Phillip Street is no longer included in the Liveable Green Network priority route with Kettle Street remaining.

Development planning has considered the location of driveways and provision of public domain space, including rationalising, and improving the Kettle Street environment to further enhance pedestrian and cyclist experience. Through site links further promote active travel and improve permeability of the area generally. All aligns and aids the liveable green network strategy.



(Source: Liveable Green Network - Volume 1)

Figure 12: City-wide Liveable Green Network

3.2 Road Upgrades

TfNSW is planning safety improvements to Cleveland Street between City Road, Camperdown and Anzac Parade, Moore Park. Cleveland Street is a major east-west connection on the periphery of the CBD linking Camperdown and Moore Park.

The upgrade has been planned to address the safety concerns that has grown with the increasing number of amenities along Cleveland Street. The upgrade works will include removing all the right turn movements from Cleveland Street in the four key intersections and reducing the speed limit along the length of Cleveland Street to 40km/h. The following intersections have been listed for upgrade:

- Wilton Street, Walker Street and Cleveland Street
- Young Street, Marlborough Street and Cleveland Street
- Crown Street and Cleveland Street
- Bourke Street and Cleveland Street.

Additionally, left turn arrows will be added to the traffic signals, where necessary with signal timing to be adjusted to allow red arrows to protect pedestrians at the start of the green signal phase. The Cleveland Street safety improvements and its proximity to the site is shown in **Figure 13**.

Source: [Cleveland Street safety improvements community update February 2021]

Figure 13: Cleveland Street safety improvements

4 Proposed Development

4.1 Overview

The proposal aims to deliver four separate buildings comprising a mix of social and affordable residential apartments and community-focused land uses across the block bounded on all sides by local and regional roads. The 355 residential apartments include 68 adaptable apartments with a mix of affordable, social and Homes NSW (HNSW) apartments. The community-focused land uses include a new and expanded PCYC facility, new head office for Bridge Housing and community hub.

Kettle Street will provide for all vehicle access to the 66 basement parking spaces, formal loading facilities and secure bicycle parking. The public domain through and surrounding the site aims to improve the local environment for community benefit, future residents and PCYC users, with the small Kettle Street cul-de-sac to make way for wider pedestrian footpaths and improved east-west connections. All frontages include notable improvements in the public domain by way of widened footpaths and improved setbacks.

The four buildings are separated to include two residential only buildings along the Walker Street frontage occupying the eastern half of the site. Building S2 is in the north-east corner and accommodates affordable housing, with building S3 in the south-east corner providing for social housing. The mixed-use building (S4) in the south-west corner incorporates social and speciality disability accommodation above ground level commercial and community space. The commercial space will be for the purposes of Bridge Housing new head office, with a co-located community lounge and community room.

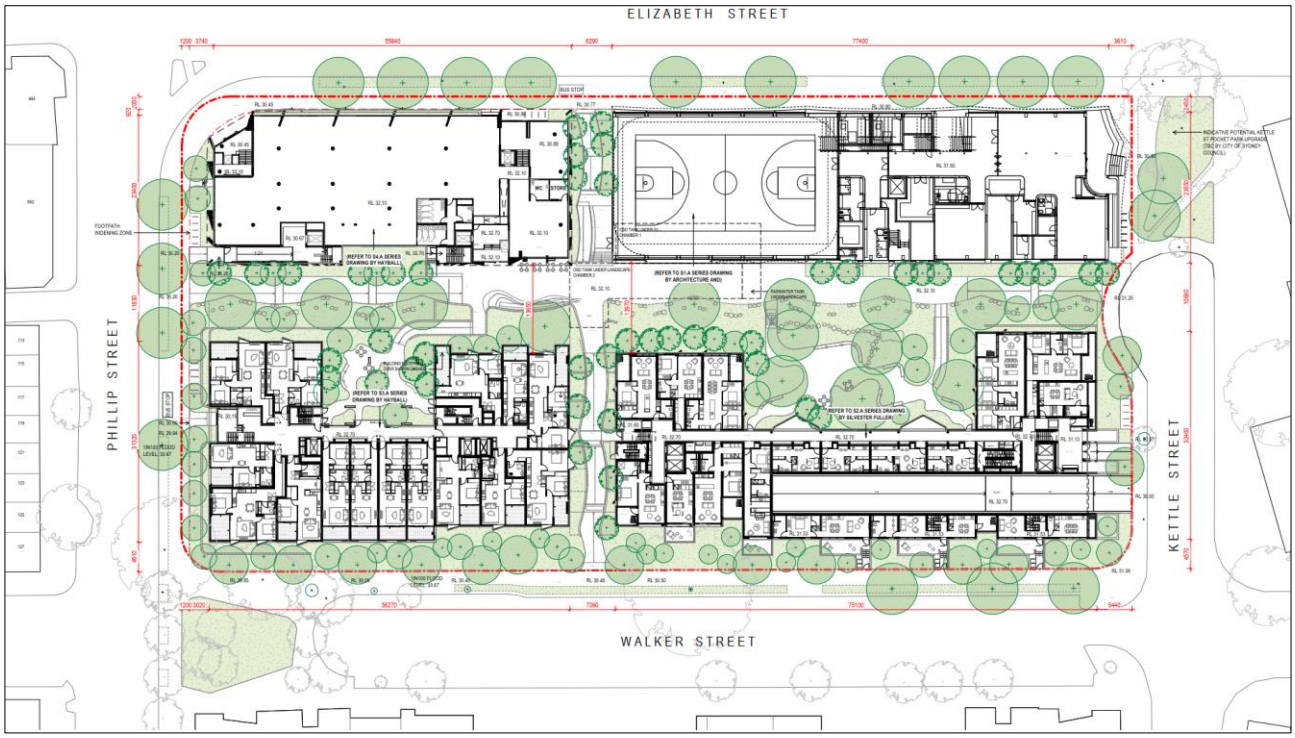
The PCYC building (S1) is in the north-west corner of the site fronting Elizabeth Street and Kettle Street. This facility covers two levels and is proposed to replace the existing PCYC building at the southern end of the site. It will provide expanded facilities intended to better provide for the local community.

The proposed yield is shown in **Table 7** and the site plan and architectural sketch in **Figure 14** and **Figure 15** respectively.

TABLE 7: PROPOSED LAND USES

Land use type	Yield
Building S1 (community)	
PCYC building	**3,571m^2 GFA**
Building S2 (residential)	
Studio	27
1 bedroom	67
2 bedrooms	93
3+ bedroom	10
Sub-total	**197 apartments**
Building S3 (residential)	
Studio	13
1 bedroom	48
2 bedrooms	44
3+ bedroom	3
Sub-total	**108 apartments**

TABLE 7: PROPOSED LAND USES	
Building S4 (residential, co-working, community)	
Studio	7
1 bedroom	26
2 bedrooms	14
3+ bedroom	3
Sub-total	**50 apartments**
Commercial	**876m² GFA**
Community space	**165m² GFA**



Source: Masterplan, Hayball, June 2024

Figure 14: Proposed site layout plan

Source: Redfern Place DA Report - Draft, Bridge Housing, June 2024

Figure 15: Aerial view (looking south-east)

4.2 Site Layout and Access Arrangements

The four buildings are well separated with generous public domain ensuring good permeability throughout while facilitating east-west and north-south pedestrian access. The eastern buildings include ground level dwellings, further improving street activation. The western buildings similarly improve activation along Elizabeth Street with suitable glazing ensuring outlook and active surveillance.

All vehicles will access the site via a single crossover on Kettle Street under building S2 in the north-east corner of the site. The access driveway would require the removal of two on-street parking spaces, including the relocation of one on-street accessible space. The ramp has been designed in accordance with Council requirements (and Australian Standards, where relevant). This includes transitions, maximum gradients, and grades across the Kettle Street footpath. All flood level requirements have also been met, in accordance with Council specifications and following extensive consultation as part of the Design Review Panel process.

The ramp design also responds with Council consultation to ensure all vehicles can access the basement, including Council's new 10.6 metre waste truck. The ramp width ensures that service vehicles can pass 99th percentile cars along its length, noting the need for flashing warning lights to inform other drivers at times when service vehicles are on the ramp and manoeuvring in the basement. The basement car park has been designed as a User Class 1A car park with minimum 5.4m long and 2.4m wide spaces with 5.8m wide circulation aisles. All residential buildings can be accessed from the basement car park via the five separate lift cores.

Vehicle swept paths and vertical clearance checks have been completed and included as **Appendix A**.

4.3 Waste and Loading Strategy

Service vehicles will use the basement loading bays for all servicing requirements, including waste collection, resident move-in/ move-out and deliveries. The formal loading dock has been designed to accommodate two service vehicles including a 6.4m small rigid vehicle and Council's 10.6m waste truck. These vehicles will stand in the loading dock clear of vehicles using the adjacent ramp. Two separate service vehicle bays will also accommodate all vans and utes up to about 7m long with an additional bay dedicated for use by the PCYC minibus of the same maximum length.

There is also opportunity to provide an additional signposted on-street loading zone on the western side of Walker Street south of Kettle Street. This space would facilitate practical daily use by small delivery vehicles and improve delivery efficiency in the local area generally. Waste trucks servicing the PCYC building would also benefit should agreement be reached with stakeholders for provision of a single on-street timed loading zone on Elizabeth Street south of the existing signalised pedestrian crossing.

The overall loading strategy will ensure dedicated use of five on-site loading bays (including the PCYC bay) plus potential for use of two on-street loading zones on Walker Street and Elizabeth Street. If agreed with stakeholders, this equates to practical access to seven loading spaces in and around the site. The on-street loading zones would be subject to Council agreement through the Local Pedestrian, Cycling and Traffic Calming Committee.

The proposed site loading strategy positively responds to the challenges associated with facilitating service vehicle basement access given the significant restrictions presented by the flood levels, headroom clearance requirements, and impacts on overall site layout and design. A headroom clearance of minimum 4 metres has been provided, including at the crest of the ramp to ensure the 3.8-metre-high waste truck can access the basement loading dock and manoeuvre as required. The waste truck will provide a minimum setback of 2 metres to the rear wall to allow sufficient space for loading activities. Cross-sections of the ramp design, as agreed with Council are included in **Appendix A**.

5 Parking Requirements

5.1 Car Parking

5.1.1 Car Parking Rates

The proposed development is subject to the maximum rates stipulated in Part 7 of LEP 2012 and in accordance with the relevant categorization. The site is in the Category B zone as defined in the Land Use and Transportation Integration Map, shown in **Figure 16.** The site does not fall under a specific category as defined by the public transport accessibility level map.

Source: eplanningdlprod.blob.core.windows.net/pdfmaps

Figure 16: Land use and transport integration map

As discussed, minimal on-site parking is currently provided for use by authorised vehicles associated with the PCYC at the southern end of the site. The proposal does not strive to meet formal parking requirements as defined by statutory requirements, preferring to adopt a sustainable approach to travel with inherent low parking provision aimed to further encouraging active and public transport.

In this regard and based on the maximum LEP 2012 residential parking rates, the proposed development is permitted to provide a maximum 224 residential parking spaces based on sites located in Category B zones as defined by the LEP. With the basement car park providing 66 parking spaces (including 18 accessible spaces) plus seven motorcycle spaces, the parking supply is appropriate and supported having regard to the site's highly accessible location and known travel mode share of the area with a range of high-frequency public transport services in close proximity (both existing and near future services). Any such minor and infrequent residential visitor, commercial and PCYC parking demand can be accommodated on-street in the precinct.

In addition, it is noted that with the proposed 68 adaptable (or similar) apartments equating to 19 per cent of the total 355 apartments, provision of 18 accessible spaces (equating to 27 per cent of the total parking supply) proportionally exceeds this. All accessible spaces have been designed in accordance with AS2890.6:2022 with adjacent shared areas (with centrally located bollard) being a minimum 2.4m wide.

Headroom clearances of minimum 2.5m (to structure and services) are provided above all accessible spaces and shared areas.

5.2 Bicycle Parking

Reference has been made to DCP 2012, Planning Guidelines for Walking and Cycling and the City of Sydney Cycle Strategy and Action Plan 2007-2017 as it relates to bicycle parking provision. In this regard, the bicycle parking requirements are summarised in **Table 8**.

TABLE 8: BICYCLE PARKING REQUIREMENTS

Type	Yield	Applicable Rate	Requirement
Residential			
residential	355 apartments	1 space per apartment	355
residential visitor		1 space per 10 apartments	36
		Sub-total	**391**
Non-residential			
commercial staff	876m^2	1 space for every 150m^2	6
commercial visitors		1 space for every 400m^2	3
PCYC staff	15-20 staff	target 10% mode share	2
PCYC visitor	100-150 visitors		10-15
		Sub-total	**21-26**

Secure bicycle parking is provided in the basement car park for use by residents and staff through a combination of storage cages and secure bicycle storage rooms fitted with bicycle lockers and bicycle racks. These facilities ensure capacity for more than 355 resident bicycle spaces and 13 commercial and PCYC staff spaces, thereby exceeding the statutory requirements.

Visitor bicycle parking is provided in the form of double-sided bicycle racks close to the building entrances and across the ground level public domain on all street frontages. This includes 14 bicycle racks adjacent to the PCYC entrance, 10 on Kettle Street in the north-east corner of the site, 10 each on the Walker Street and Phillip Street frontages and eight along Elizabeth Street. In combination, the proposal includes a total of 52 bicycle racks for use by visitors to all proposed land uses.

The overall provision of 52 bicycle racks across the site is appropriate having regard to the 10 per cent 2030 travel mode share targets. Bicycle parking demand for the commercial space and PCYC can be monitored over time as part of targeted green travel planning and adjusted should demand require. The public domain space has capacity to expand the quantum of bicycle racks, if required.

5.3 Motorcycle Parking and Car Share

DCP 2012 details the requirements for additional on-site parking facilities such as car share and motorcycles, with **Table 9** providing a summary.

TABLE 9: DCP 2012 ADDITIONAL PARKING REQUIREMENTS

Type	Yield	Parking Rate	Parking Requirement
motorcycle	66 car spaces	1 space for every 12 car spaces	6
car share		1 space per 60 car spaces	1-2

The basement car park includes provision for seven motorcycle spaces, in accordance with DCP 2012. Two car share spaces have also been provided for use by residents/ tenants and active car share members. This is common practice for car share operators such as GoGet with secure access to the basement car park permitted during the booking window only. There is also potential for one to two car share spaces to be located on-street along Walker Street and/ or Kettle Street to ensure equitable use by future residents and the surrounding community.

5.4 Service Vehicle Requirements

As discussed in Section 4.3 the proposed development aims to deliver a well-considered site layout with a focus on improving the public domain internal to and surrounding the site. To achieve this, all on-site loading will occur within the basement by use of a mix of service vehicle spaces and formal loading dock. While the provision of five bays for a range of vehicle sizes, delivered in combination with up to two on-street timed loading bays is considered the most appropriate design outcome, **Table 10** details the requirements based on DCP 2012.

TABLE 10: DCP 2012 SERVICE VEHICLE REQUIREMENTS

Land use	Yield	Parking rate	Loading requirement
Residential	355 apartments	1 space for first 50 dwellings plus 0.5 spaces for every 50 dwellings or part thereafter	5
Commercial/ community	4,611m^2	1 space per 3,300m^2 GFA, or part thereof for the first 50,000m^2	1-2

On this basis, the proposal would be required to provide up to six or seven loading bays for use by a range of service vehicles. With a basic loading dock booking system in-place, including for the purposes of resident move-in/ move-out, the proposed provision is considered appropriate, with adequate capacity to accommodate service vehicle demand as part of a managed approach across the day.

In addition to the above and given that the loading requirements of the DCP 2012 does not provide any details on the breakdown or vehicle size of each, reference is made to the TfNSW Urban Freight Forecasting Model (UFFM) to provide a more accurate assessment of service vehicle demand for the proposed development. The UFFM is a useful tool developed by TfNSW which has two main functions:

1. Provides daily profiles of the volume and types of freight and servicing activity that a building is likely to generate across a typical weekday, based on building information entered by the user.

2. Assesses the performance of loading dock parking spaces provided by a development to manage the freight demand generated by the building.

The objective of the model is to assist planners and developers in understanding the facilities that will be appropriate for a development to be self-sufficient in managing its own freight and servicing activity. The following key outputs can be produced by the model:

- Projected vehicle arrival profiles by loading spaces (HRV, MRV, SRV and cars, vans, utes etc.).
- Estimated distribution of demand throughout the day.

- Efficiency of the loading dock (dock performance).

The inputs for the UFFM model are listed in **Table 11** with the model outputs summarised in **Table 12**.

TABLE 11: UFFM CALCULATION INPUTS

Land Use	Size (GFA) / No.
number of floors	2-14
commercial area	4,611m^2
number of apartments	355
retail area	-
availability of a dedicated goods lift	Yes

TABLE 12: PARKING SPACES FOR COMMERCIAL VEHICLES

Vehicle Type	Demand
Small (B99, vans, utes)	2
Medium (SRV, small truck)	1
Large (MRV, HRV, large trucks)	1

The UFFM suggests that the proposed development may need to provide up to four loading bays, including two for vans/ utes, one for small rigid vehicles and one for large trucks. The proposed development includes the following:

- one loading bay for use by vehicles up to Council's 10.6m waste truck (excluding 8.8m medium rigid vehicles)
- one loading bay for use by all vehicles up to 6.4m small rigid vehicles
- two loading spaces for use by small vehicles including vans/ utes/ cars etc.
- one space for use by the PCYC minibus.

In this regard, the service vehicle requirements for large and medium sized trucks for the purposes of waste collection and infrequent formal deliveries meets the statutory requirements. There is a minor shortfall in capacity of the smaller bays to accommodate the demands estimated by the UFFM. It is noted that small service vehicles such as vans/ utes regularly prefer to use on-street spaces for deliveries etc. for ease of access and convenience. This is common and accepted in such locations where space is at a premium.

6 Sustainable Transport

6.1 Bicycle Parking

Bicycle parking has been provided in accordance with Sydney DCP 2012, Planning Guidelines for Walking and Cycling and the City of Sydney Cycle Strategy and Action Plan 2007-2017. As discussed, at least one bicycle is provided for every residential dwelling, consistent with the desirable outcomes of the 600-660 Elizabeth Street Design Guide. These are accommodated through a combination of storage cages and secure bicycle storage rooms in the basement car park for residents (and staff). These are spread across the basement to ensure convenient access to the various lift cores across the site.

Bicycle racks have also been provided on the ground level as part of the public domain and landscaping areas for use by all visitors. The 52 bicycle racks are provided across all four street frontages and in well-lit areas near the main entrances. This visitor provision is also in accordance with the Design Guide that defines the need for a minimum two bicycle lock-up loops at each entry.

All resident and visitor bicycle parking spaces are designed in accordance with relevant Australian Standards (AS2890.3 Bicycle parking facilities).

6.2 Active Travel Trip Generation

Based on the existing mode share near the site and an average of 2.2 people per dwelling, there would likely be a demand of up to 320 to 350 public transport trips and 150 to 170 walking trips across the weekday peak hours (each peak covering 2-3 hours). This also assumes a greater proportion of work from home arrangements are in place for up to about 10 to 20 per cent of residents when compared with the 2016 Census data.

6.3 Walking and Cycling Network

As discussed, the proposed development focuses on active travel by way of generous public domain design and provision of the through site links to encourage walking and cycling daily. The interface with the frontage streets is noticeably improved, with the Phillip Street frontage in particular improving over the existing at-grade parking and vehicle crossovers.

Numerous site access locations and activation are a focus. Connections with existing facilities external to the site, including the pedestrian signals on Elizabeth Street adjacent to the Kettle Street pocket park have similarly been considered. Connections to the existing Redfern Station and future Waterloo Metro Station will be key.

Such design principles aim to increase walking and cycling in accessible areas and aids in further promoting the mode shift away from private vehicles. The low parking provision (well below the maximum LEP 2012 requirement) further supports such active travel objectives.

6.4 Public Transport

As discussed, the site benefits from an extensive network of high-frequency heavy rail, light rail and bus services. Rail connections offer convenient access to both local and regional destinations with Redfern Station allowing for connections in all directions.

With Waterloo Metro also expected to open mid-2024 a spart of Sydney Metro Stage 2, this will further enhance accessibility of the area close to the CBD and broader key economic corridor between Redfern and Macquarie Park. Sydney Metro will also alleviate congestion on Sydney’s heavy rail network.

Given the frequent and diverse public transport options available to future residents and visitors traveling to and from the site, it is unlikely that the proposal will noticeably impact the surrounding public transport network. A preliminary Green Travel Plan is included in Section 8 and provides the context and strategies to be in place to ensure the development continues the trend of the area away from daily private vehicle trips.

7 Traffic Assessment

7.1 Traffic Generation

Traffic generation estimates for the proposed development have been sourced from a combination of TfNSW Guide to Traffic Generating Developments and Technical Direction TDT 2013/ 04 together with a first principles assessment based on turnover of parking. This approach recognises the low parking supply relative to residential apartments, which effectively equates to about one parking space per five apartments.

TDT 2013/ 04 considers traffic generation rates based on 2012 survey data for high-density residential flat dwellings, including those close to public transport services and exceeding six storeys. When assessing vehicle trip generation based on total parking supply, the average morning and evening peak hour trip generation is 0.15 and 0.12 trips per car space. Based on the proposed 66 parking spaces, the proposed development would generate up to 10 vehicle trips in any peak hour. When accounting for a slightly higher generation of 0.25 trips per car space and recognising other car-based trips (such as ride share, taxis and residents travelling with friends/ family and PCYC activity), the proposal is estimated to generate up to 30 vehicle trips in any peak hour.

7.2 Traffic Distribution

Future SIDRA Network modelling has been completed to better understand the likely or anticipated theoretical maximum traffic impacts on the surrounding road network near the site. This includes the signalised intersection of Elizabeth Street/ Redfern Street and Phillip Street/ Morehead Street given the estimated key approach and departure routes. The other study area intersections have been excluded from the future traffic assessment on account of general satisfactory existing intersection operation, distance from the site and the expected nominal impacts associated with 25 vehicle trips once several available travel routes are considered.

The directional split of traffic both spatially (which roads do they use on approach and departure) and proportionately (differential split on arrival and departures) has been completed and defined as follows:

- For residential land uses, it is broadly accepted that there is an 80:20 split in arrivals and departures during the respective peak periods. This is reflected by vehicles exiting in the AM and returning in the PM. As such and 80:20 outbound: inbound split has been applied during the weekday AM peak, reversed in the PM peak.
- In consideration of the surrounding road network and location of commuter ‘destinations’ (i.e., commercial hubs, industrial estates, business precincts, etc. it is conservatively estimated that 70 per cent of traffic will travel through the Phillip Street/ Morehead Street intersection and 30 per cent through the Elizabeth Street/ Redfern Street intersection.
- Distribution of traffic through the study intersection are based on exiting turning volumes.

7.3 Traffic Impacts

With consideration to the estimated traffic generation and distribution, the post-development intersection operation has been modelled through the two key intersections close to the site to confirm if there are any such traffic related impacts. The SIDRA results are summarised in **Table 13** and SIDRA outputs are provided in **Appendix A**.

TABLE 13: FUTURE INTERSECTION OPERATION

Intersection	Peak	Degree of Saturation (DOS)	Average Delay (sec)	95th Back of Queue (m)	Level of Service (LOS)
Elizabeth Street/ Redfern Street	AM	0.433	26.0	105.4	B
	PM	0.427	28.2	106.5	B
Morehead Street/ Phillip Street	AM	0.253	16.2	49.8	B
	PM	0.251	11.7	40.8	A

Overall, the Elizabeth Street/ Redfern Street intersection maintains an overall LOS B in both peaks and the Phillip Street/ Morehead Street intersection operates at LOS B in the AM peak hour and LOS A in the PM peak hour. The 30 trips estimated to be generated by the proposed development are not expected to have any material impact on the operation of the existing intersections surrounding the site.

8 Overview Green Travel Plan

8.1 Travel Plan Framework

Transport is an essential aspect of daily life, impacting the economy, public health, and the environment. The transportation sector stands out as one of the rapidly growing sources of emissions in Australia, presenting a significant opportunity for reducing greenhouse gases. Beyond environmental considerations, offering diverse travel options, prioritizing walking, cycling, and public transport, holds substantial public health advantages and contributes to the development of a strong and prosperous community.

While the physical infrastructure integrated into the development is a crucial component, it represents only a portion of the overall solution. A Green Travel Plan (GTP) will ensure that the transportation infrastructure, services, and policies both within and beyond the site are tailored to user needs and strategically coordinated to achieve the highest level of sustainability.

8.1.1 What is a GTP?

A GTP encompasses a set of strategies aimed at fostering eco-friendly travel choices and decreasing reliance on individual automobiles. Its purpose is not to be 'anti-car,' but rather to inspire and assist individuals in pursuing their daily activities in a more sustainable manner. Such plans can include:

- Measures limiting car usage (disincentives or 'sticks').
- Measures encouraging or supporting sustainable travel, decreasing the necessity for travel, or enhancing travel efficiency (incentives or 'carrots').

The GTP seeks to advocate for transportation alternatives other than private cars, offering users the flexibility to opt for more sustainable and environmentally conscious commuting options. The report outlines various non-car transport alternatives available at the site. Given the project's objective to minimize private travel to the location, the adoption of a GTP would prove advantageous.

8.2 Key Objectives

Underpinning this GTP comprises a package of measures which could be adopted and designed to address the specific travel needs of the site. In this regard, the overall intention is to encourage and facilitate the use of alternative and sustainable modes of transport and to reduce single-occupancy car travel for journeys to and from the site.

The primary objectives of the GTP will be to:

- Promote the use of ‘active transport’ modes such as walking and cycling, particularly for short-medium distance journeys.
- Reduce reliance on the use of private vehicles for all journeys.
- Promote use of private vehicles in an efficient manner.

The intention is that the travel plan will deliver the following benefits:

- Reduce the environmental footprint of the site.
- Improve access, amenity, convenience, and safety of sustainable transport modes to/ from the site.
- Encourage a healthier, happier, and a more active and public transport inclined culture.

8.3 Site Specific Measures

Numerous possibilities exist to incentivize users to consider alternative travel modes to and from the site. The following potential measures and initiatives could be implemented to encourage more sustainable travel modes:

Active Travel

- Establish high-quality, prominent bicycle parking.
- Foster cultural change through initiatives such as:
  - Creating a bike user group, targeting staff residing within five kilometres of the site.
  - Providing information outlining opportunities and facilities available to users, including maps of available cycling routes to the site.

Promote Carpooling

- Encourage carpooling through the establishment of a carpooling club or registry/ forum.
- Conduct community programs to encourage carpooling for residents.

Public Transport

- Develop a Travel Access Guide (TAG) for resident and PCYC access, incorporating details on site facilities and surrounding public transport services and active transport initiatives. Update the TAG as the surrounding transport environment evolves.
- Install public transport information boards/ apps to inform residents and visitors about alternative transport options, utilizing the TAG as a reference.

Additional Travel Demand Initiatives

- Establish quality pedestrian connections between the site and existing bus routes, engaging with service providers to assess the feasibility of increasing frequency and timing.
- Explore opportunities for new local bus routes to ensure convenient bus services near the site, utilizing the dedicated bus facilities proposed in ongoing design planning.

Maintain ongoing engagement with TfNSW and Council to capture any additional demand generated by the subject site as part of ongoing train and bus planning for the area.

8.3.2 Travel Access Guide

A TAG provides users with details on utilizing sustainable transport modes, including walking and public transit, to reach the site. This information is conveyed visually through a map or app, showcasing the site's location and nearby transportation options, emphasizing accessible pedestrian and cycling routes.

8.3.3 Communication Strategy

Numerous opportunities exist to provide residents and PCYC visitors with details regarding nearby transport choices. Disseminating information can aid in journey planning and enhance their awareness of convenient and cost-effective travel alternatives that encourage ongoing shifts in travel behaviour. These opportunities encompass:

- TfNSW, offering public transport timetables and journey planning through their Transport Info website: www.transportnsw.info.

Furthermore, engaging with users through social media channels might serve as a platform for informally testing new initiatives, establishing travel-buddy networks, and fostering communication.

8.3.4 Monitoring

So as to record the overall success, as well as the effectiveness of the individual measures, monitoring and review of the GTP is to be conducted at regular intervals. The appointed Travel Plan Co-ordinator (TPC) will act as the primary point of contact for all enquiries relating to the GTP's progress.

The GTP should be monitored on a regular basis, e.g. yearly, by carrying out travel surveys. Travel mode surveys would determine the proportion of persons travelling to/ from the site by each transport mode. This will be in the form of annual travel mode questionnaire surveys to be completed by all persons attending the site, as far as practicable.

If targets are not met at the end of the initial period of monitoring, the GTP will be reviewed, new measures introduced and would be reassessed at the next monitoring stage.

8.4 Summary

The proposal has the potential to formulate and implement a travel plan aimed at actively encouraging greater reliance on sustainable modes of transport. While it's challenging to anticipate the specific measures that could be identified, the outlined initiatives offer a foundation for the site and the eventual implementation of a comprehensive GTP.

A detailed GTP will be developed in future stages prior to the opening.

9 Overview Construction Pedestrian and Traffic Management

9.1 Overview

This section seeks to provide an overview of the Construction Pedestrian and Traffic Management Plan (CPTMP) initiatives to be implemented as part of the construction works associated with the proposed development. Specifically, this overview CPTMP considers the following:

- truck routes to/ from the site
- anticipated truck volumes during construction stages
- construction site access arrangements
- works zone details
- pedestrian and cyclist access
- worker parking (if any)
- traffic control measures
- overview of CPTMP requirements.

The designated contractor(s) will formulate a detailed CPTMP outlining the measures for traffic and pedestrian management throughout all construction works.

The general principles of traffic management during construction activities includes:

- minimizing disruptions to pedestrian movements
- maintaining appropriate public transport access
- mitigating impacts on existing traffic along adjacent roads and intersections
- ensuring continued access to and from adjacent properties
- maintaining construction vehicle movements along designated routes to and from the site
- exercising control over construction vehicle activity in proximity to the site
- adhering to Council-approved hours of work for construction activities

9.2 Description of Works

Construction works are estimated to cover a period of about two years, with the early works and excavation planned to commence in July 2025 with completion around September 2027. The indicative staging is shown in **Table 14**.

TABLE 14: INDICATIVE CONSTRUCTION STAGING

Stage	Timeline	Duration
Excavation	July 2025 until February 2026	7 months
Piling	February 2026 until April 2026	14 months
Structure	March 2026 until December 2026	9 months
Façade	September 2026 until March 2027	6 months
Finishing	July 2026 until September 2027	14 months

9.3 Work Hours

The works will be carried out during the approved work hours. Indicative work hours are as follows:

- Weekdays: 7:00am – 5:00pm
- Saturdays: 8:00am – 5:00pm
- Sundays and public holidays: no work permitted.

Workers would be advised of the approved work hours during induction. Any works outside of the approved work hours would be subject to specific prior approval from the appropriate authorities. Such works may include delivery of cranes, large plant or equipment required on the site that require oversize vehicle access.

9.4 Worker Induction

All workers and subcontractors engaged on-site will be required to complete site induction. The induction will include permitted arrival and departure routes for all vehicle types, as well as standard environmental, work health and safety (WHS), driver protocols and emergency procedures.

Any workers required to undertake works or traffic control within the public domain will be suitably qualified and covered by all necessary insurances.

9.5 Site Access and Loading

Construction vehicle access will likely be provided via Kettle Street and/ or Walker Street. All loading is expected to take place within the bounds of the site or within approved on-street work zones. There may be opportunity to also have construction vehicles enter via Elizabeth Street and exit via either Kettle Street or Walker Street. Should a works zone(s) be required, an application will be made to the relevant authorities prior to commencement of works.

As part of the detailed CPTMP, Traffic Guidance Schemes will be prepared in accordance with the principles of the Traffic Control at Work Sites manual (TfNSW, 2020). Traffic Guidance Schemes primarily show where construction signs will be located at specific locations along the approved truck routes and at the construction site accesses to warn other road users of the increase in construction vehicle activity. Traffic controllers may be required to oversee the movement of construction vehicles when entering and exiting the construction site, with details to be confirmed in the CPTMP.

9.6 Construction Worker Parking

It is anticipated that there will be on average 100 workers on-site at one time, with up to 200 workers on-site during peak activities. These are initial estimates and subject to change based on the final site establishment, demolition and construction staging to be confirmed by the appointed contractor. Final worker numbers broken down by the construction stages will form part of detailed CPTMP.

No construction worker parking will be provided. During site induction, workers will also be informed of the range of high frequency public transport services within a practical walking distance of the site, with all workers encouraged to use public transport to access the site daily. Appropriate arrangements will be made for any equipment/ tool storage and drop-off requirements.

9.7 Heavy Vehicle Generation and Access Routes

Construction traffic will generally incorporate 12.5m heavy rigid vehicles, 18.1m truck and dog combinations and 19m articulated vehicles throughout all construction staging. This includes for the removal of spoil and transportation of material, delivery of structural beams and on concrete pour days.

Specific approval would be sought from relevant authorities for use of the above vehicles, if required. Any oversize vehicles using local roads to access the site would require additional Council and/ or TfNSW approval.

It is anticipated that construction works would generate 20 to 30 trucks per day equating to an average of about three to five trucks per hour. Peak construction works (such as concrete pours) are anticipated to generate a maximum of 50 trucks per day equating to about five to seven vehicles in any peak hour. Such low volumes would not materially affect intersection operation nor other road users along the approach and departure routes. It is also noted that wherever possible, construction vehicle movements will be minimised during the weekday morning and afternoon peak hours.

In this regard, the key construction vehicle approach and departure route incorporates the Phillip Street/ Morehead Street signalised intersection south-east of the site. The existing conditions SIDRA modelling confirmed that the intersection operates well with minimal queuing and delay for all approaches and an overall Level of Service A/B in any peak hour. Construction vehicles, especially those travelling outside the weekday peak hours, would therefore have a nominal overall impact. In addition, the volumes of construction vehicles will be substantially less than the estimated maximum 30 vehicle trips in any peak hour estimated to be generated by the development once complete.

9.8 Heavy Vehicle Access Routes

Heavy vehicle movements would be restricted to designated routes and confined to the arterial road network wherever feasible. Heavy vehicle routes to/ from the site have been identified with the aim of providing the most direct routes to/ from the site as well as minimising the impact of heavy vehicles on local roads.

The direction, distribution, and allocation of traffic arising from construction activities will be shaped by factors such as the origin and destination of materials, site access points and the surrounding arterial road network. It is expected that heavy vehicles will use the approach and departure routes as shown **Figure 17**. The key routes rely on the key motorways (M4, M5, M8) and Eastern Distributor with South Dowling Street, McEvoy Road and Euston Road combining to ensure appropriate travel paths, subject to authority approval.

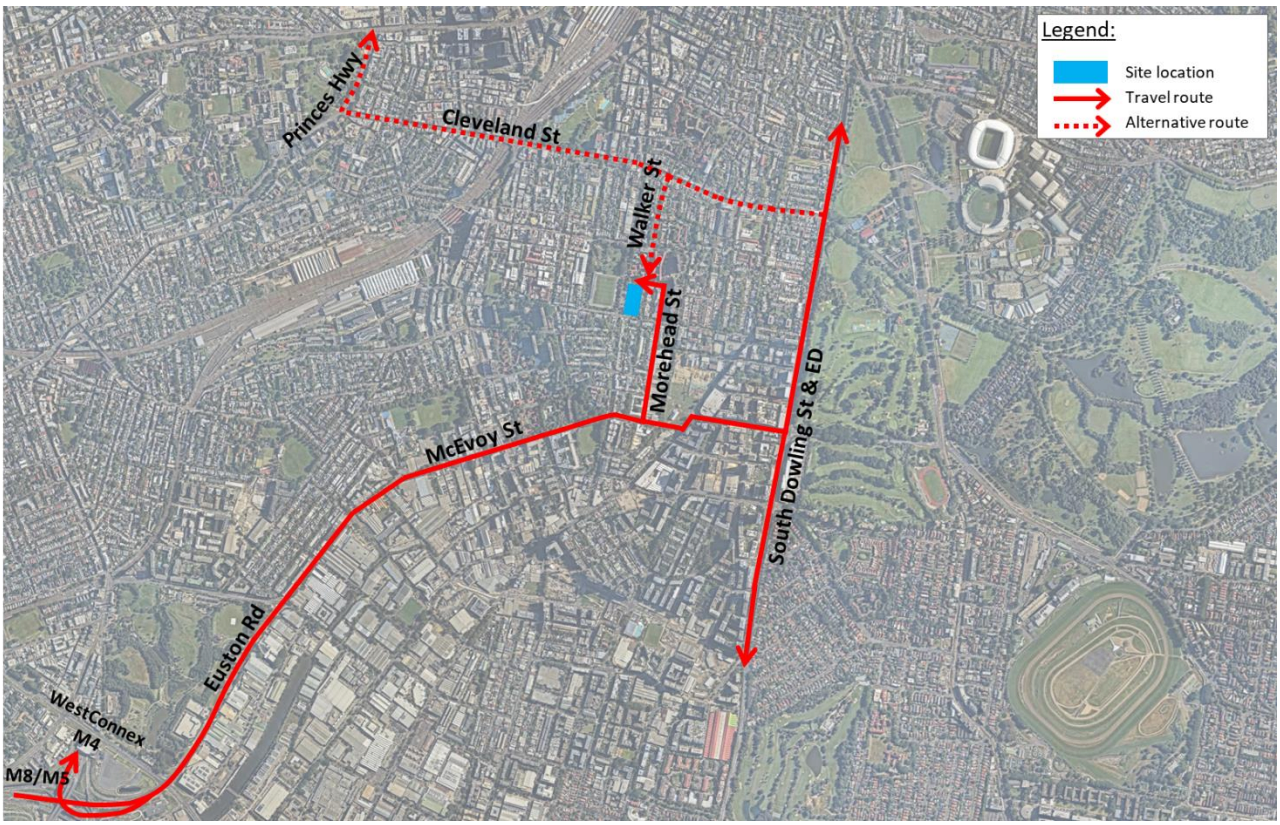


Figure 17: Anticipated Construction vehicle routes

9.9 Pedestrian and Cyclist Management

A combination of A-Class fencing, and B-Class hoardings will be installed around the perimeter of the site to maintain safe pedestrian and cyclist movement adjacent to the site. The CPTMP will detail how the construction impacts to pedestrian and cyclist movements will be minimised or any mitigation necessary to offset any such impacts.

Construction vehicle movements will be minimised during peak hours where practical to minimise the impact on pedestrians and cyclists.

10 Conclusion

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

- This traffic, transport and accessibility report has been prepared to support a State Significant Development for the proposed mixed-use development at 600-660 Elizabeth Street, Redfern and identified as Redfern Place.
- The proposal aims to deliver four separate buildings comprising a mix of social and affordable residential apartments and community-focused land uses across the block bounded on all sides by local and regional roads. This specifically includes 355 residential apartments, some commercial space and a new Police Citizens Youth Club to replace the existing facility on the site.
- The four buildings are well separated with generous public domain ensuring good permeability throughout while facilitating east-west and north-south pedestrian access and improved connections with surrounding pedestrian infrastructure.
- The existing and future public and active transport networks are more than sufficient in supporting the increase in public transport trips associated with the development. Metro Stage 2 services will commence in mid-2024 with Waterloo Metro Station within a practical walking distance. The bus network, existing heavy and light rail services also support such development in this part of Redfern.
- The proposed development generates a maximum allowable parking provision of 224 parking spaces based on LEP 2012. With the basement car park providing 66 parking spaces (including 18 accessible spaces) plus provision for bicycle parking, motorcycle parking and various service vehicles, the parking supply is appropriate having regard to the site's accessible location and known travel mode share of the area.
- The proposed development is required to provide up to seven loading bays if assessed against DCP 2012. Reference to the TfNSW Urban Freight Forecasting Model confirms the need for four on-site loading bays, including two vans/ utes and one each for small and medium rigid vehicles.
- The overall loading strategy includes dedicated use of five on-site bays (including the PCYC minibus bay) plus potential access to two on-street spaces along the key frontage streets. This equates to practical daily use of up to seven loading bays in and around the site. The proposed loading strategy positively responds to the challenges associated with facilitating service vehicle basement access given the significant restrictions presented by the flood levels, headroom clearance requirements, and impacts on overall site layout and design. The on-street loading zones would be subject to Local Pedestrian, Cycling and Traffic Calming Committee approval and not relied on to meet the daily demands of the proposed development.
- Current traffic volumes and intersection operation has been assessed to ensure a robust approach to ensure that the estimated traffic generation can be accommodated. Overall, the key study intersections are operating well with spare capacity and able to accommodate the anticipated 25 vehicle trips per hour generated by the proposal.
- The site access driveway, basement access ramp and basement parking and loading area layout has been designed in accordance with Council specifications and Australian Standards. All is expected to operate well, subject to detailed design noting that the access ramp has been designed considering Council's new 10.6m waste truck as the largest design vehicle. Council consultation has been ongoing as part of the Design Review Panel process, with support on the basement access ramp design and levels achieved for flood requirements.
- Bicycle parking has been provided in accordance with all relevant guidelines. The designated basement bicycle storage areas are of appropriate size and location to accommodate all secure resident and staff bicycle parking requirements. 52 bicycle racks for use by visitors are also provided across all four site frontages on the ground level in well-lit areas close to all building entrances.

- The proposal prioritises active modes of transportation and ensures well-connected pedestrian walkways within the vicinity. Specifically, the safe pedestrian link through the site aims to enhance accessibility and promote sustainable mobility.
- The proposed development would be able to further develop and utilise a detailed green travel plan in addition to that detailed as part of this transport assessment to actively promote increased use of sustainable transport modes, taking advantage of the site's location proximate to both established and near future public transport services.
- The anticipated construction traffic impact of the proposal is expected to be appropriately managed to minimise the impacts on pedestrians, cyclists and traffic. With no more than five to seven construction vehicles accessing the site during peak construction activities, the impacts would be minor and noticeably less than the moderate traffic volumes generated by the development once complete.
- Overall, the proposed development is well considered and supported from a transport and parking perspective.

Appendix A. SIDRA Outputs

MOVEMENT SUMMARY

Site: 101 [Elizabeth St - Redfern St (Site Folder: Existing AM)]

600-660 Elizabeth Street, Redfern
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Elizabeth Street														
1	L2	756	46	796	6.1	* 0.426	23.1	LOS B	14.1	103.5	0.66	0.76	0.66	28.4
Approach		756	46	796	6.1	0.426	23.1	LOS B	14.1	103.5	0.66	0.76	0.66	28.4
East: Redfern Street														
4	L2	6	0	6	0.0	0.430	53.4	LOS D	6.9	49.5	0.95	0.76	0.95	21.1
5	T1	116	3	122	2.6	* 0.430	50.0	LOS D	6.9	49.5	0.95	0.76	0.95	17.0
Approach		122	3	128	2.5	0.430	50.2	LOS D	6.9	49.5	0.95	0.76	0.95	17.3
North: Elizabeth Street														
7	L2	30	2	32	6.7	0.233	20.6	LOS B	5.5	42.2	0.56	0.51	0.56	33.8
8	T1	525	57	553	10.9	0.233	16.1	LOS B	6.8	52.4	0.57	0.49	0.57	37.2
9	R2	111	14	117	12.6	* 0.418	54.1	LOS D	6.3	48.6	0.94	0.79	0.94	19.3
Approach		666	73	701	11.0	0.418	22.6	LOS B	6.8	52.4	0.63	0.54	0.63	33.0
West: Redfern Street														
11	T1	84	7	88	8.3	0.133	26.2	LOS B	3.4	25.2	0.69	0.55	0.69	23.5
12	R2	65	4	68	6.2	0.158	36.9	LOS C	3.0	22.2	0.80	0.71	0.80	22.5
Approach		149	11	157	7.4	0.158	30.9	LOS C	3.4	25.2	0.74	0.62	0.74	23.0
All Vehicles		1693	133	1782	7.9	0.430	25.6	LOS B	14.1	103.5	0.67	0.66	0.67	28.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Elizabeth Street												
P1	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	223.1	219.5	0.98
East: Redfern Street												
P2	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	214.3	208.0	0.97
North: Elizabeth Street												
P3	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	218.9	214.0	0.98
West: Redfern Street												
P4	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	218.1	213.0	0.98

All Pedestrians	200	211	54.3	LOS E	0.2	0.2	0.95	0.95	218.6	213.6	0.98

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [Elizabeth St - Cleveland St (Site Folder: Existing AM)]

600-660 Elizabeth Street, Redfern
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Cleveland Street														
4	L2	78	5	82	6.4	0.484	13.2	LOS A	16.3	118.6	0.49	0.48	0.49	38.4
5	T1	1115	52	1174	4.7	0.484	8.6	LOS A	16.4	119.4	0.49	0.46	0.49	34.3
Approach		1193	57	1256	4.8	0.484	8.9	LOS A	16.4	119.4	0.49	0.46	0.49	34.7
North: Elizabeth Street														
7	L2	44	8	46	18.2	0.148	47.7	LOS D	2.3	18.3	0.86	0.73	0.86	20.7
8	T1	439	54	462	12.3	*0.769	52.0	LOS D	15.6	121.1	0.98	0.91	1.10	25.0
9	R2	180	5	189	2.8	0.709	53.4	LOS D	10.4	74.6	0.95	0.84	1.02	20.4
Approach		663	67	698	10.1	0.769	52.1	LOS D	15.6	121.1	0.96	0.88	1.06	23.6
West: Cleveland Street														
11	T1	918	39	966	4.2	0.739	11.8	LOS A	34.5	250.5	0.68	0.63	0.68	31.0
12	R2	143	8	151	5.6	*0.772	42.5	LOS C	8.9	65.3	0.84	0.93	1.07	22.6
Approach		1061	47	1117	4.4	0.772	16.0	LOS B	34.5	250.5	0.70	0.67	0.73	28.6
All Vehicles		2917	171	3071	5.9	0.772	21.3	LOS B	34.5	250.5	0.67	0.63	0.71	27.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Elizabeth Street												
P1	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	214.7	208.6	0.97
East: Cleveland Street												
P2	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	218.9	214.0	0.98
North: Elizabeth Street												
P3	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	216.9	211.4	0.97
West: Cleveland Street												
P4	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	218.9	214.0	0.98
All Pedestrians		200	211	54.3	LOS E	0.2	0.2	0.95	0.95	217.3	212.0	0.98

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [Elizabeth St - Phillip St (Site Folder: Existing AM)]

600 Elizabeth Street, Redfern
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Elizabeth Street														
1	L2	55	1	58	1.8	0.423	9.4	LOS A	10.8	79.1	0.33	0.34	0.33	50.6
2	T1	683	39	719	5.7	0.423	5.9	LOS A	13.0	95.1	0.39	0.41	0.39	49.4
3	R2	216	12	227	5.6	* 0.423	19.5	LOS B	13.0	95.1	0.65	0.69	0.65	29.3
Approach		954	52	1004	5.5	0.423	9.2	LOS A	13.0	95.1	0.45	0.47	0.45	44.9
East: Phillip Street														
4	L2	51	12	54	23.5	0.425	58.1	LOS E	5.0	40.1	0.96	0.77	0.96	14.6
5	T1	34	3	36	8.8	0.425	53.2	LOS D	5.0	40.1	0.96	0.77	0.96	17.8
6	R2	78	10	82	12.8	* 0.577	64.5	LOS E	4.9	37.9	1.00	0.79	1.02	15.6
Approach		163	25	172	15.3	0.577	60.2	LOS E	5.0	40.1	0.98	0.78	0.99	15.7
North: Elizabeth Street														
7	L2	88	17	93	19.3	0.081	8.3	LOS A	0.9	7.5	0.24	0.61	0.24	41.9
8	T1	501	46	527	9.2	* 0.594	28.6	LOS C	20.0	150.9	0.81	0.70	0.81	32.1
Approach		589	63	620	10.7	0.594	25.6	LOS B	20.0	150.9	0.72	0.69	0.72	33.0
West: Philip Street														
10	L2	5	0	5	0.0	0.061	59.1	LOS E	0.6	4.3	0.93	0.66	0.93	23.4
11	T1	15	0	16	0.0	0.239	55.8	LOS D	1.9	13.8	0.95	0.70	0.95	17.0
12	R2	23	1	24	4.3	0.239	62.5	LOS E	1.9	13.8	0.96	0.73	0.96	20.5
Approach		43	1	45	2.3	0.239	59.8	LOS E	1.9	13.8	0.96	0.71	0.96	19.7
All Vehicles		1749	141	1841	8.1	0.594	20.7	LOS B	20.0	150.9	0.60	0.58	0.60	34.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Elizabeth Street												
P1	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	216.6	211.0	0.97
East: Phillip Street												
P2	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	219.7	215.0	0.98
North: Elizabeth Street												
P3	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	219.7	215.0	0.98

West: Philip Street											
P4 Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	216.6	211.0	0.97
All Pedestrians	200	211	54.3	LOS E	0.2	0.2	0.95	0.95	218.1	213.0	0.98

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [Morehead Street-Phillip Street (Site Folder: Existing AM)]

600 Elizabeth Street, Redfern
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Morehead Street														
1	L2	36	2	38	5.6	0.246	43.5	LOS D	4.9	36.1	0.84	0.72	0.84	19.8
2	T1	43	2	45	4.7	* 0.246	38.9	LOS C	4.9	36.1	0.84	0.72	0.84	26.7
3	R2	20	2	21	10.0	0.246	43.5	LOS D	4.9	36.1	0.84	0.72	0.84	23.3
Approach		99	6	104	6.1	0.246	41.5	LOS C	4.9	36.1	0.84	0.72	0.84	23.4
East: Phillip Street														
4	L2	24	1	25	4.2	0.024	12.3	LOS A	0.6	4.1	0.37	0.60	0.37	41.7
5	T1	129	20	136	15.5	0.119	8.4	LOS A	2.9	23.2	0.40	0.34	0.40	29.8
6	R2	2	0	2	0.0	0.119	12.9	LOS A	2.9	23.2	0.40	0.34	0.40	37.1
Approach		155	21	163	13.5	0.119	9.0	LOS A	2.9	23.2	0.40	0.38	0.40	33.8
North: Morehead Street														
7	L2	4	1	4	25.0	0.050	42.4	LOS C	0.9	7.0	0.79	0.62	0.79	11.9
8	T1	12	0	13	0.0	0.050	36.6	LOS C	0.9	7.0	0.79	0.62	0.79	30.6
9	R2	3	2	3	66.7	0.050	42.9	LOS D	0.9	7.0	0.79	0.62	0.79	11.8
Approach		19	3	20	15.8	0.050	38.8	LOS C	0.9	7.0	0.79	0.62	0.79	23.3
West: Philip Street														
10	L2	38	1	40	2.6	0.050	12.5	LOS A	1.2	9.0	0.38	0.54	0.38	33.7
11	T1	270	24	284	8.9	0.252	9.1	LOS A	6.5	49.5	0.44	0.41	0.44	28.3
12	R2	11	2	12	18.2	* 0.252	13.6	LOS A	6.5	49.5	0.44	0.40	0.44	42.6
Approach		319	27	336	8.5	0.252	9.6	LOS A	6.5	49.5	0.43	0.42	0.43	30.3
All Vehicles		592	57	623	9.6	0.252	15.7	LOS B	6.5	49.5	0.50	0.47	0.50	27.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Morehead Street												
P1	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	216.3	210.6	0.97
East: Phillip Street												
P2	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	219.3	214.6	0.98
North: Morehead Street												

P3	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	216.3	210.6	0.97
West: Philip Street												
P4	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	217.3	211.9	0.98
All Pedestrians		200	211	54.3	LOS E	0.2	0.2	0.95	0.95	217.3	211.9	0.98

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [Cleveland St - Walker St - Wilton St (Site Folder: Existing AM)]

600 Elizabeth Street, Redfern
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Walker Street														
1	L2	63	1	66	1.6	0.361	59.7	LOS E	3.8	26.7	0.97	0.76	0.97	11.1
2	T1	34	1	36	2.9	* 0.403	56.6	LOS E	4.2	30.8	0.98	0.76	0.98	13.0
3	R2	36	3	38	8.3	0.403	60.1	LOS E	4.2	30.8	0.98	0.76	0.98	12.2
Approach		133	5	140	3.8	0.403	59.0	LOS E	4.2	30.8	0.98	0.76	0.98	11.9
East: Cleveland Street														
4	L2	24	1	25	4.2	0.446	8.5	LOS A	12.0	87.3	0.34	0.32	0.34	38.3
5	T1	1150	54	1211	4.7	0.446	4.1	LOS A	12.0	87.3	0.34	0.33	0.34	40.5
6	R2	24	1	25	4.2	* 0.446	8.9	LOS A	10.8	78.9	0.35	0.33	0.35	37.3
Approach		1198	56	1261	4.7	0.446	4.3	LOS A	12.0	87.3	0.34	0.33	0.34	40.3
West: Cleveland Street														
10	L2	45	0	47	0.0	0.359	8.2	LOS A	8.7	63.1	0.30	0.31	0.30	37.7
11	T1	911	47	959	5.2	0.359	3.7	LOS A	8.7	63.1	0.31	0.30	0.31	41.0
12	R2	12	0	13	0.0	0.359	8.4	LOS A	8.0	58.2	0.31	0.29	0.31	37.4
Approach		968	47	1019	4.9	0.359	3.9	LOS A	8.7	63.1	0.31	0.30	0.31	40.8
All Vehicles		2299	108	2420	4.7	0.446	7.3	LOS A	12.0	87.3	0.36	0.34	0.36	35.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Walker Street												
P1	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	217.3	211.9	0.98
East: Cleveland Street												
P2	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	219.8	215.2	0.98
North: Wilton Street												
P3	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	214.7	208.6	0.97
West: Cleveland Street												
P4	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	219.8	215.2	0.98
All Pedestrians		200	211	54.3	LOS E	0.2	0.2	0.95	0.95	217.9	212.7	0.98

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [Cleveland St - Walker St - Wilton St (Site Folder: Existing PM)]

600 Elizabeth Street, Redfern
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Walker Street														
1	L2	43	0	45	0.0	0.225	57.5	LOS E	2.5	17.4	0.95	0.73	0.95	11.4
2	T1	37	0	39	0.0	* 0.467	55.9	LOS D	5.4	38.1	0.98	0.77	0.98	13.0
3	R2	54	0	57	0.0	0.467	59.4	LOS E	5.4	38.1	0.98	0.77	0.98	12.4
Approach		134	0	141	0.0	0.467	57.8	LOS E	5.4	38.1	0.97	0.76	0.97	12.3
East: Cleveland Street														
4	L2	29	0	31	0.0	0.456	8.8	LOS A	12.9	91.9	0.35	0.34	0.35	37.8
5	T1	1145	23	1205	2.0	0.456	4.4	LOS A	12.9	91.9	0.36	0.35	0.36	39.8
6	R2	30	0	32	0.0	* 0.456	9.2	LOS A	11.1	79.0	0.36	0.35	0.36	36.8
Approach		1204	23	1267	1.9	0.456	4.7	LOS A	12.9	91.9	0.36	0.35	0.36	39.6
West: Cleveland Street														
10	L2	47	0	49	0.0	0.398	8.7	LOS A	10.5	74.5	0.33	0.33	0.33	37.2
11	T1	970	17	1021	1.8	0.398	4.3	LOS A	10.5	74.5	0.34	0.33	0.34	39.9
12	R2	22	0	23	0.0	0.398	9.2	LOS A	9.1	64.8	0.35	0.33	0.35	36.1
Approach		1039	17	1094	1.6	0.398	4.6	LOS A	10.5	74.5	0.34	0.33	0.34	39.7
All Vehicles		2377	40	2502	1.7	0.467	7.6	LOS A	12.9	91.9	0.38	0.36	0.38	34.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Walker Street												
P1	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	217.3	211.9	0.98
East: Cleveland Street												
P2	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	219.8	215.2	0.98
North: Wilton Street												
P3	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	214.7	208.6	0.97
West: Cleveland Street												
P4	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	219.8	215.2	0.98
All Pedestrians		200	211	54.3	LOS E	0.2	0.2	0.95	0.95	217.9	212.7	0.98

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [Elizabeth St - Cleveland St (Site Folder: Existing PM)]

600-660 Elizabeth Street, Redfern
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Cleveland Street														
4	L2	42	1	44	2.4	0.897	55.7	LOS D	40.2	286.5	1.00	1.04	1.18	19.5
5	T1	1141	22	1201	1.9	* 0.897	51.1	LOS D	40.4	287.3	1.00	1.04	1.18	13.7
Approach		1183	23	1245	1.9	0.897	51.3	LOS D	40.4	287.3	1.00	1.04	1.18	13.9
North: Elizabeth Street														
7	L2	75	7	79	9.3	0.159	37.7	LOS C	3.4	25.6	0.77	0.73	0.77	23.7
8	T1	757	54	797	7.1	* 0.905	59.0	LOS E	32.7	243.2	0.96	1.06	1.25	23.5
9	R2	272	2	286	0.7	0.847	53.5	LOS D	16.4	115.6	0.89	0.91	1.12	20.4
Approach		1104	63	1162	5.7	0.905	56.2	LOS D	32.7	243.2	0.93	1.00	1.19	22.8
West: Cleveland Street														
11	T1	957	10	1007	1.0	0.753	21.3	LOS B	36.3	256.2	0.82	0.76	0.83	23.6
12	R2	175	2	184	1.1	* 0.753	41.8	LOS C	14.4	101.5	0.99	0.94	1.04	23.5
Approach		1132	12	1192	1.1	0.753	24.4	LOS B	36.3	256.2	0.85	0.79	0.86	23.6
All Vehicles		3419	98	3599	2.9	0.905	44.0	LOS D	40.4	287.3	0.93	0.94	1.08	20.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Elizabeth Street												
P1	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	214.7	208.6	0.97
East: Cleveland Street												
P2	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	218.9	214.0	0.98
North: Elizabeth Street												
P3	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	216.9	211.4	0.97
West: Cleveland Street												
P4	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	218.9	214.0	0.98
All Pedestrians		200	211	54.3	LOS E	0.2	0.2	0.95	0.95	217.3	212.0	0.98

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [Elizabeth St - Redfern St (Site Folder: Existing PM)]

600-660 Elizabeth Street, Redfern
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Elizabeth Street														
1	L2	561	31	591	5.5	0.413	32.3	LOS C	12.3	90.4	0.77	0.78	0.77	24.5
Approach		561	31	591	5.5	0.413	32.3	LOS C	12.3	90.4	0.77	0.78	0.77	24.5
East: Redfern Street														
4	L2	18	0	19	0.0	0.413	48.1	LOS D	8.4	58.8	0.91	0.75	0.91	22.3
5	T1	138	0	145	0.0	* 0.413	44.7	LOS D	8.4	58.8	0.91	0.75	0.91	18.1
Approach		156	0	164	0.0	0.413	45.1	LOS D	8.4	58.8	0.91	0.75	0.91	18.6
North: Elizabeth Street														
7	L2	41	0	43	0.0	0.418	22.5	LOS B	8.7	63.1	0.61	0.56	0.61	32.9
8	T1	830	48	874	5.8	* 0.418	18.6	LOS B	14.2	104.1	0.64	0.56	0.64	35.8
9	R2	153	11	161	7.2	0.383	46.0	LOS D	7.9	59.0	0.88	0.79	0.88	21.2
Approach		1024	59	1078	5.8	0.418	22.9	LOS B	14.2	104.1	0.67	0.59	0.67	33.0
West: Redfern Street														
11	T1	106	0	112	0.0	0.152	25.1	LOS B	4.2	29.2	0.68	0.55	0.68	23.9
12	R2	101	1	106	1.0	* 0.247	36.9	LOS C	4.7	33.5	0.82	0.74	0.82	22.5
Approach		207	1	218	0.5	0.247	30.8	LOS C	4.7	33.5	0.75	0.64	0.75	23.2
All Vehicles		1948	91	2051	4.7	0.418	28.2	LOS B	14.2	104.1	0.73	0.67	0.73	28.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Elizabeth Street												
P1	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	223.1	219.5	0.98
East: Redfern Street												
P2	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	214.3	208.0	0.97
North: Elizabeth Street												
P3	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	218.9	214.0	0.98
West: Redfern Street												
P4	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	218.1	213.0	0.98

All Pedestrians	200	211	54.3	LOS E	0.2	0.2	0.95	0.95	218.6	213.6	0.98

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [Elizabeth St - Phillip St (Site Folder: Existing PM)]

600 Elizabeth Street, Redfern
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Elizabeth Street														
1	L2	39	0	41	0.0	0.365	9.1	LOS A	8.7	63.8	0.31	0.31	0.31	51.2
2	T1	474	27	499	5.7	0.365	3.6	LOS A	8.7	63.8	0.31	0.31	0.31	53.5
3	R2	243	5	256	2.1	* 0.484	33.7	LOS C	12.0	85.8	0.88	0.87	0.88	20.7
Approach		756	32	796	4.2	0.484	13.5	LOS A	12.0	85.8	0.49	0.49	0.49	39.8
East: Phillip Street														
4	L2	47	4	49	8.5	0.398	58.6	LOS E	4.9	35.4	0.96	0.77	0.96	14.9
5	T1	36	0	38	0.0	0.398	53.6	LOS D	4.9	35.4	0.96	0.77	0.96	17.7
6	R2	85	7	89	8.2	* 0.616	65.0	LOS E	5.4	40.2	1.00	0.80	1.05	15.6
Approach		168	11	177	6.5	0.616	60.8	LOS E	5.4	40.2	0.98	0.78	1.01	15.8
North: Elizabeth Street														
7	L2	119	6	125	5.0	0.119	13.3	LOS A	2.4	17.6	0.44	0.66	0.44	36.9
8	T1	833	46	877	5.5	* 0.717	20.1	LOS B	31.4	230.0	0.76	0.68	0.76	37.3
Approach		952	52	1002	5.5	0.717	19.2	LOS B	31.4	230.0	0.72	0.68	0.72	37.3
West: Philip Street														
10	L2	3	0	3	0.0	0.056	59.1	LOS E	0.6	4.0	0.93	0.65	0.93	23.7
11	T1	16	0	17	0.0	0.221	55.6	LOS D	1.8	12.5	0.95	0.69	0.95	17.2
12	R2	21	0	22	0.0	0.221	62.3	LOS E	1.8	12.5	0.96	0.72	0.96	20.6
Approach		40	0	42	0.0	0.221	59.4	LOS E	1.8	12.5	0.95	0.70	0.95	19.6
All Vehicles		1916	95	2017	5.0	0.717	21.5	LOS B	31.4	230.0	0.66	0.62	0.66	34.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Elizabeth Street												
P1	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	216.6	211.0	0.97
East: Phillip Street												
P2	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	219.7	215.0	0.98
North: Elizabeth Street												
P3	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	219.7	215.0	0.98

West: Philip Street											
P4 Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	216.6	211.0	0.97
All Pedestrians	200	211	54.3	LOS E	0.2	0.2	0.95	0.95	218.1	213.0	0.98

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [Morehead Street-Phillip Street (Site Folder: Existing PM)]

600 Elizabeth Street, Redfern
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Morehead Street														
1	L2	21	0	22	0.0	0.239	55.9	LOS D	2.9	20.2	0.93	0.74	0.93	17.4
2	T1	15	0	16	0.0	*0.239	51.4	LOS D	2.9	20.2	0.93	0.74	0.93	23.3
3	R2	15	0	16	0.0	0.239	55.9	LOS D	2.9	20.2	0.93	0.74	0.93	20.1
Approach		51	0	54	0.0	0.239	54.6	LOS D	2.9	20.2	0.93	0.74	0.93	19.9
East: Phillip Street														
4	L2	47	1	49	2.1	0.035	8.0	LOS A	0.7	4.8	0.25	0.62	0.25	45.7
5	T1	133	11	140	8.3	0.100	3.7	LOS A	2.0	15.2	0.27	0.23	0.27	41.5
6	R2	1	0	1	0.0	0.100	8.2	LOS A	2.0	15.2	0.27	0.23	0.27	45.0
Approach		181	12	191	6.6	0.100	4.8	LOS A	2.0	15.2	0.26	0.33	0.26	43.8
North: Morehead Street														
7	L2	6	0	6	0.0	0.154	56.1	LOS D	1.8	12.9	0.92	0.70	0.92	10.2
8	T1	18	0	19	0.0	0.154	50.6	LOS D	1.8	12.9	0.92	0.70	0.92	25.6
9	R2	9	0	9	0.0	0.154	56.1	LOS D	1.8	12.9	0.92	0.70	0.92	10.2
Approach		33	0	35	0.0	0.154	53.1	LOS D	1.8	12.9	0.92	0.70	0.92	18.3
West: Philip Street														
10	L2	26	0	27	0.0	0.048	8.1	LOS A	1.0	6.8	0.26	0.37	0.26	42.2
11	T1	329	9	346	2.7	0.241	4.1	LOS A	5.4	38.6	0.30	0.31	0.30	38.6
12	R2	26	0	27	0.0	*0.241	8.6	LOS A	5.4	38.6	0.31	0.30	0.31	49.1
Approach		381	9	401	2.4	0.241	4.7	LOS A	5.4	38.6	0.30	0.32	0.30	40.7
All Vehicles		646	21	680	3.3	0.241	11.1	LOS A	5.4	38.6	0.37	0.37	0.37	31.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Morehead Street												
P1	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	216.3	210.6	0.97
East: Phillip Street												
P2	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	219.3	214.6	0.98
North: Morehead Street												

P3	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	216.3	210.6	0.97
West: Philip Street												
P4	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	217.3	211.9	0.98
All Pedestrians		200	211	54.3	LOS E	0.2	0.2	0.95	0.95	217.3	211.9	0.98

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [Morehead Street-Phillip Street (Site Folder: AM Post development)]

600 Elizabeth Street, Redfern
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Morehead Street														
1	L2	36	2	38	5.6	0.249	43.5	LOS D	4.9	36.4	0.84	0.72	0.84	19.8
2	T1	44	2	46	4.5	* 0.249	38.9	LOS C	4.9	36.4	0.84	0.72	0.84	26.7
3	R2	20	2	21	10.0	0.249	43.5	LOS D	4.9	36.4	0.84	0.72	0.84	23.3
Approach		100	6	105	6.0	0.249	41.5	LOS C	4.9	36.4	0.84	0.72	0.84	23.5
East: Phillip Street														
4	L2	24	1	25	4.2	0.024	12.3	LOS A	0.6	4.2	0.37	0.60	0.37	41.7
5	T1	129	20	136	15.5	0.121	8.4	LOS A	3.0	23.3	0.40	0.35	0.40	29.7
6	R2	3	0	3	0.0	0.121	12.9	LOS A	3.0	23.3	0.40	0.34	0.40	37.0
Approach		156	21	164	13.5	0.121	9.1	LOS A	3.0	23.3	0.40	0.39	0.40	33.8
North: Morehead Street														
7	L2	6	1	6	16.7	0.076	42.6	LOS D	1.4	10.7	0.80	0.64	0.80	11.9
8	T1	20	0	21	0.0	0.076	36.9	LOS C	1.4	10.7	0.80	0.64	0.80	30.5
9	R2	4	2	4	50.0	0.076	43.0	LOS D	1.4	10.7	0.80	0.64	0.80	11.8
Approach		30	3	32	10.0	0.076	38.8	LOS C	1.4	10.7	0.80	0.64	0.80	23.9
West: Philip Street														
10	L2	40	1	42	2.5	0.051	12.5	LOS A	1.2	9.0	0.38	0.55	0.38	33.6
11	T1	270	24	284	8.9	0.253	9.1	LOS A	6.6	49.8	0.44	0.41	0.44	28.3
12	R2	11	2	12	18.2	* 0.253	13.6	LOS A	6.6	49.8	0.44	0.40	0.44	42.6
Approach		321	27	338	8.4	0.253	9.7	LOS A	6.6	49.8	0.43	0.42	0.43	30.3
All Vehicles		607	57	639	9.4	0.253	16.2	LOS B	6.6	49.8	0.51	0.47	0.51	27.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Morehead Street												
P1	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	216.3	210.6	0.97
East: Phillip Street												
P2	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	219.3	214.6	0.98
North: Morehead Street												

P3	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	216.3	210.6	0.97
West: Philip Street												
P4	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	217.3	211.9	0.98
All Pedestrians		200	211	54.3	LOS E	0.2	0.2	0.95	0.95	217.3	211.9	0.98

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [Elizabeth St - Redfern St (Site Folder: AM Post development)]

600-660 Elizabeth Street, Redfern
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Elizabeth Street														
1	L2	756	46	796	6.1	* 0.433	23.8	LOS B	14.3	105.4	0.67	0.76	0.67	28.0
Approach		756	46	796	6.1	0.433	23.8	LOS B	14.3	105.4	0.67	0.76	0.67	28.0
East: Redfern Street														
4	L2	6	0	6	0.0	0.425	52.5	LOS D	7.1	51.0	0.94	0.76	0.94	21.3
5	T1	121	3	127	2.5	* 0.425	49.1	LOS D	7.1	51.0	0.94	0.76	0.94	17.2
Approach		127	3	134	2.4	0.425	49.3	LOS D	7.1	51.0	0.94	0.76	0.94	17.4
North: Elizabeth Street														
7	L2	30	2	32	6.7	0.239	21.1	LOS B	5.6	42.8	0.57	0.52	0.57	33.5
8	T1	525	57	553	10.9	0.239	16.7	LOS B	7.0	53.7	0.58	0.50	0.58	36.9
9	R2	111	14	117	12.6	* 0.418	54.1	LOS D	6.3	48.6	0.94	0.79	0.94	19.3
Approach		666	73	701	11.0	0.418	23.1	LOS B	7.0	53.7	0.64	0.55	0.64	32.8
West: Redfern Street														
11	T1	85	7	89	8.2	0.132	25.5	LOS B	3.4	25.2	0.68	0.55	0.68	23.7
12	R2	65	4	68	6.2	0.155	36.0	LOS C	3.0	21.9	0.79	0.71	0.79	22.7
Approach		150	11	158	7.3	0.155	30.1	LOS C	3.4	25.2	0.73	0.62	0.73	23.3
All Vehicles		1699	133	1788	7.8	0.433	26.0	LOS B	14.3	105.4	0.68	0.67	0.68	28.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Elizabeth Street												
P1	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	223.1	219.5	0.98
East: Redfern Street												
P2	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	214.3	208.0	0.97
North: Elizabeth Street												
P3	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	218.9	214.0	0.98
West: Redfern Street												
P4	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	218.1	213.0	0.98

All Pedestrians	200	211	54.3	LOS E	0.2	0.2	0.95	0.95	218.6	213.6	0.98

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [Elizabeth St - Redfern St (Site Folder: PM Post development)]

600-660 Elizabeth Street, Redfern
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Elizabeth Street														
1	L2	561	31	591	5.5	0.397	30.7	LOS C	12.0	87.8	0.75	0.78	0.75	25.1
Approach		561	31	591	5.5	0.397	30.7	LOS C	12.0	87.8	0.75	0.78	0.75	25.1
East: Redfern Street														
4	L2	18	0	19	0.0	0.416	48.1	LOS D	8.5	59.2	0.91	0.75	0.91	22.3
5	T1	139	0	146	0.0	*0.416	44.7	LOS D	8.5	59.2	0.91	0.75	0.91	18.1
Approach		157	0	165	0.0	0.416	45.1	LOS D	8.5	59.2	0.91	0.75	0.91	18.6
North: Elizabeth Street														
7	L2	42	0	44	0.0	0.427	23.1	LOS B	8.8	64.1	0.62	0.56	0.62	32.5
8	T1	830	48	874	5.8	*0.427	19.3	LOS B	14.5	106.5	0.65	0.57	0.65	35.4
9	R2	153	11	161	7.2	0.412	47.9	LOS D	8.1	60.5	0.90	0.80	0.90	20.7
Approach		1025	59	1079	5.8	0.427	23.7	LOS B	14.5	106.5	0.69	0.60	0.69	32.6
West: Redfern Street														
11	T1	110	0	116	0.0	0.155	24.4	LOS B	4.3	29.9	0.68	0.55	0.68	24.2
12	R2	101	1	106	1.0	*0.240	36.7	LOS C	4.7	33.4	0.82	0.74	0.82	22.5
Approach		211	1	222	0.5	0.240	30.3	LOS C	4.7	33.4	0.74	0.64	0.74	23.3
All Vehicles		1954	91	2057	4.7	0.427	28.2	LOS B	14.5	106.5	0.73	0.67	0.73	28.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Elizabeth Street												
P1	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	223.1	219.5	0.98
East: Redfern Street												
P2	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	214.3	208.0	0.97
North: Elizabeth Street												
P3	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	218.9	214.0	0.98
West: Redfern Street												
P4	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	218.1	213.0	0.98

All Pedestrians	200	211	54.3	LOS E	0.2	0.2	0.95	0.95	218.6	213.6	0.98

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [Morehead Street-Phillip Street (Site Folder: PM Post development)]

600 Elizabeth Street, Redfern
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Morehead Street														
1	L2	21	0	22	0.0	0.241	54.9	LOS D	3.1	21.6	0.93	0.74	0.93	17.6
2	T1	19	0	20	0.0	* 0.241	50.4	LOS D	3.1	21.6	0.93	0.74	0.93	23.6
3	R2	15	0	16	0.0	0.241	54.9	LOS D	3.1	21.6	0.93	0.74	0.93	20.3
Approach		55	0	58	0.0	0.241	53.4	LOS D	3.1	21.6	0.93	0.74	0.93	20.3
East: Phillip Street														
4	L2	47	1	49	2.1	0.036	8.3	LOS A	0.7	5.0	0.26	0.62	0.26	45.4
5	T1	133	11	140	8.3	0.101	4.0	LOS A	2.1	15.7	0.28	0.23	0.28	40.6
6	R2	1	0	1	0.0	0.101	8.5	LOS A	2.1	15.7	0.28	0.23	0.28	44.5
Approach		181	12	191	6.6	0.101	5.1	LOS A	2.1	15.7	0.27	0.33	0.27	43.3
North: Morehead Street														
7	L2	6	0	6	0.0	0.159	55.2	LOS D	2.0	13.9	0.91	0.71	0.91	10.3
8	T1	20	0	21	0.0	0.159	49.6	LOS D	2.0	13.9	0.91	0.71	0.91	25.9
9	R2	10	0	11	0.0	0.159	55.1	LOS D	2.0	13.9	0.91	0.71	0.91	10.3
Approach		36	0	38	0.0	0.159	52.1	LOS D	2.0	13.9	0.91	0.71	0.91	18.7
West: Philip Street														
10	L2	33	0	35	0.0	0.050	8.3	LOS A	1.0	7.2	0.26	0.42	0.26	41.0
11	T1	329	9	346	2.7	0.251	4.4	LOS A	5.7	40.8	0.31	0.32	0.31	37.6
12	R2	26	0	27	0.0	* 0.251	9.0	LOS A	5.7	40.8	0.32	0.31	0.32	48.7
Approach		388	9	408	2.3	0.251	5.1	LOS A	5.7	40.8	0.31	0.33	0.31	39.8
All Vehicles		660	21	695	3.2	0.251	11.7	LOS A	5.7	40.8	0.38	0.39	0.38	30.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Effective Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Morehead Street												
P1	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	216.3	210.6	0.97
East: Phillip Street												
P2	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	219.3	214.6	0.98
North: Morehead Street												

P3	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	216.3	210.6	0.97
West: Philip Street												
P4	Full	50	53	54.3	LOS E	0.2	0.2	0.95	0.95	217.3	211.9	0.98
All Pedestrians		200	211	54.3	LOS E	0.2	0.2	0.95	0.95	217.3	211.9	0.98

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

Appendix B. Vehicle Swept Paths

Refer to Landscape Drawings

RL+32,700

RL+32,700

RL+31,130

5,400

RL+30,870

Indicated Intercom Location

Indicated Car Park Exhaust

Kettle Street

32,400

8,450

8,450

4,700

+30,720

+30,850

+31,020

4,567

Walker Street

75,100

E
S2.A06/01

5,440

N
S2.A06/02

D

E

10.604

1.862 4.5 5.175

VEHICLE ENVELOPE
300mm CLEARANCE
600mm CLEARANCE

10.6m City of Sydney Waste Vehicle

Overall Length	10.604m
Overall Width	2.500m
Overall Body Height	3.800m
Min Body Ground Clearance	0.372m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	10.500m

B99 Vehicle (AS/NZS2890.1:2004)

5.2

0.95 3.05

VEHICLE ENVELOPE
300mm CLEARANCE
500mm CLEARANCE

Overall Length	5.200m
Overall Width	1.940m
Overall Body Height	2.200m
Min Body Ground Clearance	0.312m
Track Width	1.840m
Lock to Lock Time	4.00 sec
Curb to Curb Turning Radius	6.30m

GENERAL NOTES

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DESIGNED	Isaac Obermaier
PAPER SIZE	A3
APPROVED BY	R. Hazell
DATE	12.06.2024
SCALE	1:250
	0 2.5 5

CLIENT
Hickory

PROJECT
2434
600-660 Elizabeth Street, Redfern

DOCUMENT INFORMATION
Design Review
Site Access Design

FILE NAME	SHEET
AG2434-01-v17.dwg	AG01

asongroup
Suite 17.02, Level 17, 1 Castlereagh St
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Refer to Landscape Drawings

RL+32,700

RL+32,700

RL+31,130

RL+30,870

5,400

Kettle Street

32,400

Indicated Intercom Location

Indicated Car Park Exhaust

8,450

8,450

4,700

+30,720

+30,850

+31,020

4,567

10.6m City of Sydney Waste Vehicle

Walker Street

75,100

E
S2.A06/01

5,440

N
S2.A06/02

D

E

10.604

1.882 4.5 5.175

VEHICLE ENVELOPE
300mm CLEARANCE
600mm CLEARANCE

10.6m City of Sydney Waste Vehicle

Overall Length	10.604m
Overall Width	2.500m
Overall Body Height	3.800m
Min Body Ground Clearance	0.372m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	10.500m

B99 Vehicle (AS/NZS2890.1:2004)

5.2

0.95 3.05

VEHICLE ENVELOPE
300mm CLEARANCE
500mm CLEARANCE

Overall Length	5.200m
Overall Width	1.940m
Overall Body Height	2.200m
Min Body Ground Clearance	0.312m
Track Width	1.840m
Lock to Lock Time	4.00 sec
Curb to Curb Turning Radius	6.30m

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	0 2.5 5

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PROJECT: 2434

600-660 Elizabeth Street, Redfern

DOCUMENT INFORMATION

Design Review

Site Access Design

FILE NAME	SHEET
AG2434-01-v17.dwg	AG02

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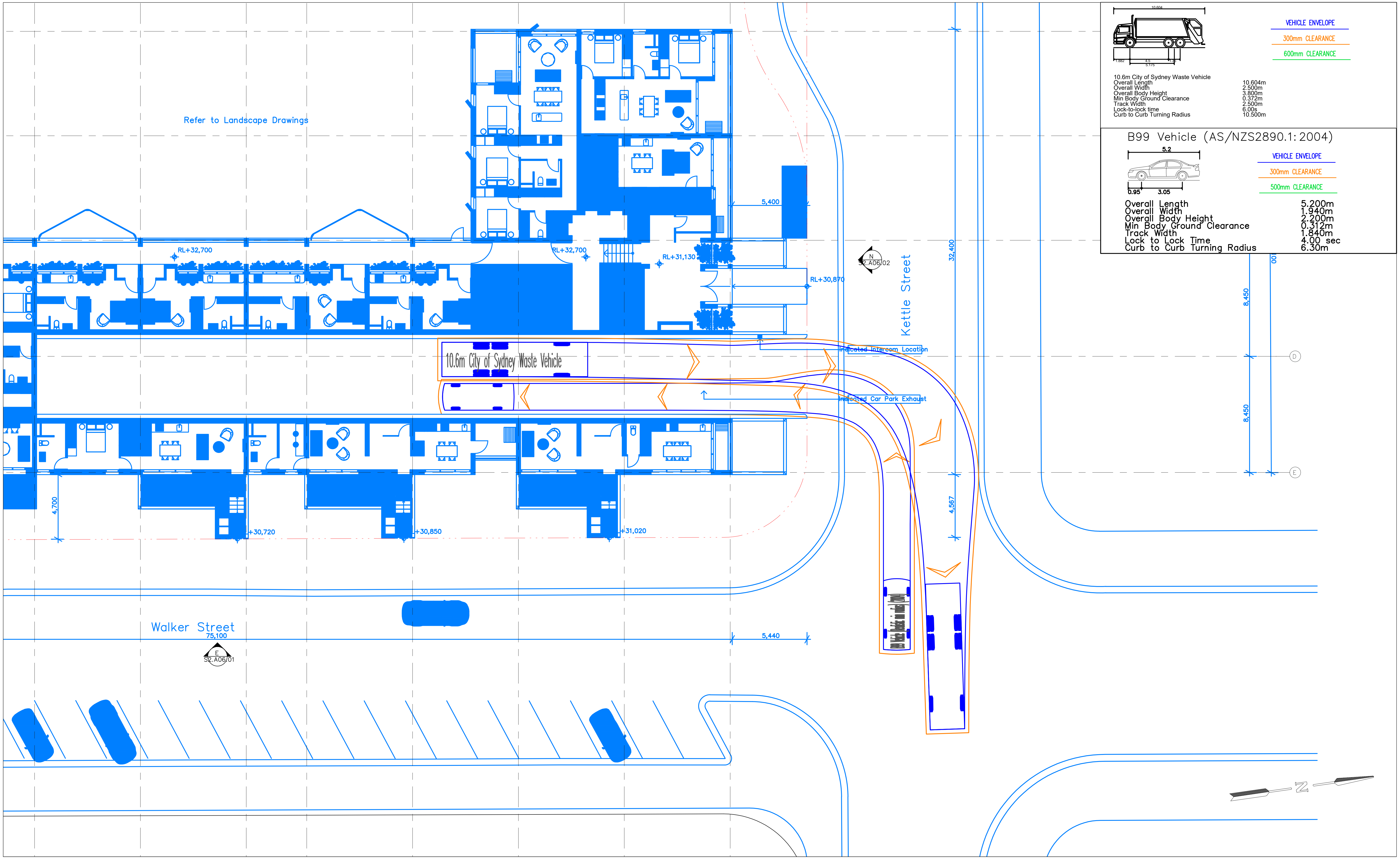

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APPROVED BY	DATE
R. Hazell	12.06.2024
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1:250	0 2.5 5

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600-660 Elizabeth Street, Redfern

DOCUMENT INFORMATION

Design Review

Site Access Design

FILE NAME	SHEET
AG2434-01-v17.dwg	AG03

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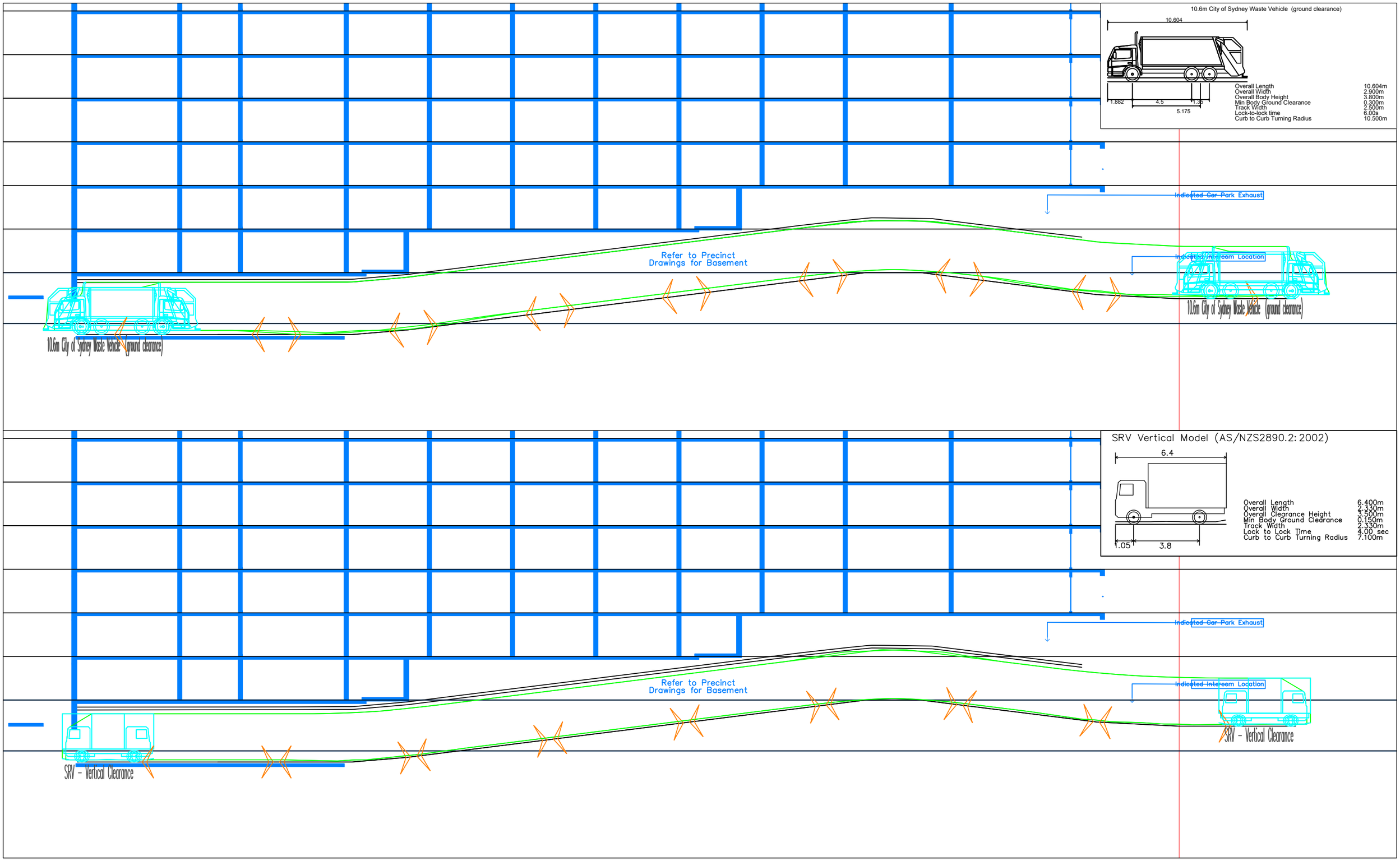

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PROJECT
2434
600-660 Elizabeth Street, Redfern

DOCUMENT INFORMATION
Design Review
Vehicle Access Ramp Vertical Check

FILE NAME	SHEET
AG2434-01-v17.dwg	AG04

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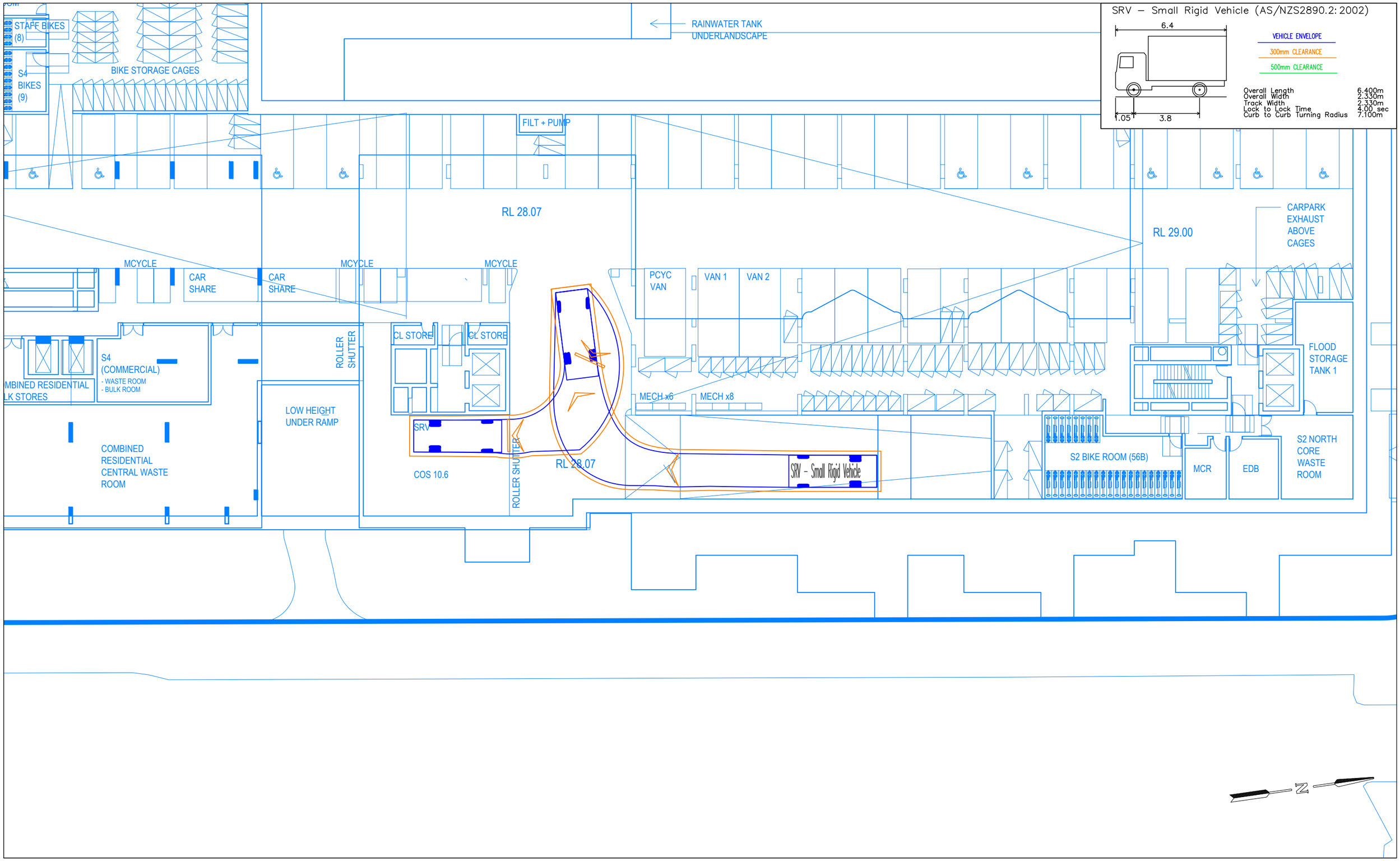

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DATE	12.06.2024
SCALE	1:250
	0 2.5 5

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PROJECT
2434
600-660 Elizabeth Street, Redfern

DOCUMENT INFORMATION
Design Review
Basement movement review

FILE NAME	SHEET
AG2434-01-v17.dwg	AG05

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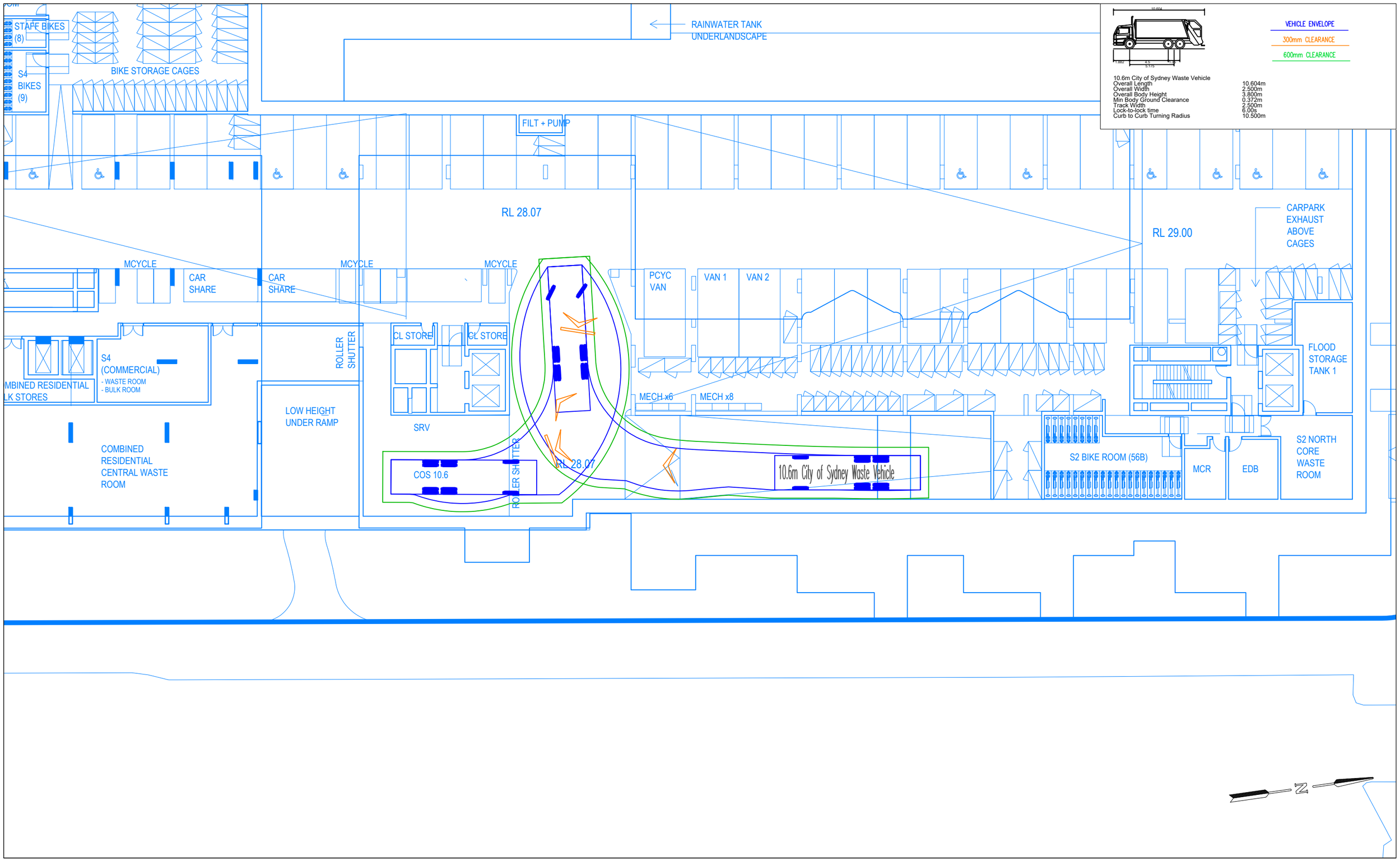

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PAPER SIZE	A3
APPROVED BY	R. Hazell
DATE	12.06.2024
SCALE	1:250
	0 2.5 5

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PROJECT
2434
600-660 Elizabeth Street, Redfern

DOCUMENT INFORMATION
Design Review
Basement movement review

FILE NAME	SHEET
AG2434-01-v17.dwg	AG06

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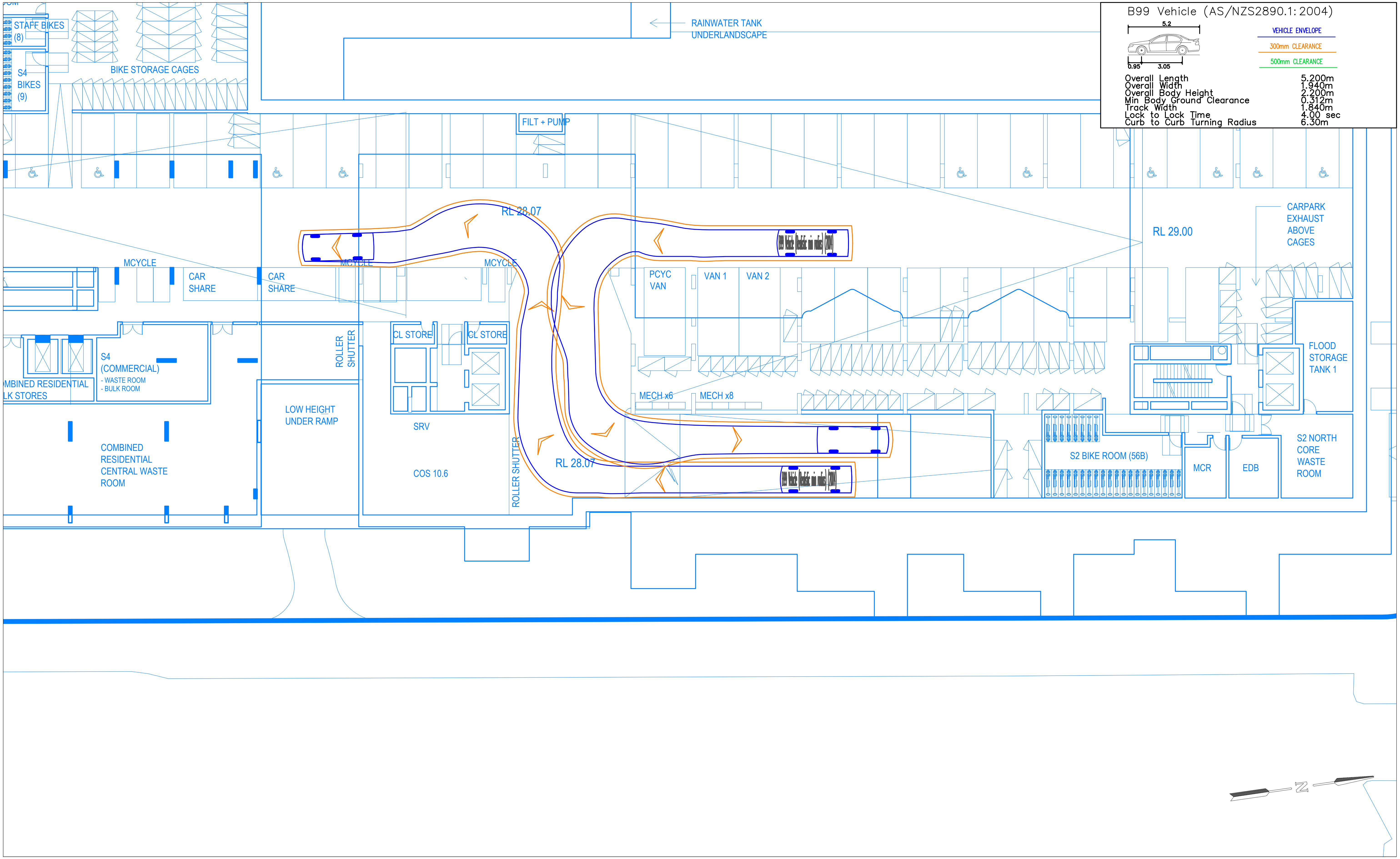

GENERAL NOTES

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DESIGNED Isaac Obermaier	PAPER SIZE A3	CLIENT Hickory	DOCUMENT INFORMATION Design Review Basement movement review
APPROVED BY R. Hazell	DATE 12.06.2024	PROJECT 2434 600-660 Elizabeth Street, Redfern	
SCALE 1:250	0 2.5 5		FILE NAME AG2434-01-v17.dwg
			SHEET AG07

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