

SSD-89869959
Proposed Mixed-Use Development, including In-fill Affordable Housing

**10 Dangar Street,
Wickham**

TRAFFIC AND PARKING ASSESSMENT REPORT



17 April 2026

Ref 25325

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1.0 INTRODUCTION

1.1 Introduction

This report is submitted to the *Department of Planning, Housing and Infrastructure* (DPHI) on behalf *UPG Wickham Pty. Ltd.* (UPG) (the Applicant), to support a State Significant Development Application (SSDA) and concurrent Rezoning Report for the construction of a 43-storey mixed-use development at 10 Dangar Street, Wickham (the site), as seen in Figures 1 and 2.

The site is located within the Newcastle local government area (LGA) and occupies a prominent corner position immediately north of the Newcastle Interchange.

The project has been selected by the *NSW Housing Delivery Authority* (HDA) as a key development to help accelerate the delivery of well-located, diverse and affordable housing in New South Wales. Commencing in early 2025, the HDA plays a coordinating role across government agencies, focusing on unlocking complex sites through strategic planning, infrastructure coordination, and streamlined assessment pathways.

Following the Applicant's expression of interest (EOI 240837), the HDA considered and recommended to the *Minister for Planning and Public Spaces* (the Minister) that the project be declared SSD under Section 4.36(3) of the *Environmental Planning and Assessment Act 1979* (EP&A Act) on 23 June 2025.

Following this recommendation, the development was declared by the Minister to be SSD pursuant to the *State Significant Development Declaration Order 2025 (No 10), Part 2, Section 1(a)*, dated 30 June 2025.

1.2 Project Background

The site was identified under the *Wickham Master Plan 2017* as a strategically significant location for increased development capacity, given its proximity to the Newcastle Interchange and its potential to support high-density, mixed-use development.

The Master Plan proposed an uplift in planning controls, increasing the permissible building height from 45m to 60m, and the FSR from 5:1 to 6:1, subject to the delivery of public domain improvements, including a 3-metre southern setback adjacent to the transport interchange.

This strategic vision was subsequently reaffirmed in the *Wickham Master Plan 2021 Update* (PP-2021-1506) and further refined in the 2022 amendment, which supported additional incentive-based planning controls. The Community Infrastructure Incentives in *Wickham Planning Proposal* (PP-2022/1541), endorsed by Council in March 2022 (and subsequently approved 08 November 2022), proposed:

- An incentive FSR of 7:1 for Area E (the site),
- A maximum incentive building height of 60m, and
- Community infrastructure requirements.

In alignment with these strategies, the site has been subject to successive development consents as outlined in the Environmental Impact Statement (EIS) prepared by Beam Planning. These prior consents have been physically commenced through demolition and excavation works and establish the maximum envelope for basement structures. This SSDA will adopt and refine these commenced elements to expedite the assessment process, continue construction progress on the site, and ensure continuity with previously endorsed planning outcomes.

1.3 Project Summary

To facilitate the proposed development, a concurrent Rezoning Proposal is sought to make the following amendments to the *Newcastle Local Environmental Plan 2012* (Newcastle LEP 2012) in relation to the site:

- Amend Clause 7.9 to permit a maximum building height of RL152 on the site; and,
- Amend the Clause 7.9A to permit a maximum FSR of 14.4:1 on the site.

The proposed amendments to the Newcastle LEP 2012, as outlined above, will facilitate the following development, proposed via a concurrent SSDA. Specifically, the proposed works sought under the SSDA include:

- Construction of a 43-storey (+ plant) mixed-use tower, comprising:
 - 245 residential apartments
 - 99 co-living units
 - Ground floor retail premises, to all three street frontages
 - A hotel component within the podium
 - Basement car parking for 215 cars
- Associated landscaping and public domain improvements, including the provision of a pedestrian through-site link that runs east/west adjacent to the Newcastle Interchange.

It is noted that the project will commit to providing 15% of the residential GFA as affordable housing for a minimum of 15 years, to be managed by a registered Community Housing Provider (CHP).

The proposed SSDA will seek consent for the use of the built basement structures and enabling works approved under DA2018/01197 (as modified).

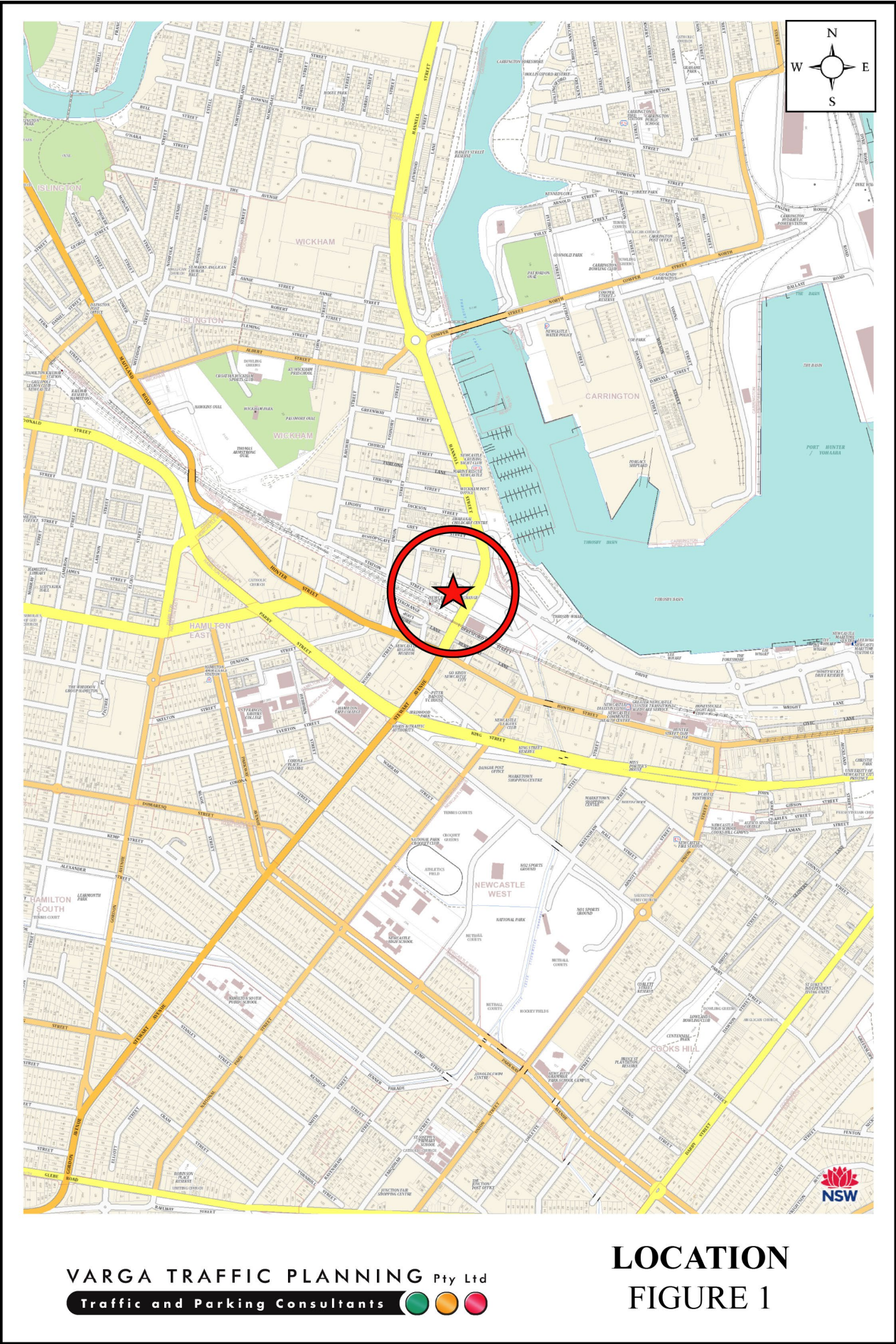
Vehicular access to the car parking facilities is to be provided via a new entry/exit driveway off the Dangar Street site frontage.

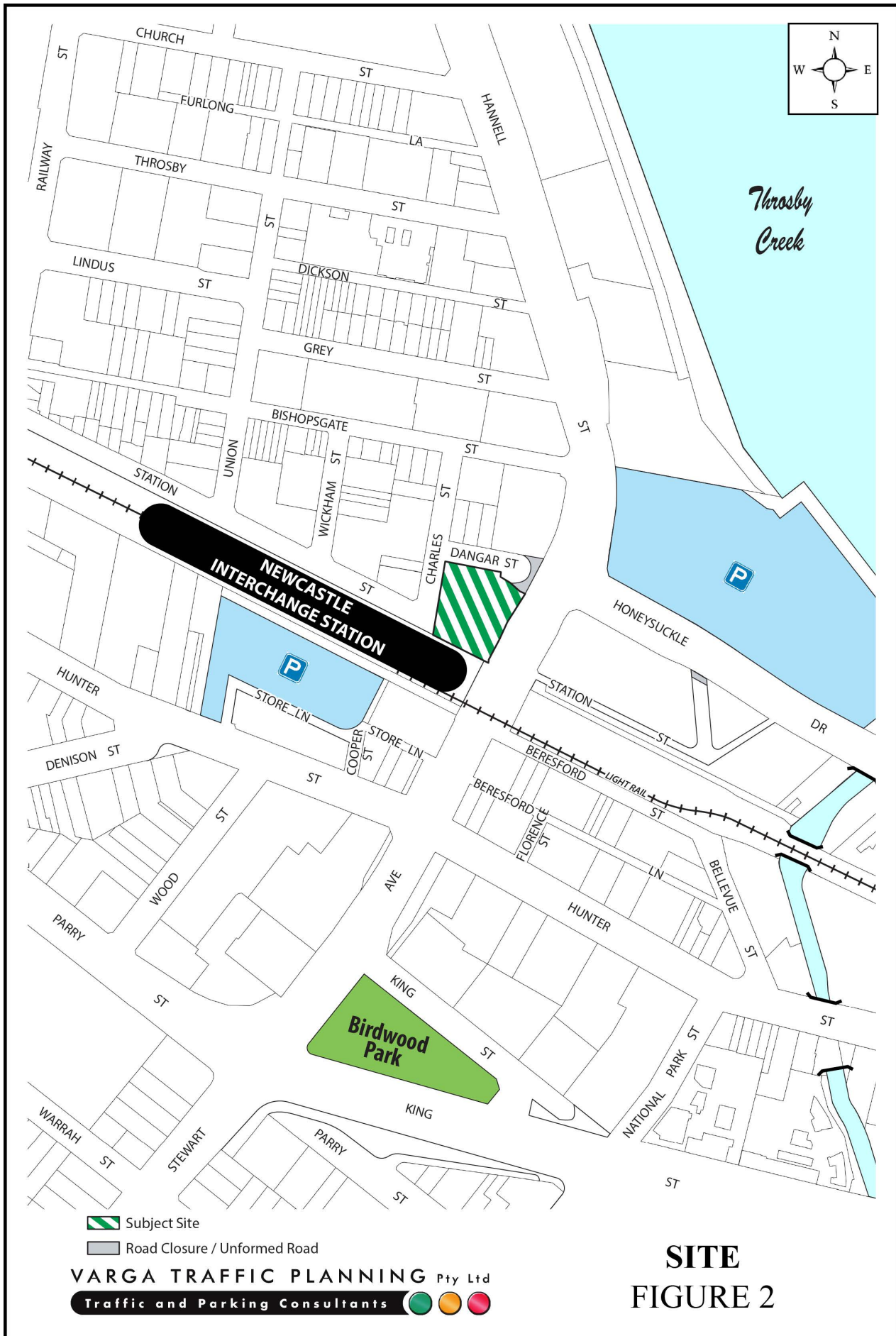
For a detailed description of the proposed development, refer to the EIS prepared by Beam Planning, and the Architectural Drawings prepared by SJB Architecture.

1.4 Purpose of this Report

The purpose of this report is to assess the traffic and parking implications of the development proposal and to address the items raised in the Secretary's Environmental Assessments Requirements (SEARs) for the State Significant Development (SSD), SSD-89869959. To that end this report:

- describes the site and provides details of the development proposal
- reviews the road network in the vicinity of the site, and the traffic conditions on that road network
- estimates the traffic generation potential of the development proposal, and assigns that traffic generation to the road network serving the site
- assesses the traffic implications of the development proposal in terms of road network capacity
- reviews the geometric design features of the proposed car parking and loading facilities for compliance with the relevant codes and standards





1.5 Secretary's Environmental Assessment Requirements

This report addresses the following relevant Secretary's Environmental Assessment Requirements (SEARs) issued for the project set out in the table below.

In this regard, a separate Construction Traffic Management Plan (CTMP) and Green Travel Plan (GTP) has been provided under a separate cover.

Table 1: SEARs Compliance Table

SEARs Requirements	Report Section
9. Transport - Provide a Transport Impact Assessment (TIA) in accordance with the processes and methodology recommended in the Guide to Transport Impact Assessment (GITA) published by TfNSW. - If the construction of the development would cause interruptions to regular pedestrian and transport routes (including public transport, active transport or general traffic), a preliminary Construction Traffic (or Transport) Management Plan (CTMP) should be prepared as part of the TIA to mitigate any such impacts	This Report Refer to CTMP
Additional Assessment Requirements	Report Section
A Green Travel Plan (GTP) identifying site-specific measures that promote and maximise the use of more sustainable modes of transport, such as walking, cycling, public transport, and carpooling. In particular, the GTP should demonstrate how travel demand management measures will be implemented to maximise utilisation of the Newcastle Interchange. The preparation of the GTP should align with the principles and requirements outlined in Transport for NSW's Travel Demand Management framework (Travel Demand Management nsw)	Refer to GTP
The following matters must be addressed in the submitted Transport Impact Assessment: - Identify the requirements for parking for each mode of transport (GTIA Section 8.3 & 8.5) Document the number of parking spaces by mode proposed by the development. If statutory parking requirements are not satisfied, the assessment must provide justification. - Detail the safety and functionality of the development's proposed multimodal access arrangements and internal road/parking layout, including service and parking areas for all user groups (e.g. freight and servicing, general traffic, visitor parking, disabled parking, car share and car charging) and pedestrians and cyclists. The design must address Council's waste requirements as specified in Newcastle DCP 2023. Any proposed shared use of the loading dock must be	Chapter 4.2, 4.3, 4.4 & 4.5 Chapter 2.3, 3.7, 4.2, 4.3 & 4.5

supported by a detailed operational plan.	
- The provision of well-designed active transport connections both within the site and linking to the surrounding area and key destinations such as Newcastle interchange, the Honeysuckle Precinct and the local park is essential. To support the best practice design, please refer to the following guidance documents: • Cycle Design Toolbox (2020) • Walking Space Guide (2020) • Relevant Council Public Domain Guide or Strategy including Wickham Community Infrastructure Plan, Wickham Masterplan and Wickham Public Domain Plan	Chapter 2.3, 4.3 & Refer to GTP
- A statement by a chartered/registered engineer for any bicycle, car commercial vehicle or mobility parking spaces that parking spaces comply with AS2890 and that any new or modified driveway has sight distance and appropriate dimensions for the design vehicle (refer GTIA Section 7.3.1). If the facilities do not comply with standards, deficiencies should be documented and justified. Swept path plans must be provided as required to demonstrate compliance.	Chapter 4.2, 4.5, & Appendix D

2.0 PROPOSED DEVELOPMENT

2.1 Site

The site is located at 10 Dangar Street, Wickham, within the Newcastle LGA. The site benefits from triple street frontages, with a primary street frontage of approximately 64m to Dangar Street, and secondary street frontages of approximately 61m to Hannell Street and 50m to Charles Street.

The surrounding locality comprises a diverse mix of land uses including residential, commercial, and light industrial uses, reflecting the area's ongoing transition. The site's frontage to Hannell Street, a major arterial road, supports high levels of connectivity to the broader metropolitan area.

The site is located immediately north of the Newcastle Interchange, providing bus, rail and light rail services. Strategically, the site sits at the intersection of the Newcastle West End, Wickham, and Honeysuckle precincts, positioning it to support the city's transition to a higher-density, mixed use metropolitan centre.

As the site is directly adjoining Newcastle Interchange Station, it is defined to be located within an *accessible area* as per the *SEPP (Housing) 2021* below.

Dictionary

accessible area means land within–

- (a) 800m walking distance of a public entrance to–
 - (i) a railway station, or
 - (ii) a wharf from which a Sydney Ferries service operates, or
- (b) 400m walking distance of–
 - (i) a public entrance to a light rail station, or
 - (ii) for a light rail station with no entrance—a platform of the light rail station, or
- (c) 400m walking distance of a bus stop used by a regular bus service, within the meaning of the Passenger Transport Act 1990, that has at least 1 bus per hour servicing the bus stop between–
 - (i) 6am and 9pm each day from Monday to Friday, both days inclusive, and
 - (ii) 8am and 6pm on each Saturday and Sunday

The site is currently vacant following completion of the demolition and excavation works of the three (3) level basement parking area, approved under DA2018/01197 (as modified).

The figure below illustrates the location of the site.



The site is located within the “Newcastle City Centre” as identified in Council’s *Newcastle Local Environmental Plan 2012 Key Sites Map Newcastle City Centre Map* document, as well as the “Wickham” key precinct, as identified in Council’s *Newcastle Development Control Plan 2023 Section E7 Wickham*, reproduced on the following page.

Given the site’s proximity to public transport services and location within the Wickham key precinct, which includes a wide range of essential shops and services including licensed clubs, pubs, banks, supermarkets, gymnasiums, restaurants, and specialty stores, it is an ideally located to reduce reliance on private car usage and to encourage increased usage of public transport services.

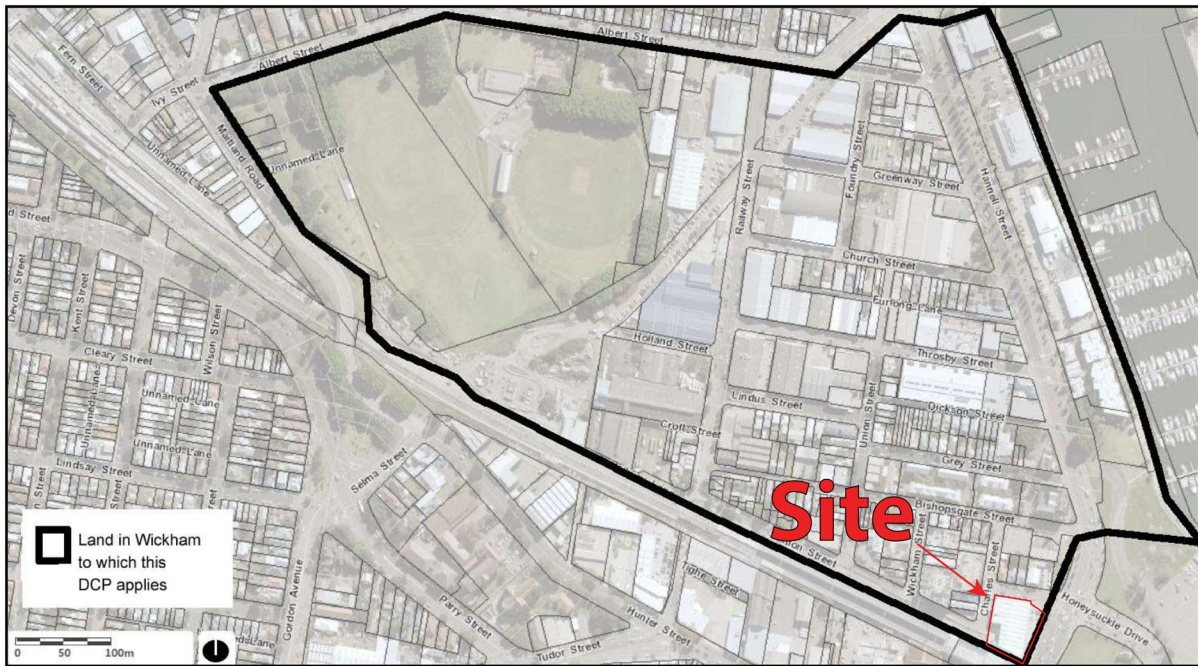


Figure E7.01: Wickham

Source: Newcastle Development Control Plan 2023

2.2 Previously Approved Development

In April 2019, Council granted deferred commencement consent for DA2018/01197, which involved the demolition of the existing structures on site to facilitate the construction of a 14-storey mixed-use development comprising 97 residential apartments and approximately 8,256m² of retail/commercial floor space.

Subsequently, in December 2022, Council approved DA2022/00448 for the alterations and additions to the approved mixed-use development, which involved alterations to the approved floor plans and three additional floors of shop top housing above the approved structure.

A total of 118 residential apartments was approved as follows:

Approved Unit Mix

1-bedroom apartments:	19
2-bedroom apartments:	77
3-bedroom apartments:	19
4-bedroom apartments:	3
TOTAL APARTMENTS:	118

A retail and commercial component was approved on the podium levels with a cumulative floor area of 1,173m² and 6,881m² respectively.

Off-street parking was approved for a total of 195 cars across four-levels, including a new three-level basement parking area, as per **DA consent condition No.12a** under DA2022/00448, reproduced below:

- a) A maximum of 195 on-site car parking must be provided as follows:
 - i) maximum of 111 resident car parking spaces
 - ii) maximum of 10 retail car parking spaces
 - iii) maximum of 62 commercial car parking spaces
 - iv) 12 residential visitor car parking spaces
 - v) A minimum of 12 car parking spaces from the proposed commercial/retail car parking spaces must be shared as residential visitor parking during off-peak retail/commercial business hours.
 - vi) At least 6 car parking spaces shall be designed as disabled parking and could be distributed between residential, retail and commercial use.

It is noted that this parking provision resulted in a 'shortfall' of 74 spaces, when assessed under Council's *DCP*.

The shortfall of parking was considered acceptable as the site is located within Newcastle City Centre, adjacent to Newcastle Interchange Station, such that it has excellent access to services and amenities as well as public transport options. It was also noted that due to the existence of a water table on the site, it is not possible to excavate additional basement levels.

Vehicular access to the parking facilities was approved via a new entry/exit driveway midway off the Charles Street site frontage.

Loading/servicing was approved to be undertaken by a variety of light commercial vehicles up to and including 6.4m long SRV trucks. In this regard, 4 loading bays were approved as per **DA consent condition No.12d** under DA2022/00448, reproduced below:

- d) A total of 4 loading bay parking spaces must be provided as follows:
 - i) 1 small rigid vehicle loading bay
 - ii) 2 light commercial/utility vehicle loading bays
 - iii) 1 carwash/loading bay

2.3 Proposed Development

The proposed development involves the construction of a new 43-storey mixed-use development. A total of 245 residential apartments is proposed, as follows:

Development Breakdown

1-bedroom apartments:	47
2-bedroom apartments:	152
3-bedroom apartments:	44
4-bedroom apartments:	2
TOTAL APARTMENTS:	245

It is noted that the project will commit to providing 15% of the residential GFA as affordable housing for a minimum of 15 years, to be managed by a registered Community Housing Provider (CHP)

A retail component is proposed on the ground floor of the new podium, with a cumulative floor area of approximately 500m².

In addition, a hotel component is proposed across the upper podium levels, comprising a total of 171 units. The hotel will have a maximum of 30 staff on-site at any one time.

A co-living component is also proposed, comprising a total of 99 rooms, in accordance with *State Environmental Planning Policy (Housing) 2021* requirements.

The target demographic of the proposed co-living housing will primarily comprise students and young professionals who traditionally have a low car ownership, particularly those who prefer living in close proximity to shops, restaurants and excellent public transport facilities that the subject site provides.

The proposed hotel will cater for the needs of business travellers, tourists and other visitors to the *Newcastle City Centre* who require short-term accommodation and will arrive by either public transport or taxi. These people generally do not own a private vehicle and as such do not require a parking space.

The proposed SSDA will seek consent for the use of the built basement structures and enabling works approved under DA2018/01197 (as modified).

Off-street parking is proposed for a total of 215 cars, comprising 197 residential spaces, 6 retail staff spaces, 10 hotel staff spaces, and 2 car share spaces in a three-level basement parking area.

Given the subject site has a frontage to Hannell Street, which is a classified road, the proposed development is subject to *Section 2.119* of the *State Environmental Planning Policy (Transport and Infrastructure) 2021*, reproduced below:

2.119 Development with frontage to classified road

- (1) The object of this section are–
 - (a) to ensure that new development does not compromise the effective and ongoing operation and function of classified roads, and
 - (b) to prevent or reduce the potential impact of traffic noise and vehicle emission on development adjacent to classified roads.
- (2) The consent authority must not grant consent to development on land that has a frontage to a classified road unless it is satisfied that–
 - (a) where practicable and safe, vehicular access to the land is provided by a road other than the classified road, and
 - (b) the safety, efficiency and ongoing operation of the classified road will not be adversely affected by the development as a result of–
 - (i) the design of the vehicular access to the land, or
 - (ii) the emission of smoke or dust from the development, or
 - (iii) the nature, volume or frequency of vehicles using the classified road to gain access to the land, and
 - (c) the development is of a type that is not sensitive to traffic noise or vehicle emissions, or is appropriately located and designed, or includes measures, to ameliorate potential traffic noise or vehicle emissions within the site of the development arising from the adjacent classified road.

Consistent with the requirements of *Section 2.119(2)* of the *SEPP (Transport and Infrastructure) 2021*, vehicular access to the car parking facilities is to be provided via a new entry/exit driveway off the Dangar Street site frontage.

Loading/servicing for the proposed development is expected to be undertaken by a variety of light commercial vehicles such as the *Hyundai iLoad* and similar “white vans”, up to and including 12.5m long HRV trucks subject to a minimum height clearance of 4.5m.

A separate entry-only service driveway is located towards the western end of the Dangar Street site frontage, with an exit-only service driveway located midway off the Charles Street site frontage, providing future access for HRV trucks, including Council's waste collection vehicles.

A Loading Dock Management Plan (LDMP) will be provided prior as part of the Construction Certificate to ensure the safe operation of the loading dock.

As part of the development, a through-site pedestrian link is provided on the southern side of the site, adjoining the Newcastle Interchange, connecting Station Street / Charles Street to Hannell Street, as per Council's *Wickham Public Domain Plan 2023*.

Associated landscaping and public domain improvement works are also to be provided along the Charles Street and Dangar Street site frontage/s.

Pedestrian access is provided via separate residential/hotel/co-living pedestrian lobbies, as well as direct pedestrian access to the retail tenancies off Hannell Street, Dangar Street, and via the through-site pedestrian link.

The pedestrian entries are well separated from the vehicular access driveway and provide safe and convenient pedestrian access to the pedestrian footpaths located along the frontage road. All of these pedestrian footpaths provide safe and convenient pedestrian access to the nearby Newcastle Interchange Station as well as throughout the Newcastle City Centre.

Plans of the proposed development have been prepared by *SJB Architects Pty Ltd* and are reproduced in **Appendix A**.

3.0 TRAFFIC ASSESSMENT

3.1 Road Hierarchy

The road hierarchy allocated to the road network in the vicinity of the site by Transport for New South Wales (TfNSW) is illustrated on Figure 3.

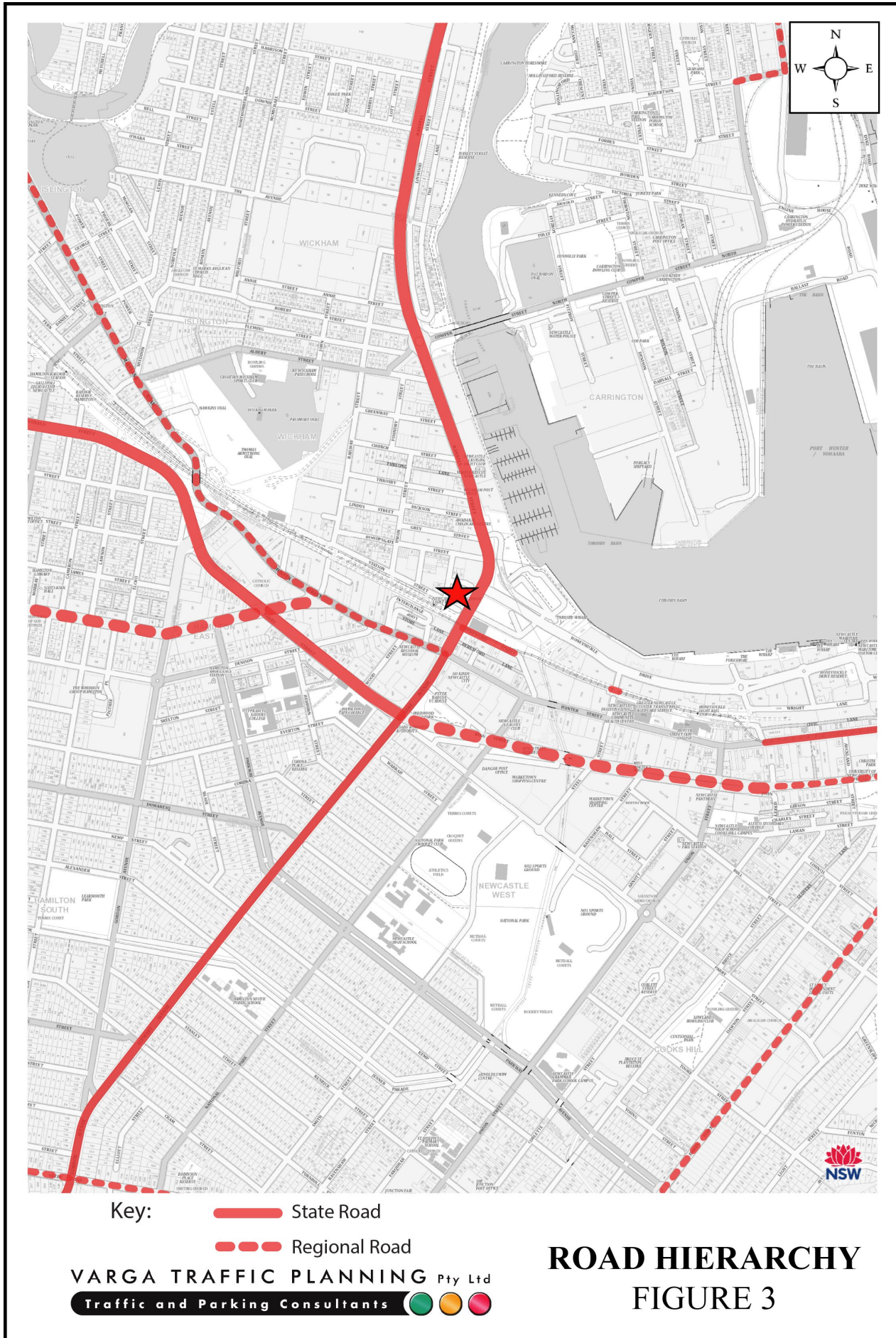
Hannell Street / Stewart Avenue are classified by TfNSW as *State Roads* and form part of the A43 road corridor, linking the A1 Pacific Highway in the north at Hexham, to the M1 Pacific Motorway in the south at Jilliby. It typically carries two traffic lanes in each direction in the vicinity of the site, separated by a central median island, with additional lanes provided at key intersections. Kerbside parking is generally prohibited along both sides of the road.

Parry Street / Donald Street / Griffiths Road is classified by TfNSW as a *State Road* and provides the key east-west road link in the area, linking Stewart Avenue in the east at Newcastle, to the M1 Pacific Motorway in the west at the Newcastle Interchange near Minmi. It typically carries two traffic lanes in each direction, separated by a central median island, with additional lanes provided at key locations. Kerbside parking is generally permitted along both sides of the road, subject to signposted restrictions.

Hunter Street is classified by TfNSW as a *State Road* east of Worth Place, and as a *Regional Road* west of Stewart Avenue, and performs the function of an east-west *collector route* through the area, linking Newcastle in the east, to the A43 Maitland Road in the west at Warabrook. It typically carries one to two traffic lanes in each direction, with additional lanes provided at key intersections.

Charles Street and Station Street are local, unclassified roads which are primarily used to provide vehicular and pedestrian access to frontage properties. They are generally restricted to one-way westbound traffic flow, with kerbside parking generally permitted, subject to signposted restrictions.

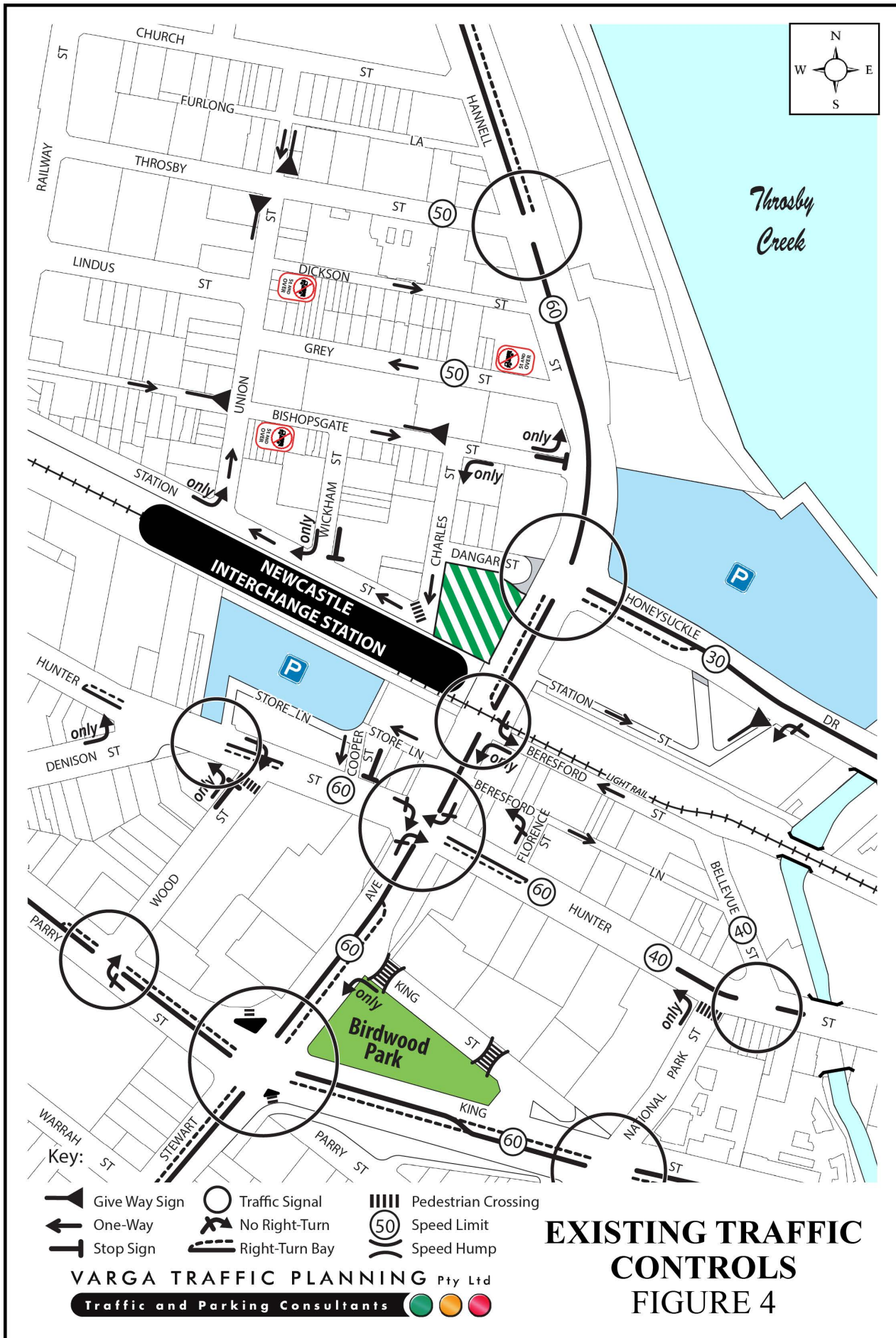
Dangar Street is a local, unclassified 'dead-end' road, which terminates approximately 60m east of the Dangar Street and Charles Street intersection, and is primarily used to provide vehicular and pedestrian access to frontage properties. Kerbside parking is generally permitted on the northern side of the road.



3.2 Existing Traffic Controls

The existing traffic controls which apply to the road network in the vicinity of the site are illustrated on Figure 4. Key features of those traffic controls are:

- a 60 km/h SPEED LIMIT which applies to Hannell Street, Stewart Street, Hunter Street, Parry Street, and King Street
- a 50 km/h SPEED LIMIT which applies to Charles Street, Dangar Street, Station Street, and all other local roads in the area
- a 30 km/h SPEED LIMIT which applies to Honeysuckle Drive
- TRAFFIC SIGNALS in Hannell Street where it intersects with Throsby Street and Honeysuckle Drive
- TRAFFIC SIGNALS in Stewart Street where it intersects with Beresford Street, Hunter Street, and Parry Street/King Street
- a CENTRAL MEDIAN ISLAND in Hannell Street and Stewart Avenue which precludes right-turn movements to/from side streets/driveways, including Bishopsgate Street
- a ONE WAY southbound restriction in Charles Street south of Dangar Street
- a ONE WAY westbound restriction in Station Street between Union Street and Charles Street
- a ONE WAY eastbound restriction in Bishopsgate Street east of Railway Street
- a PEDESTRIAN CROSSING where Charles Street intersects with Station Street, directly outside the entrance of Newcastle Interchange
- a STOP SIGN in Bishopsgate Street where it intersects with Hannell Street.



3.3 Existing Public Transport Services

The existing public transport services available in the vicinity of the site are illustrated in Figures 5A and 5B.

The site is located directly adjacent Newcastle Interchange Station, which is serviced by the CCN Central Coast & Newcastle Line operating between Newcastle Interchange to Central via Strathfield or Gordon, and the Hunter Line operating between Scone or Dungog to Newcastle Interchange. Trains operate out of Newcastle Interchange Station every 10-50 minutes throughout the day, although individual servicing frequencies for different train routes may vary.

Newcastle Interchange Station also services the Newcastle Light Rail operating between Newcastle Interchange to Newcastle Beach. The light rail service has high-frequency ‘turn-up-and-go’ services 7 days per week, departing approximately every 7-8 minutes in peak periods, and every 15 minutes at all other times.

Newcastle Interchange Station also forms part of the Regional Trains and Coaches Network. The Regional Trains and Coaches Network operate long-distance train services and coach services to areas not accessible by train, connecting Sydney with various regional centres across New South Wales and into neighbouring states. Newcastle Interchange Station services the 151 and 153 coach routes, as well a number of temporary coach routes.

In addition to the rail services, a major bus interchange is available outside of Newcastle Interchange Station servicing an extensive range of bus routes, including the 11, 12, 13, 22, 23, 24, 26, 28, 47, 130, 131, 138, 140, 160, 266 and 10X bus services which operate on the Hunter Bus Network, and the 150, 151, 152 bus services which operate on the Newcastle and Hunter Network.

A summary of those bus services is provided in the table below, revealing that there are approximately 764 bus services per day traversing the road network within the vicinity of the site on weekdays, reducing to approximately 444 bus services per day on Saturdays and approximately 362 bus services per day on Sundays and Public Holidays.



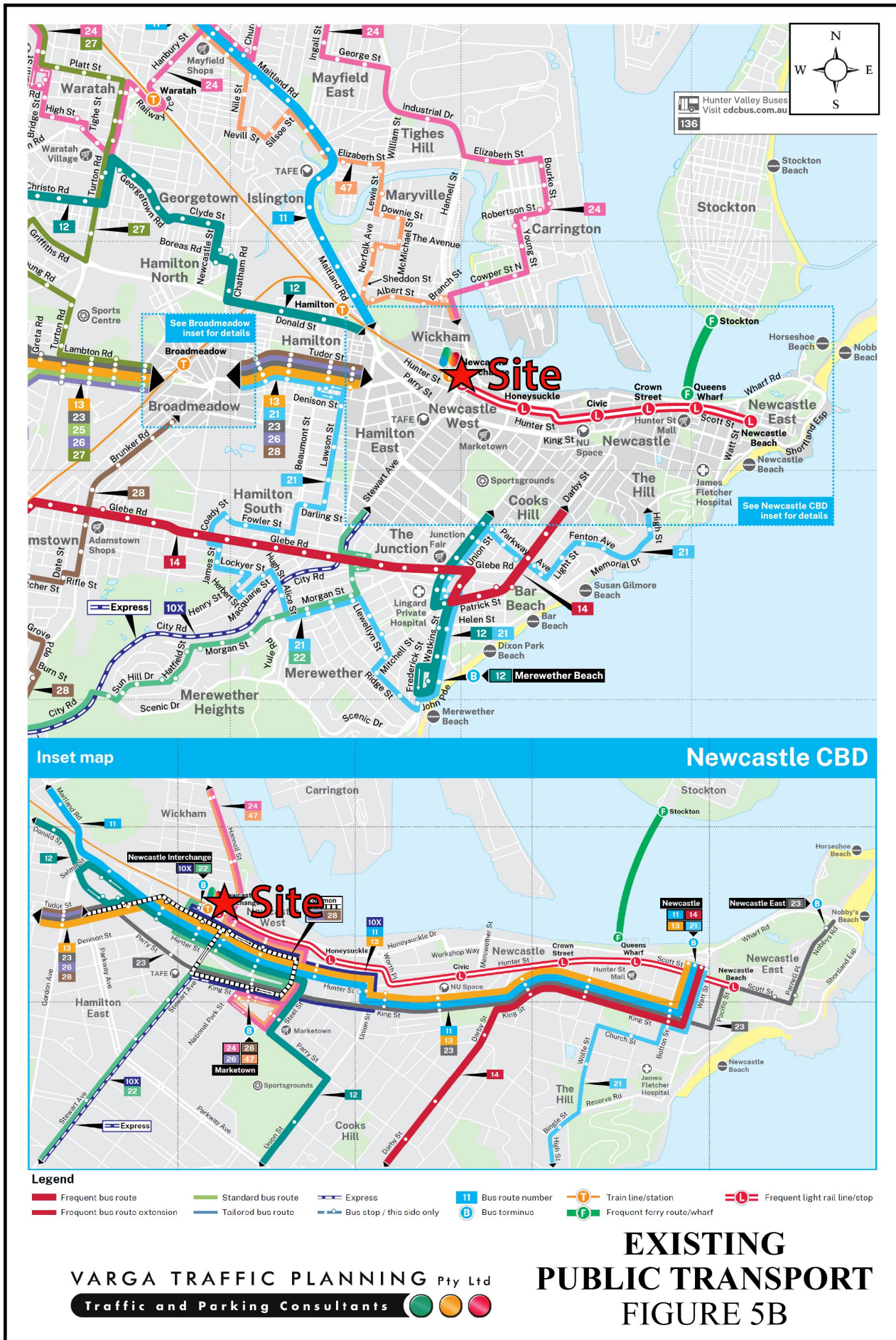


Table 2: Existing Bus Routes and Frequencies

Bus Routes and Frequencies							
Route No.	Route	Weekdays		Saturday		Sunday	
		IN	OUT	IN	OUT	IN	OUT
10X	Charlestown to Newcastle Interchange (Express Service)	9	9	0	0	0	0
11	Charlestown to Newcastle via Jesmond	64	65	32	35	30	30
12	Maryland to Merewether Beach via Wallsend and Newcastle Interchange	60	63	32	35	30	30
13	Glendale to Newcastle via Cardiff & John Hunter Hospital	61	64	31	35	30	30
22	Charlestown to Newcastle West via Merewether	19	20	14	14	12	11
23	Wallsend to Newcastle East via Lambton & Newcastle Interchange	23	22	14	14	11	12
24	Wallsend to Marketown via Mayfield	22	23	15	15	12	12
26	Wallsend to Newcastle West via Kotara & Newcastle Interchange	24	22	15	15	12	12
28	Mount Hutton to Newcastle West via Broadmeadow & Newcastle Interchange	22	21	15	14	12	12
47	Jesmond to Marketown via Warabrook	13	13	12	12	10	10
130	Fingal Bay to Newcastle via Gan Gan Rd	18	16	9	9	8	8
131	Fingal Bay to Newcastle (Express Service)	1	3	0	0	0	0
138	Newcastle Interchange to Lemon Tree Passage via Airport	1	1	0	0	0	0
140	Newcastle Interchange to Raymond Terrace	32	33	24	25	12	12
150	Taree to Newcastle Interchange via Tuncurry, Forster & Hawks Nest	2	2	1	1	1	1
151	Taree Station to Newcastle Interchange via Tuncurry & Forster	1	1	1	1	1	1
152	Hawks Nest to Newcastle	1	1	0	0	0	0
160	Cessnock to Newcastle	4	4	2	2	0	0
266	Newcastle to West Wallsend	2	2	0	0	0	0
TOTAL		379	385	217	227	181	181

The site is therefore considered to be highly accessible to public transport options and is ideally located to reduce reliance on private car usage and to encourage increased usage of public transport services.

3.4 Active Transport Options

The existing bicycle routes located in the vicinity of the site are illustrated on Figure 6.

The bicycle routes are readily accessible from the subject site and are designed to enable cyclists a direct, connected set of routes through the area, enabling connection to key employment, education, health, entertainment, and recreational facilities.

The key bicycle routes linking the local area in the vicinity of the site includes the following routes:

- Foreshore & Throsby Creek
- Bathers Way
- Newcastle City to Belmont and Swansea
- Newcastle City to University of Newcastle
- Newcastle City to Wallsend
- Kotara South to Mayfield, Newcastle TAFE, and University of Newcastle

In addition, Council plans to renovate its cycling network, delivering a safe, comfortable, inclusive, and continuous network of cycle routes that connect all major destinations throughout the area. Council also provides bicycle racks at key locations throughout the local government area.

Furthermore, the proposed development makes provision for off-street bicycle parking within the residential levels, as well as bicycle racks within the public domain, and will enhance the *active* transport options available to the future occupants/visitors of the site.

The site is located within the Newcastle City Centre and Wickham key precinct, which includes a wide variety of essential shops and services, including licensed clubs, pubs, banks, supermarkets, gymnasiums, restaurants, and specialty stores.

The subject site is therefore considered readily accessible by *active transport* options such as cycling and walking.



3.5 Existing Traffic Conditions

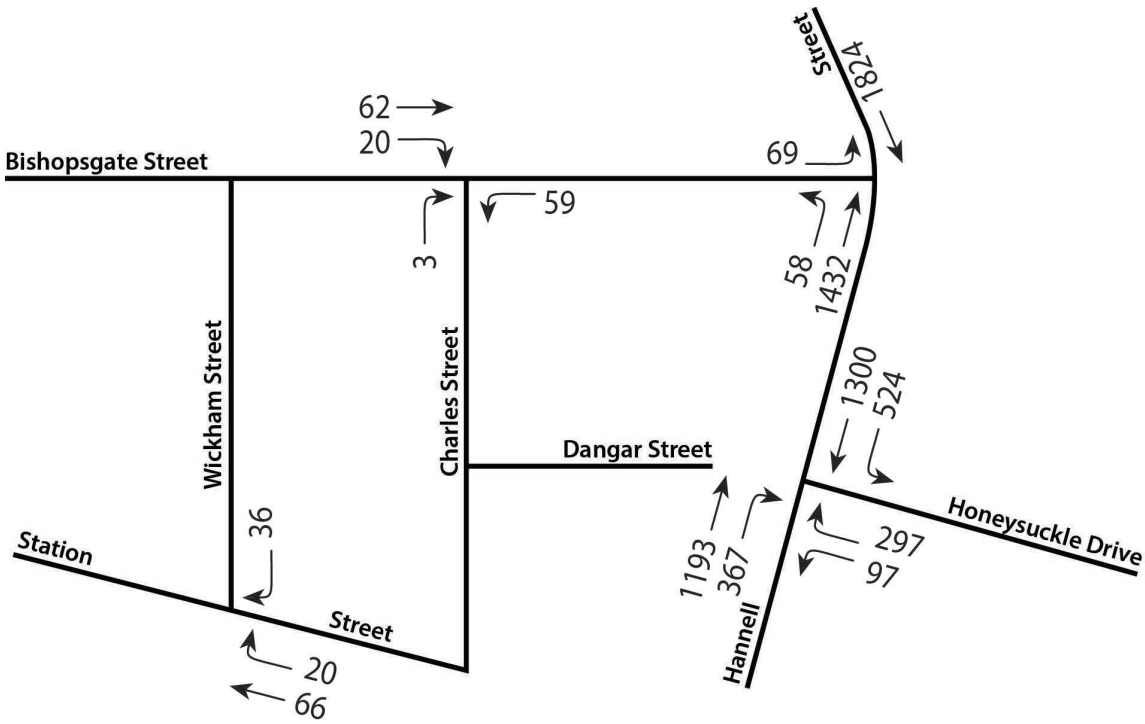
An indication of the existing traffic conditions on the road network in the vicinity of the site is provided by peak period traffic surveys undertaken as part of this traffic study.

The traffic surveys were undertaken on Wednesday 3rd September 2025 between 6:30am-10:30am and 3:00pm-7:00pm at the following intersections:

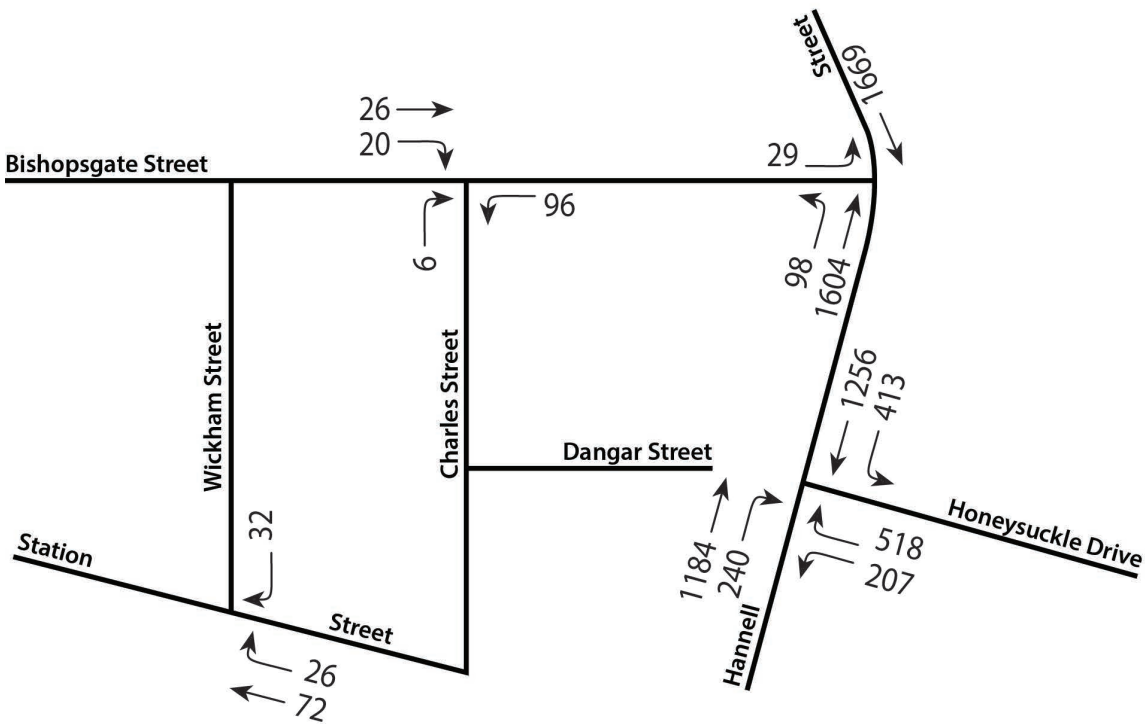
- Wickham Street and Station Street
- Bishopsgate Street and Charles Street
- Hannell Street and Bishopsgate Street
- Hannell Street and Honeysuckle Drive

The results of the traffic surveys are reproduced in full in **Appendix B** and are summarised on Figure 7, revealing that:

- the weekday AM network peak period occurred between 7:45am and 8:45am whilst the weekday PM network peak period occurred between 4:45pm and 5:45pm
- northbound traffic flows in Hannell Street past the site frontage are typically in the order of 1,560 vph during the AM peak period, *decreasing* to 1,424 vph during the PM peak period
- southbound traffic flows in Hannell Street past the site frontage are typically in the order of 1,397 vph during the AM peak period, *increasing* to 1,463 vph during the PM peak period
- southbound traffic flows in Charles Street past the site frontage are typically in the order of 80 vph during the AM peak period, *increasing* to 98 vph during the PM peak period
- eastbound traffic flows in Bishopsgate Street are typically in the order of 69 vph during the AM peak period, *decreasing* to 29 vph during the PM peak period.



AM Peak: 7:45am-8:45am



PM Peak: 4:45pm-5:45pm

EXISTING PEAK HOUR TRAFFIC FLOWS
FIGURE 7

3.6 Projected Traffic Generation

The traffic implications of development proposals primarily concern the effects of the *additional* traffic flows generated as a result of the development and its impact on the operational performance of the adjacent road network.

An indication of the traffic generation potential of the development proposal is provided by reference to the Transport for NSW's publication *Guide to Transport Impact Assessment Version 1.1, Chapter 5 – Land Use Trip Generation (September 2024)* document.

The TfNSW *Guide to Transport Impact Assessment* document notes that it replaces the *Guide to Traffic Generating Developments v2.2 (October 2002)* and the updated traffic generation rates in the *Technical Direction TDT 2013/04a (August 2013)* document.

The TfNSW *Guide to Transport Impact Assessment* document is based on extensive surveys of a wide range of land uses and nominates the following traffic generation rates which are applicable to the development proposal:

High Density Residential Dwellings – Regional (High Public Transport Accessibility)

AM: 0.53 peak hour vehicle trips per unit

PM: 0.32 peak hour vehicle trips per unit

In addition, the TfNSW *Guide to Transport Impact Assessment* document does not nominate a traffic generation rate for small, local shops, referring only to shopping centres incorporating supermarkets and department stores.

Therefore, for the purposes of this assessment, the traffic generation rate for “offices” has been adopted in respect of the retail uses of the development proposal as follows:

Offices – Regional

AM: 0.99 peak hour vehicle trips per 100m² GFA

PM: 0.96 peak hour vehicle trips per 100m² GFA

TfNSW *Guide to Transport Impact Assessment* document also does not nominate a traffic generation rate for hotels.

Therefore, for the purposes for this assessment, the traffic generation rate nominated in the TfNSW *Guide to Transport Impact Assessment* for “motels” has been adopted in respect of the development proposal as follows:

Motels

PM: 0.4 peak hour vehicle trips per unit

It is pertinent to note that the TfNSW *Guide to Transport Impact Assessment* do not provide a rate for the peak hour vehicle trips during the AM commuter peak period for motels. Hence, by way of a more rigorous assessment, it has been assumed that the traffic generation rate of the hotel is the same during both the AM and PM commuter peak periods.

The TfNSW *Guide to Transport Impact Assessment* also does not nominate a traffic generate rate for co-living development, referring only to traditional residential apartment (flat) buildings.

Reference is therefore made to the *SEPP (Housing) 2021* parking requirements detailed in Chapter 5 of this report, which require “0.2 spaces for each co-living room”.

If parking was provided in accordance with the *SEPP* parking rate, and if half of the users of those parking spaces departed/returned during a single peak hour, the traffic generation potential of the co-living component of the development proposal would be in the order of 10 vehicles per hour.

Application of the above traffic generation rates to the development proposal yields a traffic generation potential of approximately 213 vehicles per hour (vph) during the weekday AM peak period and approximately 162 vph during the weekday PM peak period, as set out below:

Projected Future Traffic Generation Potential		
	AM	PM
Residential (245 units):	129.9 vph	78.4 vph
Co-Living (20 parking spaces):	9.9 vph	9.9 vph
Hotel (171 units):	68.4 vph	68.4 vph
Retail (500m ² GFA):	5.0 vph	4.8 vph
TOTAL TRAFFIC GENERATION POTENTIAL:	213.2 vph	161.5 vph

That projected future level of traffic generation potential should however, be offset or *discounted* by the volume of traffic which could reasonably be expected to be generated by the previously approved uses of the site, in order to determine the *nett increase (or decrease)* in traffic generation potential of the site expected to occur as a consequence of the development proposal when compared with the previously approved development on the site.

Application of the above traffic generation rates to the approved DA2022/00448 scheme yields a traffic generation potential of approximately 142 vph during the weekday AM peak period and approximately 115 vph during the weekday PM period, as set out below:

Previously Approved DA2022/00448 Traffic Generation Potential

	AM	PM
Residential (118 units):	62.5 vph	37.8 vph
Retail (1,173m ² GFA):	11.6 vph	11.3 vph
Commercial (6,881m ² GFA):	68.1 vph	66.1 vph
TOTAL TRAFFIC GENERATION POTENTIAL:	142.2 vph	115.2 vph

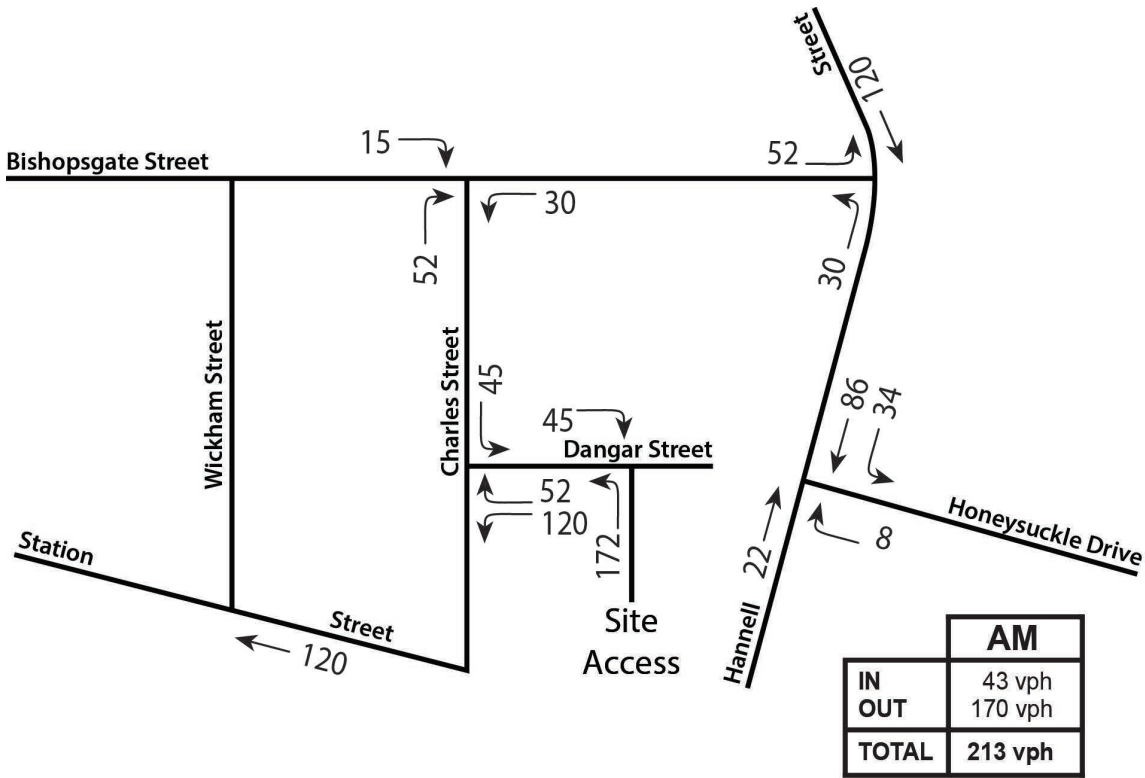
Accordingly, it is likely that the proposed development will result in a *nett increase* in the traffic generation potential of approximately 71 vph during the weekday AM peak period, and approximately 46 vph during the PM peak period, as set out below:

**Projected Nett Increase in Peak Hour Traffic Generation Potential
of the site as a consequence of the Development Proposal**

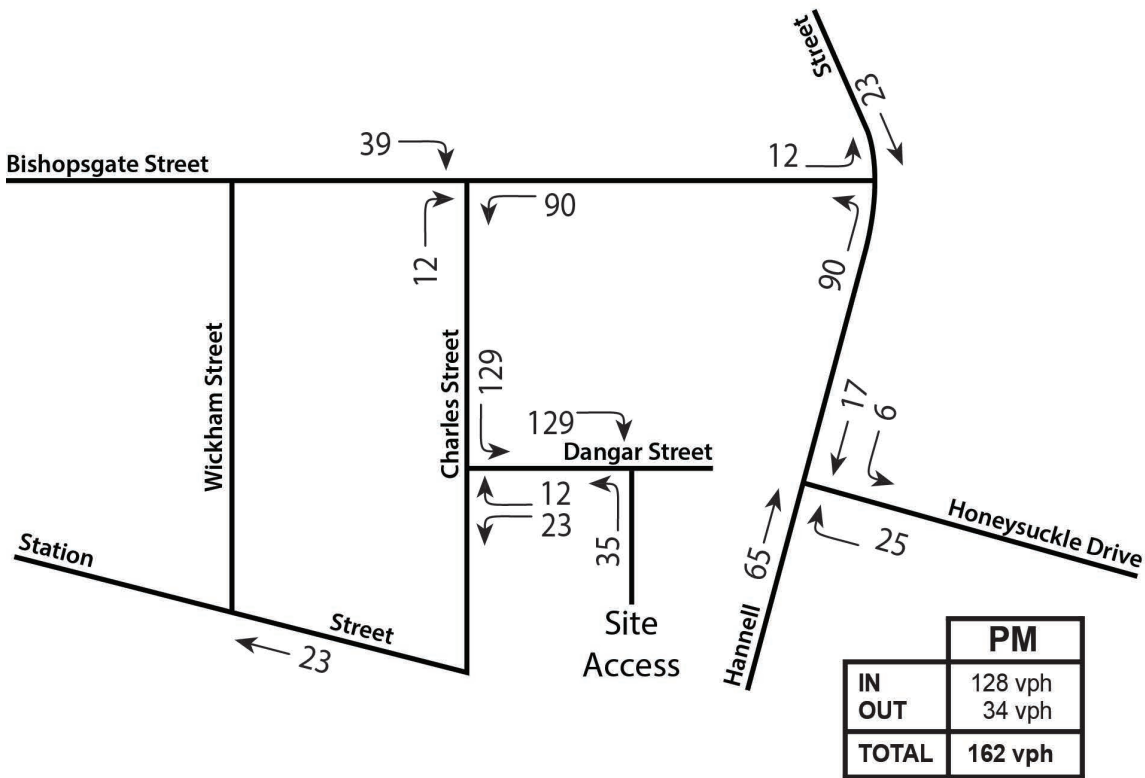
	AM	PM
Projected Future Traffic Generation Potential:	213.2 vph	161.5 vph
Less Previously Approved Traffic Generation Potential:	-142.2 vph	-115.2 vph
NETT INCREASE IN TRAFFIC GENERATION POTENTIAL:	71.0 vph	46.3 vph

However, for the purposes of this assessment, it has been assumed that *all* of the projected future traffic flows of 213 vph during the AM peak period, and 162 vph during the PM peak period will be new or *additional* to the existing traffic flows currently using the adjacent road network.

The distribution of those volumes onto the surrounding road network is shown on Figure 8.



AM Peak: 7:45am-8:45am



PM Peak: 4:45pm-5:45pm

PROJECTED ADDITIONAL PEAK HOUR TRAFFIC FLOWS
FIGURE 8

In practice however, the traffic generation potential of both the previously approved and proposed uses of the site are likely to be *substantially less* than is suggested by the traffic generation rates suggested above because:

- the subject site is highly accessible with an extensive range of public transport services located within easy walking distance of the site
- the subject site is also located within easy walking distance of an extensive range of shops and services, including licensed clubs, pubs, banks, supermarkets, gymnasiums, restaurants and specialty stores
- the TfNSW *Guide to Transport Impact Assessment* traffic generation rate for “motels” is based on suburban motels which are traditionally “car based” with a car parking space for each room
- the proposed hotel will cater primarily for the needs of business travellers, tourists and other visitors to the *Newcastle City Centre* who require short-term accommodation and will arrive by either public transport, rideshare or taxi
- the TfNSW traffic generate rates assume that car parking is provided generally in accordance with the parking rates which are also nominated in the TfNSW *Guide to Transport Impact Assessment* document. In this case, the parking provisions allocated to the proposed development are *constrained* at levels well below the parking rates nominated in the TfNSW *Guide to Transport Impact Assessment*
- visitation to the site may be in the form of “*linked trips*” whereby patrons of the retail tenancies will make visits to other premises within the Newcastle City Centre. This would effectively reduce the site’s traffic activity compared to other retail developments.

In any event, the projected *nett increase* in the traffic generation potential of the site as a consequence of the development proposal will not have any unacceptable traffic implications in terms of road network capacity, as is demonstrated in the following section of this report.

3.7 Traffic Implications – Road Network Capacity

The traffic implications of development proposals primarily concern the effects that any *additional* traffic flows may have on the operational performance of the nearby road network. Those effects can be assessed using the SIDRA program which is widely used by TfNSW and many LGA's for this purpose.

The results of the SIDRA analysis of the surrounding intersections are summarised on the table below:

Table 3: SIDRA Modelling Results

Intersection	Key Indicators	Existing Traffic Demand		Projected Additional Traffic Demand	
		AM	PM	AM	PM
Wickham Street & Station Street	LOS	A	A	A	A
	DS	0.046	0.050	0.107	0.062
	AVD	2.9	2.8	1.6	2.4
Bishopsgate Street & Charles Street	LOS	A	A	A	A
	DS	0.068	0.053	0.086	0.102
	AVD	4.1	4.4	4.4	4.6
Hannell Street & Bishopsgate Street	LOS	A	A	A	A
	DS	0.403	0.452	0.412	0.477
	AVD	0.7	0.5	1.2	0.7
Hannell Street and Honeysuckle Drive	LOS	B	B	B	B
	DS	0.833	0.767	0.861	0.777
	AVD	21.3	20.0	22.4	20.3

LOS – Level of Service; DS – Degree of Saturation; AVD – Average Vehicle Delays (secs/veh)

The detailed SIDRA *movements summaries* are reproduced in full in **Appendix C**, with criteria for evaluating the results of the analysis reproduced in the following pages. In summary, the SIDRA capacity analysis of the development proposal demonstrates that:

- the development proposal will not have any unacceptable traffic implications in terms of road network capacity

- all intersections will continue to operate at current/satisfactory *Levels of Service*, and
- no road improvements or intersection upgrades are required as a consequence of the development proposal.

Criteria for Interpreting Results of Sidra Analysis

1. Level of Service (LOS)

LOS	Traffic Signals and Roundabouts	Give Way and Stop Signs
'A'	Good operation.	Good operation.
'B'	Good with acceptable delays and spare capacity.	Acceptable delays and spare capacity.
'C'	Satisfactory.	Satisfactory but accident study required.
'D'	Operating near capacity.	Near capacity and accident study required.
'E'	At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode.	At capacity and requires other control mode.
'F'	Unsatisfactory and requires additional capacity.	Unsatisfactory and requires other control mode.

2. Average Vehicle Delay (AVD)

The AVD provides a measure of the operational performance of an intersection as indicated on the table below which relates AVD to LOS. The AVD's listed in the table should be taken as a guide only as longer delays could be tolerated in some locations (i.e., inner city conditions) and on some roads (i.e., minor side street intersecting with a major arterial route).

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way and Stop Signs
A	less than 14	Good operation.	Good operation.
B	15 to 28	Good with acceptable delays and spare capacity.	Acceptable delays and spare capacity.
C	29 to 42	Satisfactory.	Satisfactory but accident study required.
D	43 to 56	Operating near capacity.	Near capacity and accident study required.
E	57 to 70	At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode.	At capacity and requires other control mode.

3. Degree of Saturation (DS)

The DS is another measure of the operational performance of individual intersections.

For intersections controlled by traffic signals¹ both queue length and delay increase rapidly as DS approaches 1, and it is usual to attempt to keep DS to less than 0.9. Values of DS in the order of 0.7 generally represent satisfactory intersection operation. When DS exceeds 0.9 queues can be anticipated.

For intersections controlled by a roundabout or GIVE WAY or STOP signs, satisfactory intersection operation is indicated by a DS of 0.8 or less.

¹ The values of DS for intersections under traffic signal control are only valid for cycle length of 120 secs.

4.0 PARKING IMPLICATIONS

4.1 Existing Kerbside Parking Restrictions

The existing kerbside parking restrictions which apply to the road network in the vicinity of the site are illustrated on Figure 9 and comprise:

- NO STOPPING restrictions along the northern side of Station Street and Bishopsgate Street, both sides of Hannell Street, the southern side of Dangar Street, and the eastern side of Charles Street between Dangar Street and Station Street, including along the site frontage
- a LOADING ZONE on the western side of Charles Street opposite the Dangar Street intersection
- generally 2 HOUR PARKING (TICKETED) elsewhere on the local road network

4.2 Off-Street Car Parking Provisions

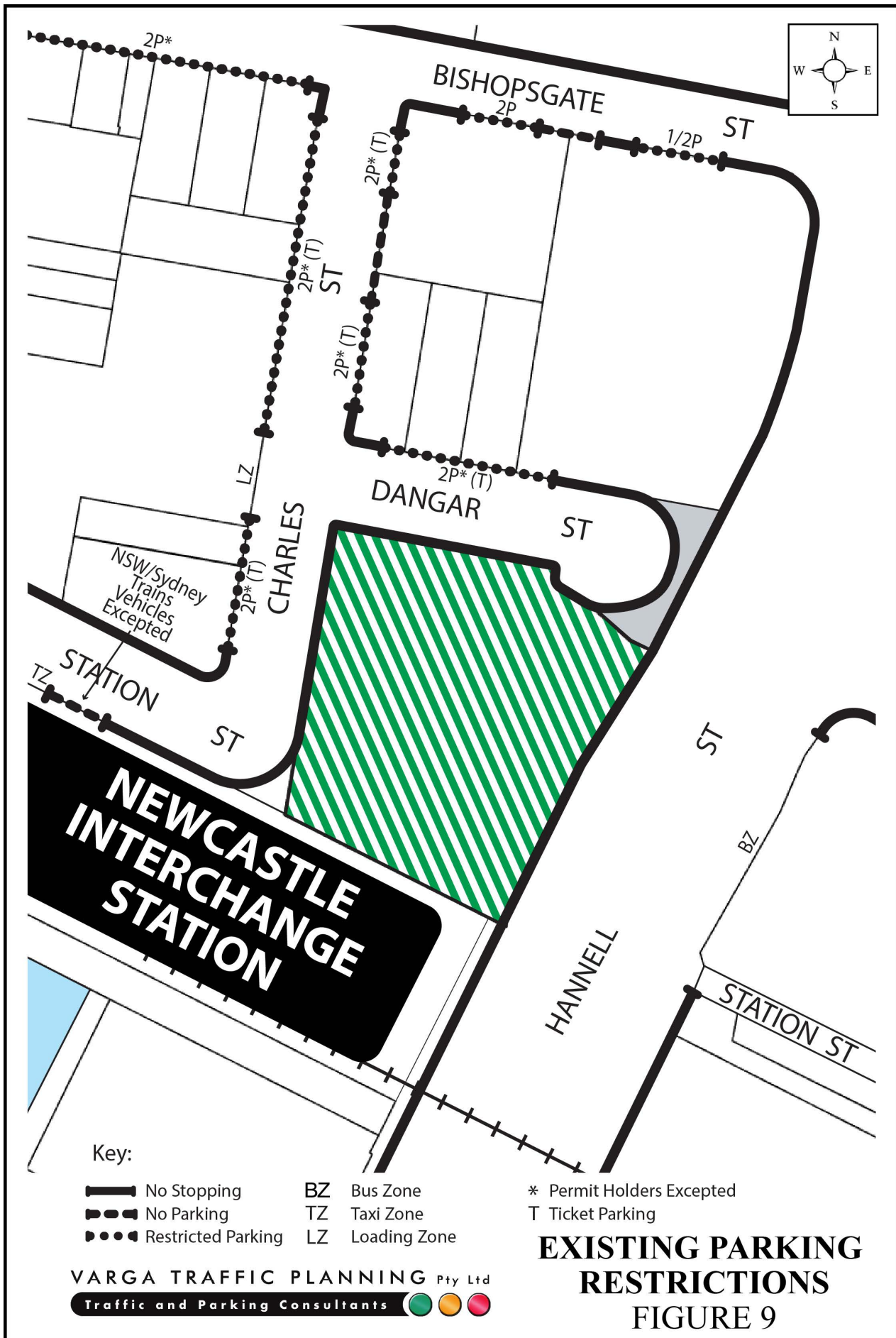
Reference is made to the *Guide to Transport Impact Assessment Version 1.1, Chapter 5 – Land Use Trip Generation (September 2024)* in the following terms:

8.3 Car parking provision

8.3.1 Parking controls

Parking for a development should satisfy requirements for cars, bicycles, delivery and servicing vehicles, as provided in relevant planning instruments. These requirements are typically outlined in Environmental Planning Instruments (EPIs) such as Local Environmental Plans (LEPs) as well as Development Control Plans (DCPs). In some circumstances, off-street parking requirements for specific land uses are specified in State Environmental Planning Policies (SEPPs).

The off-street parking requirements applicable to the residential component of the development proposal are specified in the *State Environmental Planning Policy (Housing) 2021* document in the following terms:



Chapter 4 Design of residential apartment development

148 Non-discretionary development standards for residential apartment development—the Act, s 4.15

- (1) The object of this section is to identify development standards for particular matters relating to residential apartment development that, if complied with, prevent the consent authority from requiring more onerous standards for the matters.
- (2) The following are non-discretionary development standards –
 - (a) the car parking for the building must be equal to, or greater than, the recommended minimum amount of car parking specified in Part 3J of the Apartment Design Guide

Reference is therefore made to the *Apartment Design Guide 2015, Section 3J – Bicycle and Car Parking* document which nominates the following car parking requirements:

Objective 3J-1

Car parking is provided based on proximity to public transport in metropolitan Sydney and centres in regional areas

For development in the following locations:

- on sites that are within 800 metres of a railway station or light rail stop in the Sydney Metropolitan Area; or
- on land zoned, and sites within 400 metres of land zoned, B3 Commercial Core, B4 Mixed Use or equivalent in a nominated regional centre

the minimum car parking requirements for residents and visitors is set out in the Guide to Traffic Generating Developments, or the car parking requirement prescribed by the relevant council, whichever is less.

The car parking needs for a development must be provided off street.

Comparison therefore needs to be drawn between the off-street car parking requirements for residential flat buildings outlined in Council's *DCP* and also the TfNSW *Guide to Transport Impact Assessment* to determine the *lesser* requirement.

The subject site is defined as a "Category 2" area, typical of outer urban areas or regional centres with more variability in alternative transport options and medium car mode share.

In this instance, the relevant car parking rates outlined in the TfNSW *Guide to Transport Impact Assessment* are reproduced below:

High Density Residential Dwellings – TfNSW reference rates per dwelling (Category 2)

- 0.7 spaces per studio/1 bedroom dwellings
- 0.9 spaces per 2 bedroom dwellings
- 1.4 spaces per 3+ bedroom dwellings
- 1 space per 5 dwellings (visitor parking)

The *maximum* off-street parking requirements applicable to the residential component of the development proposal are specified in Council’s *Newcastle DCP 2023 Section C1 Traffic parking and access* document in the following terms:

Residential accommodation – Newcastle City Centre (maximum)

- | | |
|------------|-------------------------|
| 1-bedroom: | 1 space per dwelling |
| 2-bedroom: | 1 space per dwelling |
| 3-bedroom: | 2 spaces per dwelling |
| Visitors: | 1 space per 5 dwellings |

In this instance, as Council’s *DCP* is a *maximum* parking rate, it is considered the *lesser* car parking requirement for residents and visitors of the proposed development.

In addition, the off-street parking requirements applicable to the co-living component of the development proposal are specified in the *SEPP (Housing) 2021* in the following terms:

Chapter 3 Diverse Housing**Part 3 Co-living housing****68 Non-discretionary development standards—the Act, s 4.15**

- (1) The object of this section is to identify development standards for particular matters relating to development for the purposes of co-living that, if complied with, prevent the consent authority from requiring more onerous standards for the matters.
- (2) The following are non-discretionary development standards in relation to development for the purposes of co-living housing—
 - (e) unless a relevant planning instrument specifies a lower number—
 - (i) for development on land in an accessible area—0.2 parking spaces for each private room, or
 - (ii) otherwise—0.5 parking spaces for each private room

The subject site is located within an *accessible area* as defined by the *SEPP* and is therefore subject to the above *SEPP* parking rates of “0.2 parking spaces per private room”.

The off-street parking requirements applicable to the non-residential components of the development proposal are specified in Council's *Newcastle DCP 2023 Section C1 Traffic parking and access* document in the following terms:

Shop (minimum)

1 space per 40m² GLFA

Hotel, Motel or Serviced apartment accommodation (minimum)

1 space per 2 staff plus minimum 0.5 spaces per unit

In addition, reference is made to Council's *Newcastle Development Control Plan 2023 Section C1 Traffic parking and access* document in the following terms:

12.0 Car share parking

C.1 The following controls are to be considered in the car parking assessment:

- a. minimum car share parking for development is provided in accordance with the following rates:
 - i. residential development – 1 space per 60 car spaces provided
 - ii. office, business, industrial or retail premises – 1 space per 40 car spaces provided

Application of the above parking requirements to the proposed development yields a *maximum* off-street parking provision of 340 residential/visitor spaces, and a *minimum* off-street car parking requirement of 137 co-living/hotel/retail/car share spaces, as set out in the table below:

CUMULATIVE PARKING REQUIREMENTS

Residential (NDCP 2023)	Maximum	Proposed
1-bedroom (47 dwellings):	47 spaces	
2-bedroom (152 dwellings):	152 spaces	
3-or-more bedroom (46 dwellings):	92 spaces	
Sub-Total:	291 spaces	197 spaces
 Visitor (NDCP 2023)	 Maximum	 Proposed
Visitor (245 dwellings):	49 spaces	0 spaces
Sub-Total:	49 spaces	0 spaces
MAXIMUM RESIDENTIAL PARKING:	340 spaces	197 spaces

Co-Living Housing (SEPP 2021)	Required	Proposed
Co-Living (99 rooms)	20 spaces	0 spaces
Sub-Total:	20 spaces	0 spaces
 Hotel (NDCP 2023)	 Required	 Proposed
Hotel (30 staff/171 units):	101 spaces	10 spaces
Sub-Total:	101 spaces	10 spaces
 Retail (NDCP 2023)	 Required	 Proposed
Retail (500m ² GFA):	13 spaces	6 spaces
Sub-Total:	13 spaces	6 spaces
 Car Share (NDCP 2023)	 Required	 Proposed
Residential (197 car spaces):	3 spaces	2 spaces
Retail Premises (6 car spaces):	0 spaces	0 spaces
Sub-Total:	3 spaces	2 spaces
TOTAL PARKING REQUIRED:	137 spaces	18 spaces

The proposed development makes provision for a total of 215 cars (including 2 disabled spaces), comprising 197 residential spaces, 10 hotel staff spaces, 6 retail staff spaces, and 2 car share spaces, thereby resulting in a shortfall of 20 co-living spaces, 91 hotel spaces, 7 retail spaces, and 1 car share space.

Zero parking spaces are to be allocated for the co-living housing component, thereby resulting in a shortfall of 20 co-living spaces when assessed under the *SEPP (Housing) 2021* car parking requirements.

However, there is a distinction to be made pursuant to the requirements of the *SEPP* in that the requirements of Clause 68, if complied with, prevent the consent authority from requiring more onerous standards for the matters. Thus, the provision of car parking for co-living use is *not* a mandatory requirement under the *SEPP*.

In addition, reference is made to Council's *Newcastle Development Control Plan 2023 Section C1 Traffic parking and access* document in the following terms:

C-4 Car parking is provided in accordance with the rates set out in **Table C1.01**, except for car parking for development in the Newcastle City Centre, Renewal Corridors, The Junction and Hamilton B2 Local Centre zone and Darby Street Mixed Use zone. The rates may be varied within these areas, subject to merit assessment of the proposal. The total number of spaces to be provided for each type of parking is rounded up to the nearest whole number.

The proposed development is located within the Newcastle City Centre, and as such, the abovementioned car parking rates may be varied subject to merit assessment of the proposal.

The shortfall in car parking for co-living, retail, and hotel components is considered acceptable in this instance because:

- the site is highly accessible, within an extensive range of public transport services, comprising light rail, inter-urban rail, and a bus rail interchange, all located within easy walking distance of the site
- the site is also located within easy walking distance of an extensive range of essential shops and services including licensed clubs, pubs, banks, supermarkets, gymnasiums, restaurants, and specialty stores
- Council generally encourages “constrained” parking provision in private developments which are located in accessible areas such as the subject site, and
- the requirements of Clause 68 of the *SEPP*, if satisfied, cannot be used to refuse consent – i.e. in planning terms, the provision of off-street car parking for the co-living component is *not* a mandatory requirement under the *SEPP*.

Importantly, the constrained parking provision for both the co-living/retail/hotel components aligns with the strategic vision for the site, maximising housing delivery and diversity, employment opportunities, and urban amenity within a key transit-oriented location.

In this regard, a Green Travel Plan (GTP) has been prepared under a separate cover and sets out measures to promote sustainable travel choices for residents, staff and visitors of the proposed mixed-use development.

In addition, as noted in the foregoing, due to the existing of a water table, it is not possible to excavate additional basement levels to provide additional parking.

The geometric design layout of the proposed car parking facilities has been designed to comply with the relevant requirements specified in the Standards Australia publication *Parking Facilities Part 1 - Off-Street Car Parking AS2890.1* and *Parking Facilities Part 6 - Off-Street Parking for People with Disabilities AS2890.6* in respect of parking bay dimensions, ramp grades, aisle widths, and overhead clearances.

In addition, a number of *swept turning path* diagrams have been prepared which are reproduced in **Appendix D**, demonstrating that B85 and B99 design vehicles are able to pass each other, as specified in AS2890.1, whilst travelling in a forward direction at all times.

4.3 Off-Street Bicycle Parking Provisions

The following off-street bicycle parking requirements applicable to the co-living component of the development proposal are also specified in *SEPP (Housing) 2021* in the following terms:

Part 3 Co-living housing

69 Standards for co-living housing

- (1) Development consent must not be granted for development for the purposes of co-living housing unless the consent authority is satisfied that–
 - (e) the co-living housing will include adequate bicycle and motorcycle parking spaces.

Reference is therefore made to Council’s *Newcastle Development Control Plan 2023 Section C1 Traffic parking and access* document to establish if an ‘adequate’ provision of bicycle parking spaces has been provided for the ‘co-living housing’ component as well as other various components outlined in the development proposal.

Residential accommodation

Residents:	1 space per dwelling (The required security level – A or B will be determined)
Visitors:	1 space per 7 dwellings (Security Level C)

Co-living

Residents:	1 space per 7 bedrooms (Security Level B)
Visitors:	1 space per 10 bedrooms (Security Level C)

Shop

2 spaces per 200m² GFA (50% Security Level B, 50% Security Level C)

Hotel, Motel or Serviced apartment accommodation

1 space per 15 units (Security Level B)

Application of the above requirements to the various components outlined in the development proposal yields an off-street bicycle parking requirement of 320 spaces, as set out in the table below:

DCP Bicycle Parking Requirements

Residential (245 dwellings):	245 spaces
Residential Visitors (245 dwellings):	35 spaces
Co-Living Residents (99 rooms):	14 spaces
Co-Living Visitors (99 rooms):	10 spaces
Retail (500m ² GFA):	5 spaces
Hotel (171 units):	11 spaces
TOTAL PARKING REQUIREMENT:	320 spaces

By way of comparison, reference is made to the NSW Government's *Planning Guidelines for Walking and Cycling* document which nominates the following suggested bicycle parking provision:

Residential Flat Buildings

Residents:	0.2-0.3 spaces per unit
Visitors:	0.05-0.1 spaces per unit

Boarding Houses

Resident:	0.05-0.1 spaces per room
Visitor:	0.03-0.05 spaces per room

Tourist Hotels, Serviced Apartments

Staff:	0.03-0.05 spaces per staff
Visitor:	0.03-0.05 spaces per room

Retail Shops

Staff:	0.03-0.05 spaces per staff
Customer:	0.05-0.1 spaces per staff

Application of the above requirements to the various components outlined in the development proposal yields an off-street bicycle parking requirement of 78-129 spaces, as set out in the table below:

Planning Guidelines Bicycle Parking Requirements

Residential (245 dwellings):	49-74 spaces
Residential Visitors (245 dwellings):	12-25 spaces
Co-Living Residents (99 rooms):	5-10 spaces
Co-Living Visitors (99 rooms):	3-5 spaces
Retail Staff (24 staff):	1-1 spaces
Retail Visitor (24 staff):	1-2 spaces
Hotel Staff (50 staff):	2-3 spaces
Hotel Visitors (171 units):	5-9 spaces
TOTAL PARKING REQUIREMENT:	78-129 spaces

As can be seen in the assessment above, the majority of the bicycle parking requirement is attributed to the onerous requirement of *1 space per dwelling* for the residential component. In this instance, the above NSW Government's *Planning Guidelines for Walking and Cycling* suggest a bicycle parking provision ranging between 78-129 spaces.

Notwithstanding, off-street bicycle parking is provided for residents in private storage areas within the residential levels, as well as bicycle racks within the public domain. It is also noted that the design of the basement parking facilities can potentially cater for additional bicycle parking.

4.4 Off-Street Motorcycle Parking Provisions

The off-street motorcycle parking requirements applicable to the development proposal are specified in Council's *Newcastle Development Control Plan 2023 Section C1 Traffic parking and access* document in the following terms:

Motorbike Parking

1 space per 20 car spaces

In addition, the following off-street bicycle parking requirements applicable to the co-living component of the development proposal are also specified in *SEPP (Housing) 2021* in the following terms:

Part 3 Co-living housing

69 Standards for co-living housing

- (1) Development consent must not be granted for development for the purposes of co-living housing unless the consent authority is satisfied that–
 - (h) the co-living housing will include adequate bicycle and motorcycle parking spaces.

By way of comparison, reference is therefore made to Council's *Newcastle Development Control Plan 2023 Section C1 Traffic parking and access* document to establish if an 'adequate' provision of motorcycle parking spaces has been provided.

Application of the above rates to the 215 car parking spaces proposed yields a motorcycle parking requirement of 11 motorcycle spaces.

The proposed development makes provision for a total of 0 off-street motorcycle spaces, thereby resulting in a shortfall under Council's *DCP* and *SEPP (Housing) 2021* motorcycle parking requirement.

In this regard, it is noted that the site is located directly adjoining the Newcastle Interchange Station and is ideally located to reduce reliance on private vehicle usage and to encourage increased usage of public transport services.

It is also noted that the target demographic of the proposed co-living housing will primarily comprise students and young professionals who traditionally have a low private vehicle ownership, particularly those who prefer living in close proximity to shops, restaurants and excellent public transport facilities that the subject site provides.

As such, the shortfall of off-street motorcycle spaces is considered acceptable to reduce reliance on private vehicle usage and to encourage increased usage of public transport services.

4.5 Loading/Service Provisions

Loading/servicing for the proposed development is expected to be undertaken by a variety of light commercial vehicles such as the *Hyundai iLoad* and similar “white vans”, up to and including 12.5m long HRV trucks subject to a minimum height clearance of 4.5m.

In this regard, a dedicated drive-through loading area is proposed on the ground level, adjacent the bin holding room, capable of accommodating Council’s waste truck.

A Loading Dock Management Plan (LDMP) will be provided as part of the Construction Certificate to ensure the safe operation of this drive-through loading area.

The geometric design layout of the proposed loading facilities has been designed to comply with the relevant requirements specified in the Standards Australia publication *Parking Facilities Part 2 - Off-Street Commercial Vehicle Facilities AS2890.2* in respect of loading dock dimensions, overhead clearances and service area requirements.

The manoeuvring area has been designed to accommodate the swept turning path requirements of these 12.5m long HRV trucks, allowing them to enter and exit the loading dock satisfactorily, as shown in the attached *swept turning path* diagrams which are reproduced in **Appendix D**. Importantly, all vehicles, including trucks, can enter and exit the site in a forward direction at all times.

5.0 CONCLUSION

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

- the proposed development involves the demolition of the existing buildings on the site to facilitate the construction of a new mixed-use development, comprising 245 residential apartments, 171 hotel units, 99 *co-living* rooms and approximately 500m² GFA of retail floor space
- the proposed development will use the basement structures and enabling works approved under DA2018/01197 (as modified). Due to the existence of a water table on the site, it is not possible to excavate additional basement levels to provide additional parking
- the traffic generation potential of the development will result in a *nett increase* of approximately 71 vph and 46 vph during the AM and PM peak periods respectively when compared to the previously approved development based on the rates published in the TfNSW *Guide to Transport Impact Assessment*. This change in traffic generation is consistent with the zoning objectives of the site and will not have any unacceptable traffic implications in terms of road network capacity
- the SIDRA capacity analysis of the 4 nearby intersections located around the perimeter of the site indicates that all intersections will continue to operate satisfactorily under the projected additional traffic demands
- the parking requirement of the site has been assessed with regards to Council's *DCP* and *SEPP (Housing) 2021*, resulting in a *maximum* requirement of 340 residential spaces, and a *minimum* requirement of 137 non-residential spaces. In response the development provides 215 parking spaces, comprising 197 residential spaces, 10 hotel staff spaces, 6 retail staff spaces, and 2 car share spaces, thereby resulting in a shortfall of 20 co-living spaces, 91 hotel spaces, 7 retail spaces and 1 car share space

- this shortfall is considered acceptable in this instance as the site is located within *Newcastle City Centre* and *Wickham Key Precinct*, directly adjoining the Newcastle Interchange Station, such that it has excellent access to services and amenities as well as public transport options, and is ideally located to reduce reliance on private car usage and to encourage increased use of public transport services
- the proposed access and internal design arrangements comply with the relevant requirements specified in the Standards Australia *AS2890* series. In addition, the proposed loading and manoeuvring area will satisfactorily allow 12.5m long HRV trucks to enter and exit the site whilst travelling in a forward direction at all times, as demonstrated by the *swept turning path* diagrams

It is therefore reasonable to conclude that the proposed development will not have any unacceptable implications in terms of road network capacity, vehicular access or off-street parking/loading requirements.

APPENDIX A

ARCHITECTURAL PLANS



GENERAL NOTES:

- Number of accessible and shared spaces awaiting access and traffic advice.
- Overall parking numbers TBC
- Basement structure location based on surveyed information

PARKING SCHEDULE	
Type	Count
CAR SHARE:	
STANDARD 5400x2400	2
	2
HOTEL STAFF	
ACCESSIBLE 5400x2400	1
STANDARD 5400x2400	9
	10
RESIDENTIAL	
SMALL 5000x2300	18
STANDARD 5400x2400	179
	197
RETAIL STAFF	
ACCESSIBLE 5400x2400	1
STANDARD 5400x2400	5
	6
Grand total	215

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PRELIMINARY

0 1 2 5m
1:100 (BA0)

Nominated Architects: Adam Haddow-7188 | John Pradea-7084

Rev	Date	Revision	By	Chk.
A	27.03.2026	ISSUED FOR SSCA		

NOTE: MINOR CHANGES TO FORM AND CONFIGURATION MAY BE REQUIRED WHEN DRAWINGS ARE SUBSEQUENTLY PREPARED FOR CONSTRUCTION PURPOSES AFTER THE GRANT OF DEVELOPMENT CONSENT.

Client
URBAN
PROPERTY

Project
UPG NEWCASTLE
10 DANGAR STREET, WICKHAM

Drawing Name
FLOOR PLAN - BASEMENT 03

Date
27.03.2026

Scale
1 : 100

Sheet Size
A0

Drawn
CN

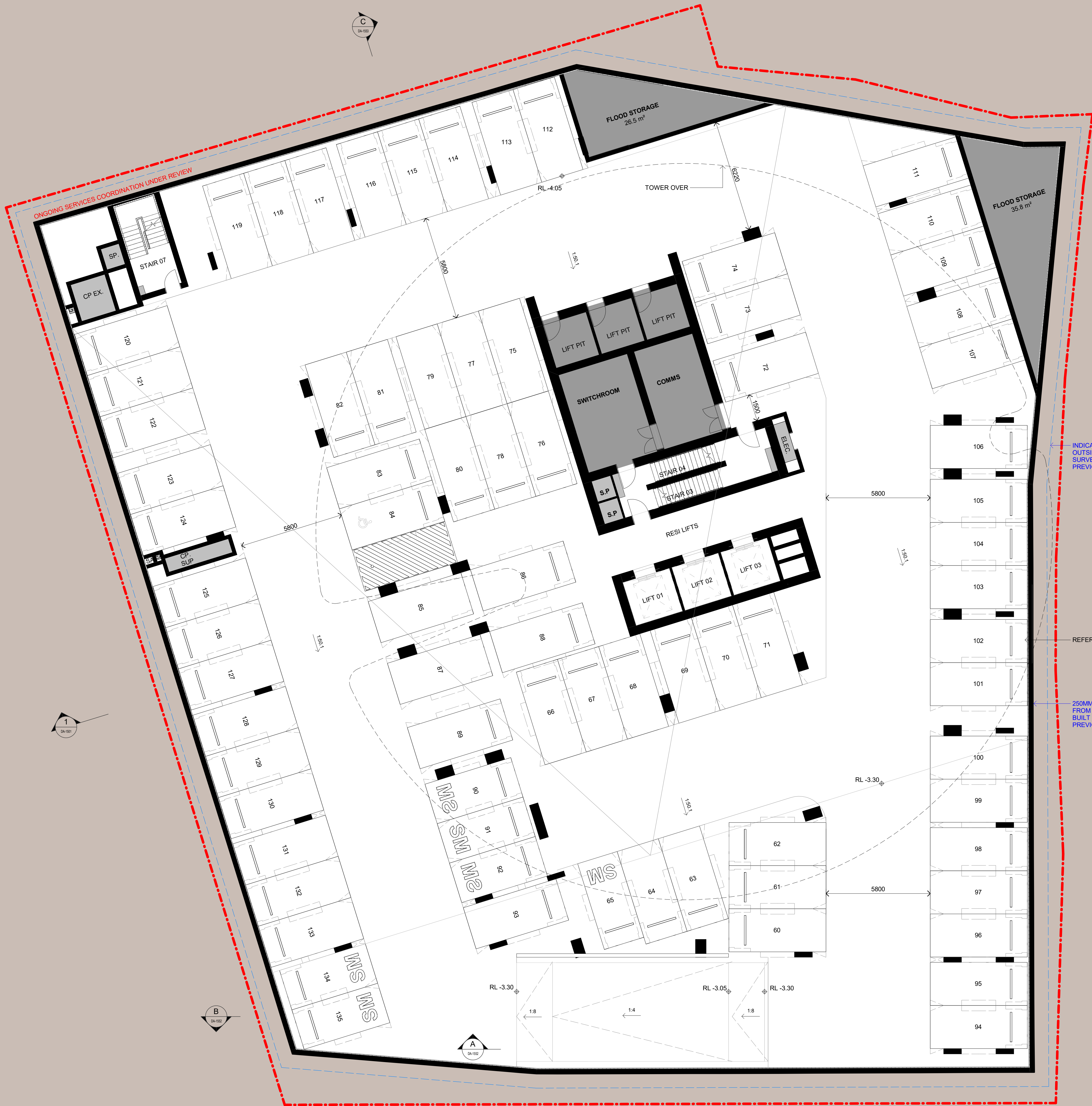
Chk.
WG

Job No.
7105

Drawing No.
DA-1004

Revision
/ A

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INDICATIVE LINE SHOWING THE OUTSIDE FACE OF THE AS BUILT + SURVEYED PILING, BASED OFF PREVIOUS ADVICE

REFER TO LANDSCAPE DRAWINGS

250MM WALL + 50MM TOLERANCE FROM THE INSIDE FACE OF THE AS BUILT + SURVEYED PILING, BASED OFF PREVIOUS ADVICE

GENERAL NOTES:

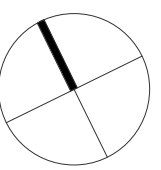
- Number of accessible and shared spaces awaiting access and traffic advice.
- Overall parking numbers TBC
- Basement structure location based on surveyed information

PARKING SCHEDULE	
Type	Count
CAR SHARE	
STANDARD 5400x2400	2
	2
HOTEL STAFF	
ACCESSIBLE 5400x2400	1
STANDARD 5400x2400	9
	10
RESIDENTIAL	
SMALL 5000x2300	18
STANDARD 5400x2400	179
	197
RETAIL STAFF	
ACCESSIBLE 5400x2400	1
STANDARD 5400x2400	5
	6
Grand total	215

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PRELIMINARY



0 1 2
1:100 @A0

Nominated Architects: Adam Haddow-7188 | John Pradd-7084

Rev	Date	Revision	By	Chk.
A	27.03.2026	ISSUED FOR SSCA		

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Client
URBAN
PROPERTY

Project
UPG NEWCASTLE
10 DANGAR STREET, WICKHAM

Drawing Name
FLOOR PLAN - BASEMENT 02

Date
27.03.2026
Scale
1 : 100
Sheet Size
A0
Drawn
CN
Chk.
WG
Job No.
7105
Drawing No.
DA-1005
Revision
/ A

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INDICATIVE LINE SHOWING THE OUTSIDE FACE OF THE AS BUILT + SURVEYED PILING, BASED OFF PREVIOUS ADVICE

REFER TO LANDSCAPE DRAWINGS

250MM WALL + 50MM TOLERANCE FROM THE INSIDE FACE OF THE AS BUILT + SURVEYED PILING, BASED OFF PREVIOUS ADVICE

GENERAL NOTES:

- Number of accessible and shared spaces awaiting access and traffic advice.
- Overall parking numbers TBC
- Basement structure location based on surveyed information

PARKING SCHEDULE	
Type	Count
CAR SHARE	
STANDARD 5400x2400	2
	2
HOTEL STAFF	
ACCESSIBLE 5400x2400	1
STANDARD 5400x2400	9
	10
RESIDENTIAL	
SMALL 5000x2300	18
STANDARD 5400x2400	179
	197
RETAIL STAFF	
ACCESSIBLE 5400x2400	1
STANDARD 5400x2400	5
	6
Grand total	215

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PRELIMINARY

Nominated Architects: Adam Haddow-7188 | John Pradell-7004

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Client
URBAN
PROPERTY

Project
UPG NEWCASTLE
10 DANGAR STREET, WICKHAM

Drawing Name
FLOOR PLAN - BASEMENT 01

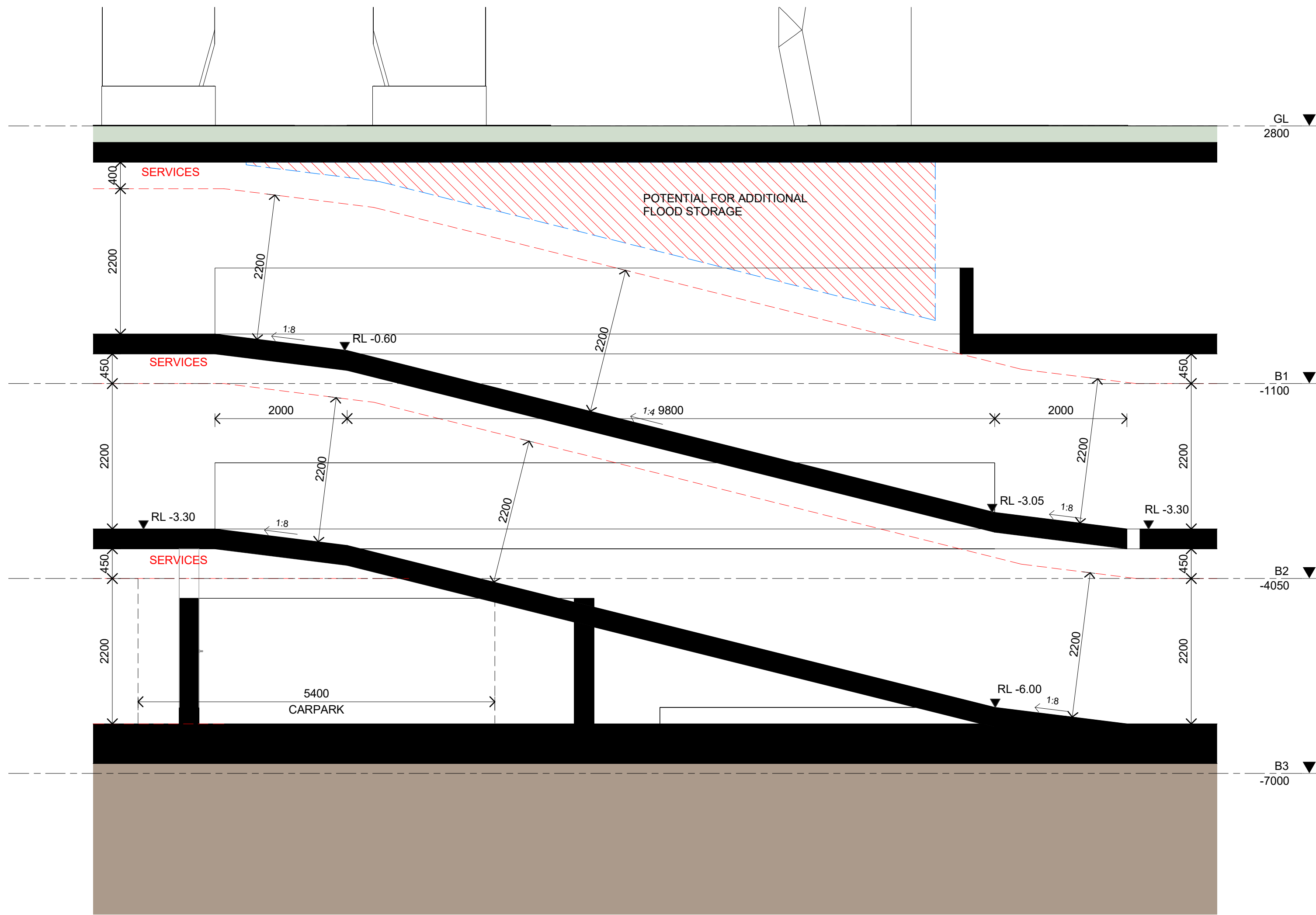
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CN	WG	7105
Drawing No.	Revision	
DA-1006	/ A	

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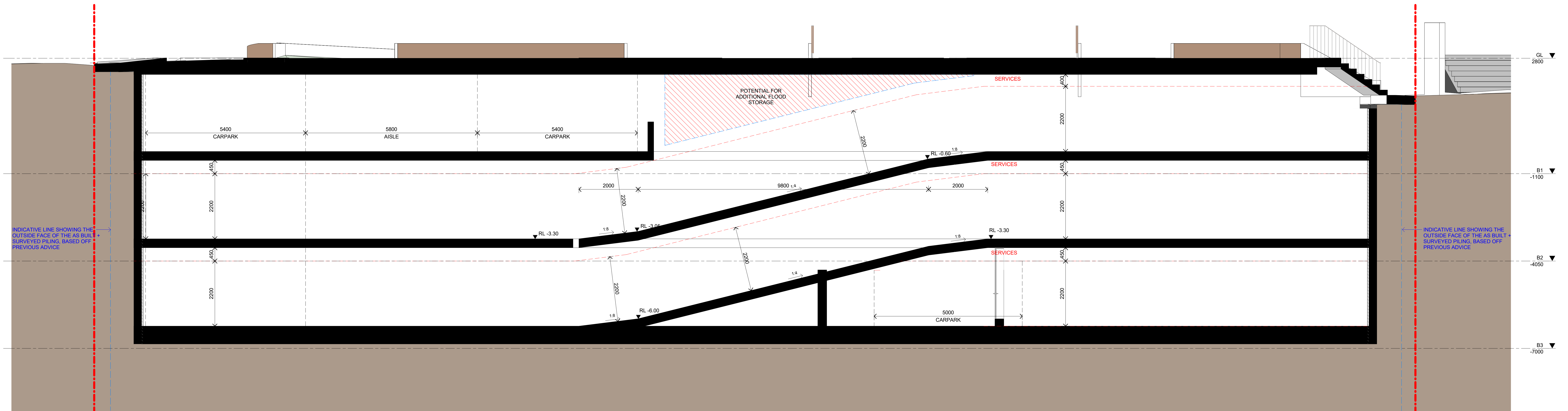


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A COORDINATION SECTION A
DA-1004 SCALE 1:50



B COORDINATION SECTION B
DA-1004 SCALE 1:50

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Rev	Date	Revision	By	Chk.
A	27.03.2026	ISSUED FOR SSCA		

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1:50 @A0

Nominated Architects: Adam Haddow-7188 | John Pradell-7004

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Client
URBAN
PROPERTY

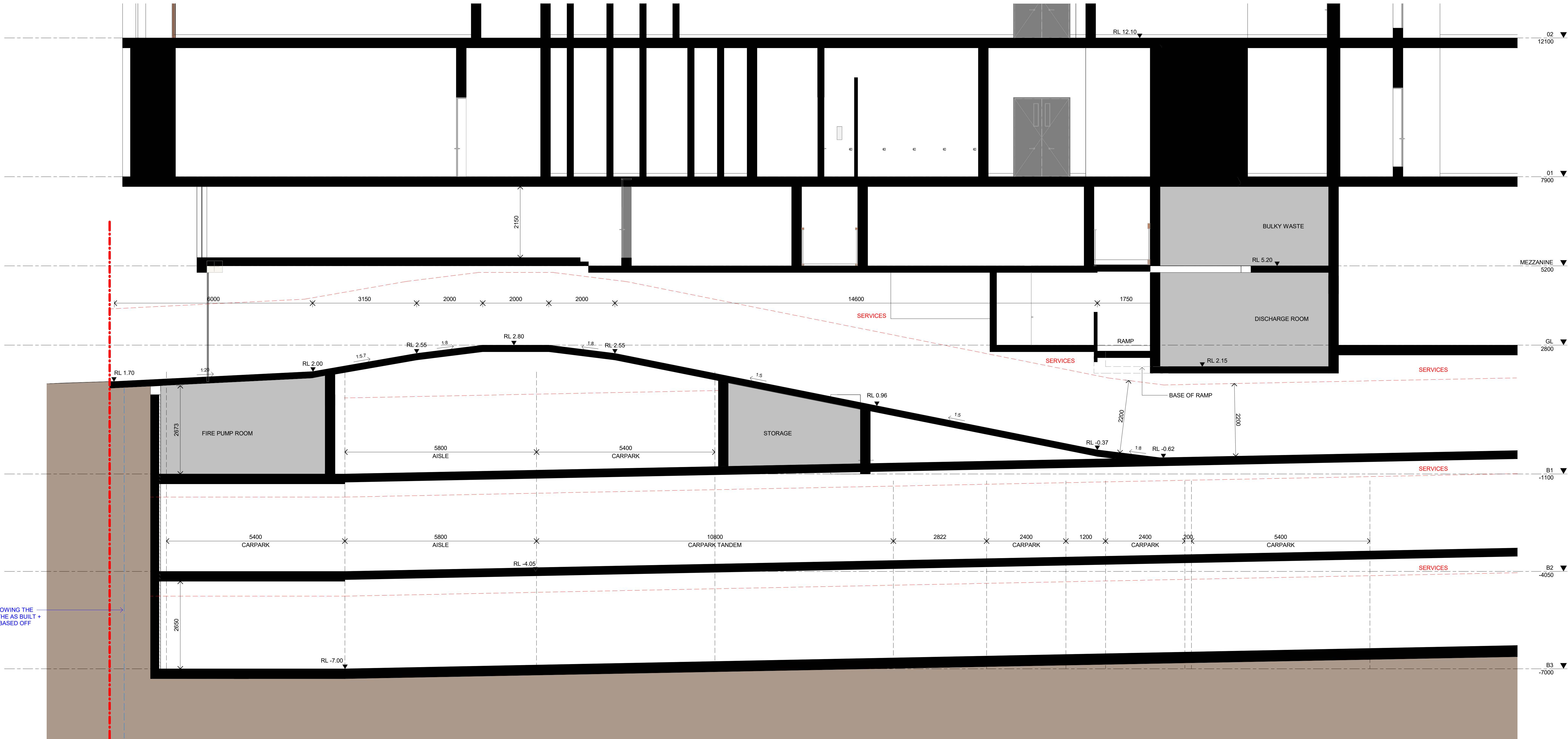
Project
UPG NEWCASTLE
10 DANGAR STREET, WICKHAM

Drawing Name
SECTION - COORDINATION

Date	Scale	Sheet Size
27.03.2026	1 : 50	A0
Drawn	Chk.	Job No.
CN	WG	7105
Drawing No.	Revision	
DA-1552	/ A	

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C COORDINATION SECTION C
DA-001 SCALE 1:50

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0 500 1000 2500mm
1:50 @A0

Nominated Architects: Adam Haddow-7188 | John Pradell-7004

Rev	Date	Revision	By	Chk.
A	27.03.2026	ISSUED FOR SSCA		

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Client

URBAN
PROPERTY

Project

UPG NEWCASTLE
10 DANGAR STREET, WICKHAM

Drawing Name

SECTION - COORDINATION

Date	Scale	Sheet Size
27.03.2026	1 : 50	A0
Drawn	Chk.	Job No.
CN	WG	7105
Drawing No.	Revision	
DA-1553	/ A	

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APPENDIX B

TRAFFIC SURVEY DATA

TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY

trafficsurvey.com.au



Intersection of Station St and Wickham St, Wickham

GPS -32.923530, 151.758567

Date:	Wed 03/09/25
Weather:	Fine
Suburban:	Wickham
Customer:	Varga

North:	Wickham St
East:	Station St
South:	N/A
West:	Station St

Survey	AM:	6:30 AM-10:30 AM
Period	PM:	3:00 PM-7:00 PM
Traffic	AM:	7:45 AM-8:45 AM
Peak	PM:	5:15 PM-6:15 PM

All Vehicles

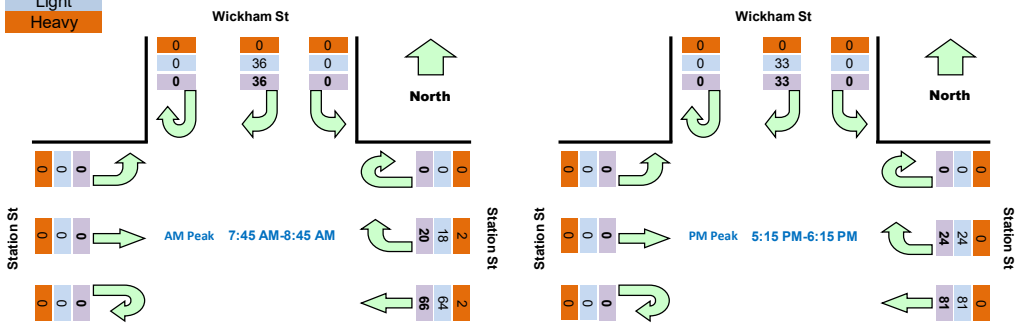
Time		North Approach Wickham St			East Approach Station St			West Approach Station St			Hourly Total	
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	Hour	Peak
6:30	6:45	0	5	0	0	1	9	0	0	0	60	
6:45	7:00	0	3	0	0	1	8	0	0	0	67	
7:00	7:15	0	4	0	0	1	14	0	0	0	89	
7:15	7:30	0	3	0	0	2	9	0	0	0	96	
7:30	7:45	0	11	0	0	6	5	0	0	0	111	
7:45	8:00	0	8	0	0	8	18	0	0	0	122	Peak
8:00	8:15	0	9	0	0	5	12	0	0	0	104	
8:15	8:30	0	10	0	0	6	13	0	0	0	108	
8:30	8:45	0	9	0	0	1	23	0	0	0	107	
8:45	9:00	0	5	0	0	5	6	0	0	0	101	
9:00	9:15	0	7	0	0	6	17	0	0	0	111	
9:15	9:30	0	7	1	0	7	13	0	0	0	97	
9:30	9:45	0	4	0	0	7	16	0	0	0	87	
9:45	10:00	0	6	0	0	4	16	0	0	0		
10:00	10:15	0	3	0	0	7	6	0	0	0		
10:15	10:30	0	2	0	0	6	10	0	0	0		
15:00	15:15	0	3	0	0	8	12	0	0	0	91	
15:15	15:30	0	4	0	0	5	14	0	0	0	96	
15:30	15:45	0	6	0	0	4	11	0	0	0	101	
15:45	16:00	0	3	0	0	8	13	0	0	0	101	
16:00	16:15	0	7	0	0	5	16	0	0	0	106	
16:15	16:30	0	7	0	0	10	11	0	0	0	110	
16:30	16:45	0	5	0	0	4	12	0	0	0	127	
16:45	17:00	0	6	0	0	5	18	0	0	0	130	
17:00	17:15	0	8	0	0	8	16	0	0	0	137	
17:15	17:30	0	14	0	0	10	21	0	0	0	138	Peak
17:30	17:45	0	4	0	0	3	17	0	0	0	124	
17:45	18:00	0	5	0	0	5	26	0	0	0	126	
18:00	18:15	0	10	0	0	6	17	0	0	0	108	
18:15	18:30	0	5	0	0	6	20	0	0	0		
18:30	18:45	0	5	0	0	8	13	0	0	0		
18:45	19:00	0	4	0	0	4	10	0	0	0		

Peak Time		North Approach Wickham St			East Approach Station St			West Approach Station St			Peak total
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	
7:45	8:45	0	36	0	0	20	66	0	0	0	122
17:15	18:15	0	33	0	0	24	81	0	0	0	138

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

Total
Light
Heavy



Time		North Approach Wickham St			East Approach Station St			West Approach Station St		
Period Start	Period End	U	R	L	U	R	WB	U	EB	L
6:30	6:45	0	5	0	0	1	9	0	0	0
6:45	7:00	0	3	0	0	0	8	0	0	0
7:00	7:15	0	4	0	0	1	14	0	0	0
7:15	7:30	0	3	0	0	2	8	0	0	0
7:30	7:45	0	11	0	0	6	4	0	0	0
7:45	8:00	0	8	0	0	6	18	0	0	0
8:00	8:15	0	9	0	0	5	12	0	0	0
8:15	8:30	0	10	0	0	6	12	0	0	0
8:30	8:45	0	9	0	0	1	22	0	0	0
8:45	9:00	0	5	0	0	5	6	0	0	0
9:00	9:15	0	7	0	0	6	17	0	0	0
9:15	9:30	0	7	1	0	7	13	0	0	0
9:30	9:45	0	4	0	0	7	15	0	0	0
9:45	10:00	0	6	0	0	4	16	0	0	0
10:00	10:15	0	3	0	0	7	6	0	0	0
10:15	10:30	0	2	0	0	6	9	0	0	0
15:00	15:15	0	3	0	0	8	12	0	0	0
15:15	15:30	0	4	0	0	5	14	0	0	0
15:30	15:45	0	6	0	0	4	11	0	0	0
15:45	16:00	0	3	0	0	8	13	0	0	0
16:00	16:15	0	7	0	0	5	16	0	0	0
16:15	16:30	0	7	0	0	10	11	0	0	0
16:30	16:45	0	4	0	0	4	12	0	0	0
16:45	17:00	0	6	0	0	5	18	0	0	0
17:00	17:15	0	8	0	0	8	16	0	0	0
17:15	17:30	0	14	0	0	10	21	0	0	0
17:30	17:45	0	4	0	0	3	17	0	0	0
17:45	18:00	0	5	0	0	5	26	0	0	0
18:00	18:15	0	10	0	0	6	17	0	0	0
18:15	18:30	0	5	0	0	6	20	0	0	0
18:30	18:45	0	5	0	0	8	13	0	0	0
18:45	19:00	0	4	0	0	4	10	0	0	0

Heavy Vehicles

[illegible]

TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY

trafficsurvey.com.au



Intersection of Bishopsgate St and Charles St, Wickham

GPS -32.922791, 151.759604

Date:	Wed 03/09/25
Weather:	Fine
Suburban:	Wickham
Customer:	Varga

North:	N/A
East:	Bishopsgate St
South:	Charles St
West:	Bishopsgate St

Survey	AM:	6:30 AM-10:30 AM
Period	PM:	3:00 PM-7:00 PM
Traffic	AM:	7:45 AM-8:45 AM
Peak	PM:	4:15 PM-5:15 PM

All Vehicles

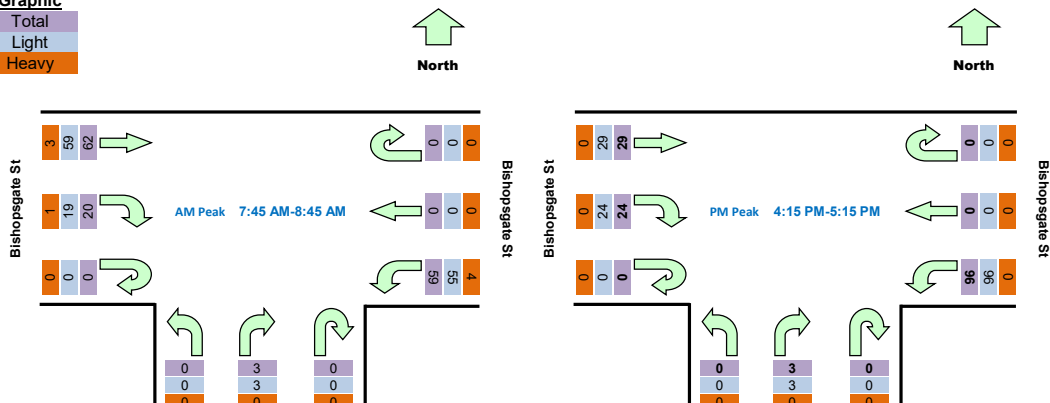
Time		East Approach Bishopsgate			South Approach Charles St			West Approach Bishopsgate			Hourly Total	
Period Start	Period End	U	WB	L	U	R	L	U	R	EB	Hour	Peak
6:30	6:45	0	0	11	0	1	0	0	2	7	86	
6:45	7:00	0	0	8	0	0	0	0	2	11	89	
7:00	7:15	0	0	7	0	0	0	0	4	11	108	
7:15	7:30	0	0	8	0	2	0	0	3	9	128	
7:30	7:45	0	0	7	0	1	0	0	4	12	135	
7:45	8:00	0	0	19	0	0	0	0	5	16	144	Peak
8:00	8:15	0	0	11	0	2	0	0	6	23	133	
8:15	8:30	0	0	14	0	0	0	0	4	11	121	
8:30	8:45	0	0	15	0	1	0	0	5	12	124	
8:45	9:00	0	0	14	0	2	0	0	3	10	127	
9:00	9:15	0	0	18	0	2	0	0	3	7	131	
9:15	9:30	0	0	18	0	2	0	0	6	6	122	
9:30	9:45	0	0	15	0	0	0	0	5	16	114	
9:45	10:00	1	0	18	0	0	0	0	1	13		
10:00	10:15	0	0	11	0	0	0	0	2	8		
10:15	10:30	0	0	11	0	1	0	0	7	5		
15:00	15:15	0	0	13	0	1	0	0	3	8	110	
15:15	15:30	0	0	13	0	1	0	0	9	6	117	
15:30	15:45	0	0	18	0	1	0	0	2	4	124	
15:45	16:00	0	0	21	0	3	0	0	5	2	134	
16:00	16:15	0	0	18	0	0	0	0	5	9	146	
16:15	16:30	0	0	21	0	0	0	0	6	9	152	Peak
16:30	16:45	0	0	20	0	0	0	0	5	10	148	
16:45	17:00	0	0	30	0	3	0	0	6	4	148	
17:00	17:15	0	0	25	0	0	0	0	7	6	150	
17:15	17:30	0	0	18	0	1	0	0	6	7	147	
17:30	17:45	0	0	23	0	2	0	0	1	9	152	Peak
17:45	18:00	0	0	25	0	1	0	0	10	9	144	
18:00	18:15	0	0	23	1	0	0	0	5	6	123	
18:15	18:30	0	0	18	0	4	0	0	8	7		
18:30	18:45	0	0	16	0	1	0	0	4	6		
18:45	19:00	0	0	13	0	0	0	0	3	8		

Peak Time		East Approach Bishopsgate			South Approach Charles St			West Approach Bishopsgate			Peak total
Period Start	Period End	U	WB	L	U	R	L	U	R	EB	
7:45	8:45	0	0	59	0	3	0	0	20	62	144
16:15	17:15	0	0	96	0	3	0	0	24	29	152

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

Total
Light
Heavy



Time		1st Approach Bishopsgate			South Approach Charles Street			2nd Approach Bishopsgate		
Period Start	Period End	U	WB	L	U	R	L	U	R	EB
6:30	6:45	0	0	10	0	1	0	0	2	7
6:45	7:00	0	0	8	0	0	0	0	2	10
7:00	7:15	0	0	7	0	0	0	0	4	11
7:15	7:30	0	0	8	0	2	0	0	2	9
7:30	7:45	0	0	6	0	1	0	0	4	12
7:45	8:00	0	0	18	0	0	0	0	4	15
8:00	8:15	0	0	10	0	2	0	0	6	22
8:15	8:30	0	0	13	0	0	0	0	4	10
8:30	8:45	0	0	14	0	1	0	0	5	12
8:45	9:00	0	0	14	0	2	0	0	3	10
9:00	9:15	0	0	18	0	2	0	0	3	7
9:15	9:30	0	0	18	0	2	0	0	5	6
9:30	9:45	0	0	14	0	0	0	0	5	15
9:45	10:00	1	0	18	0	0	0	0	1	13
10:00	10:15	0	0	10	0	0	0	0	2	8
10:15	10:30	0	0	11	0	1	0	0	7	5
15:00	15:15	0	0	13	0	1	0	0	3	8
15:15	15:30	0	0	13	0	1	0	0	9	6
15:30	15:45	0	0	18	0	1	0	0	2	4
15:45	16:00	0	0	21	0	3	0	0	5	2
16:00	16:15	0	0	18	0	0	0	0	5	9
16:15	16:30	0	0	21	0	0	0	0	6	9
16:30	16:45	0	0	20	0	0	0	0	5	10
16:45	17:00	0	0	30	0	3	0	0	6	4
17:00	17:15	0	0	25	0	0	0	0	7	6
17:15	17:30	0	0	18	0	1	0	0	6	7
17:30	17:45	0	0	23	0	2	0	0	1	9
17:45	18:00	0	0	25	0	1	0	0	10	9
18:00	18:15	0	0	23	1	0	0	0	5	6
18:15	18:30	0	0	18	0	4	0	0	8	7
18:30	18:45	0	0	16	0	1	0	0	4	6
18:45	19:00	0	0	13	0	0	0	0	3	8

Heavy Vehicles

[illegible]

TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY

trafficsurvey.com.au



Intersection of Bishopsgate St and Hannell St, Wickham

GPS -32.922871, 151.760628

Date:	Wed 03/09/25
Weather:	Fine
Suburban:	Wickham
Customer:	Varga

North:	Hannell St
East:	N/A
South:	Hannell St
West:	Bishopsgate St

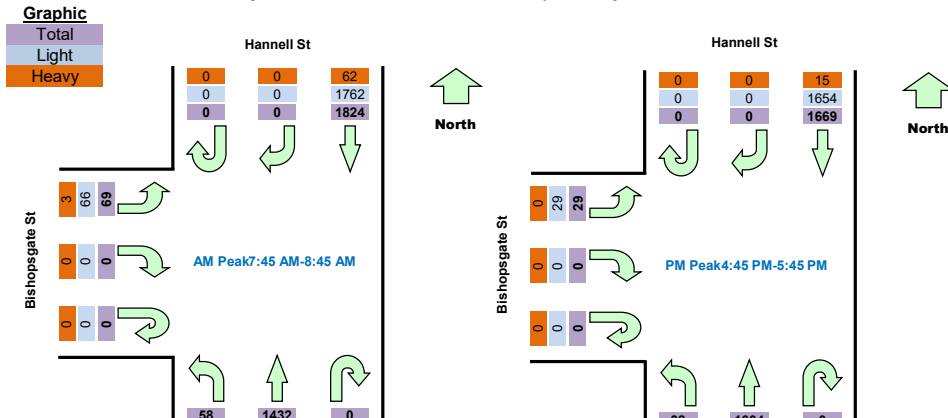
Survey	AM:	6:30 AM-10:30 AM
Period	PM:	3:00 PM-7:00 PM
Traffic	AM:	7:45 AM-8:45 AM
Peak	PM:	4:45 PM-5:45 PM

All Vehicles

Time		North Approach Hannell St			South Approach Hannell St			West Approach Bishopsgate			Hourly Total	
Period Start	Period End	U	R	SB	U	NB	L	U	R	L	Hour	Peak
6:30	6:45	0	0	214	0	276	12	0	0	9	2491	
6:45	7:00	0	0	243	0	353	8	0	0	12	2757	
7:00	7:15	0	0	281	0	342	6	0	0	12	3024	
7:15	7:30	0	0	288	0	415	8	0	0	12	3217	
7:30	7:45	0	0	366	0	389	8	0	0	14	3339	
7:45	8:00	0	0	460	0	388	18	0	0	17	3383	Peak
8:00	8:15	0	0	431	0	366	11	0	0	26	3291	
8:15	8:30	0	0	455	0	363	15	0	0	12	3160	
8:30	8:45	0	0	478	0	315	14	0	0	14	2934	
8:45	9:00	0	0	437	0	327	15	0	0	12	2741	
9:00	9:15	0	0	348	0	329	17	0	0	9	2551	
9:15	9:30	0	0	307	0	284	19	0	0	9	2418	
9:30	9:45	0	0	301	0	298	14	0	0	15	2333	
9:45	10:00	0	0	319	0	249	18	0	0	15		
10:00	10:15	0	0	291	0	261	11	0	0	7		
10:15	10:30	0	0	262	0	255	11	0	0	6		
15:00	15:15	0	0	382	0	327	13	0	0	9	3084	
15:15	15:30	0	0	350	0	377	14	0	0	7	3117	
15:30	15:45	0	0	364	0	374	19	0	0	6	3170	
15:45	16:00	0	0	447	0	367	22	0	0	6	3206	
16:00	16:15	0	0	394	0	343	19	0	0	8	3228	
16:15	16:30	0	0	372	0	398	21	0	0	10	3281	
16:30	16:45	0	0	405	0	363	21	0	0	10	3368	
16:45	17:00	0	0	457	0	369	31	0	0	7	3400	Peak
17:00	17:15	0	0	387	0	399	26	0	0	5	3378	
17:15	17:30	0	0	402	0	462	17	0	0	7	3200	
17:30	17:45	0	0	423	0	374	24	0	0	10	2892	
17:45	18:00	0	0	422	0	383	26	0	0	11	2488	
18:00	18:15	0	0	312	0	296	24	0	0	7	2022	
18:15	18:30	0	0	263	0	290	17	0	0	10		
18:30	18:45	0	0	200	0	202	17	0	0	8		
18:45	19:00	0	0	171	0	186	12	0	0	7		

Peak Time		North Approach Hannell St			South Approach Hannell St			West Approach Bishopsgate			Peak
Period Start	Period End	U	R	SB	U	NB	L	U	R	L	total
7:45	8:45	0	0	1824	0	1432	58	0	0	69	3383
16:45	17:45	0	0	1669	0	1604	98	0	0	29	3400

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.



Light Vehicles

Time		North Approach Hannell St			South Approach Hannell St			West Approach Bishopsgate		
Period Start	Period End	U	R	SB	U	NB	L	U	R	L
6:30	6:45	0	0	201	0	268	11	0	0	9
6:45	7:00	0	0	226	0	347	8	0	0	11
7:00	7:15	0	0	263	0	328	6	0	0	12
7:15	7:30	0	0	271	0	400	8	0	0	12
7:30	7:45	0	0	348	0	379	7	0	0	14
7:45	8:00	0	0	443	0	374	17	0	0	16
8:00	8:15	0	0	414	0	348	10	0	0	25
8:15	8:30	0	0	438	0	353	14	0	0	11
8:30	8:45	0	0	467	0	293	13	0	0	14
8:45	9:00	0	0	419	0	314	15	0	0	12
9:00	9:15	0	0	336	0	305	17	0	0	9
9:15	9:30	0	0	291	0	258	19	0	0	9
9:30	9:45	0	0	286	0	274	13	0	0	14
9:45	10:00	0	0	304	0	240	18	0	0	15
10:00	10:15	0	0	274	0	246	10	0	0	7
10:15	10:30	0	0	253	0	237	11	0	0	6
15:00	15:15	0	0	373	0	316	13	0	0	9
15:15	15:30	0	0	340	0	355	14	0	0	7
15:30	15:45	0	0	353	0	359	19	0	0	6
15:45	16:00	0	0	445	0	352	22	0	0	6
16:00	16:15	0	0	392	0	333	19	0	0	8
16:15	16:30	0	0	364	0	390	21	0	0	10
16:30	16:45	0	0	401	0	356	21	0	0	10
16:45	17:00	0	0	453	0	362	31	0	0	7
17:00	17:15	0	0	384	0	394	26	0	0	5
17:15	17:30	0	0	397	0	454	17	0	0	7
17:30	17:45	0	0	420	0	368	24	0	0	10
17:45	18:00	0	0	416	0	378	26	0	0	11
18:00	18:15	0	0	305	0	293	24	0	0	7
18:15	18:30	0	0	261	0	287	17	0	0	10
18:30	18:45	0	0	198	0	200	17	0	0	8
18:45	19:00	0	0	170	0	184	12	0	0	7

Peak Time		North Approach Hannell St			South Approach Hannell St			West Approach Bishopsgate			Peak total
Period Start	Period End	U	R	SB	U	NB	L	U	R	L	
7:45	8:45	0	0	1762	0	1368	54	0	0	66	3250
16:45	17:45	0	0	1654	0	1578	98	0	0	29	3359

Heavy Vehicles

Time		North Approach Hannell St			South Approach Hannell St			West Approach Bishopsgate		
Period Start	Period End	U	R	SB	U	NB	L	U	R	L
6:30	6:45	0	0	13	0	8	1	0	0	0
6:45	7:00	0	0	17	0	6	0	0	0	1
7:00	7:15	0	0	18	0	14	0	0	0	0
7:15	7:30	0	0	17	0	15	0	0	0	0
7:30	7:45	0	0	18	0	10	1	0	0	0
7:45	8:00	0	0	17	0	14	1	0	0	1
8:00	8:15	0	0	17	0	18	1	0	0	1
8:15	8:30	0	0	17	0	10	1	0	0	1
8:30	8:45	0	0	11	0	22	1	0	0	0
8:45	9:00	0	0	18	0	13	0	0	0	0
9:00	9:15	0	0	12	0	24	0	0	0	0
9:15	9:30	0	0	16	0	26	0	0	0	0
9:30	9:45	0	0	15	0	24	1	0	0	1
9:45	10:00	0	0	15	0	9	0	0	0	0
10:00	10:15	0	0	17	0	15	1	0	0	0
10:15	10:30	0	0	9	0	18	0	0	0	0
15:00	15:15	0	0	9	0	11	0	0	0	0
15:15	15:30	0	0	10	0	22	0	0	0	0
15:30	15:45	0	0	11	0	15	0	0	0	0
15:45	16:00	0	0	2	0	15	0	0	0	0
16:00	16:15	0	0	2	0	10	0	0	0	0
16:15	16:30	0	0	8	0	8	0	0	0	0
16:30	16:45	0	0	4	0	7	0	0	0	0
16:45	17:00	0	0	4	0	7	0	0	0	0
17:00	17:15	0	0	3	0	5	0	0	0	0
17:15	17:30	0	0	5	0	8	0	0	0	0
17:30	17:45	0	0	3	0	6	0	0	0	0
17:45	18:00	0	0	6	0	5	0	0	0	0
18:00	18:15	0	0	7	0	3	0	0	0	0
18:15	18:30	0	0	2	0	3	0	0	0	0
18:30	18:45	0	0	2	0	2	0	0	0	0
18:45	19:00	0	0	1	0	2	0	0	0	0

Peak Time		North Approach Hannell St			South Approach Hannell St			West Approach Bishopsgate			Peak total
Period Start	Period End	U	R	SB	U	NB	L	U	R	L	
7:45	8:45	0	0	62	0	64	4	0	0	3	133
16:45	17:45	0	0	15	0	26	0	0	0	0	41

TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY

trafficsurvey.com.au



Intersection of Hannell St and Honeysuckle Dr, Wickham

GPS: -32.923602, 151.760442

Date:	Wed 03/09/25
Weather:	Fine
Suburban:	Wickham
Customer:	Varga

North:	Hannell St
East:	Honeysuckle Dr
South:	Hannell St
West:	N/A

Survey Period	AM: 6:30 AM-10:30 AM
	PM: 3:00 PM-7:00 PM
Traffic Peak	AM: 7:45 AM-8:45 AM
	PM: 4:45 PM-5:45 PM

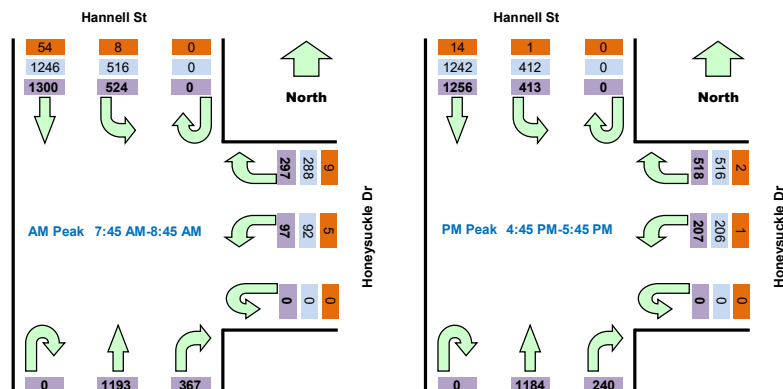
All Vehicles

Time		North Approach Hannell St			East Approach Honeysuckle			South Approach Hannell St			Hourly Total	
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	Hour	Peak
6:30	6:45	0	165	49	0	38	11	0	35	250	2744	
6:45	7:00	0	193	50	0	74	22	0	63	287	3083	
7:00	7:15	0	210	71	0	63	20	0	51	285	3391	
7:15	7:30	0	211	77	0	59	21	0	75	364	3625	
7:30	7:45	0	262	104	0	71	30	0	94	326	3767	
7:45	8:00	0	305	155	0	71	22	0	109	335	3778	Peak
8:00	8:15	0	305	126	0	74	27	0	99	303	3686	
8:15	8:30	0	329	126	0	86	31	0	85	292	3545	
8:30	8:45	0	361	117	0	66	17	0	74	263	3284	
8:45	9:00	0	326	111	0	65	31	1	94	277	3097	
9:00	9:15	0	251	97	0	62	25	0	74	284	2856	
9:15	9:30	0	199	108	0	52	24	0	54	251	2718	
9:30	9:45	0	207	94	0	59	26	0	72	253	2657	
9:45	10:00	0	242	77	0	61	27	0	51	206		
10:00	10:15	0	220	71	0	56	30	0	62	216		
10:15	10:30	0	200	62	0	57	38	0	61	209		
15:00	15:15	1	302	79	0	90	45	0	42	249	3406	
15:15	15:30	0	285	65	0	73	31	0	55	318	3455	
15:30	15:45	1	301	62	0	87	53	0	54	305	3509	
15:45	16:00	0	354	93	0	86	35	0	37	303	3555	
16:00	16:15	0	318	76	0	119	61	0	40	243	3612	
16:15	16:30	0	288	84	0	123	46	0	44	296	3692	
16:30	16:45	0	303	102	0	124	64	0	56	260	3791	
16:45	17:00	0	338	119	0	111	42	0	66	289	3818	Peak
17:00	17:15	0	301	86	0	129	65	0	60	296	3791	
17:15	17:30	0	306	96	0	123	42	0	57	356	3594	
17:30	17:45	0	311	112	0	155	58	0	57	243	3271	
17:45	18:00	0	323	99	0	90	46	0	61	319	2838	
18:00	18:15	0	254	58	0	89	47	1	60	231	2326	
18:15	18:30	0	196	67	1	82	41	0	45	225		
18:30	18:45	0	157	43	0	58	37	0	47	161		
18:45	19:00	0	138	33	0	56	21	0	36	142		

Peak Time		North Approach Hannell St			East Approach Honeysuckle			South Approach Hannell St			Peak
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	total
7:45	8:45	0	1300	524	0	297	97	0	367	1193	3778
16:45	17:45	0	1256	413	0	518	207	0	240	1184	3818

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic
Total
Light
Heavy



Light Vehicles

Time		North Approach Hannell St			East Approach Honeysuckle			South Approach Hannell St		
Period Start	Period End	U	SB	L	U	R	L	U	R	NB
6:30	6:45	0	153	48	0	38	10	0	32	241
6:45	7:00	0	180	46	0	74	22	0	61	281
7:00	7:15	0	194	69	0	63	20	0	51	271
7:15	7:30	0	199	72	0	56	20	0	75	352
7:30	7:45	0	247	101	0	71	29	0	93	315
7:45	8:00	0	291	152	0	67	20	0	108	324
8:00	8:15	0	291	123	0	71	25	0	99	287
8:15	8:30	0	312	126	0	86	30	0	84	281
8:30	8:45	0	352	115	0	64	17	0	72	242
8:45	9:00	0	309	110	0	63	28	1	92	266
9:00	9:15	0	241	95	0	60	21	0	74	262
9:15	9:30	0	188	103	0	49	24	0	54	228
9:30	9:45	0	194	92	0	57	25	0	70	230
9:45	10:00	0	227	77	0	60	27	0	51	198
10:00	10:15	0	205	69	0	52	29	0	60	204
10:15	10:30	0	193	60	0	55	38	0	60	193
15:00	15:15	1	295	77	0	90	44	0	42	238
15:15	15:30	0	276	64	0	71	30	0	52	298
15:30	15:45	1	293	59	0	84	53	0	54	293
15:45	16:00	0	352	93	0	84	35	0	37	290
16:00	16:15	0	316	76	0	117	61	0	40	235
16:15	16:30	0	283	81	0	121	46	0	44	290
16:30	16:45	0	299	102	0	122	64	0	56	255
16:45	17:00	0	335	118	0	110	42	0	66	283
17:00	17:15	0	298	86	0	129	65	0	59	291
17:15	17:30	0	301	96	0	122	41	0	56	349
17:30	17:45	0	308	112	0	155	58	0	56	237
17:45	18:00	0	317	99	0	89	46	0	61	315
18:00	18:15	0	247	58	0	89	47	1	60	228
18:15	18:30	0	194	67	0	82	41	0	45	222
18:30	18:45	0	155	43	0	58	37	0	47	159
18:45	19:00	0	137	33	0	56	21	0	36	140

Peak Time		North Approach Hannell St			East Approach Honeysuckle			South Approach Hannell St			Peak total
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	
7:45	8:45	0	1246	516	0	288	92	0	363	1134	3639
16:45	17:45	0	1242	412	0	516	206	0	237	1160	3773

Heavy Vehicles

Time		North Approach Hannell St			East Approach Honeysuckle			South Approach Hannell St		
Period Start	Period End	U	SB	L	U	R	L	U	R	NB
6:30	6:45	0	12	1	0	0	1	0	3	9
6:45	7:00	0	13	4	0	0	0	0	2	6
7:00	7:15	0	16	2	0	0	0	0	0	14
7:15	7:30	0	12	5	0	3	1	0	0	12
7:30	7:45	0	15	3	0	0	1	0	1	11
7:45	8:00	0	14	3	0	4	2	0	1	11
8:00	8:15	0	14	3	0	3	2	0	0	16
8:15	8:30	0	17	0	0	0	1	0	1	11
8:30	8:45	0	9	2	0	2	0	0	2	21
8:45	9:00	0	17	1	0	2	3	0	2	11
9:00	9:15	0	10	2	0	2	4	0	0	22
9:15	9:30	0	11	5	0	3	0	0	0	23
9:30	9:45	0	13	2	0	2	1	0	2	23
9:45	10:00	0	15	0	0	1	0	0	0	8
10:00	10:15	0	15	2	0	4	1	0	2	12
10:15	10:30	0	7	2	0	2	0	0	1	16
15:00	15:15	0	7	2	0	0	1	0	0	11
15:15	15:30	0	9	1	0	2	1	0	3	20
15:30	15:45	0	8	3	0	3	0	0	0	12
15:45	16:00	0	2	0	0	2	0	0	0	13
16:00	16:15	0	2	0	0	2	0	0	0	8
16:15	16:30	0	5	3	0	2	0	0	0	6
16:30	16:45	0	4	0	0	2	0	0	0	5
16:45	17:00	0	3	1	0	1	0	0	0	6
17:00	17:15	0	3	0	0	0	0	0	1	5
17:15	17:30	0	5	0	0	1	1	0	1	7
17:30	17:45	0	3	0	0	0	0	0	1	6
17:45	18:00	0	6	0	0	1	0	0	0	4
18:00	18:15	0	7	0	0	0	0	0	0	3
18:15	18:30	0	2	0	1	0	0	0	0	3
18:30	18:45	0	2	0	0	0	0	0	0	2
18:45	19:00	0	1	0	0	0	0	0	0	2

Peak Time		North Approach Hannell St			East Approach Honeysuckle			South Approach Hannell St			Peak total
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	
7:45	8:45	0	54	8	0	9	5	0	4	59	139
16:45	17:45	0	14	1	0	2	1	0	3	24	45

APPENDIX C

SIDRA MOVEMENT SUMMARIES

MOVEMENT SUMMARY

 **Site: 101 [Wickham Street and Station Street AM (Site Folder: Existing AM Peak)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Wickham Street and Station Street Intersection
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
East: Station St (E)															
5	T1	All MCs	69	3.0	69	3.0	0.046	0.0	LOS A	0.0	0.0	0.00	0.14	0.00	46.5
6	R2	All MCs	21	10.0	21	10.0	0.046	5.0	LOS A	0.0	0.0	0.00	0.14	0.00	40.0
Approach			91	4.7	91	4.7	0.046	1.2	NA	0.0	0.0	0.00	0.14	0.00	44.7
North: Wickham St (N)															
9	R2	All MCs	38	0.0	38	0.0	0.032	7.2	LOS A	0.1	0.7	0.16	0.90	0.16	28.5
Approach			38	0.0	38	0.0	0.032	7.2	LOS A	0.1	0.7	0.16	0.90	0.16	28.5
All Vehicles			128	3.3	128	3.3	0.046	2.9	NA	0.1	0.7	0.05	0.37	0.05	39.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 102 [Bishopgate Street and Charles Street AM (Site Folder: Existing AM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Bishopgate Street and Charles Street Intersection
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h %		Arrival Flows [Total HV] veh/h %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh Dist] veh m		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Charles St (S)															
3	R2	All MCs	3	0.0	3	0.0	0.002	4.6	LOS A	0.0	0.0	0.00	0.54	0.00	32.0
Approach			3	0.0	3	0.0	0.002	4.6	NA	0.0	0.0	0.00	0.54	0.00	32.0
East: Bishopgate St (E)															
4	L2	All MCs	62	6.8	62	6.8	0.034	4.6	LOS A	0.0	0.0	0.00	0.53	0.00	32.3
Approach			62	6.8	62	6.8	0.034	4.6	NA	0.0	0.0	0.00	0.53	0.00	32.3
West: Bishopgate St (W)															
11	T1	All MCs	65	4.8	65	4.8	0.068	3.3	LOS A	0.2	1.8	0.03	0.48	0.03	38.1
12	R2	All MCs	21	5.0	21	5.0	0.068	4.8	LOS A	0.2	1.8	0.03	0.48	0.03	36.2
Approach			86	4.9	86	4.9	0.068	3.7	LOS A	0.2	1.8	0.03	0.48	0.03	37.6
All Vehicles			152	5.6	152	5.6	0.068	4.1	NA	0.2	1.8	0.02	0.50	0.02	35.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

 **Site: 103 [Hannell Street and Bishopgate Street AM (Site Folder: Existing AM Peak)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Hannell Street and Bishopgate Street Intersection
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Hannell St (S)															
1	L2	All MCs	61	6.9	61	6.9	0.403	4.1	LOS A	0.0	0.0	0.00	0.04	0.00	12.5
2	T1	All MCs	1507	4.5	1507	4.5	0.403	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.5
Approach			1568	4.6	1568	4.6	0.403	0.2	NA	0.0	0.0	0.00	0.02	0.00	57.2
West: Bishopgate St (W)															
10	L2	All MCs	73	4.3	73	4.3	0.115	12.5	LOS A	0.5	3.5	0.62	0.96	0.62	42.2
Approach			73	4.3	73	4.3	0.115	12.5	LOS A	0.5	3.5	0.62	0.96	0.62	42.2
All Vehicles			1641	4.6	1641	4.6	0.403	0.7	NA	0.5	3.5	0.03	0.06	0.03	56.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

 **Site: 104 [Hannell Street and Honeysuckle Drive AM (Site Folder: Existing AM Peak)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Hannell Street and Honeysuckle Drive Intersection

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 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	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh.]	[Dist]				
			veh/h		veh/h		v/c	sec		veh	m				km/h
South: Hannell St (S)															
2	T1	All MCs	1256	4.9	1256	4.9	0.524	8.4	LOS A	13.3	96.7	0.59	0.53	0.59	44.4
3	R2	All MCs	386	1.1	386	1.1	* 0.774	46.2	LOS D	8.1	57.1	1.00	0.92	1.20	25.1
Approach			1642	4.0	1642	4.0	0.774	17.3	LOS B	13.3	96.7	0.68	0.62	0.73	35.9
East: Honeysuckle Dr (E)															
4	L2	All MCs	102	5.2	102	5.2	0.135	20.7	LOS B	2.4	17.7	0.64	0.72	0.64	35.6
6	R2	All MCs	313	3.0	313	3.0	* 0.404	35.7	LOS C	5.4	38.9	0.91	0.79	0.91	30.2
Approach			415	3.6	415	3.6	0.404	32.0	LOS C	5.4	38.9	0.84	0.77	0.84	31.3
North: Hannell St (N)															
7	L2	All MCs	552	1.5	552	1.5	0.387	10.5	LOS A	8.4	59.8	0.43	0.70	0.43	45.1
8	T1	All MCs	1368	4.2	1368	4.2	* 0.833	27.1	LOS B	26.8	194.5	0.96	0.95	1.07	28.3
Approach			1920	3.4	1920	3.4	0.833	22.3	LOS B	26.8	194.5	0.81	0.88	0.89	33.1
All Vehicles			3977	3.7	3977	3.7	0.833	21.3	LOS B	26.8	194.5	0.76	0.76	0.82	33.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[Ped]	[Dist]			sec	m	m/sec
South: Hannell St (S)												
P1	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
East: Honeysuckle Dr (E)												
P2	Full	25	26	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
North: Hannell St (N)												
P31	Stage 1	25	26	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
P32	Stage 2	25	26	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
P3B	Slip/ Bypass	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
All Pedestrians		175	184	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06

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.

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MOVEMENT SUMMARY

 **Site: 101 [Wickham Street and Station Street PM (Site Folder: Existing PM Peak)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Wickham Street and Station Street Intersection
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h %		Arrival Flows [Total HV] veh/h %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. Dist] veh m		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Station St (E)															
5	T1	All MCs	76	0.0	76	0.0	0.050	0.0	LOS A	0.0	0.0	0.00	0.17	0.00	45.9
6	R2	All MCs	27	0.0	27	0.0	0.050	4.9	LOS A	0.0	0.0	0.00	0.17	0.00	40.5
Approach			103	0.0	103	0.0	0.050	1.3	NA	0.0	0.0	0.00	0.17	0.00	44.2
North: Wickham St (N)															
9	R2	All MCs	34	0.0	34	0.0	0.029	7.3	LOS A	0.1	0.6	0.17	0.90	0.17	28.5
Approach			34	0.0	34	0.0	0.029	7.3	LOS A	0.1	0.6	0.17	0.90	0.17	28.5
All Vehicles			137	0.0	137	0.0	0.050	2.8	NA	0.1	0.6	0.04	0.35	0.04	39.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 102 [Bishopgate Street and Charles Street PM (Site Folder: Existing PM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Bishopgate Street and Charles Street Intersection
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h %		Arrival Flows [Total HV] veh/h %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh Dist] veh m		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Charles St (S)															
3	R2	All MCs	6	0.0	6	0.0	0.003	4.6	LOS A	0.0	0.0	0.00	0.54	0.00	32.0
Approach			6	0.0	6	0.0	0.003	4.6	NA	0.0	0.0	0.00	0.54	0.00	32.0
East: Bishopgate St (E)															
4	L2	All MCs	101	0.0	101	0.0	0.053	4.6	LOS A	0.0	0.0	0.00	0.53	0.00	32.6
Approach			101	0.0	101	0.0	0.053	4.6	NA	0.0	0.0	0.00	0.53	0.00	32.6
West: Bishopgate St (W)															
11	T1	All MCs	27	0.0	27	0.0	0.039	3.3	LOS A	0.1	0.9	0.05	0.49	0.05	37.7
12	R2	All MCs	21	0.0	21	0.0	0.039	4.8	LOS A	0.1	0.9	0.05	0.49	0.05	35.8
Approach			48	0.0	48	0.0	0.039	4.0	LOS A	0.1	0.9	0.05	0.49	0.05	36.9
All Vehicles			156	0.0	156	0.0	0.053	4.4	NA	0.1	0.9	0.02	0.52	0.02	34.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

 **Site: 103 [Hannell Street and Bishopgate Street PM (Site Folder: Existing PM Peak)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Hannell Street and Bishopgate Street Intersection
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Hannell St (S)															
1	L2	All MCs	103	0.0	103	0.0	0.452	4.1	LOS A	0.0	0.0	0.00	0.07	0.00	12.5
2	T1	All MCs	1688	1.6	1688	1.6	0.452	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	59.3
Approach			1792	1.5	1792	1.5	0.452	0.3	NA	0.0	0.0	0.00	0.03	0.00	56.0
West: Bishopgate St (W)															
10	L2	All MCs	31	0.0	31	0.0	0.050	12.5	LOS A	0.2	1.4	0.62	0.92	0.62	42.3
Approach			31	0.0	31	0.0	0.050	12.5	LOS A	0.2	1.4	0.62	0.92	0.62	42.3
All Vehicles			1822	1.5	1822	1.5	0.452	0.5	NA	0.2	1.4	0.01	0.05	0.01	55.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

 **Site: 104 [Hannell Street and Honeysuckle Drive PM (Site Folder: Existing PM Peak)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Hannell Street and Honeysuckle Drive Intersection

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 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	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh.]	[Dist]				
			veh/h		veh/h		v/c	sec		veh	m				km/h
South: Hannell St (S)															
2	T1	All MCs	1246	2.0	1246	2.0	0.511	8.3	LOS A	13.0	92.4	0.58	0.52	0.58	44.6
3	R2	All MCs	253	1.3	253	1.3	* 0.558	43.0	LOS D	4.9	34.7	0.99	0.79	0.99	26.0
Approach			1499	1.9	1499	1.9	0.558	14.2	LOS A	13.0	92.4	0.65	0.57	0.65	38.4
East: Honeysuckle Dr (E)															
4	L2	All MCs	218	0.5	218	0.5	0.287	22.4	LOS B	5.7	39.9	0.71	0.76	0.71	34.7
6	R2	All MCs	545	0.4	545	0.4	* 0.691	38.8	LOS C	10.4	72.9	0.98	0.86	1.03	29.2
Approach			763	0.4	763	0.4	0.691	34.1	LOS C	10.4	72.9	0.90	0.83	0.94	30.4
North: Hannell St (N)															
7	L2	All MCs	435	0.2	435	0.2	0.297	9.7	LOS A	5.9	41.1	0.38	0.67	0.38	45.8
8	T1	All MCs	1322	1.1	1322	1.1	* 0.767	21.9	LOS B	22.9	161.6	0.91	0.84	0.94	31.4
Approach			1757	0.9	1757	0.9	0.767	18.9	LOS B	22.9	161.6	0.78	0.80	0.80	35.3
All Vehicles			4019	1.2	4019	1.2	0.767	20.0	LOS B	22.9	161.6	0.75	0.72	0.77	34.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[Ped]	[Dist]			sec	m	m/sec
South: Hannell St (S)												
P1	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
East: Honeysuckle Dr (E)												
P2	Full	25	26	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
North: Hannell St (N)												
P31	Stage 1	25	26	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
P32	Stage 2	25	26	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
P3B	Slip/ Bypass	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
All Pedestrians		175	184	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06

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.

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Project: \\vtp_nas\Data\DATA\Data\Jobs01\Jobs\25work\25325_10DangarStWickham\SIDRA\SIDRA260109\Existing Network.sip9

MOVEMENT SUMMARY

 **Site: 101 [Wickham Street and Station Street AM (Site Folder: Proposed AM Peak)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Wickham Street and Station Street Intersection
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
East: Station St (E)															
5	T1	All MCs	196	1.1	196	1.1	0.107	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	48.5
6	R2	All MCs	21	10.0	21	10.0	0.107	5.0	LOS A	0.0	0.0	0.00	0.06	0.00	41.4
Approach			217	1.9	217	1.9	0.107	0.5	NA	0.0	0.0	0.00	0.06	0.00	47.6
North: Wickham St (N)															
9	R2	All MCs	38	0.0	38	0.0	0.036	7.7	LOS A	0.1	0.8	0.27	0.89	0.27	28.1
Approach			38	0.0	38	0.0	0.036	7.7	LOS A	0.1	0.8	0.27	0.89	0.27	28.1
All Vehicles			255	1.7	255	1.7	0.107	1.6	NA	0.1	0.8	0.04	0.18	0.04	43.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 102 [Bishopgate Street and Charles Street AM (Site Folder: Proposed AM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Bishopgate Street and Charles Street Intersection
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h %		Arrival Flows [Total HV] veh/h %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh Dist] veh m		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Charles St (S)															
3	R2	All MCs	58	0.0	58	0.0	0.030	4.6	LOS A	0.0	0.0	0.00	0.54	0.00	32.0
Approach			58	0.0	58	0.0	0.030	4.6	NA	0.0	0.0	0.00	0.54	0.00	32.0
East: Bishopgate St (E)															
4	L2	All MCs	94	4.5	94	4.5	0.050	4.6	LOS A	0.0	0.0	0.00	0.53	0.00	32.4
Approach			94	4.5	94	4.5	0.050	4.6	NA	0.0	0.0	0.00	0.53	0.00	32.4
West: Bishopgate St (W)															
11	T1	All MCs	65	4.8	65	4.8	0.086	3.5	LOS A	0.3	2.2	0.17	0.49	0.17	36.9
12	R2	All MCs	37	2.9	37	2.9	0.086	5.3	LOS A	0.3	2.2	0.17	0.49	0.17	35.2
Approach			102	4.1	102	4.1	0.086	4.2	LOS A	0.3	2.2	0.17	0.49	0.17	36.3
All Vehicles			254	3.3	254	3.3	0.086	4.4	NA	0.3	2.2	0.07	0.52	0.07	34.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

 **Site: 103 [Hannell Street and Bishopgate Street AM (Site Folder: Proposed AM Peak)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Hannell Street and Bishopgate Street Intersection
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Hannell St (S)															
1	L2	All MCs	93	4.5	93	4.5	0.412	4.1	LOS A	0.0	0.0	0.00	0.07	0.00	12.5
2	T1	All MCs	1507	4.5	1507	4.5	0.412	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	59.3
Approach			1600	4.5	1600	4.5	0.412	0.3	NA	0.0	0.0	0.00	0.03	0.00	56.0
West: Bishopgate St (W)															
10	L2	All MCs	127	2.5	127	2.5	0.193	12.4	LOS A	0.9	6.1	0.63	0.96	0.63	42.3
Approach			127	2.5	127	2.5	0.193	12.4	LOS A	0.9	6.1	0.63	0.96	0.63	42.3
All Vehicles			1727	4.3	1727	4.3	0.412	1.2	NA	0.9	6.1	0.05	0.10	0.05	54.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

 **Site: 104 [Hannell Street and Honeysuckle Drive AM (Site Folder: Proposed AM Peak)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Hannell Street and Honeysuckle Drive Intersection

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 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	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]		[Total HV]					[Veh.	Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
South: Hannell St (S)															
2	T1	All MCs	1279	4.9	1279	4.9	0.533	8.5	LOS A	13.6	99.3	0.59	0.53	0.59	44.3
3	R2	All MCs	386	1.1	386	1.1	* 0.852	50.7	LOS D	8.6	60.8	1.00	1.00	1.36	23.8
Approach			1665	4.0	1665	4.0	0.852	18.3	LOS B	13.6	99.3	0.69	0.64	0.77	35.1
East: Honeysuckle Dr (E)															
4	L2	All MCs	102	5.2	102	5.2	0.139	21.3	LOS B	2.5	18.1	0.66	0.72	0.66	35.2
6	R2	All MCs	321	3.0	321	3.0	* 0.414	35.8	LOS C	5.6	40.0	0.91	0.79	0.91	30.2
Approach			423	3.5	423	3.5	0.414	32.3	LOS C	5.6	40.0	0.85	0.77	0.85	31.2
North: Hannell St (N)															
7	L2	All MCs	587	1.4	587	1.4	0.405	10.2	LOS A	8.8	62.4	0.42	0.69	0.42	45.3
8	T1	All MCs	1459	3.9	1459	3.9	* 0.861	29.2	LOS C	30.1	218.1	0.97	1.00	1.12	27.1
Approach			2046	3.2	2046	3.2	0.861	23.8	LOS B	30.1	218.1	0.81	0.91	0.92	32.2
All Vehicles			4135	3.5	4135	3.5	0.861	22.4	LOS B	30.1	218.1	0.77	0.79	0.85	33.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[Ped]	[Dist]			sec	m	m/sec
South: Hannell St (S)												
P1	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
East: Honeysuckle Dr (E)												
P2	Full	25	26	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
North: Hannell St (N)												
P31	Stage 1	25	26	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
P32	Stage 2	25	26	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
P3B	Slip/ Bypass	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
All Pedestrians		175	184	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06

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.

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MOVEMENT SUMMARY

 **Site: 101 [Wickham Street and Station Street PM (Site Folder: Proposed PM Peak)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Wickham Street and Station Street Intersection
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h %		Arrival Flows [Total HV] veh/h %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. Dist] veh m		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Station St (E)															
5	T1	All MCs	100	0.0	100	0.0	0.062	0.0	LOS A	0.0	0.0	0.00	0.13	0.00	46.6
6	R2	All MCs	27	0.0	27	0.0	0.062	4.9	LOS A	0.0	0.0	0.00	0.13	0.00	41.0
Approach			127	0.0	127	0.0	0.062	1.1	NA	0.0	0.0	0.00	0.13	0.00	45.2
North: Wickham St (N)															
9	R2	All MCs	34	0.0	34	0.0	0.029	7.3	LOS A	0.1	0.6	0.20	0.89	0.20	28.4
Approach			34	0.0	34	0.0	0.029	7.3	LOS A	0.1	0.6	0.20	0.89	0.20	28.4
All Vehicles			161	0.0	161	0.0	0.062	2.4	NA	0.1	0.6	0.04	0.29	0.04	40.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 102 [Bishopgate Street and Charles Street PM (Site Folder: Proposed PM Peak)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Bishopgate Street and Charles Street Intersection
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h %		Arrival Flows [Total HV] veh/h %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh Dist] veh m		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Charles St (S)															
3	R2	All MCs	19	0.0	19	0.0	0.010	4.6	LOS A	0.0	0.0	0.00	0.54	0.00	32.0
Approach			19	0.0	19	0.0	0.010	4.6	NA	0.0	0.0	0.00	0.54	0.00	32.0
East: Bishopgate St (E)															
4	L2	All MCs	196	0.0	196	0.0	0.102	4.6	LOS A	0.0	0.0	0.00	0.53	0.00	32.6
Approach			196	0.0	196	0.0	0.102	4.6	NA	0.0	0.0	0.00	0.53	0.00	32.6
West: Bishopgate St (W)															
11	T1	All MCs	27	0.0	27	0.0	0.079	3.3	LOS A	0.3	1.9	0.14	0.51	0.14	36.5
12	R2	All MCs	62	0.0	62	0.0	0.079	5.5	LOS A	0.3	1.9	0.14	0.51	0.14	34.6
Approach			89	0.0	89	0.0	0.079	4.8	LOS A	0.3	1.9	0.14	0.51	0.14	35.1
All Vehicles			304	0.0	304	0.0	0.102	4.6	NA	0.3	1.9	0.04	0.52	0.04	33.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

 **Site: 103 [Hannell Street and Bishopgate Street PM (Site Folder: Proposed PM Peak)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Hannell Street and Bishopgate Street Intersection
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Hannell St (S)															
1	L2	All MCs	198	0.0	198	0.0	0.477	4.1	LOS A	0.0	0.0	0.00	0.12	0.00	12.4
2	T1	All MCs	1688	1.6	1688	1.6	0.477	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	59.0
Approach			1886	1.5	1886	1.5	0.477	0.5	NA	0.0	0.0	0.00	0.06	0.00	53.1
West: Bishopgate St (W)															
10	L2	All MCs	43	0.0	43	0.0	0.066	12.0	LOS A	0.3	1.9	0.61	0.92	0.61	42.7
Approach			43	0.0	43	0.0	0.066	12.0	LOS A	0.3	1.9	0.61	0.92	0.61	42.7
All Vehicles			1929	1.4	1929	1.4	0.477	0.7	NA	0.3	1.9	0.01	0.08	0.01	52.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

 **Site: 104 [Hannell Street and Honeysuckle Drive PM (Site Folder: Proposed PM Peak)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Hannell Street and Honeysuckle Drive Intersection

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 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	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh.]	[Dist]				
			veh/h		veh/h		v/c	sec		veh	m				km/h
South: Hannell St (S)															
2	T1	All MCs	1315	1.9	1315	1.9	0.538	8.6	LOS A	14.1	100.1	0.60	0.54	0.60	44.3
3	R2	All MCs	253	1.3	253	1.3	* 0.558	43.0	LOS D	4.9	34.7	0.99	0.79	0.99	26.0
Approach			1567	1.8	1567	1.8	0.558	14.1	LOS A	14.1	100.1	0.66	0.58	0.66	38.4
East: Honeysuckle Dr (E)															
4	L2	All MCs	218	0.5	218	0.5	0.287	22.4	LOS B	5.7	39.9	0.71	0.76	0.71	34.7
6	R2	All MCs	572	0.4	572	0.4	* 0.724	39.7	LOS C	11.1	78.1	0.99	0.88	1.07	28.8
Approach			789	0.4	789	0.4	0.724	34.9	LOS C	11.1	78.1	0.91	0.85	0.97	30.1
North: Hannell St (N)															
7	L2	All MCs	441	0.2	441	0.2	0.301	9.7	LOS A	6.0	41.9	0.38	0.67	0.38	45.8
8	T1	All MCs	1340	1.1	1340	1.1	* 0.777	22.4	LOS B	23.6	166.4	0.92	0.86	0.96	31.1
Approach			1781	0.9	1781	0.9	0.777	19.3	LOS B	23.6	166.4	0.78	0.81	0.82	35.0
All Vehicles			4138	1.1	4138	1.1	0.777	20.3	LOS B	23.6	166.4	0.76	0.73	0.79	34.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Crossing	Input Vol.	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	ped/h	sec		[Ped]	[Dist]			sec	m	m/sec
South: Hannell St (S)												
P1	Full	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
East: Honeysuckle Dr (E)												
P2	Full	25	26	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
North: Hannell St (N)												
P31	Stage 1	25	26	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
P32	Stage 2	25	26	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
P3B	Slip/Bypass	50	53	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06
All Pedestrians		175	184	34.3	LOS D	0.1	0.1	0.93	0.93	188.1	200.0	1.06

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.

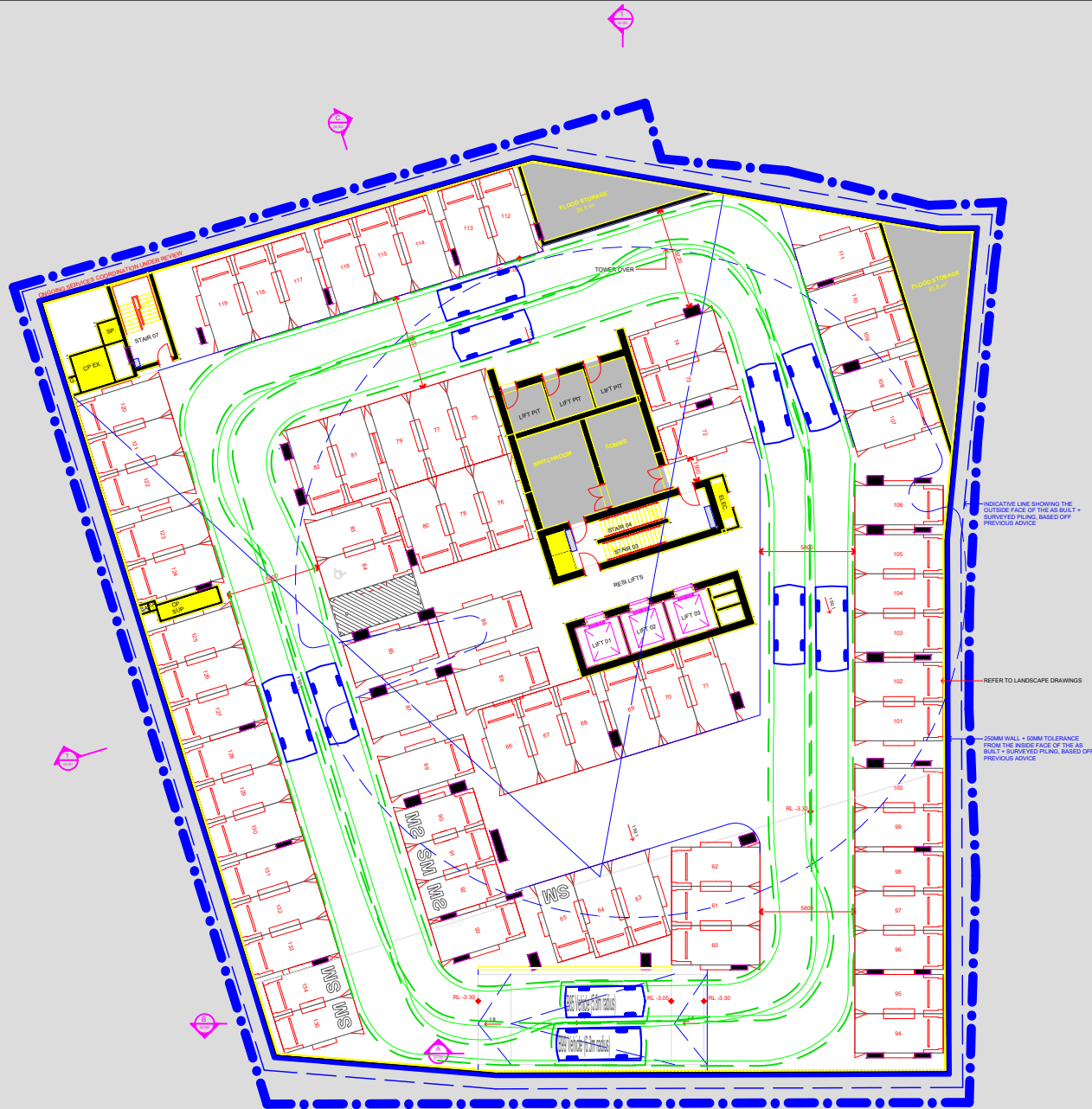
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Project: \\vtp_nas\Data\DATA\Data\Jobs01\Jobs\25work\25325_10DangarStWickham\SIDRA\SIDRA260309\Proposed Network.sip9

APPENDIX D

SWEPT TURNING PATH DIAGRAMS



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PROJECT
 UPG NEWCASTLE



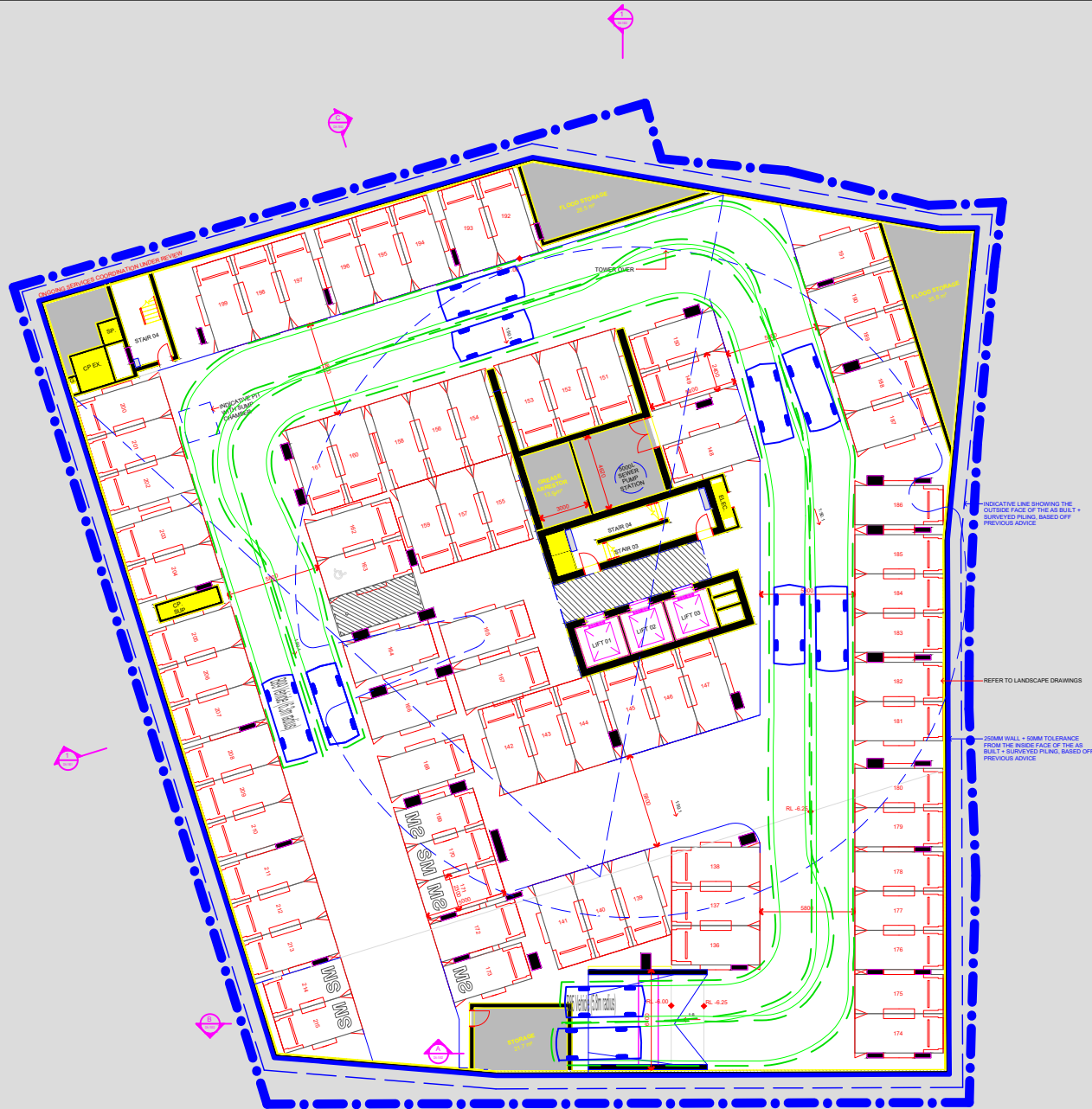
DRAWING TITLE
B99 & B85 TURNING PATHS - BASEMENT 02
 Entering/Exiting Car Parking Area
 ADDRESS
 10 Dangar Street,
 Wickham

PROJECT NO.
 25325
 REVIEWED
 DONALD LEE

1:400 @ A4
 DATE DRAWN
 2026-4-1
 PREPARED
 ZACHARY CAI

VARGA TRAFFIC PLANNING Pty Ltd
 Transport, Traffic and Parking Consultants





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PROJECT
 UPG NEWCASTLE



DRAWING TITLE
B99 & B85 TURNING PATHS - BASEMENT 03
 Entering/Exiting Car Parking Area

ADDRESS
 10 Dangar Street,
 Wickham

PROJECT NO.
 25325

REVIEWED
 DONALD LEE

1:400 @ A4

DATE DRAWN
 2026-4-1

PREPARED
 ZACHARY CAI

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