

30 May 2026

SIG Property Group Pty Ltd
C/- HAL Architects
3 / 709 Main Street
Kangaroo Point QLD 4169

Attention: Adam Lockhart

Dear Adam,

**RE: 28 & 34 BELL STREET, KANGAROO POINT
TRAFFIC ENGINEERING ASSESSMENT**

INTRODUCTION

This report has been prepared by PTT, as requested by HAL Architects, to assess the traffic engineering aspects of a proposed residential development at 28 & 34 Bell Street, Kangaroo Point. The proposal comprises 18 residential units.

The aim of this assessment is to review the proposed development in terms of its site access arrangements, car parking provision and design, servicing arrangements and active transport facilities, with respect to Brisbane City Council's (Council) Planning Scheme and Australian Standards Parking Facilities Part 1: Off-Street Car Parking (AS2890.1).

EXISTING CONDITIONS

SUBJECT SITE

The subject site is formally described as Lots 16 and 17 on RP11109 and currently comprises two residential dwellings. According to Council's City Plan (2014), the site is zoned as medium density residential and is located within the City Frame. The site is bounded by Bell Street to the south and residential uses to the north, east and west, as indicated in Figure 1. The surrounding area predominantly comprises residential uses.

Access to the site is currently provided via two crossovers on Bell Street.

ROAD NETWORK

Bell Street is an undivided road with one lane of traffic in each direction, has a posted speed limit of 50km/h and is classified as a neighbourhood road (ie minor road) according to Council's City Plan.

Figure 1: SITE LOCALITY



ACTIVE & PUBLIC TRANSPORT

Footpaths are provided on both sides of Bell Street, which connects the site to surrounding areas. There are two access points to the Kangaroo Point Cliffs Walkway located within 300m walking distance from the site. According to Council's Mapping Overlay, Main Street is a designated secondary cycle route and River Terrace is a designated local cycle route.

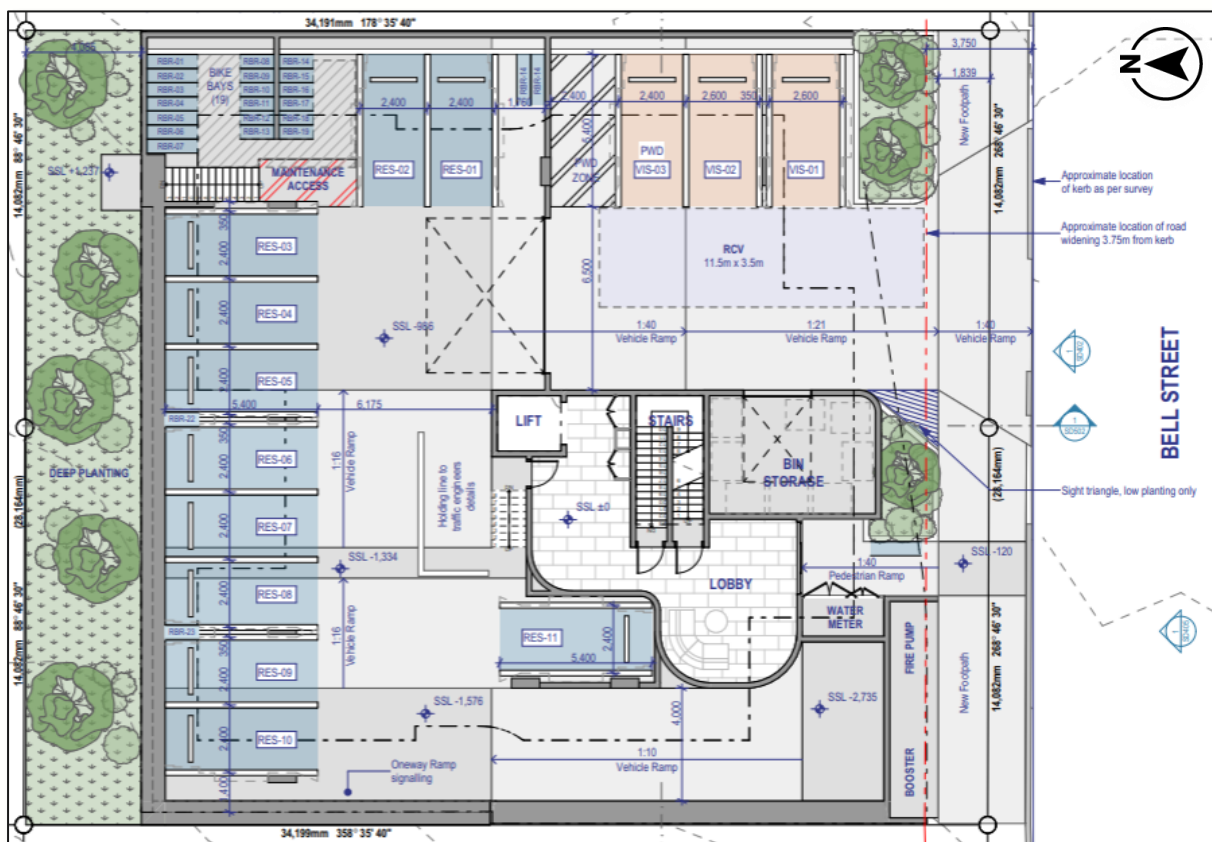
A bus stop pair (ID: 019059 and ID: 004533) is located approximately 120m south-east of the site on Main Street. This bus stop pair is serviced by TransLink bus route 234 which provides frequent services to Brisbane City, Fortitude Valley, Woolloongabba and Kangaroo Point. Accordingly, the site is served by public transport.

PROPOSED DEVELOPMENT

OVERVIEW

The development application seeks approval for a Material Change of Use (MCU) for a residential development comprising 18 units (each comprising three bedrooms). The development would be supported by 34 parking spaces, including 31 residential parking spaces and three visitor parking spaces. The proposed ground floor layout is shown in Figure 2, with dimensioned plans attached.

Figure 2: PROPOSED GROUND FLOOR LAYOUT



ACCESS

LOCATION

The proposed development would be accessed via a 6.5m wide driveway on Bell Street. The proposed driveway would be wholly contained within the frontage of the site and would achieve in excess of 3.0m separation to neighbouring accessing driveways. The proposed access location complies with Council's Transport, Access, Parking and Servicing (TAPS) Policy requirements and are considered appropriate for the proposed scale of use.

DESIGN

Council's TAPS Policy outlines that a Type B2 driveway is required for crossovers that have low / medium turnover rates, located on minor roads and catering for parking areas comprising 26-250 spaces. However, given the limited site frontage on Bell Street, a Type B1 driveway is proposed. This driveway design would (a) minimise impact to on-street parking on Bell Street and (b) cater for the access and egress of a Refuse Collection Vehicle. This driveway type was approved at a nearby similar scale residential development at 14 and 24 Paton Street, Kangaroo Point.

It is recommended that the crossover be designed as a Type B1 access in accordance with Council's Standard Drawing BSD-2021.

SIGHT DISTANCE

Table 6 of Council's TAPS Policy required development access driveways in a 50km/h speed environment be located to achieve at least 90m sight distance. Approximately 60m and 80m of sight distance is available on Bell Street to the nearby River Terrace and Main Street intersections, respectively. Vehicles are expected to be travelling at low speeds when approaching the site from the east and west (ie around 20km/h), having just turned into Bell Street from River Terrace or Main Street. Therefore, the available sight distance to the east and west of the proposed access is considered adequate.

QUEUING

Section 4.8(8) of Council's TAPS Policy recommends queuing be provided based on the car park capacity and design, service rate and frontage road classification, in order to allow a free influx of traffic which will not adversely affect traffic or pedestrian flows on the frontage road. The 95th percentile queue at the site access is considered to be an adequate measure of an acceptable queuing provision.

Therefore, to determine the adequacy of this queuing provision, we have undertaken an assessment of the predicted 95th percentile queuing at the site access using the queuing theory outlined in the PTT Queuing Practice Note¹ 1 (attached). This assessment is based on an expected weekday peak arrival rate of seven vehicles per hour (based on a trip generation rate of 0.5 trips per dwelling and an 80:20 in:out split during the evening peak), with an average service rate (ie vehicle parking rate) of 14.7 seconds.

The results of the analysis indicate a 95th percentile queue of less than 1.0m at the site access. The proposed layout incorporates 3.0m of queuing space at the access, measured between the proposed new Bell Street site boundary and first internal visitor parking space. Thus, the proposed queuing provision is sufficient to accommodate the predicted 95th percentile queue and is not expected to significant impact on the adjacent road network.

PARKING

REQUIREMENT

The car parking requirement for the proposed development has been determined based on rates in Council's TAPS Policy for a multiple dwelling located within the city frame. A minimum parking provision of 27 spaces is required, as indicated in Table 1.

¹ PTT Practice Note: "Queuing Characteristics at Site Accesses"

Table 1: CAR PARKING REQUIREMENT

USER	SCALE	PARKING RATE	REQUIREMENT
Resident (3-bedroom units)	18 dwellings	1.3 spaces per dwelling	24 spaces
Visitors	18 dwellings	0.15 spaces per dwelling	3 spaces
Total			27 spaces

PROVISION

A parking provision of 34 residential spaces (including six tandem spaces) and three visitor spaces is proposed. This equates to a total parking provision of 37 spaces and a surplus of 10 parking spaces when applying Council's minimum parking rates for a multiple dwelling located within the City Frame.

PERSONS WITH DISABILITY

Council's TAPS Policy requires multiple dwellings with more than 10 units provide a minimum of one visitor parking space designated and reserved for persons with a disability. The proposal comprises 18 dwellings and therefore, at least one PWD bay is required. The proposed development comprises one PWD parking space which complies with Council's requirements.

DESIGN

The proposed basement parking layout is shown in Figure 3. The proposed on-site parking area has been designed generally in accordance with the requirements of Council's TAPS and AS2890.1, in terms of minimum parking bay and aisle dimensions. This is typified by the following:

- resident parking bays – dimensioned minimum 2.4m wide by 5.4m long
- tandem resident parking bays – dimensioned 2.4m wide by 10.8m long
- small resident parking bay – dimensioned 2.6m wide by 5.0m long
- visitor parking bays – dimensioned 2.6m wide by 5.4m long
- PWD shared bay – dimensioned 2.4m wide by 5.4m long
- parking aisles – dimensioned 6.2m wide or greater
- end of aisle treatment – dimensioned 1.0m wide
- single lane circulation ramp – dimensioned 3.9m wide or greater
- maximum summit ramp transition grade – dimensioned at 1:10 (ie 10%)
- maximum sag ramp transition grade – dimensioned at 1:7 (ie 14.2%)

The proposed ramp grade transitions comply with AS2890.1.

Australian Standards AS2890.6:2022 Parking Facilities Part 6: Off-street Parking for People with Disabilities (AS2890.6) outlines that PWD bays be dimensioned a minimum 2.4m wide by 5.4m long. It is recommended that the PWD bay be dimensioned a minimum 2.4m wide to adhere with AS2890.6 requirements.

Swept path analyses demonstrating vehicles passing (ie B85 car) at each end of the ramp are shown in attached drawings 26-559-001 and 26-559-002.

The proposed ramp arrangement (including the traffic management measures recommended above) is expected to operate safely and efficiently because:

- the internal ramp would only cater for residential traffic (ie accessing parking on the basement level) and it is expected that residents would be familiar with the ramp arrangements and traffic management devices installed
- traffic volumes on the internal ramps are expected to be low
- the vehicle detectors, warning lights and convex mirrors would inform drivers of another vehicle already on the ramp
- signage and line marking would be installed to designate hold points and improve driver wayfinding
- there is adequate space at each end of the ramp to allow vehicles to wait for the ramp to become available, minimising impact on vehicle circulation
- ample queue storage would be provided on the ground floor to cater for multiple vehicles waiting to enter the basement parking area
- the proposed arrangement is consistent with a recently approved equivalent sized residential development at 14 and 24 Paton Street, Kangaroo Point.

It is recommended that the proposed traffic management system be assessed and endorsed by a Traffic and Parking Systems consultant.

SERVICING

REFUSE COLLECTION

On-site refuse collection is proposed, with a refuse store comprising 1,100L bins located within the site. Council's TAPS Policy outlines regular access be provided for rear-lift RCV. An RCV is expected to access the site in a single reverse manoeuvre, as demonstrated in attached drawing 26-556-003. The proposed parking aisle width (ie 6.5m) and grades (ie maximum grade of 1:20) over the RCV standing area complies with Council's TAPS and Refuse Planning Scheme Policies.

Under the proposed refuse collection arrangement an RCV would:

- access the site in reverse gear from Bell Street
- stand within the driveway collect bins from the bin store
- exit to Bell Street in a forward gear
- not obstruct other vehicles from entering / exiting the development

The proposed refuse collection arrangement is consistent with the recently approved equivalent sized residential development at 14 and 24 Paton Street.

FURNITURE DELIVERIES

Council’s TAPS Policy requires that the proposed development accommodates occasional access for a large rigid vehicle (LRV) for furniture deliveries. Allowance for a LRV is considered unreasonable given the scale of the development and the number of dwellings proposed. On occasions where furniture removal trucks require access to the site, it is expected that smaller trucks such as a medium rigid vehicle (MRV) would be used. These vehicles would stand on-site similar to an RCV.

Accordingly, the proposed servicing arrangements are expected to be sufficient to cater for the proposed development.

ACTIVE TRANSPORT

PEDESTRIANS

A dedicated pedestrian access (separate to the vehicular driveway) is proposed on Bell Street site frontage. This would provide a safe and direct connection between the Bell Street frontage and the main ground floor entrance / lift lobby.

It is recommended that low lying landscaping (up to 0.5m high) be planted within the 2.0m wide by 2.5m deep pedestrian sight triangle on the exit side of the access driveway, as indicated in drawing 26-559-003. This would ensure that exiting drivers has sufficient sight distance to locate approaching pedestrians in the Bell Street verge.

CYCLISTS

The bicycle parking requirement for the proposed development has been determined based on rates in Council’s TAPS Policy. A bicycle parking provision of 23 bicycle parking spaces is required, as indicated in Table 2.

Table 2: BICYCLE PARKING REQUIREMENT

USE	SCALE	PARKING RATE	REQUIRED
Residents	18 dwellings	1 space per dwelling	18 spaces
Visitors		1 space per 4 dwellings	5 spaces
Total			23 spaces

A total of 21 bicycle parking spaces are proposed on the ground floor, with nine spaces provided as horizontal parking and 14 spaces provided as vertical parking. This represents a shortfall of two spaces with respect to Council’s requirements. Therefore, it is recommended that an additional two bicycle parking spaces be provided. It is expected that an additional bicycle space could be readily provided adjacent to parking bays RES-01 and RES-10 on the ground floor.

TRAFFIC GENERATION

The peak hour traffic generation for the proposed development has been estimated using a trip generation rate of 0.5 vehicles per hour (vph), based on published trip generation rates from the TfNSW (formerly RTA) Guide to Traffic Generating Developments for medium density residential buildings. The predicted peak hour traffic generation for the weekday morning and evening is summarised in Table 3.

Table 3: PROPOSED PEAK TRAFFIC GENERATION

TIME	SCALE	TRIP GENERATION RATE	TRIPS (VPH)
Medium Density Residential	18 dwellings	0.5 trips per dwelling	9 trips

Based on the above, the development is expected to generate approximately nine trips during the weekday morning and evening peak hours. Therefore, the addition of development generated traffic is not expected to have a significant adverse impact on the operation of the surrounding road network.

CONCLUSIONS AND RECOMMENDATIONS

The proposed multi-dwelling residential development located at 28 and 34 Bell Street, Kangaroo Point has been evaluated in terms of the site access arrangements, parking provision and design, servicing arrangements and pedestrian facilities. The main points to note are:

- the proposed development comprises 18 multi-unit residential dwellings, all comprising three-bedrooms
- access is proposed via a 6.5m wide crossover on Bell Street
- there is sufficient queuing available to accommodate the expected 95th percentile queue during peak hours
- the proposed development includes 37 on-site parking spaces, including 34 resident spaces and three visitor spaces
- the parking layout has been designed generally in accordance with Council and AS2890.1 requirements
- a traffic management system is proposed throughout the parking area to manage vehicle circulation on the single lane two-way ramp
- servicing of the site will be undertaken on-site via Bell Street
- a dedicated pedestrian access is proposed on Bell Street, separate to the vehicular driveway
- the addition of development generated traffic is not expected to have a significant adverse impact on the operation of the surrounding road network

Based on the above, it is recommended that the following be implemented:

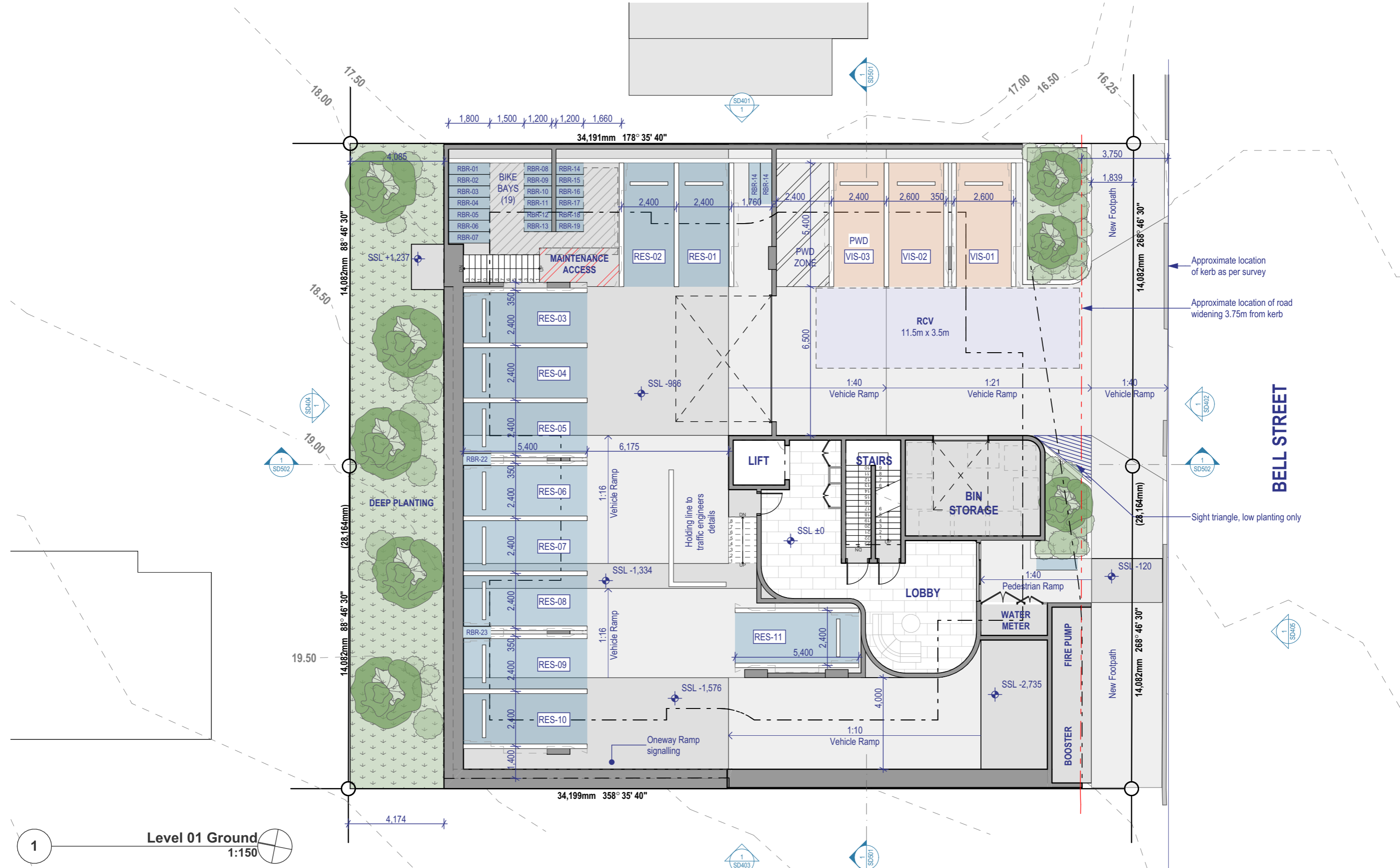
- the crossover be designed as a Type B1 access in accordance with Council's Standard Drawing BSD-2021
- the proposed traffic management system be assessed and endorsed by a Traffic and Parking Systems consultant
- two additional bicycle parking spaces be provided to adhere with Council requirements
- low lying landscaping (up to 0.5m high) be planted within the 2.0m wide by 2.5m deep pedestrian sight triangle on the exit side of the access driveway, as indicated in drawing 26-559-003

If you have any questions regarding the issues discussed above, please do not hesitate to contact us.

Yours sincerely,



Casey Glover
Principal Engineer (RPEQ 34450)



Bell Street

Level 1 Ground Floor - Floor Plan

Project
Multi-Residential Apartment
28-34 Bell Street, Kangaroo Point, QLD, 4169

Scale @ A3
1:150
Drawn: JG
Checked: EA
Project Number: H5043BEL
Drawing Number: SD202
Issue: B

Drawing Title:
Level 1 Ground Floor - Floor Plan
Phase:
Sketch Design

Date	Issue	Details	Checked
14/04/2026	A	Preliminary Drawings	EA
08/05/2026	B	Preliminary Drawings	EA

General Notes
This drawing is Copyright © Any design or drawing is not to be reproduced, either in whole or part, without written permission by Hayes Anderson Lynch Architects Pty. Ltd. Confirm all dimensions on site. Do not scale off drawings. All levels are approximate only and are subject to confirmation by licenced surveyor. All workmanship, materials and construction to comply with the Queensland Building Act 1975, the Queensland Development Code, the Building Code of Australia ####, Premises Standard and AS1428.1. Work to be carried out in a neat and appropriate manner. Where ambiguities or discrepancies exist, Hayes Anderson Lynch Architects Pty. Ltd. shall be contacted for clarification.

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PRACTICE NOTE

QUEUING CHARACTERISTICS AT SITE ACCESSSES



BACKGROUND

On-site queuing areas are required at site access locations to ensure that vehicles do not queue across pedestrian paths or back onto the frontage road.

However, with queuing requirements in planning scheme policies becoming increasingly onerous, the usage of these figures can result in excessive queuing areas which can unnecessarily have an adverse effect on construction costs and development yields.

This practice note demonstrates how conventional queuing theory can be used in traffic engineering to determine the anticipated queue length at access locations as a function of local conditions.

QUEUING THEORY

To calculate the amount of queuing space required, we must estimate the probability of a number of vehicles in a queue (n) exceeding a specified number of vehicles (N) at any instant. This is calculated using the following formula:

$$\Pr(n > N) = \rho^{N+1} \leq \alpha$$

Where:

- ρ is the queue utilisation factor
- α is the probability of a queue of N vehicles being exceeded

Rearranging this formula enables the calculation of the design queue length in terms of the number of vehicles as follows:

$$N = \frac{\log(\alpha)}{\log(\rho)} - 1$$

The **minimum** design queue would be calculated as N vehicles, which may include a fraction of a vehicle (eg 1.2 vehicles). This

design queue could be applied subject to engineering judgment.

The **desirable** design queue would be the smallest integer which contains the value, N (ie rounded up to the nearest integer).

Application of a standard vehicle length of 6m per vehicle results in a design queue length in metres.

QUEUE UTILISATION FACTOR

The utilisation factor, ρ , is the ratio of the mean arrival rate (r) and the mean service rate (s), ie:

$$\rho = \frac{r}{s}$$

The mean arrival rate (veh/hr) varies for each situation. It is calculated using the peak hour trip generation for the facility. This is expressed in vehicles per hour.

The mean service rate (veh/hr) is determined by observing the operations of similar facilities.

PTT has calculated the mean service rate for a non-controlled (ie no boom gate) parking facility by surveying the average time taken for cars to enter and leave from visitor parks in a residential development.

This survey was undertaken at a recently approved and constructed mixed use commercial/residential development at Nundah on a Wednesday in July 2014 between 4:30-6:00pm. A minimum of 30 observations were made for both "parking" and "unparking" manoeuvres. The results of this analysis are shown in Table 1.

PRACTICE NOTE

QUEUING CHARACTERISTICS AT SITE ACCESSSES



Table 1: MEAN VEHICLE MANOEUVRING TIME (seconds/vehicle)

MANOEUVRE	MEAN TIME	STD DEV	MIN	MAX
Parking	12.2	13.8	1.1	69.5
Unparking	14.7	7.1	2.1	37.2

The application of the mean “unparking” value from Table 1 assumes that each vehicle which enters the access will be waiting for a car to “unpark” from the space nearest to the access. This is an extremely conservative assumption, which will result in an over-estimate of queue lengths.

The mean service time for car parks with entrance controls such as boom gates, ticket dispensing machines, car stackers and mechanical parking installations can usually be provided by the supplier of the product.

PROBABILITY OF EXCEEDANCE

The queuing formula is used to calculate the queue length given a specified probability (α).

Generally, the 95th percentile queue is considered an adequate measure of an acceptable queue at access driveways. This infers that there is a 5% probability that the queue length will be exceeded (ie $\alpha=0.05$).

Australian Standards, AS2890.1, outlines the requirement to provide a 98th percentile queue for situations where mechanical parking installations such as car stackers are used (ie $\alpha=0.02$).

EXAMPLE

A development with a mean peak hour trip generation of 100 veh/hr and a 80:20 in:out split results in a vehicle arrival rate of 80 veh/hr.

The service rates from Table 1 can be applied to calculate the queue utilisation factor. However common units are required to find a ratio.

Therefore, the service rate, s , is:

$$\frac{\text{vehicle}}{\text{hour}} = 3,600 \left(\frac{\text{seconds}}{\text{vehicle}} \right)^{-1}$$
$$s = \frac{3,600}{14.7} = 244.9 \text{ vehicles per hour}$$

The queue utilisation factor is:

$$\rho = \frac{r}{s} = \frac{80}{244.9} = 0.327$$

The 95th percentile design queue:

$$N = \frac{\log(\alpha)}{\log(\rho)} - 1$$
$$N = \frac{\log(0.05)}{\log(0.327)} - 1$$
$$N = 1.68 \text{ vehicles}$$

Therefore, desirably, the development should be designed to allow for an entrance queue of two vehicles (ie 12m). However, an available queuing distance of 1.68 vehicles (ie 10.1m) would be considered acceptable to cater for the 95th percentile queue, subject to engineering judgment.

PRACTICE NOTE

QUEUING CHARACTERISTICS AT SITE ACCESSSES



CONCLUSION

Conventional traffic engineering queuing theory can be used to determine the anticipated queue length at access locations. This ensures that queuing does not adversely impact on nearby traffic or pedestrian flows whilst ensuring that the queuing area is not excessive.

REFERENCES

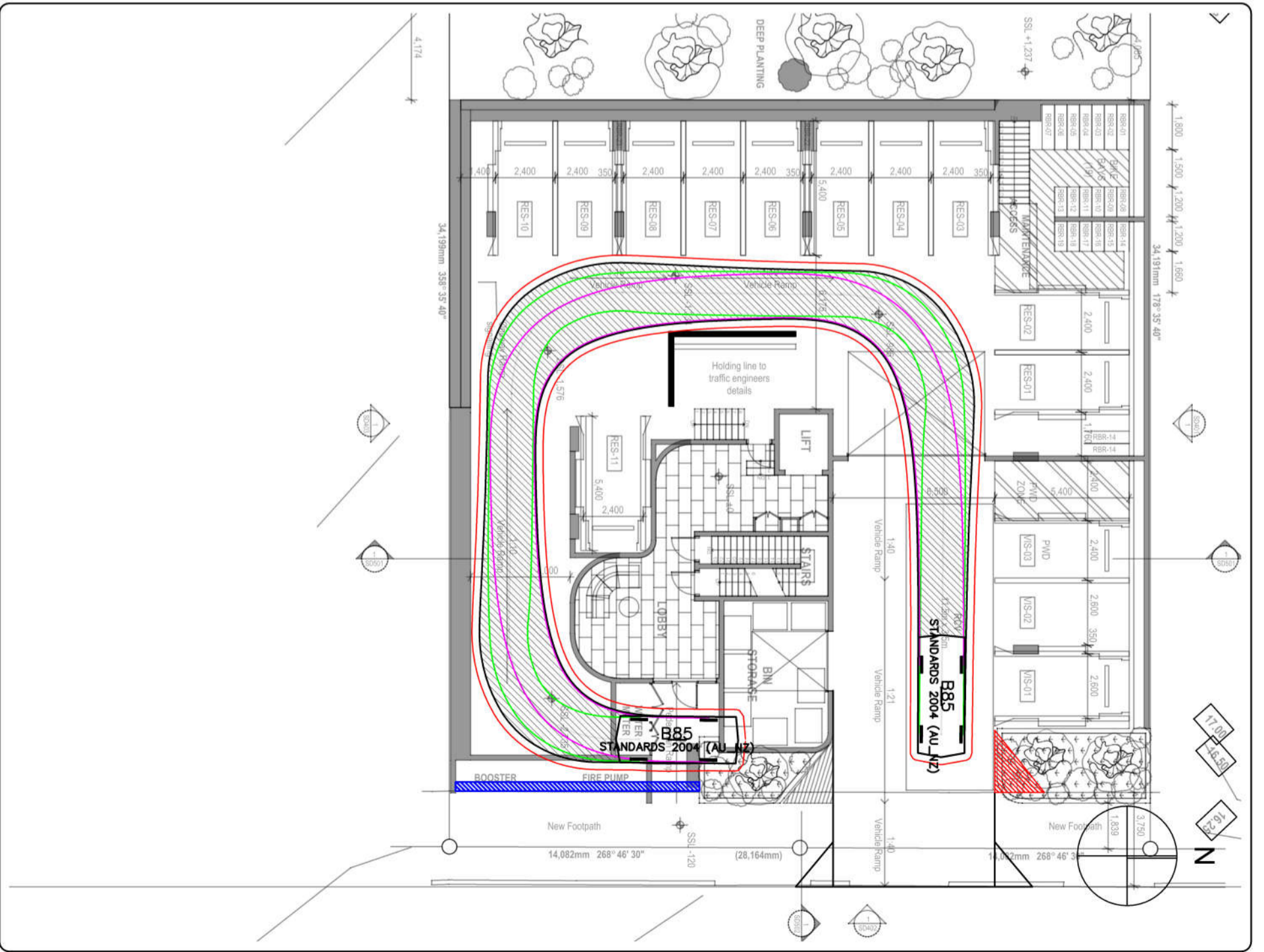
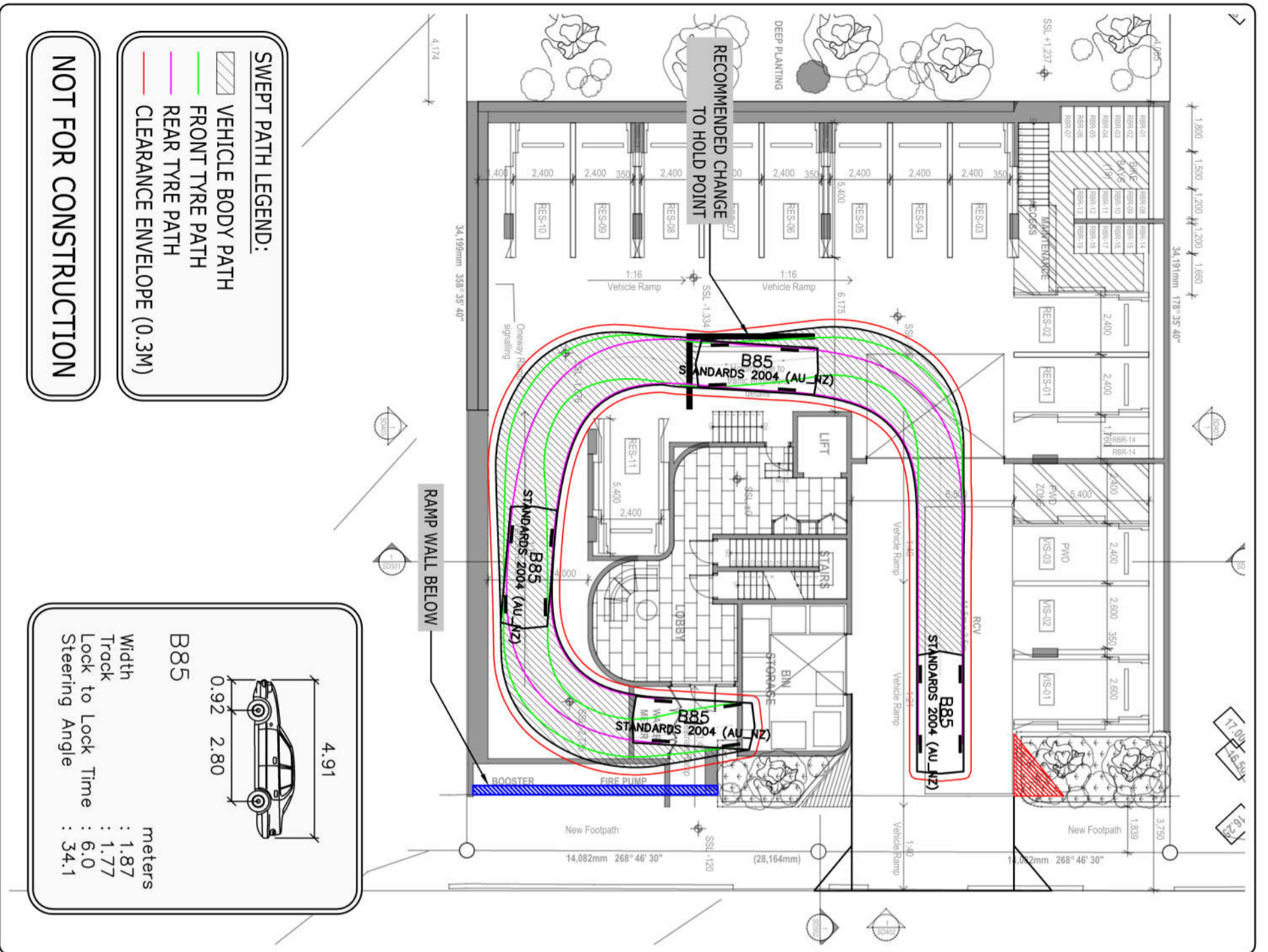
Bennett, DW and Rose, G (1988), *Unsignalised Intersection Analysis*, University of Melbourne

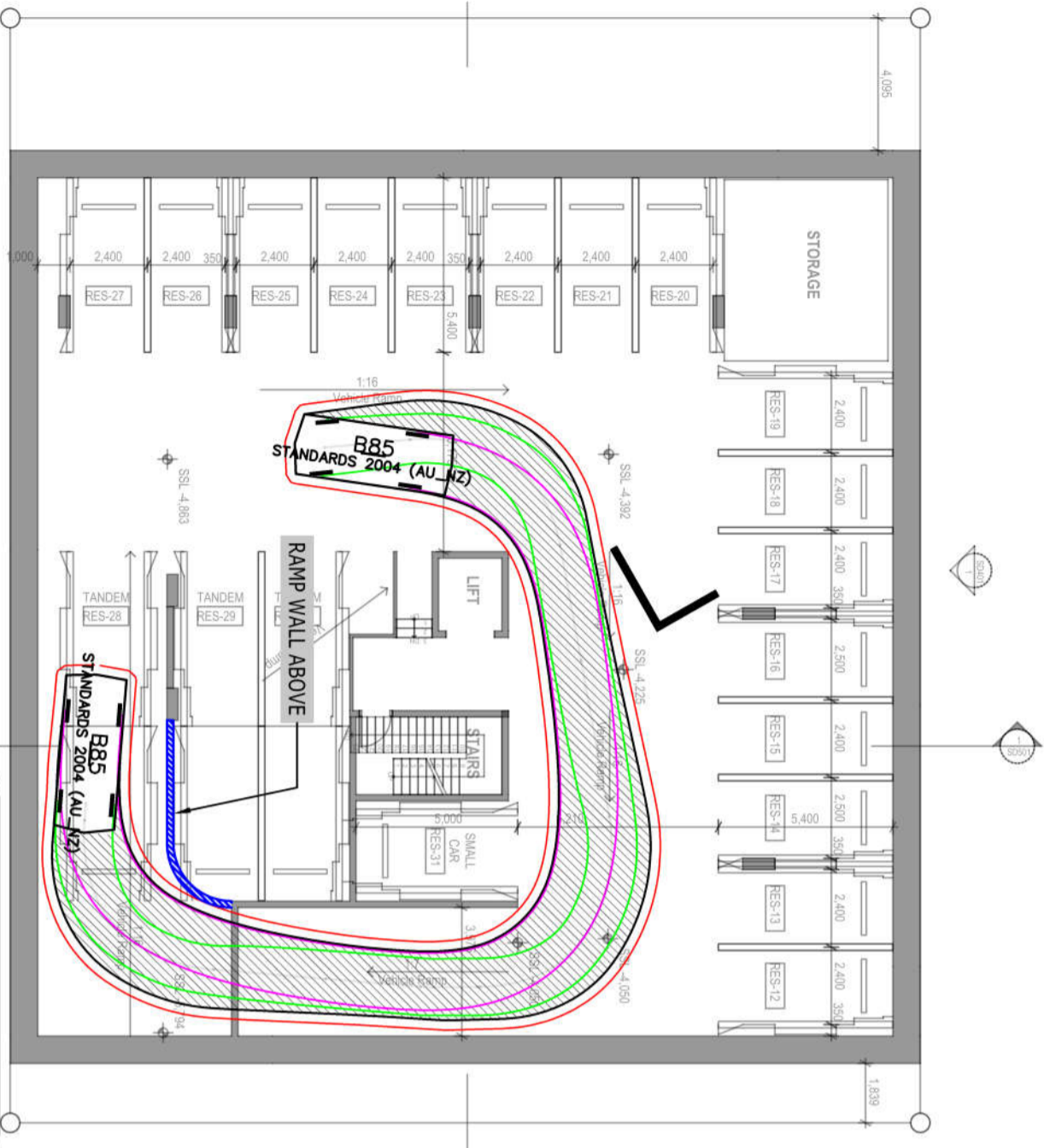
Institute of Transport Studies Monash University (2003), *Traffic Engineering and Management*, Volume 2, Caulfield East

Standards Australia (2004), *AS2890.1:2004 Parking facilities Part 1: Off-street car parking*, Sydney

DISCLAIMER

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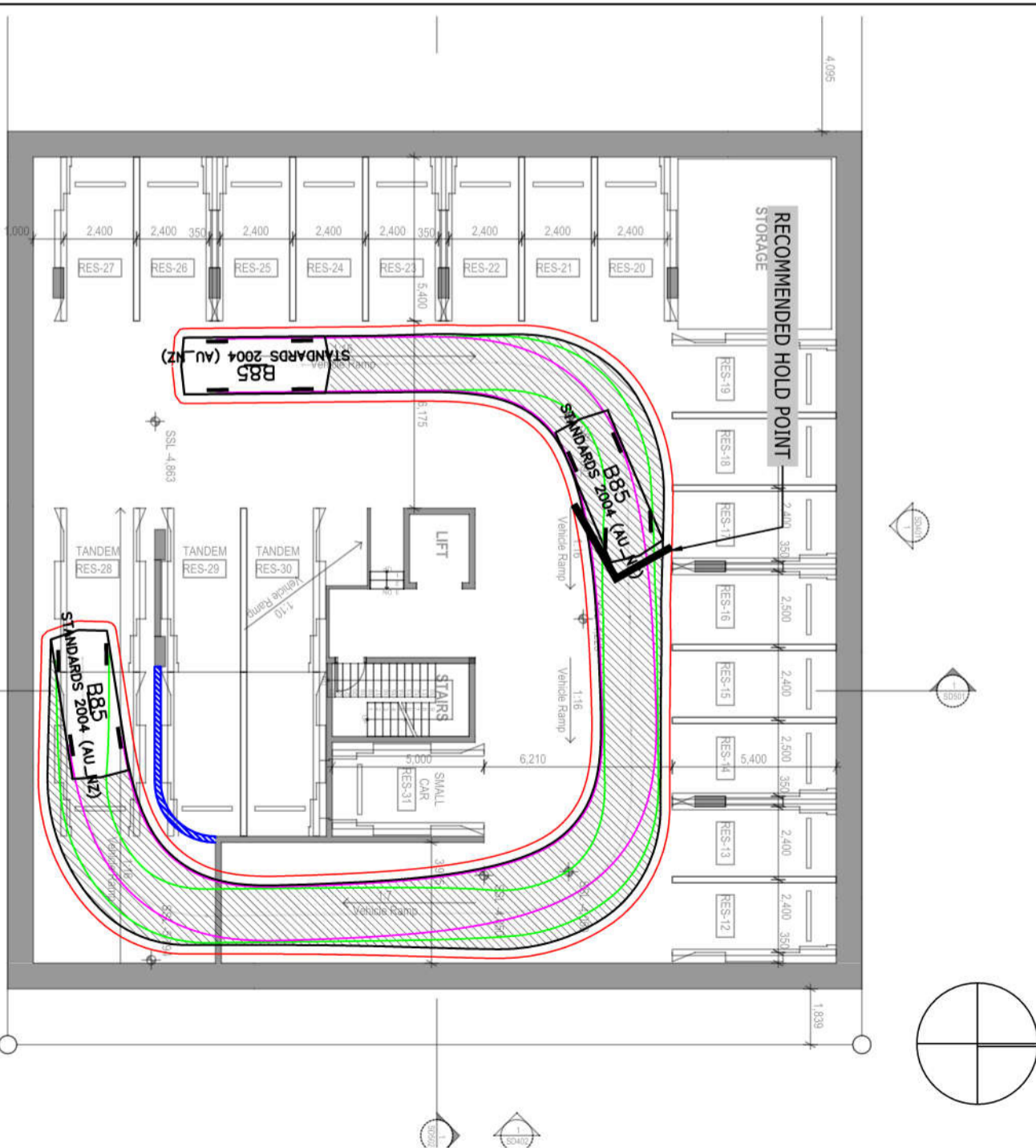
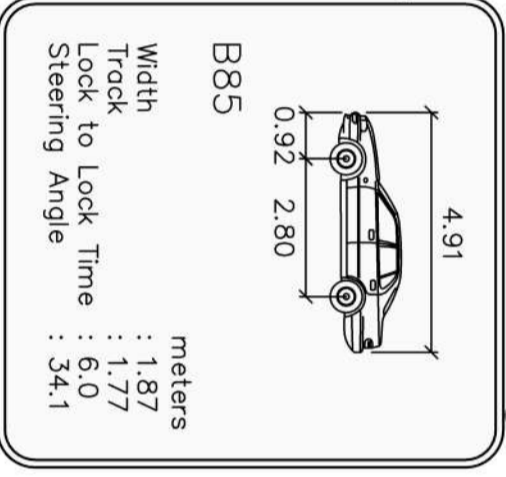




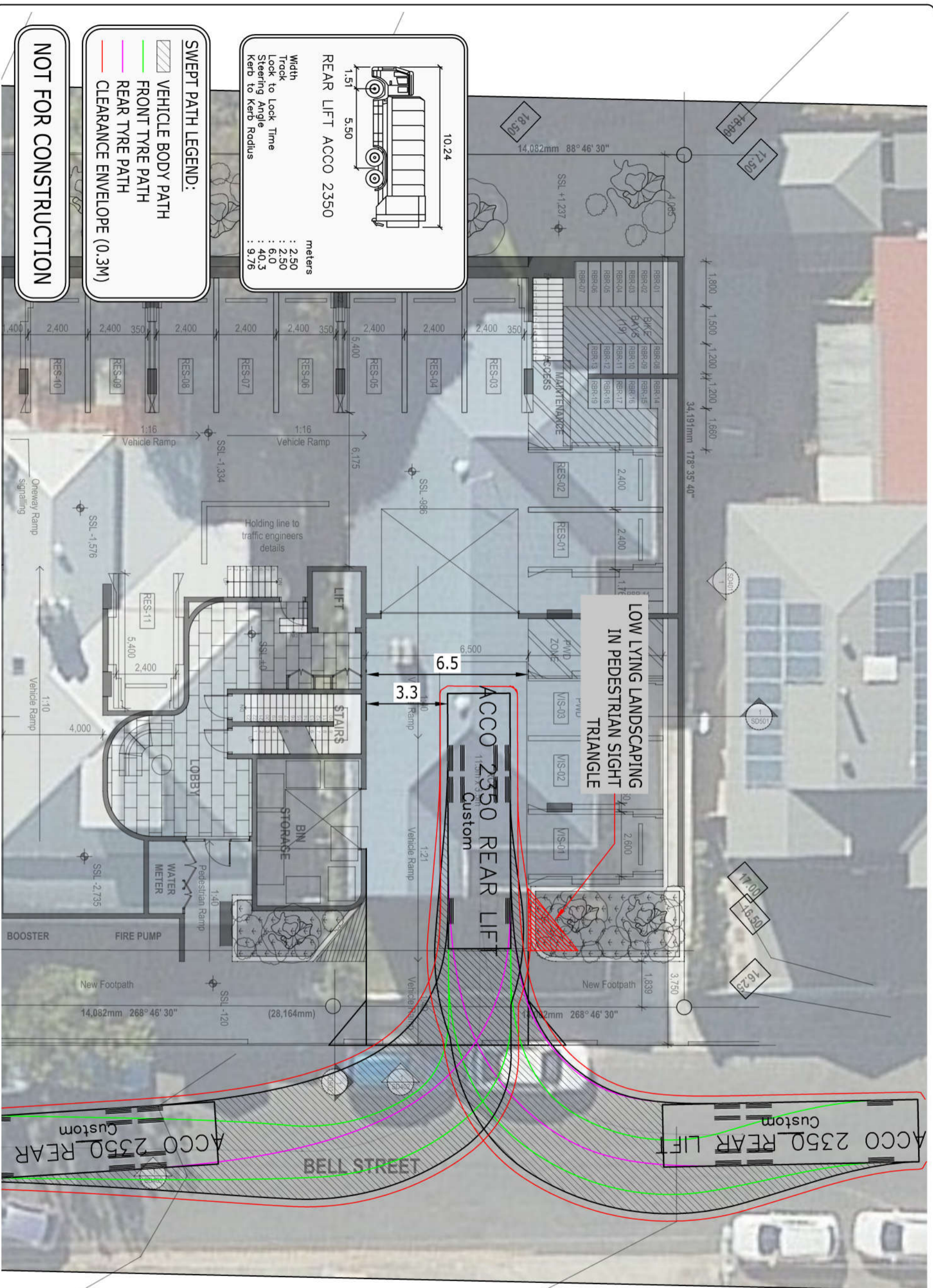
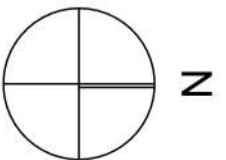
SWEPT PATH LEGEND:

- VEHICLE BODY PATH
- FRONT TYRE PATH
- REAR TYRE PATH
- CLEARANCE ENVELOPE (0.3M)

NOT FOR CONSTRUCTION



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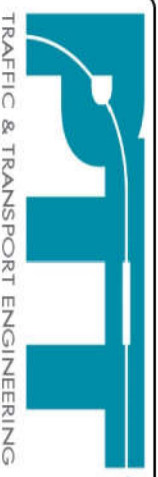
NOT FOR CONSTRUCTION

SWEPT PATH LEGEND:

- VEHICLE BODY PATH
- FRONT TYRE PATH
- REAR TYRE PATH
- CLEARANCE ENVELOPE (0.3M)

REAR LIFT ACCO 2350

Dimensions	Value (meters)
Width	: 2.50
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 40.3
Kerb to Kerb Radius	: 9.76



TRAFFIC & TRANSPORT ENGINEERING

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CG 29/05/26

RCV SERVICING
PROJECT TITLE:
28 & 34 BELL STREET, KANGAROO POINT

DRAWING NO: 26-559-003
REV: A
SCALE: 1:150 @ A3

APPROVED BY:
CG (RPEQ 34450)
C. Spence