PLANS AND DOCUMENTS
referred to in the PDA
DEVELOPMENT APPROVAL

Approval no: DEV2025/1602

Date: 27 May 2025

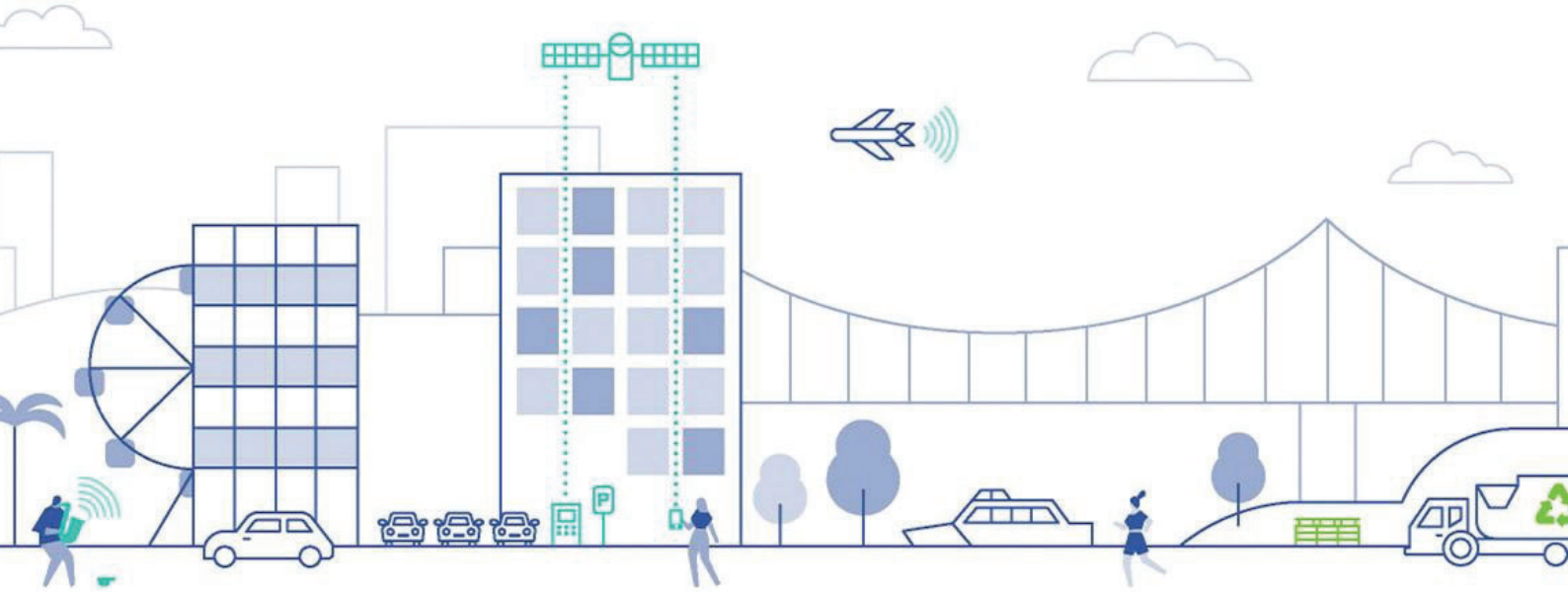
Queensland Government

Transport Engineering Report

Lot 18B, 260 MacArthur Avenue, Hamilton

Multiple Dwelling Development

On behalf of Silverstone Developments



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Revision Record

No.	Author	Reviewed/Approved		Description	Date
1.	J. Harrison			DA Report (Draft)	25.02.25
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4.					

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1. Introduction

1.1. Purpose

Colliers International Engineering & Design (TTMC) Pty Limited (Colliers) has been engaged by Silverstone to prepare a Transport Engineering Report investigating a proposed multiple dwelling development at Lot 18B, 260 MacArthur Avenue, Hamilton. It is understood this report will accompany a Development Application to be lodged with Economic Development Queensland (EDQ), given the site is located within the Northshore Hamilton Priority Development Area (PDA).

Whilst the application will be submitted to EDQ, it is noted that many of the provisions of the Northshore Hamilton PDA Development scheme revert to the respective requirements of the Brisbane City Council Brisbane City Plan 2014.

1.2. Scope

The scope of the transport aspects investigated includes:

- Reviewing the prevailing traffic and transport conditions surrounding the site.
- Identifying parking supply required to cater for development demands.
- Assessing the parking layout to provide efficient and safe internal circulation and manoeuvring.
- Assessing the access configuration to provide efficient and safe manoeuvring between the site and the public road network for cars, service vehicles, cyclists and pedestrians.
- Identifying the service vehicle needs for the site.
- Assessing the internal service vehicle layouts to provide efficiency and safety for on-site service vehicle operation.
- Reviewing access to a suitable level of public and active transport provisions.
- Identification of likely traffic impacts of development on the surrounding road network.

The development plans have been assessed against the following guidelines and planning documents:

- Northshore Hamilton PDA Development Scheme
- Northshore Hamilton PDA Infrastructure Plan Background Report (IPBR)
- Brisbane City Council Brisbane City Plan 2014 (City Plan 2014), specifically:
    - *Transport, Access, Parking and Servicing Code (TAPS Code)*
    - *Transport, Access, Parking and Servicing Planning Scheme Policy (TAPS PSP)*
    - *Infrastructure Design Planning Scheme Policy (Infrastructure PSP)*
    - *Local Government Infrastructure Plan (LGIP)*

  - *Refuse Planning Scheme Policy (Refuse PSP)*
  - *Streetscape Design Overlay Code*
  - *Road Hierarchy Overlay Code*
  - *Bicycle Network Overlay Code*
- Australian Standards for Parking Facilities, specifically:
  - *Part 1: Off-street car parking (AS2890.1:2004)*
  - *Part 2: Off-street commercial vehicle facilities (AS2890.2:2018)*
  - *Part 3: Bicycle parking (AS2890.3:2015)*
  - *Part 5: On-street parking (AS2890.5:2020)*
  - *Part 6: Off-street parking for people with disabilities (AS2890.6:2022).*
- Austroads 'Guide to Traffic Management' (GTM)

2. Site Context and Travel Environment

2.1. Site Location

The site is identified as 260 MacArthur Avenue (Lot 18B on SP326594), Hamilton, as shown in Figure 2-1 and Figure 2-2. The site has a total site area of 6,622 m² and is currently used for storage and car parking.

The subject site is zoned as "Mixed-use High Density" under the Northshore Hamilton PDA and has frontage to Karakul Road to the north, MacArthur Avenue to the south and Barcham Road to the west.

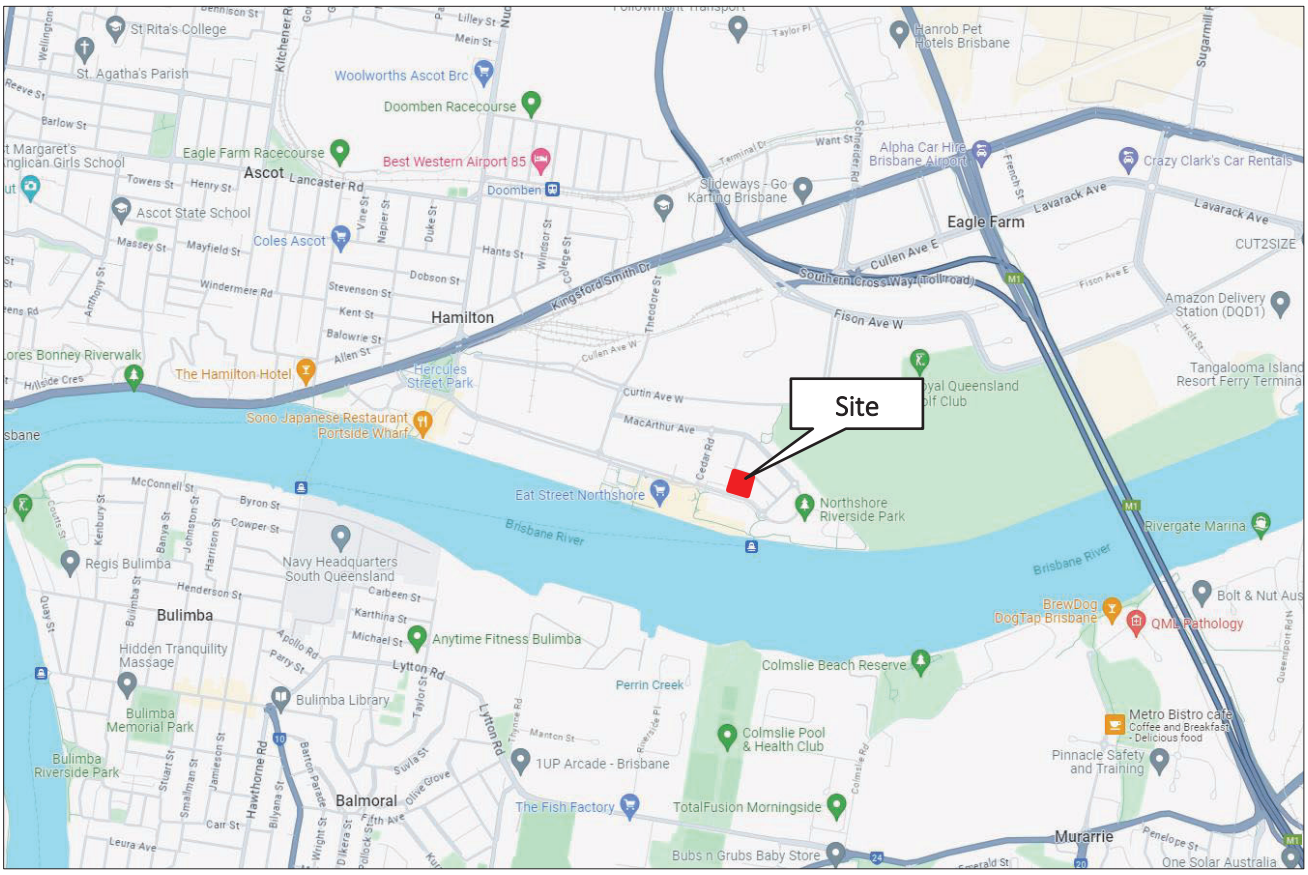


Figure 2-1: Site location (Surrounding Context) - Source: Google Maps

Figure 2-2: Site Location (Immediate Context) - Source: Nearmap 2024

2.2. The Road Network

2.2.1. Road Hierarchy

The hierarchy and characteristics of roads in the immediate vicinity of the site are shown in Table 2-1. The road classification is based on the Northshore Hamilton PDA Infrastructure Plan Background Report (IPBR).

Table 2-1: Local Road Hierarchy

Road	Speed Limit	Road Configuration			Classification
		Reserve Width	Carriageway Width	Lane Configuration	
MacArthur Avenue North/ MacArthur Avenue South	60km/h	28m	20m	2 traffic lanes (divided) Formal kerbside parking on both sides On-street bicycle lane provisions	District Road
Karakul Road	50km/h*	20m	6m	2 traffic lanes (undivided) Formal kerbside parking on both sides	Local Road
Barcham Road	50km/h*	20m	6m	2 traffic lanes (undivided) Formal kerbside parking on both sides	Neighbourhood Road
Angora Road	50km/h*	20m	6m	2 traffic lanes (undivided) Formal kerbside parking on both sides	Neighbourhood Road
Theodore Street	60km/h	35m	14m	2 traffic lanes (undivided)	Suburban Road

*Default speed limit on unsigned roads in built-up areas in Queensland.

MacArthur Avenue is also classified as Primary freight access under the BCC City Plan – Road Hierarchy Overlay.

2.2.2. Intersections

All intersections in the immediate vicinity of the site are priority controlled, with all movements permitted. The key exception being the intersection of Macarthur Avenue North / Barcham Road which is configured as left-in/left-out movements only.

2.2.3. On-Street Parking

There are no on-street parking restrictions surrounding the development site. The three site frontages (Karakul Road, MacArthur Avenue and Barcham Road) provide formal indented parking on both sides of the road.

2.3. Public and Active Transport Facilities

2.3.1. Public Transport

Figure 2-3 shows the public transport facilities within a 400m radius of the subject site.

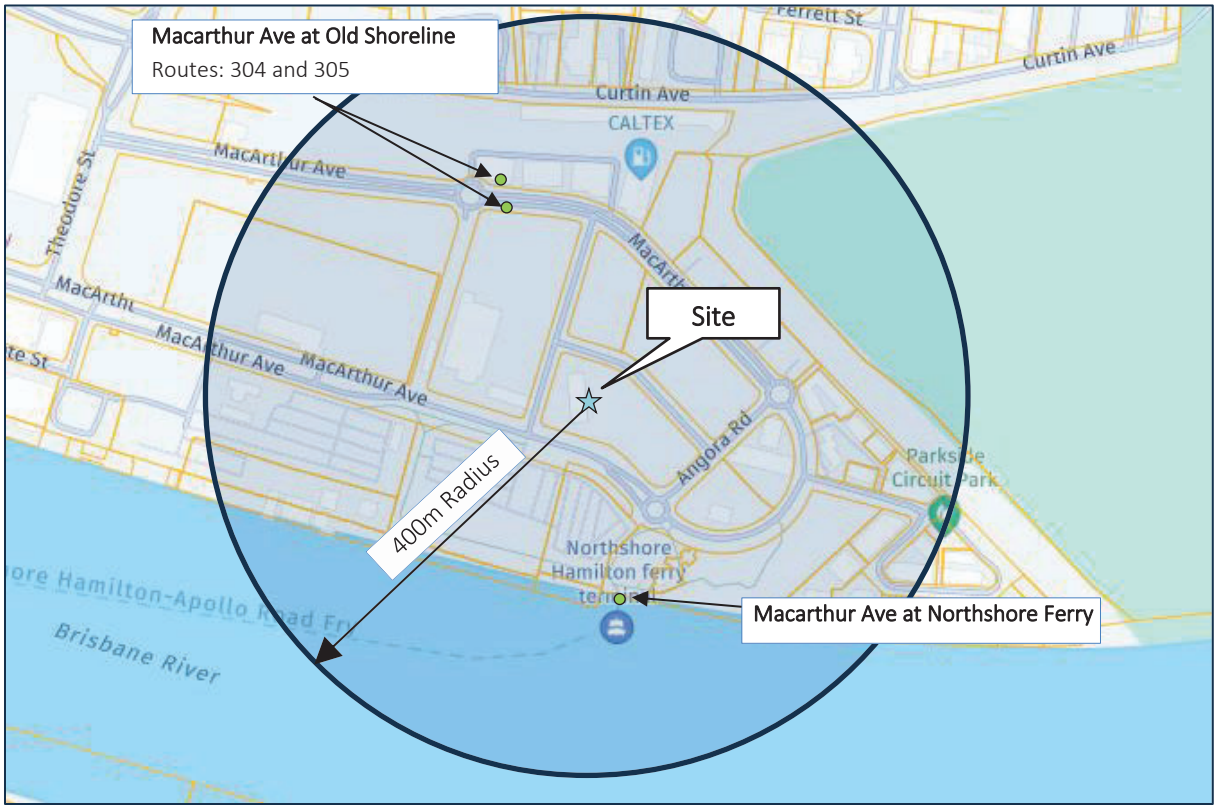


Figure 2-3: Surrounding Public Transport Provisions – Source: Nearmap 2025

Bus Services

The following is a summary of the bus routes currently serviced by the nearby stops:

- Route 304: This service connects the Northshore Hamilton Ferry Terminal to Portside Wharf and Ascot, traveling via MacArthur Avenue, Remora Road, Nudgee Road, and Racecourse Road. It operates Monday to Friday between 9:00am and 4:20pm, with a frequency of every 30 minutes.
- Route 305: This service connects Northshore Hamilton Ferry Terminal to Brisbane City, travelling via Ascot, Hamilton, Newstead, and Fortitude Valley. It operates Monday to Friday, with inbound trips from 6:25am to 8:25am and outbound trips from 4:25pm to 6:35pm, at 15-minute intervals during these times.

There are additional bus services accessible via stops in the wider surrounding area, which includes:

- Route 302: Stops for this route are located on Theodore Street, approximately 800 meters west of the site. It connects Eagle Farm to the City and operates Monday to Friday, with morning services from 6:00am to 7:15am (City to Eagle Farm) and afternoon services from 3:50pm to 4:45pm (Eagle Farm to the City), at 20-minute intervals.

Train Services

The closest train station to the site is Doomben, situated approximately 2.3 km to the northwest. This station services the following lines:

- Doomben – Brisbane City
- Doomben – Beenleigh
- Doomben – Cleveland

The average departure frequency is every 30 minutes on weekdays from 5:45am to 8:00pm, and every 60 minutes on weekends from 7:45am to 8:00pm.

Ferry Services

The Northshore Hamilton Ferry Terminal is located approximately 350m from the site, providing connections from Northshore to UQ St Lucia, with stops along the river at Bulimba, Teneriffe, New Farm Park, QUT Gardens Point, Southbank, Toowong, and West End. Services operate Monday to Friday from 5:30am to 10:15pm, with departures approximately every 15 minutes. On weekends and public holidays, services run from 6:00am to 10:15pm, with a 15-minute frequency.

Figure 2-4 illustrates the estimated area accessible via public transportation within a 30-minute travel time from the development site.

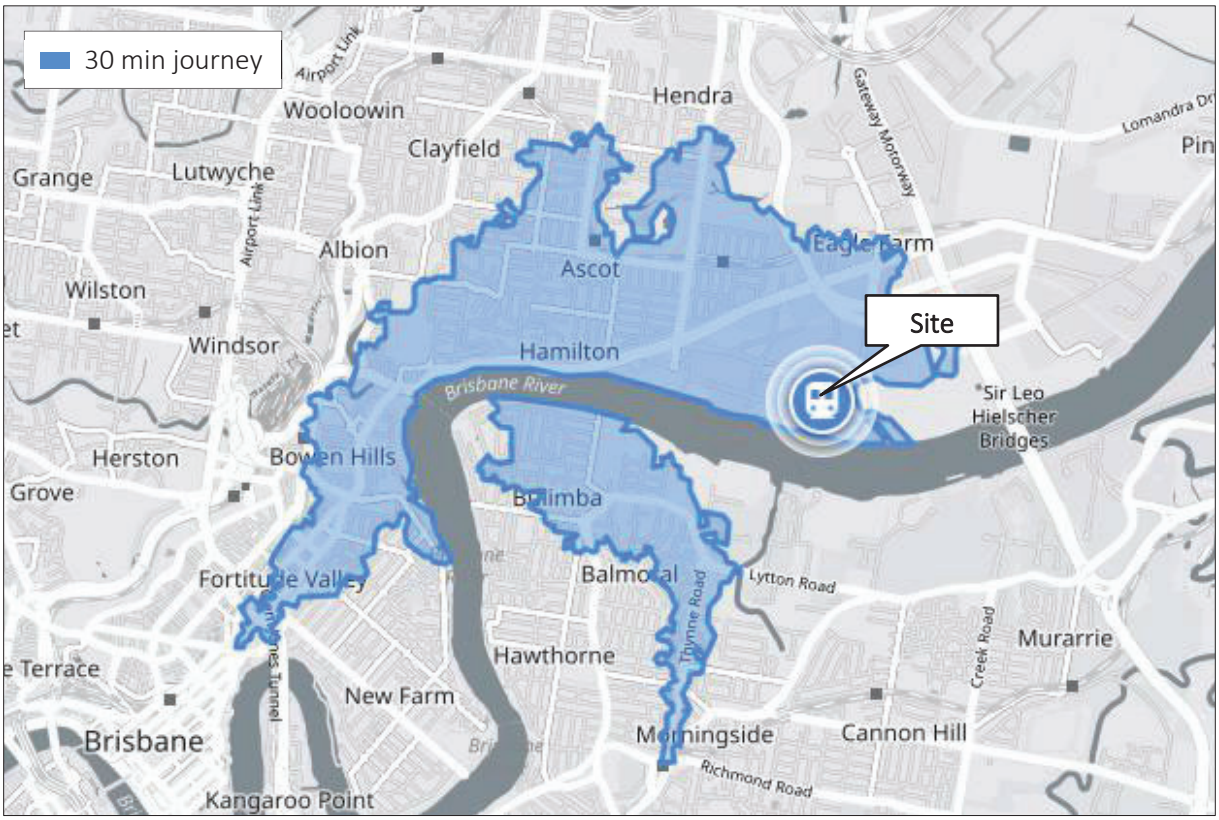


Figure 2-4: Public Transport Trip Catchment – 30 Minute Journey

Overall, the quality of public transportation can be considered satisfactory in facilitating access to/from the site.

2.3.2. Cycle Routes

An extract of existing cycle routes surrounding the subject site is shown in Figure 2-5.

Figure 2-5: Existing Cycle Routes - Map Source: Google Maps

A comprehensive network of bicycle infrastructure within the Northshore Hamilton PDA area is continuing to be delivered as part of the ongoing internal road upgrade works. This will include a mixture of dedicated offroad cycle paths/tracks, shared paths (such as along the river front) and on-road cycle provisions. The proposed ultimate bicycle network hierarchy for the Northshore Hamilton PDA area, as identified in the Cardno Transport Masterplan (discussed further in Section 2.4), is shown in Figure 2-6. Once this is delivered, internal movement within the PDA area by bicycle will be more convenient and therefore an attractive travel mode.

Figure 2-6: Proposed PDA Cycle Network and External Connections - Source: Cardno Transport Masterplan Report

It is also noted that the subject site is well located proximate to other external bicycle routes connecting with the wider Brisbane network. Key external cycle routes include:

- Kingsford Smith Drive, which includes on-road bicycle lanes east of Racecourse Road and a dedicated off-road separated pedestrian/cycle path west towards the Brisbane CBD.
- The Gateway Bridge Bikeway, which features a dedicated pedestrian and bicycle path, linking Hamilton Northshore to Brisbane's southern suburbs.

Figure 2-7 Illustrates the locations that can be reached by a 20-minute bike ride from the development.

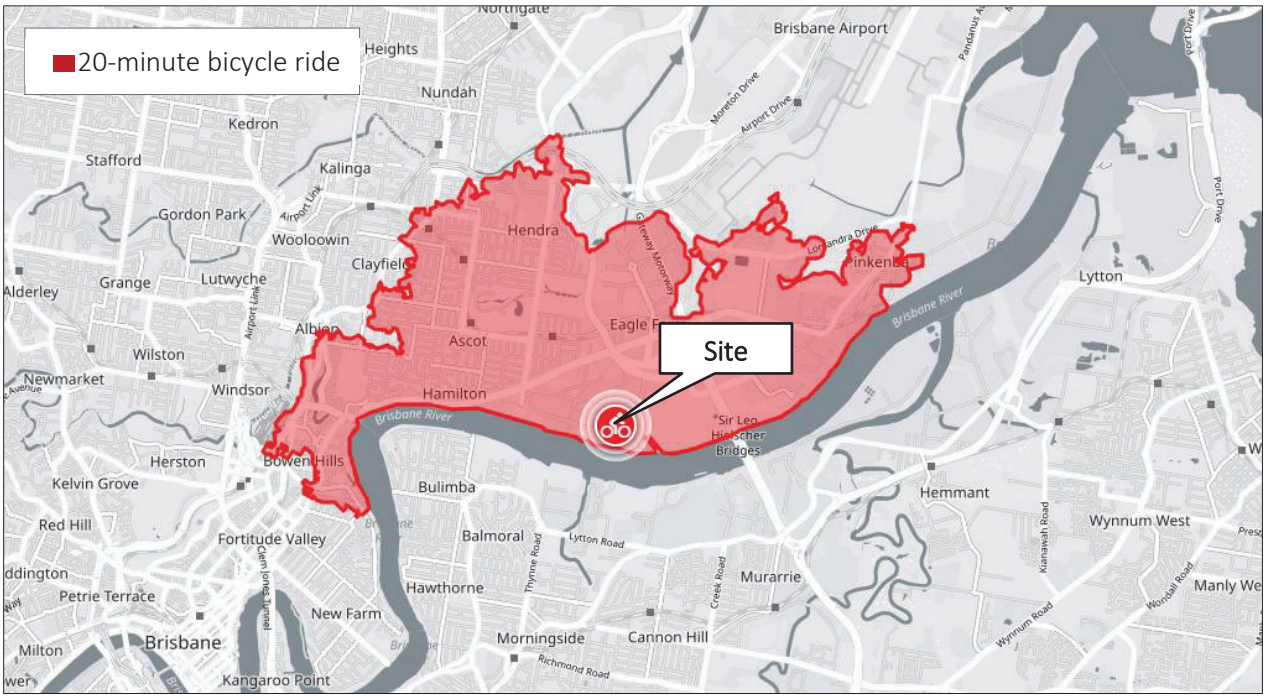


Figure 2-7: Cycle Catchment – 20 Minute Journey

Overall, the site is considered to be well located with good access to established bicycle routes and infrastructure (which is proposed to continue to improve).

2.3.3. Pedestrians

Formal pedestrian footpaths are located on both sides of the roads in the immediate vicinity of the site. Kerb ramps and informal crossings are provided at all nearby intersections.

There is also a proposed new cross-block link between Karakul Road and MacArthur Avenue. This aligns with the existing pedestrian link to the north to provide a continuous north-south pedestrian route (which is shown in Figure 2-9).

2.4. Transport Planning

Northshore Hamilton PDA

The PDA Development Scheme and IPBR proposes a new network of internal roads to service the redevelopment of the area. Improvements to public and active transport provisions are also proposed.

Figure 2-8 and Figure 2-9 show extracts of the various PDA planning documents identifying the ultimate roads, public transport, and active transport provisions.

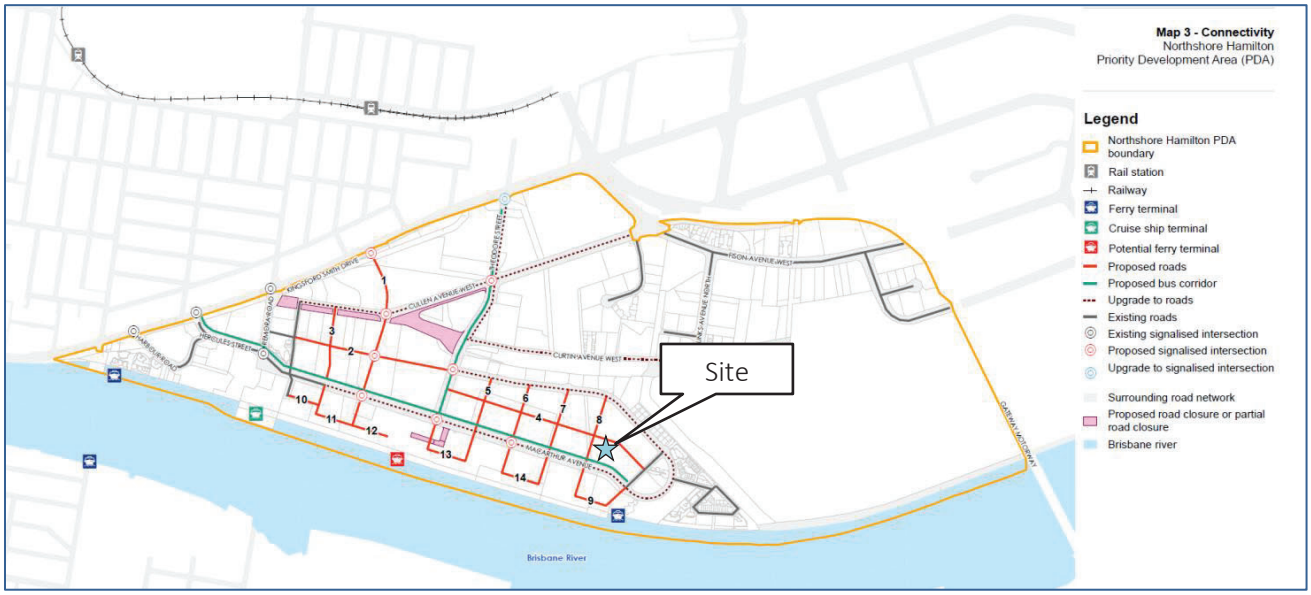


Figure 2-8: PDA Internal Transport Network Upgrades – Roads and Public Transport - Source: PDA Development Scheme

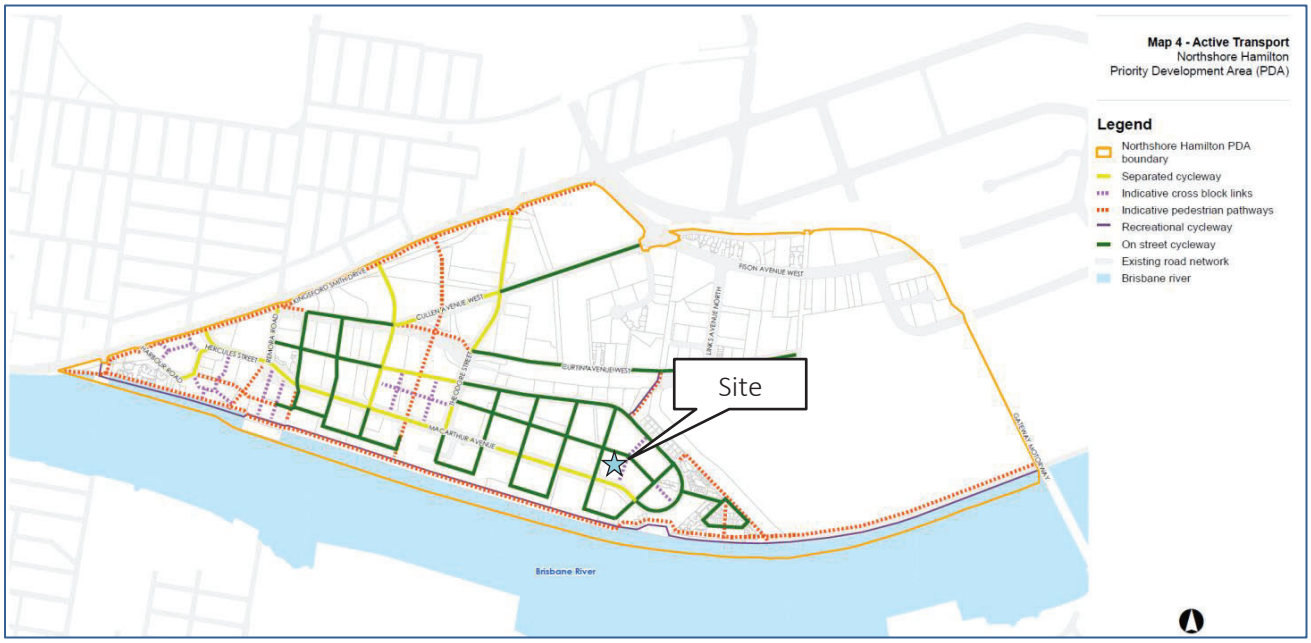


Figure 2-9: PDA Internal Transport Network Upgrades – Active Transport - Source: PDA Development Scheme

Public Transport Provisions

Cardno Transport Masterplan

Colliers has reviewed the 2021 Transport Masterplan Report prepared by Cardno which inform the Northshore Hamilton PDA. This report assessed existing public transport accessibility for the PDA and future improvements to service the redevelopment. This report generally identified the following:

- No upgrade/extension to existing train services on the Doomben line.
- A potential additional ferry terminal (mid-way between the Bretts Wharf and Hamilton Northshore terminals) to provide more proximate access from central redevelopment zones. Potential additional services also suggested if demand dictates.
- New/extended bus services into the internal roads, looping through the PDA via MacArthur Avenue and joining with Kingsford Smith Drive for access to the Brisbane CBD and other high-priority destinations. It has been suggested this take the form of a high-frequency service (5–10-minute peak hour frequencies).

Gold City Glider

It is understood that Brisbane City Council has recently submitted a business case to Translink for a new Gold CityGlider route to complement the existing Blue and Maroon routes. The proposed new Gold route would run from Woolloongabba to Hamilton Northshore via Brisbane City, Fortitude Valley and Newstead. The indicative route map suggests this would terminate at the western end of the Northshore Hamilton PDA (near the Hercules Street Park). This would be approximately 1.5km walk from the subject site to the west. This is anticipated to provide a service span and frequency similar to existing routes, which would be at least every 10 minutes in peak hours and 15-mintutes off peak periods. Implementation of this route is subject to a joint funding agreement between Translink and Council, and so there is no indicative timeframe for establishment of this route.

Should this route proceed, it is strongly suggested that it is extended further east into the wider Northshore Hamilton PDA area; in effect becoming the high-frequency bus service as recommended in the Cardno Transport Masterplan Report. If this were done, this extended route would potentially have stops much closer to the subject site, as well as all surrounding Mixed-use High Density land uses, making this a more convenient public transport option.

3. The Proposed Development

3.1. Development Profile

The proposed development consists of one 13-storey residential building and one 17-storey residential building, providing a combination of one, two and three-bedroom apartments. The proposed development scheme is summarised in Table 3-1.

Table 3-1: Proposed Development Scheme

Land Use	Yield
Multiple Dwellings • 1 Bedroom unit • 2 Bedroom units • 3 Bedroom units	**253 units (total)** 25 units 188 units 40 units

A copy of the architectural plans, prepared by Carr, is included in **Appendix A**.

3.2. Parking

The development scheme provides a total of 341 car parking spaces, including:

- 303 resident car parking spaces (incl. 6 Persons with Disabilities (PWD) spaces)
- 38 visitor car parking spaces (incl. 1 PWD space)

A total of 358 bicycle spaces are also provided, including:

- 264 resident bicycle spaces on the ground level.
- 64 visitor bicycle spaces, located on the ground level

Further details regarding the proposed car and bicycle parking provisions are included in Section 4.

3.3. Access

The development plan includes the following access arrangements:

- A 6.2m wide Type B2 crossover (residential/visitor access) to Barcham Road on the western site frontage. This access will accommodate all vehicles with all movements permitted.
- A 5.0m wide Type B2 crossover (service vehicle/loading bay access)
- Pedestrian access to/from the development from the northern, southern and western site frontage (Karakul Road, MacArthur Avenue and Barcham Road).
- Direct access to visitor bicycle racks from the footpath and resident access via either vehicle access (Barcham Road) and ramp to basement or building lifts.

Further details regarding the proposed access arrangements are included in Section 5.

3.4. Servicing

The proposed development allows access for vehicles up to the size of a 10.3m rear-loading Refuse Collection Vehicle (RCV). A dedicated loading bay is provided on at Ground Level, accessed from Barcham Road.

Further details regarding the proposed servicing arrangements are included in Section 6.

4. Parking Arrangements

4.1. Parking Supply

4.1.1. Car parking

The minimum requirements for car parking supply under the Northshore Hamilton PDA and the proposed provisions for the development scheme are summarised in Table 4-1 below.

Table 4-1: Northshore Hamilton PDA Car Parking Supply Requirement

Land Use / Component	PDA Requirement	Extent	Requirements	Provision
Multiple Dwelling (Resident) • Minimum • Maximum	 0.75 space per unit 2 spaces per unit	253 units	 189.75 spaces (min) 506 spaces (max)	297 spaces
Multiple Dwelling (Visitor)	0.15 spaces per unit	253 units	37.95 spaces (min)	38 spaces Incl. 1 PWD space & 1 VAN bay
PWD Parking	0.02 spaces per unit	253 units	5.06 spaces	6 spaces
Total				**341 spaces**

[1] Parking rates as per Northshore Hamilton PDA Development Scheme for Shop land use

[2] Parking rates as per uses within the City Frame, as specified in the BCC TAPS PSP.

As seen in Table 4-1, the development scheme proposes a total of 297 residential car parking spaces which achieves compliance within the specified range of parking as per the Northshore Hamilton PDA.

Regarding visitor parking, a supply of 38 car spaces is provided, meeting the requirements of the Northshore Hamilton PDA. Although one visitor space has been designated as a van bay, its primary use for mail and courier deliveries will be limited to daytime business hours. Outside these hours, including evenings and weekends—when visitor demand is at its peak—the bay will be available for general visitor parking.

Overall, the proposed car parking supply is deemed fit for purpose.

4.1.2. PWD Parking

The Northshore Hamilton PDA indicates that PWD parking should be provided at a rate of 0.02 spaces per dwelling, with a minimum of 1 parking space. This parking supply is also separate from the residential/visitor parking rates. For 255 units, this equates to a requirement of 6 PWD spaces.

The development plans make allowance for a total of 6 PWD spaces, which can be shared between use by either residents or visitors. This meets the requirements of the Northshore Hamilton PDA.

Overall, the PWD parking provisions for the development meet the requirements of the Northshore Hamilton PDA.

4.1.3. Bicycle Parking

The Northshore Hamilton PDA refers to the TAPS PSP rates with regards to the bicycle provisions. Therefore, the bicycle parking supply requirements for the proposed development have been determined in line with Table 21 of the TAPS PSP. Table 4-1 provides a summary of the bicycle parking supply requirements in line with the TAPS PSP, and the proposed provisions, for the development scheme.

Table 4-2: TAPS PSP Bicycle Parking Supply Requirement

Land Use / Component	TAPS PSP Requirement	Extent	Requirement	Provision
Multiple Dwelling (Residents)	1 space per unit	253 units	253 spaces	264 spaces
Multiple Dwelling (Visitors)	1 space per 4 units	253 units	64 spaces	64 spaces
Total			**317 spaces**	**328 spaces**

As seen in Table 4-2, the development scheme proposes a total of 328 bicycle parking spaces, which exceeds the TAPS PSP minimum requirements.

The bicycle parking arrangements, including location, quantum, rack form and access provisions, for the development generally entail the following:

Resident Bicycle Parking

- A total of 264 bicycle racks will be located on the ground level, including:
  - 255 Cora E3DT-GP Rack Series, which comply with AS2890.3:2015, providing 400mm spacing between post centres and the edges of walls or other obstructions.

Access to the bicycle parking will be via the vehicle driveway on Barcham Road or via the pedestrian access located on Karakul Road.

Visitor Bicycle Parking

A total of 64 visitor bicycle parking spaces (ground racks) will be provided at ground level, positioned at the northern, southern and western site frontages, close to the building access points.

Further details on the bicycle parking layouts and design compliance are included in Section 4.2.

Overall, the bicycle parking supply for the development is considered acceptable.

4.2. Parking Layout

The Northshore Hamilton PDA does not specify the requirements for a car parking design layout. Therefore, the proposed development car parking layout has been assessed against the Council TAPS PSP provisions.

The development scheme provides parking on Level 1 (Podium), Ground Level and the Basement Level. Table 4-3 identifies the characteristics of the proposed parking layouts with respect to the TAPS PSP design provisions. The last column identifies the compliance of each design aspect. Where compliance with the TAPS PSP is not achieved, further information is provided below.

Table 4-3: TAPS PSP Parking Design Requirements

Design Aspect	TAPS PSP Provision	Proposed Provision	Compliance
Car Parking			
Parking space length: • Standard space (Class 3) • PWD space (Class 5)	 5.4m (min) 5.4m (min)	 5.4m (min) 5.4m (min	 TAPS PSP Compliant TAPS PSP Compliant
Parking space width: • Standard space (Class 3) • PWD space (Class 5)	 2.6m (min 2.4m + 2.4m 'Shared Area.	 2.6m (min) 2.4m + 2.4m 'Shared Area.'	 TAPS PSP Compliant TAPS PSP Compliant
Aisle Width: • Parking aisle • Circulation road/ramp (two-way)[1]	 6.2m (min) 6.2m (min) + 0.3m kerbs/clearance.	 6.2m (min) 6.2m + 0.3m kerbs/clearance.	 TAPS PSP Compliant TAPS PSP Compliant
Parking envelope clearance	Located as per Figure m of TAPS PSP	Located as per Figure 5.2 of AS2890.1:2004	Performance Solution
Maximum Gradient: • PWD parking • Parking aisle • Ramps	 1:40 (2.5%) 1:20 (5.0%) 1:6 (16.7%)	 Flat Flat 1:6 (16.7%)	 TAPS PSP Compliant TAPS PSP Compliant TAPS PSP Compliant
Maximum Gradient Transitions[2]	1:8 (12.5%) summit 1:6.67 (15.0%) sag	1:10 (10.0%) summit 1: 8 (12.5%) sag	TAPS PSP Compliant TAPS PSP Compliant
Blind Aisle Extension	2m beyond the last bay or 8.0m aisle width	1.0m aisle extension	Performance Solution
Height Clearance: • General Minimum • Absolute Minimum • Over PWD space	 2.3m (min) 2.1m (min) 2.5m (min)	 2.3m (min) 2.3m (min) 2.5m (min)	 TAPS PSP Compliant TAPS PSP Compliant TAPS PSP Compliant
Tandem car bay allocation	2 spaces are provided for 1 dwelling	2 spaces are provided for 1 dwelling	TAPS PSP Compliant
Bicycle Parking[1]			
Ground Rack length	1.8m (min)	1.8m (min)	AS2890.3 Compliant
Rack spacing (Standard)	0.5m (min)	0.5m (min)	AS2890.3 Compliant
Rack spacing (Dynamic)	0.4m (min)	0.4m (min)	AS2890.3 Compliant
Maneuvering/Access Paths	1.5m (min)	1.5m (min)	AS2890.3 Compliant
Height Clearance	2.2m (min)	2.2m (min)	AS2890.3 Compliant

[1] TAPS PSP is silent with regard to this matter, so revert to AS2890 requirements as per Section 1.2 of the TAPS PSP.

The development parking layout is generally consistent with the provisions of the TAPS PSP. Further details in relation to deemed compliance of required provisions or justification for design aspects resolved with performance solutions are provided following.

Parking envelope clearance (column/walls) intrusion

The development plans make allowance for structure/walls within the allowable envelopes adjacent to car spaces as per Figure 5.2 of AS2890.1:2004. This differs slightly from the provision of Figure f of the TAPS PSP. Notably, there is only a 0.05m difference in the acceptable location of columns closest to the parking aisle and allowance for additional columns to be located adjacent to bays towards the front/end of the parking space. These differences, however, are not expected to have any adverse impacts on the ability of vehicles to manoeuvre into/out of the car spaces or open the doors (the two key considerations driving these design envelopes around car spaces).

It is noted that the columns located along the eastern parking aisle on the ground level are positioned in line with the front of the adjacent parking space. The TAPS PSP specifies that a clearance zone measuring 0.8m x 0.3m should be provided at the front corners of parking spaces to facilitate vehicle manoeuvring. This requirement is based on a standard 6.2m wide aisle. The parking aisle adjacent to the columns in question measure 7.0m wide. The additional 0.8m aisle width provides additional space for vehicle manoeuvring allowing for vehicles to straighten more prior to entering the impacted parking spaces. The proposed column location with the compensatory aisle width is therefore considered appropriate to support the development.

Blind aisle extension

The TAPS PSP details that at the end of terminating/blind parking aisles, a 2.0m aisle extensions needs to be provided to facilitate appropriate manoeuvring from the final parking space/s. The proposed development generally provides a minimum of 1.0m aisle extensions beyond the final parking spaces on each of the dead-end parking aisles, which meets the minimum requirements of AS2890.1:2004. Colliers's experience shows that manoeuvring for a standard car from a dead-end space with a 6.2m wide aisle, 2.6m wide parking bay and 1.0m aisle extension can be completed comfortably.

5. Access Arrangements

5.1. Vehicular Access

Access to the proposed development is proposed via Barcham Road, as it is a lower-order road compared to Macarthur Avenue, aligning with best practice for minimising traffic impacts on higher-order roads. Additionally, Barcham Road provides superior sightlines in both directions compared to Karakul Road. Access via Karakul Road would be less desirable due to its location near a road bend, which significantly reduces available sight distance and may compromise safety. Furthermore, Karakul Road already accommodates multiple approved and proposed large-scale developments with existing or planned access points in close proximity to the potential access location for Lot 18B. Introducing an additional access along Karakul Road would increase the concentration of vehicular movements in a constrained area.

The development proposes two access points:

- General vehicle access via a 6.2m Type B2 crossover on Barcham Road. This access will accommodate general passenger vehicles with all movements permitted.
- Service vehicle access vis a 5m wide Type B2 crossover on Barcham Road.

This access arrangement offers several key benefits:

- Traffic efficiency: Separating service vehicle movements reduces congestion and potential operational conflicts within the development's parking area.
- Safety improvement: Dedicated servicing access minimises interactions between large vehicles and pedestrians moving to/from their vehicles, as well as cyclists accessing designated bicycle parking areas.

Further information regarding each of the access crossovers is provided under the respective heading below.

5.1.1. General Vehicle Access

The primary vehicle access will enable car movement to and from the development parking areas. Except for Vans, no service vehicles will use this crossover. The proposed driveway specifications are outlined in Table 5-1.

Table 5-1: General Vehicle Access Arrangements

Design Aspect	TAPS PSP Provision	Proposed Provision	Compliance
Width / Crossover Type to accommodate: • Cars[12]	6.0-9.0m / Type C1	6.2m / Type B2	Performance Solution
Distance from: • minor intersection[1] • adjacent driveway[1]	10m (min) 3m (min)	20m – Karakul Road 25m – development service vehicle access	TAPS PSP Compliant TAPS PSP Compliant
Sight Distance[12]	90m (desirable)	South: >60m to the intersection North: >90m	TAPS PSP Compliant
Visibility Sight Splays	2.0m wide x 5.0m deep (on each side)	2.0m wide x 4.1m deep (on both sides)	Performance Solution
Minimum Queuing Provisions [2]	8 vehicles / 48m	2 vehicles / 12m	Performance Solution
Maximum Driveway grade	1:20 (5%) maximum within first 6m	1:20 (5%) maximum within first 6m	TAPS PSP Compliant.

[1] Based on Barcham Road being classed as a 'minor road' and speed limit of 50km/h.

[2] Based on the access servicing ~340 low turnover car parking spaces.

Further details in relation to the general vehicular access design aspects resolved with performance solutions are provided as follows.

Crossover Type

While BCC's TAPS PSP identifies a Type C1 crossover for the proposed development based on the number of car spaces, a Type B2 crossover is considered more appropriate given the low-turnover nature of the residential use. The reduced width also decreases the crossing distance for pedestrians, reducing the conflict zone between vehicles access the site and passing pedestrians.

Sight Distance

There is approximately 60m of site distance to the Barcham Road / Macarthur Avenue intersection. While this is less than the 90m desirable sight distance specified in the TAPS PSP, drivers will have a clear unobstructed view of the intersection. The speed of traffic turning from Macarthur Avenue onto Karakul Road will be relatively low at under 30kph. As such, there is ample opportunity for vehicles utilising the site access to identify approaching vehicles.

On this basis, the sight distance provisions are considered appropriate.

Visibility Sight Splays

The development plan includes an allowance for minimum 2.0m wide x 4.1m deep sight splays on each side of the driveway, which exceed the provisions outlined in AS2890.1:2004. On this basis, provision for an AS2890.1:2004 compliant sight splay arrangement is considered an acceptable performance solution.

Minimum Queuing Provisions

The development plan provides internal queuing of 2 vehicles / 12m from the boundary through to the first conflict point, that being the Van service bay. Whilst the queuing provision falls below the provision of the TAPS PSP requirement for 8 vehicles / 48m, this is considered an acceptable performance solution based on

the practical movement demands at this access. As detailed in Section 7, the peak hour traffic generation of the development was estimated to be 128 vehicles per hour (vph) two-way. Based on a worst-case peak hour inflow of 70% (such as during a weekday evening peak hour – when residents are returning home / visitors attending site), this equates to 88vph at most entering the site. Based on the 'Poisson Distribution' for queueing theory as detailed in the Austroads GTM, Part 2: Traffic Theory the chances of more than 2 vehicles arriving during any given 30 second period for an average arrival flow of 88vph would be less than 5%. This means that the 2-vehicle queuing capacity is sufficient to satisfy in excess of the 95th percentile queuing demands expected for the driveway.

Overall, the proposed access arrangements are considered suitable for the proposed development and 'fit for purpose'.

5.1.2. Service Vehicle Access

A dedicated service vehicle access is proposed to the south of the general vehicle access. No light vehicles will utilise this crossover. The proposed driveway requirements are specified in Table 5-2.

Table 5-2: Service Vehicle Access Arrangements

Design Aspect	TAPS PSP Provision	Proposed Provision	Compliance
Width / Crossover Type to accommodate: • Service vehicles[1]	7.0m (min) / Type B2	5.0m / Type B2	Performance Solution
Distance from: • minor intersection[1] • adjacent driveway[1]	10m (min) 3m (min)	30m – Macarthur Avenue 25m – development general vehicle access	TAPS PSP Compliant TAPS PSP Compliant
Sight Distance[12]	90m (desirable)	South: Approx. 30m – to intersection North: >90m	Performance Solution
Visibility Sight Splays	2.0m wide x 5.0m deep (on each side)	2.0m wide x 4.1m deep (on both sides)	Performance Solution
Maximum Driveway grade	1:20 (5%) maximum within first 6m	1:20 (5%) maximum within first 6m	TAPS PSP Compliant.

[1] Based on Barcham Road being classed as a 'minor road' and speed limit of 50km/h.

Further details in relation to the service vehicular access design aspects resolved with performance solutions are provided as follows.

Crossover Width

While BCC's TAPS PSP identifies a 7.0m wide Type B2 crossover for the proposed development based on the largest design service vehicle (Large Rigid Vehicle (LRV)). However, this is to facilitate 2 way access through a driveway. As this crossover directly access a service bay, catering for 1 vehicle at a time, a reduced width is appropriate. Swept path analysis included in **Appendix B**, illustrates that the proposed driveway width is able to accommodate movements for a 10.3m RCV (the largest proposed design vehicle for the development). The reduced crossover width also reduces any conflict area with pedestrians, which is considered significant in a higher density zone with moderate to high pedestrian activity. Based on this, the proposed 5.0m wide Type B2 driveway configuration is considered acceptable.

Sight Distance

There is approximately 30m of site distance to the Barcham Road / Macarthur Avenue intersection. While this is less than the 90m desirable sight distance specified in the TAPS PSP, drivers will have a clear unobstructed view of the intersection. The speed of traffic turning from Macarthur Avenue onto Karakul Road will be relatively low at under 30kph. As such, there is ample opportunity for vehicles utilising the site access to identify approaching vehicles.

On this basis, the sight distance provisions are considered appropriate.

Visibility Sight Splays

The development plan includes an allowance for minimum 2.0m wide x 4.1m deep sight splays on each side of the driveway, which exceed the provisions outlined in AS2890.1:2004 (2.0m x 2.5m). On this basis, provision for an AS2890.1:2004 compliant sight splay arrangement is considered an acceptable performance solution.

Further, the service vehicle standing for loading will be positioned just inside the property boundary. Before exiting, the driver will have a full and unobstructed view of the pedestrian footpath, ensuring safe interaction with pedestrians. Given this operational characteristic, the proposed sight splays are considered suitable.

5.1.3. Impact to On Street Parking

The proposed locations of the two vehicular access are currently configured to provide indented parking zones with capacity for four on-street spaces. Therefore, the new access will require the removal of four existing on street parking spaces. This outcome is generally unavoidable, as all frontages for the subject site are fully occupied by existing intended parking zones and existing services. It is envisaged that local road planning envisages a reduction of this street parking as adjacent land uses develop, with site access driveways.

5.2. Active Transport Access

Pedestrian access to the development is available from the Karakul Road, Macarthur Avenue and Barcham Road footpaths.

Cyclist access to the development is provided via multiple means, including:

- Ride up access to the bicycle parking via the Bachaman Road vehicular access.
- Use of the pedestrian access points and internal building lifts to access bicycle parking on the basement level.
- Direct access to visitor bicycle racks (visitor bicycle parking) from the footpaths on Karakul Road, Macarthur Avenue and Barcham Road.

6. Service Vehicle Arrangements

6.1. PDA Requirements

Similar to other transport related elements, the Hamilton Northshore PDA Development Scheme refers to the TAPS PSP for the service vehicle needs for the development.

Section 3 of the TAPS PSP indicates that a Multiple Dwelling land uses requires "Occasional Access" for a Large Rigid Vehicle (LRV) and "Regular Access" for a Refuse Collection Vehicle (RCV).

6.2. Proposed Loading Provisions

6.2.1. PDA Requirements

Similar to other transport related elements, the Hamilton Northshore PDA Development Scheme refers to the TAPS PSP for the service vehicle needs for the development.

Section 3 of the TAPS PSP indicates that a Multiple Dwelling land uses requires "Occasional Access" for a Large Rigid Vehicle (LRV) and "Regular Access" for a Refuse Collection Vehicle (RCV).

6.2.2. Proposed Loading Provisions / Design Vehicles

The primary servicing demand generated by a Multiple Dwelling development involves furniture delivery vehicles and general delivery vehicles (mail and groceries). Colliers notes that requiring occasional access for a Large Rigid Vehicle (LRV), typically representing furniture vehicles, is considered overly onerous for this scale of development, particularly where the significant majority of units are 1 or 2 bedrooms (representing 84% of the overall unit yield). Based on Colliers's experience, a Medium Rigid Vehicle (MRV) is deemed more suitable for these purposes.

A service zone with minimum dimensions of 11.0m by 3.5m is provided via the Barcham Road service vehicle access. This area is primarily designated for refuse collection vehicles but can also accommodate an 8.8m Medium Rigid Vehicle (MRV) with a maximum height clearance of 3.8m. While this clearance is below the 4.5m requirement specified in the TAPS PSP for MRVs, it is considered appropriate based on the following justification.

Suitability for Smaller Service Vehicles

Most moving and general delivery trucks associated with multiple dwelling developments, particularly for 2-bedroom units, are typically smaller MRVs, which can be accommodated within a 3.8m height clearance. In particular, where residents primarily move their own contents into a home, the largest vehicle that can be rented on an open car licence is equivalent to a 6.4m Small Rigid Vehicle (SRV). As such, except in instances where professional moving companies are involved, this is the largest likely vehicle to access the site for this purpose.

Infrequent Large Service Vehicle Demand

The likelihood of service vehicles exceeding the 3.8m clearance height is minimal, as the majority (84%) of the development's units are one or two bedrooms, typically requiring only MRVs or smaller vehicles for furniture and general deliveries. The designated service area will accommodate the majority of these vehicles. In the infrequent cases where a larger MRV (>3.8m) or an LRV is necessary, on-street parking provisions, including indented parallel bays along Barcham Road, Karakul Road, and Macarthur Avenue, provide a practical alternative. Given the low frequency of such occurrences, the temporary use of two adjacent on-street bays for an LRV would not significantly impact the surrounding road network. These vehicles would only remain stationary for the duration of loading/unloading, which is a short-term activity. Considering these factors, the proposed servicing arrangements are deemed fit for purpose.

6.2.3. Refuse Collection

Refuse collection is to occur by a rear loading RCV which is up to 10.3m long. Swept paths for a 10.3m RCV are shown in in Appendix B which shows a reverse in/forward out movement. The on-site standing area has a maximum grade of 1:20 and provides a height clearance of 3.8m, which meets the minimum requirements specified in Table 3 of the Refuse Planning Scheme Policy.

Overall, Colliers consider the service vehicle and refuse collection arrangements to be suitable for the proposed development.

7. Potential Development Traffic Impacts

It is noted that the 2021 Transport Master Plan report prepared by Cardno included detailed modelling of the full development potential of the Northshore Hamilton PDA to inform road upgrade requirements. It is understood the outcomes of this report fed into the PDA IPBR. Therefore, in terms of quantifying the potential impacts of the proposed development Colliers considers the primary aim is to compare the traffic generation potential to what would have been assumed under the original modelling for the subject site. The following process was adopted to complete this exercise:

1. The PDA allows a maximum plot ratio of 4:1. Therefore, given the Lot 18B site area is 6,622m^2, the maximum allowable GFA is approximately 26,500m^2 GFA.

2. Table 2 in Appendix B of the IPBR identifies the assumed breakdown in GFA to different land uses based on the site's zoning. Conversion of GFA for residential uses into number of dwellings is also based on a 90m^2 GFA per dwelling average size. For the subject site, which is included in the "Mixed Use High Density" zoning, the breakdown of contemplated land uses would be as shown in Table 7-1.

Table 7-1: Subject Site – Assumed Development Potential/Breakdown under IPBR Yield Scenario

Land use	% GFA Allocated	GFA Distribution	Equivalent Unit Yield (90m² per unit)	
Residential	95%	25,175m^2	Small 35%	98 units
			Medium 45%	126 units
			Large 20%	56 units
Total				**280 units**
Commercial	4%	1,060m^2		
Retail	1%	265m^2		

3. The peak hour traffic generation potential for the assumed land uses/extent has been adopted as follows:
   a. Small units = 0.29 vehicles per hour (vph) per unit (Source: RTA GTGD "High Density" rate)
   b. Medium units = 0.5vph per unit (Source: RTA GTGD "Medium Density", small/medium unit rate)
   c. Large units = 0.65vph per unit (Source: RTA GTGD "Medium Density", large unit rate)
   d. Commercial = 2.0vph per 100m² GFA (Source: RTA GTGD)
   e. Retail = 5.0vph per 100m² GFA (Source: RTA GTGD, 'Restaurant' rate).

4. Based on the IPBR assumed yield as demonstrated in the Table 7-1 and assumed generation rates above, Colliers estimates the assumed peak hour traffic generation for the site contemplated under the IBPR is 161vph, as shown in Table 7-2.

Table 7-2: Subject Site – Assumed Peak Hour Traffic Generation Potential under IBPR Yield Scenario

Land Use	Yield / GFA	Traffic Generation Rate	Total Potential Traffic Gen.
Small Units	98 units	0.29vph / unit	28vph
Medium Units	126 units	0.5vph / unit	63vph
Large Units	56 units	0.65vph / unit	36vph
Commercial	1,060 m^2 GFA	2vph / 100m^2 GFA	21vph
Retail	265 m^2 GFA	5vph / 100m^2 GFA	13vph
Total			**161vph**

5. The proposed development includes 255 residential units, which is less than the 280 units anticipated under the IPBR Yield Scenario. Further, the development scheme does not propose any commercial/retail space. Therefore, the traffic generation potential on-balance is expected to be less than that assumed under the IPBR Scenario. To quantify this, the peak hour traffic generation of the proposed development scheme has been estimated, adopting the same generation rates as above. Table 7-3 provides a summary of the assumed traffic generation potential of the development scheme

Table 7-3: Subject Site – Assessed Peak Hour Traffic Generation Potential for Development Scheme

Land Use	Yield / GFA	Traffic Generation	Total Potential Traffic Gen.
Small Units	25 units	0.29vph / unit	8vph
Medium Units	188 units	0.5vph / unit	94vph
Large Units	40 units	0.65vph / unit	26vph
Commercial	0 m^2 GFA	2vph / 100m^2 GFA	0vph
Retail	0 m^2 GFA	5vph / 100m^2 GFA	0vph
Total			**128vph**

As demonstrated, the proposed development scheme is projected to generate 128 vehicles per hour (vph) during peak periods, compared to the 161 vph anticipated under the IPBR Yield Scenario (-33vph).

In summary, Colliers considers that the proposed development will not result in a higher traffic generation potential compared to that previous contemplated for the subject site in previous PDA transport modelling. On this basis, no further assessment of the potential traffic impacts of the development is considered necessary as these have already been accounted for in wider transport assessments of the PDA.

8. Summary and Conclusions

8.1. Parking Arrangements

The development plan provides a total of 341 car parking spaces. This includes 303 resident car spaces (including 6 PWD spaces) and 38 visitor car spaces (including 1 PWD car space). Residential parking is provided across the basement, ground and podium levels. Residential visitor parking is provided on the ground level.

The car parking layout generally complies with the TAPS PSP requirements, aside from performance solutions for the parking envelopes and blind aisle extensions, which are deemed fit for purpose.

Overall, Colliers considers the car parking arrangements for the development to be acceptable

8.2. Access Arrangements

General vehicle access to the development is provided via a 6.2m wide Type B2 crossover to Barcham Road.

Service vehicle access to the development is provided via a 5.0m wide Type B2 crossover to Barcham Road.

This driveway crossovers will result in the loss of 4 on street parking spaces and require relocation of an existing streetlight, which is generally unavoidable given the recent construction of the surrounding roads provided on-street parking along all frontage space and did not consider allowance for vehicular access to the subject site.

The design provisions of the access generally meet the requirements of the TAPS PSP. However, design aspect of the crossover type, sight distance, pedestrian sight splays and queueing provisions are proposed as a performance solution.

Overall, the access arrangements for the proposed development are considered acceptable.

8.3. Service Vehicle Arrangements

The development scheme makes allowance for service vehicle access for a 10.3m rear-loading RCV.

The development plan makes allowance for a dedicated loading bay on the ground level, accessed via Barcham Road.

Overall, the proposed service vehicle arrangements for the development are considered acceptable.

8.4. Public and Active Transport

The site is located proximate to public and active transport infrastructure that will encourage alternative transport options for residents. This will continue to improve as the Northshore Hamilton PDA develops and new provisions are brought online.

The development provides 328 bicycle parking spaces meeting the requirements of the TAPS PSP. Bicycle parking is spread throughout the basement and ground level (all visitor parking is located close to building entries).

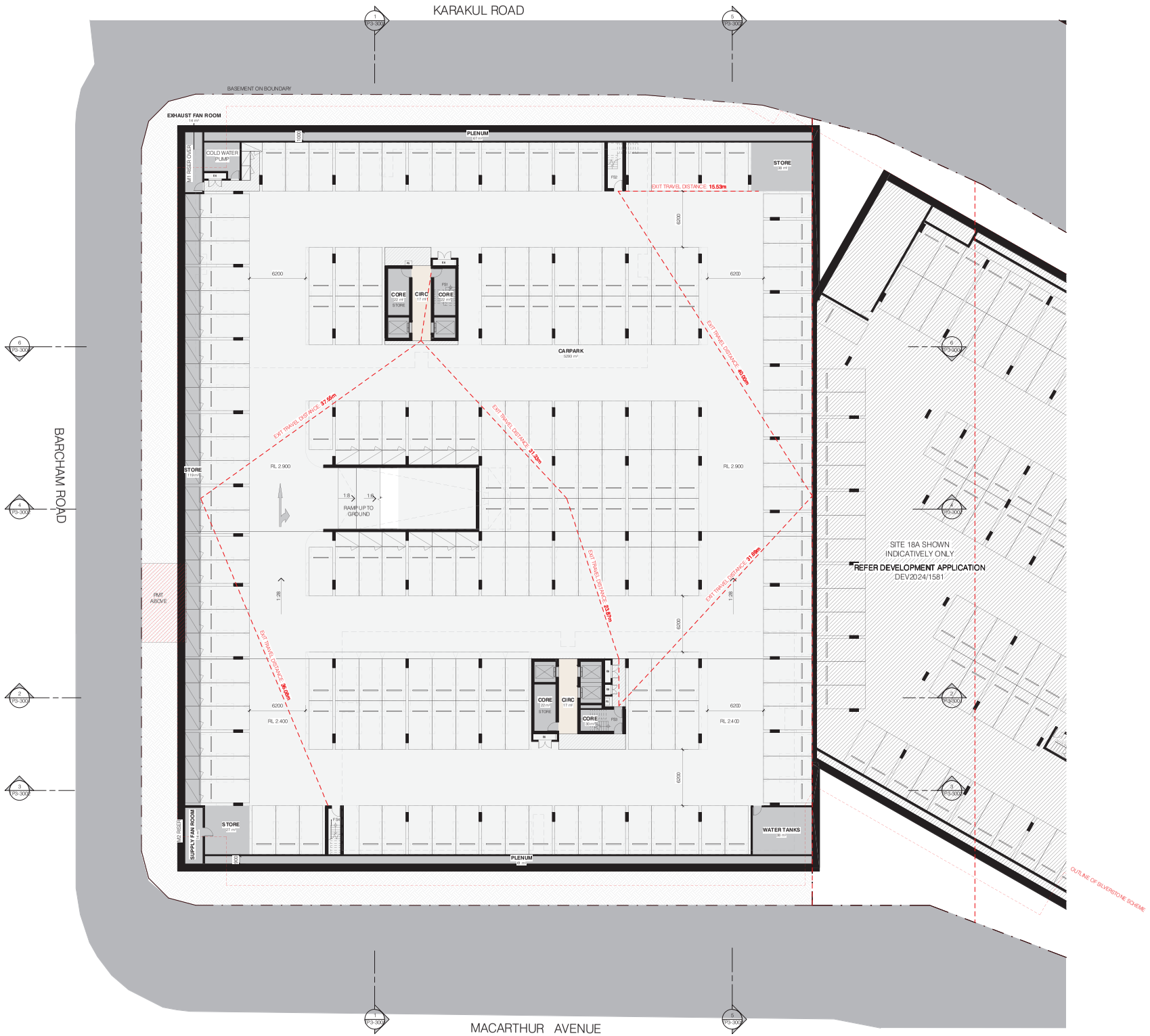
8.5. Potential Traffic Impacts

The proposed development is expected to generate approximately 128vph in peak hours, which is less than that contemplated for the subject site based on the IBPR Yield assumptions which fed into the original PDA traffic modelling. Therefore, no further assessment of the potential impacts of the development is considered necessary.

8.6. Conclusion

Based on the assessment contained within this report, Colliers sees no traffic engineering reason why the relevant approvals should not be granted.

Appendix A Development Plans



Builders / Contractors shall verify all dimensions before any work commences. Dimensions shown are nominal. Figured dimensions shall take precedence over scaled dimensions. Any discrepancies are to be made known to the Architects / Designers studio prior to any works commencing on site. All shop drawings shall be submitted for review and manufacture shall not commence prior to the return of stamped shop drawings.

GENERAL NOTES

Rev	Date	Chkd	Reason for Issue
TP1	11/03/2025		DA ISSUE

Based on Drawings Received :

NORTH

SCALE 1:200

TOWN PLANNING ISSUE

NOT FOR CONSTRUCTION

carr
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3000 Australia
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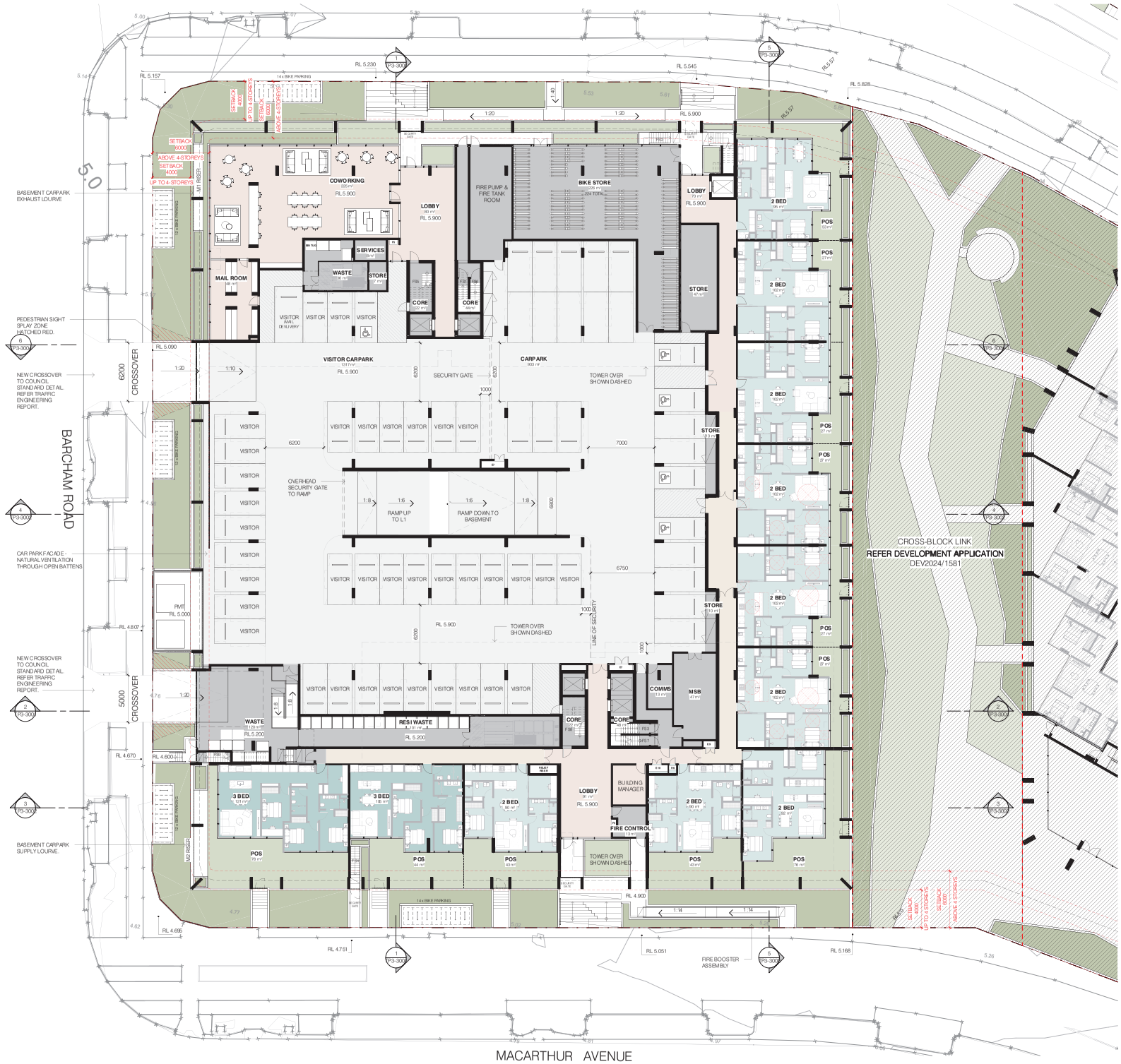
Project	NORTHSHORE HAMILTON
	SITE 18B
Title	BASEMENT 01
Date	11/03/2025
Project No	24047
Scale @ A1	1 : 200
Dwg No	TP3-1001
Drawn By	AK/CE
Chkd	KW
Rev	TP1



Builders / Contractors shall verify all dimensions before any work commences. Dimensions shown are nominal. Figured dimensions shall take precedence over scaled dimensions. Any discrepancies are to be made known to the Architects / Designers studio prior to any works commencing on site. All shop drawings shall be submitted for review and manufacture shall not commence prior to the return of stamped shop drawings.

GENERAL NOTES

Rev	Date	Chkd	Reason for Issue
TP1	11/03/2025		DA ISSUE

Based on Drawings Received :

NORTH

SCALE 1:200 (0 2 4 10m)

TOWN PLANNING ISSUE

NOT FOR CONSTRUCTION

carr
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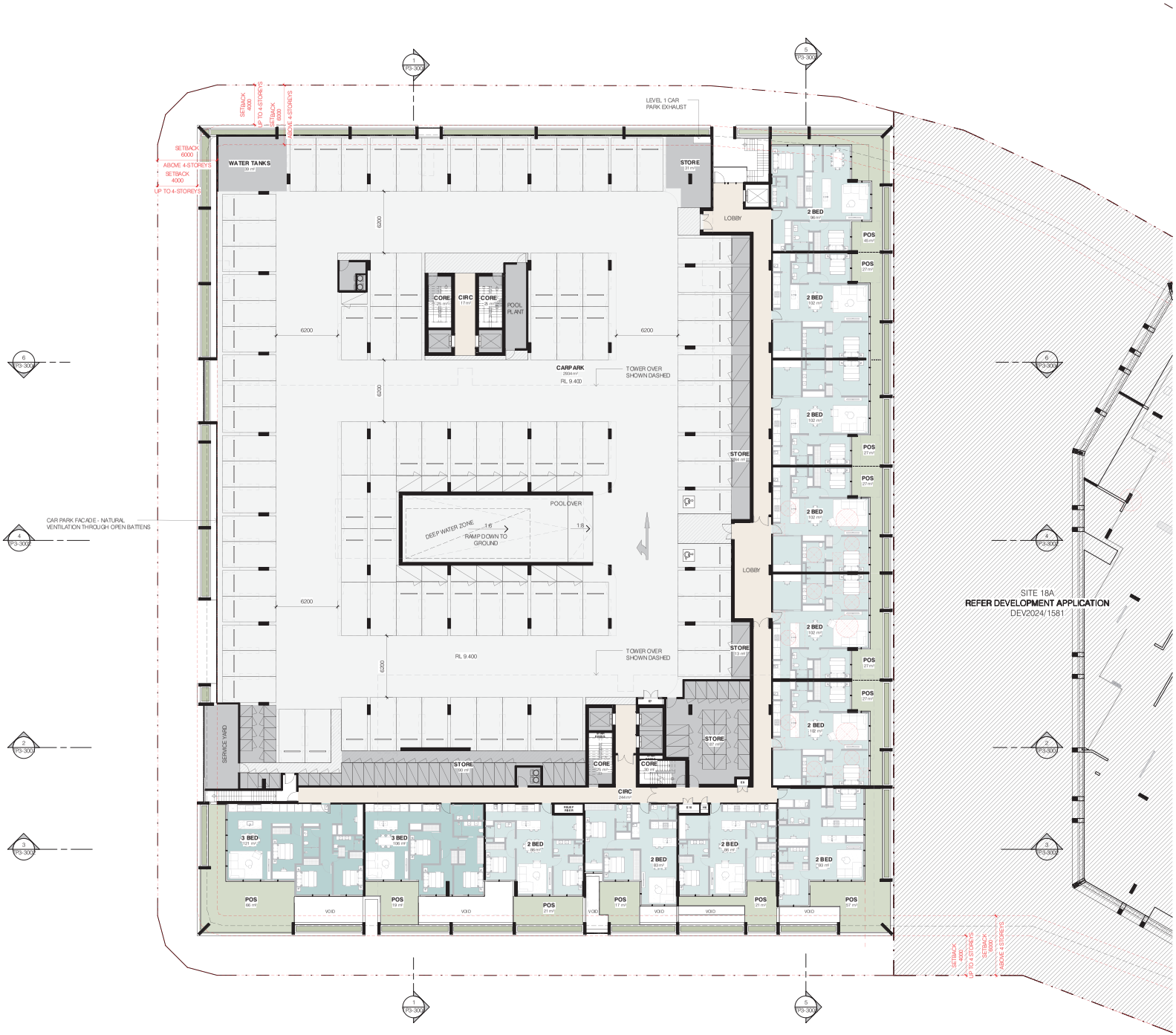
Melbourne VIC
3000 Australia
+61 3 9665 2300
melb@carr.net.au
carr.net.au

Project	NORTHSHORE HAMILTON
	SITE 16B
Title	GROUND LEVEL
Date	11/03/2025
Project No	24047
Scale @ A1	1 : 200
Dwg No	TP3-1002
Drawn By	CE
Chkd	KW
Rev	TP1



GENERAL NOTES

Rev	Date	Chkd	Reason for Issue
TP1	11/03/2025		DA ISSUE

Based on Drawings Received:

NORTH

SCALE 1:200 0 2 4 10m

TOWN PLANNING ISSUE

NOT FOR CONSTRUCTION

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Level 4
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melb@carr.net.au
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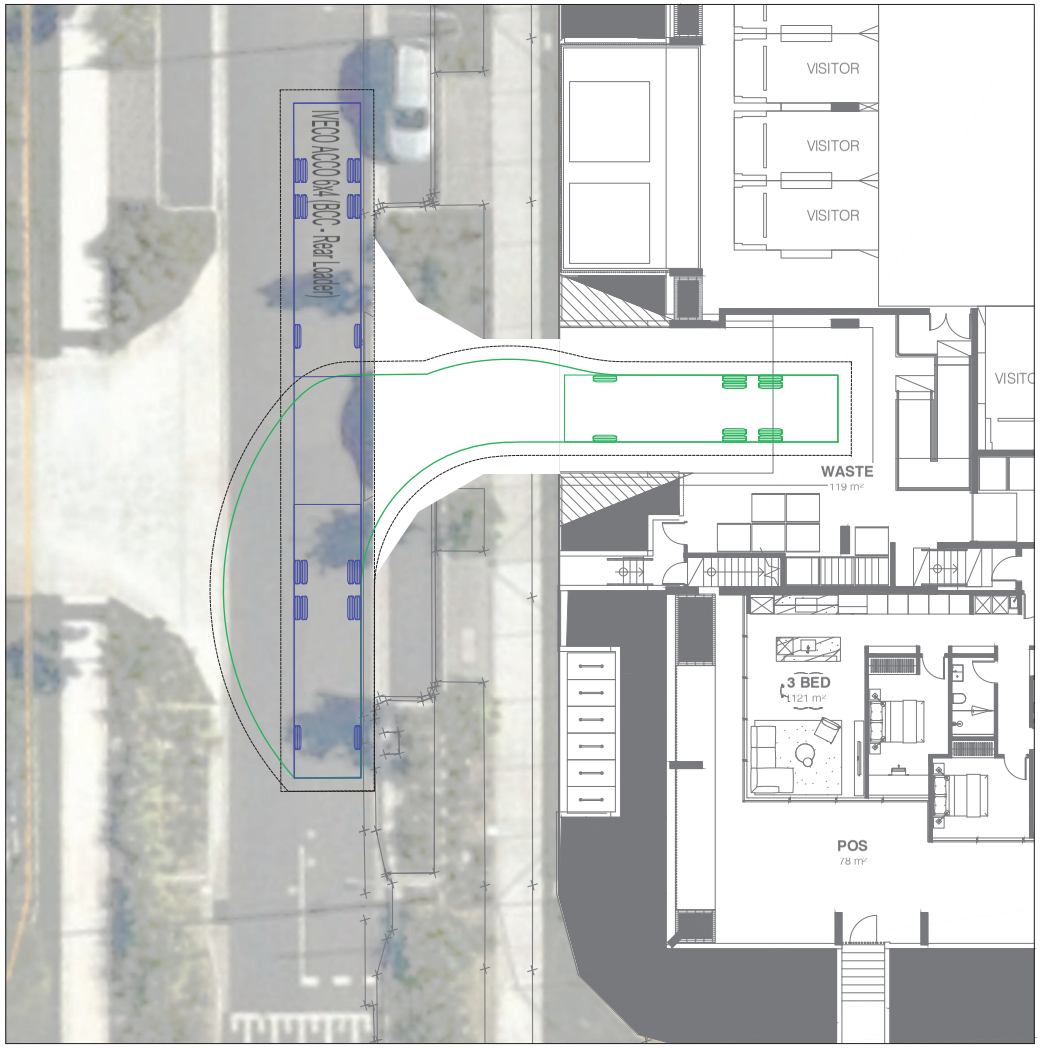
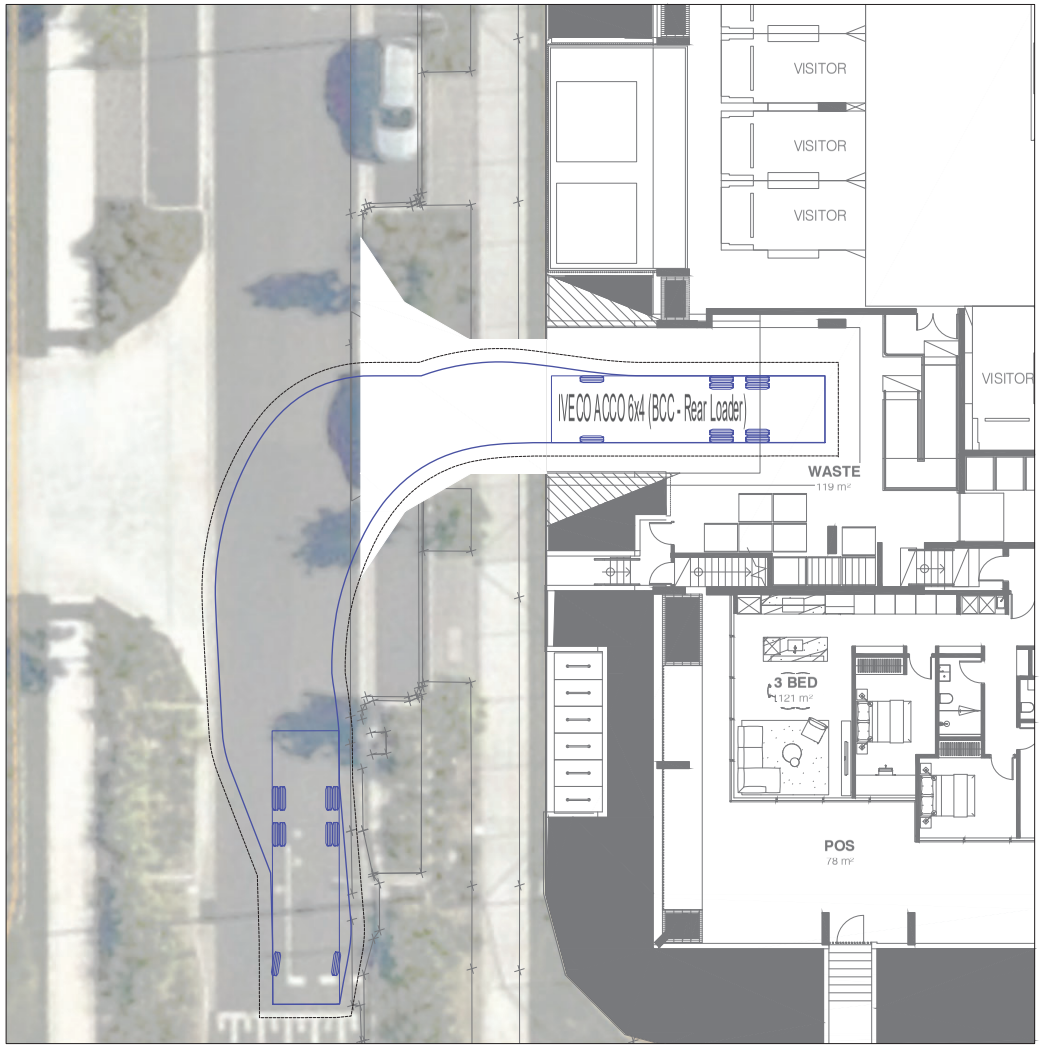
Project	NORTHSHORE HAMILTON
	SITE 18B
Title	LEVEL 1 - PODIUM
Date	11/03/2025
Project No	24047
Scale @ A1	1 : 200
Dwg No	TP3-1003
Drawn By	CE/AK Chkd KW
Rev	TP1

Appendix B Colliers Drawings

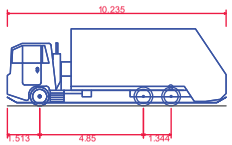


RCV INGRESS



RCV INGRESS

VEHICLE PROFILE



IVECO ACCO 6x4 (BCC - Rear Loader)	
Overall Length	10.235m
Overall Width	2.500m
Overall Body Height	3.600m
Min Body Ground Clearance	0.260m
Track Width	2.500m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	9.757m
Design Speed Forward	5.0km/h
Clearance Envelope	0.500m

PRINCIPAL CONSULTANT
MATT GRIERSON RPEQ 31037
APPROVED 12 Mar 2025

PRELIMINARY ADVICE ONLY
12 March 2025

REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
A	12.03.2025	ORIGINAL ISSUE	JH	SC	SC

SCALE 0 2 4 6 8 10m
SCALE 1:200 AT ORIGINAL SIZE
NORTH
CLIENT: SILVERSTONE DEVELOPMENTS

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PROJECT: **LOT 18A, 260 MACARTHUR AVENUE, HAMILTON**
DRAWING TITLE: **SWEPT PATH ANALYSIS**
REFUSE COLLECTION VEHICLE (RCV)

PROJECT NUMBER	24BRT0000
ORIGINAL SIZE	A3
DRAWING NUMBER	24BRT0000-01
REVISION	A
DATE	12 Mar 2025
SHEET	1 OF 1