Transport Engineering Report

Lot 18B, 260 MacArthur Avenue, Hamilton

Multiple Dwelling Development

On behalf of Silverstone Developments



Revision Record

No.	Author	Reviewed/Approved		Description	Date
1.	J. Harrison	S.Crank RPEQ 18360		DA Report (Draft)	10.07.26
2.	J. Harrison	S.Crank RPEQ 18360		DA Report	28.08.26
3.	J. Harrison	S.Crank RPEQ 18360		DA Report	4.09.26
4.	J. Harrison	S.Crank RPEQ 18360		DA Report	22.09.26

© 2026 - Colliers International Engineering & Design (TTMC) Pty Limited (Colliers) ABN 65 010 868 621
Level 8, 369 Ann Street, Brisbane. PO Box 12015 George Street Brisbane 4003

Contents

1. Introduction 4
   1.1. Purpose 4
   1.2. Scope 4
2. Site Context and Travel Environment 6
   2.1. Site Location 6
   2.2. The Road Network 7
      2.2.1. Road Hierarchy 7
      2.2.2. Intersections 8
      2.2.3. On-Street Parking 8
   2.3. Public and Active Transport Facilities 8
      2.3.1. Public Transport 8
      2.3.2. Cycle Routes 10
      2.3.3. Pedestrians 12
   2.4. Transport Planning 12
3. The Proposed Development 15
   3.1. Development Profile 15
   3.2. Parking 15
   3.3. Access 15
   3.4. Servicing 16
4. Parking Arrangements 17
   4.1. Parking Supply 17
      4.1.1. Car parking 17
      4.1.2. PWD Parking 18
      4.1.3. Bicycle Parking 19
   4.2. Parking Layout 20
5. Access Arrangements 22
   5.1. Vehicular Access 22
      5.1.1. General Vehicle Access 22
      5.1.2. Service Vehicle Access 25
      5.1.3. Impact to On Street Parking 26
   5.2. Active Transport Access 26

6. Service Vehicle Arrangements 27
6.1. PDA Requirements 27
6.2. Proposed Loading Provisions 27
6.2.1. Refuse Collection 27
7. Potential Development Traffic Impacts 29
8. Summary and Conclusions 32
8.1. Parking Arrangements 32
8.2. Access Arrangements 32
8.3. Service Vehicle Arrangements 32
8.4. Public and Active Transport 33
8.5. Potential Traffic Impacts 33
8.6. Conclusion 33
Appendix A Development Plans 34
Appendix B Colliers Drawings 35

Table Index

Table 2-1: Local Road Hierarchy 7
Table 3-1: Proposed Development Scheme 15
Table 4-1: Northshore Hamilton PDA Car Parking Supply Requirement 17
Table 4.2: Council's TAPS PSP and Austroads Bicycle Parking Requirements 19
Table 4.3: Council and Austroads Requirements Comparison to Proposed Provision 19
Table 4-4: TAPS PSP Parking Design Requirements 20
Table 5-1: General Vehicle Access Arrangements 22
Table 5-2: Service Vehicle Access Arrangements 25
Table 6-1: BCC Service Vehicle Requirements 27
Table 7-1: Subject Site – Assumed Development Potential/Breakdown under IPBR Yield Scenario 29
Table 7-2: Subject Site – Assumed Peak Hour Traffic Generation Potential under IBPR Yield Scenario 30
Table 7-3: Subject Site – Assessed Peak Hour Traffic Generation Potential for Development Scheme 30

Figure Index

Figure 2-1: Site location (Surrounding Context) - Source: Google Maps 6
Figure 2-2: Site Location (Immediate Context) - Source: Nearmap 2024 7
Figure 2-3: Surrounding Public Transport Provisions – Source: Nearmap 2025 8
Figure 2-4: Public Transport Trip Catchment – 30 Minute Journey 10
Figure 2-5: Existing Cycle Routes - Map Source: Google Maps 10

Figure 2-6: Proposed PDA Cycle Network and External Connections - Source: Cardno Transport Masterplan Report 11
Figure 2-7: Cycle Catchment – 20 Minute Journey 12
Figure 2-8: PDA Internal Transport Network Upgrades – Roads and Public Transport - Source: PDA Development Scheme 13
Figure 2-9: PDA Internal Transport Network Upgrades – Active Transport - Source: PDA Development Scheme 13

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 mixed use development (multiple dwelling and retail) 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.

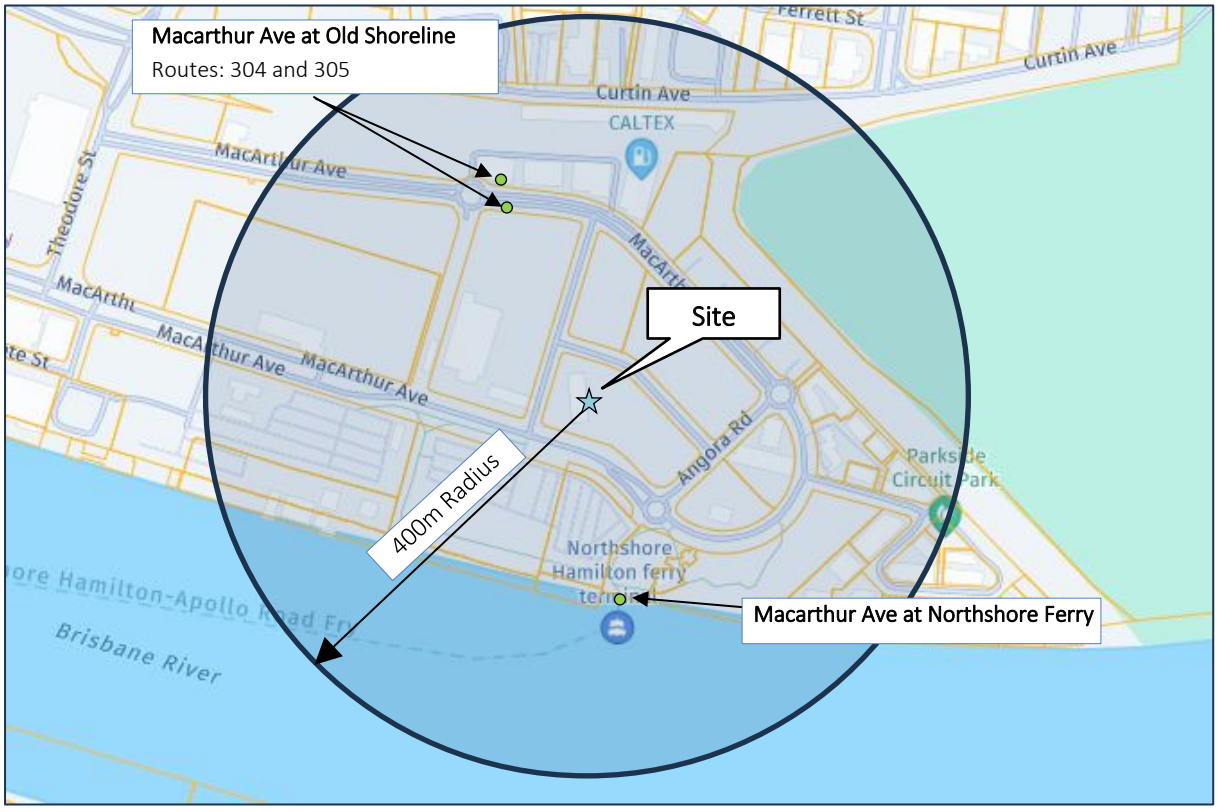


Figure 2-3: Surrounding Public Transport Provisions – Source: Nearmap 2025

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.

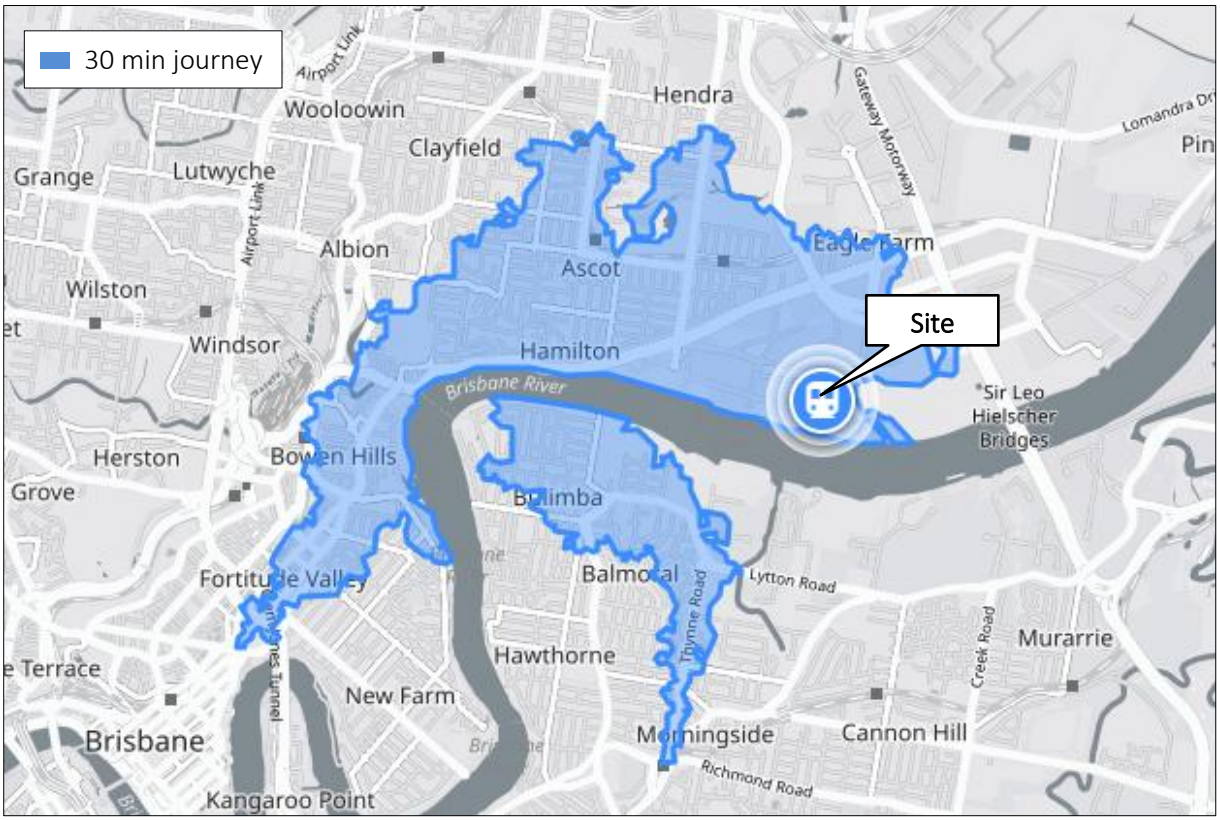


Figure 2-4: Public Transport Trip Catchment – 30 Minute Journey

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.

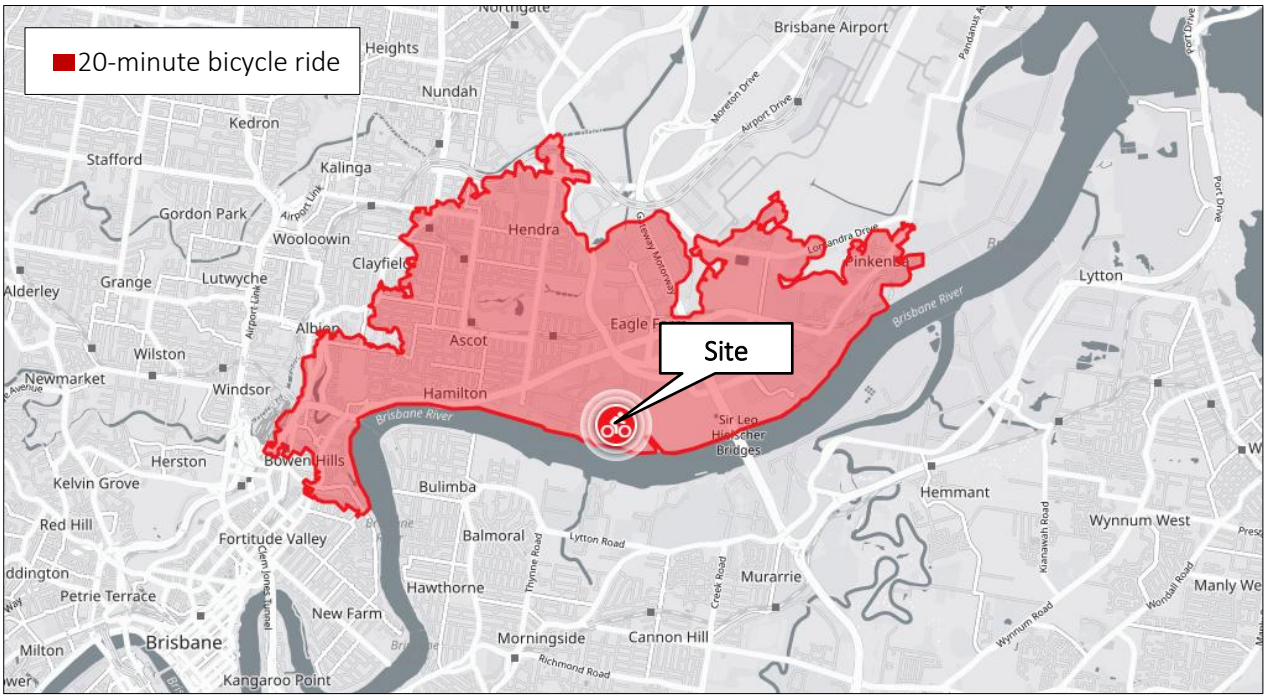


Figure 2-7: Cycle Catchment – 20 Minute Journey

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.

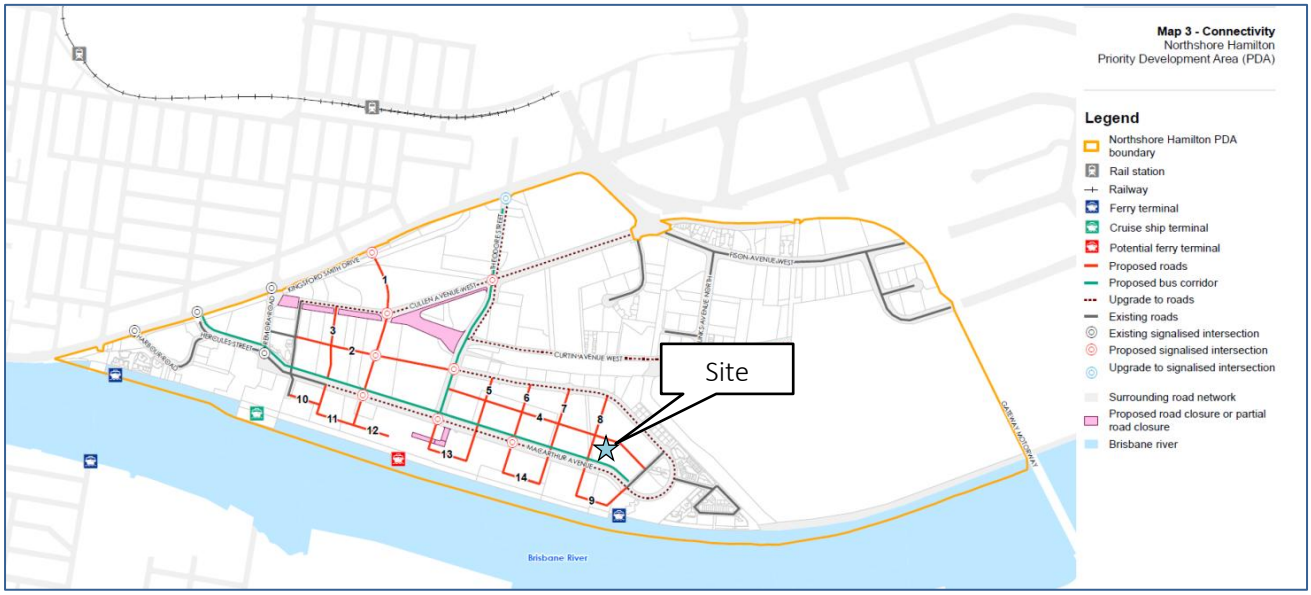


Figure 2-8: PDA Internal Transport Network Upgrades – Roads and Public Transport - Source: PDA Development Scheme

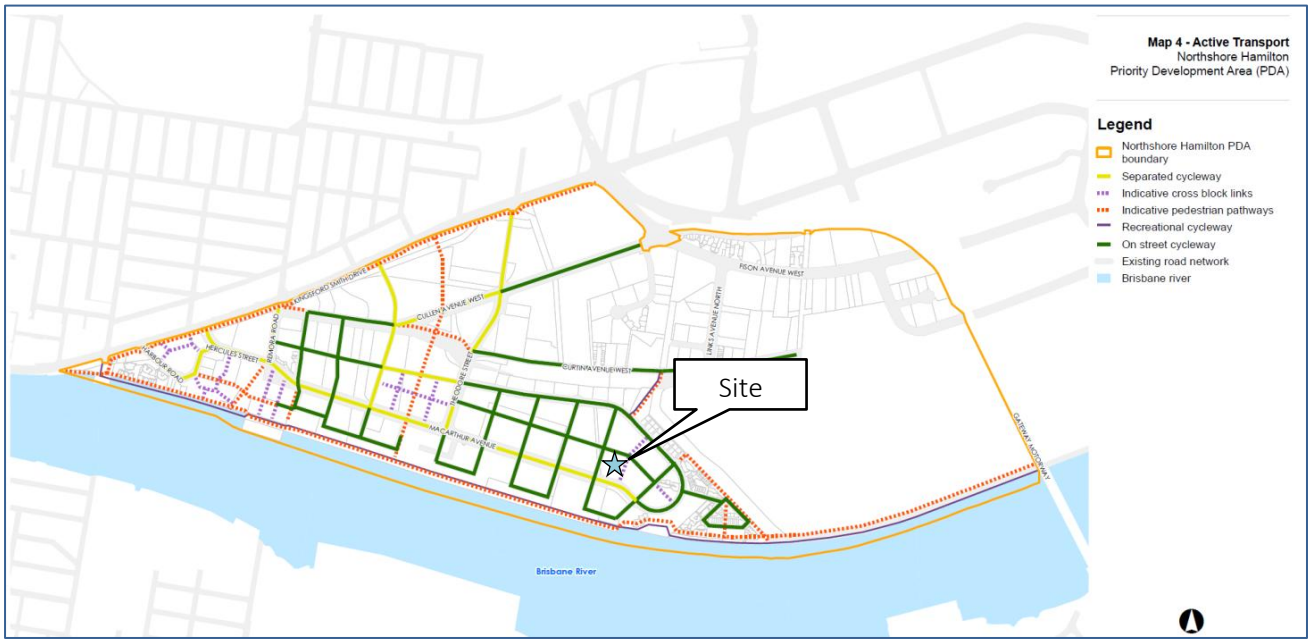


Figure 2-9: PDA Internal Transport Network Upgrades – Active Transport - Source: PDA Development Scheme

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	**275 units (total)** 18 units 101 units 156 units
Retail: • 7 x Tenancies	**661m² GFA**

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

3.2. Parking

The development scheme provides a total of 469 car parking spaces, including:

- 435 resident car parking spaces
- 34 visitor car parking spaces (including 4 PWD parking space), which may be shared between residential and retail visitors

A total of 276 bicycle spaces are also provided, including:

- 226 resident bicycle spaces across the Ground, Basement and Podium levels.
- 50 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 Karakul Road on the northern site frontage. This access will accommodate all residential/visitor vehicles with all movements permitted.
- A 5.5m wide Type B2 crossover (service vehicle/loading bay access) to Barcham Road
- Pedestrian access to/from the development from the northern, southern and eastern site frontage (Karakul Road, MacArthur Avenue and eastern cross-block link).

- Direct access to visitor bicycle racks from the footpath and resident access via the Karakul Road vehicle access and ramp to basement or building lifts.

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

3.4. Servicing

The development allows for regular access by a 10.235m rear-loading Refuse Collection Vehicle (RCV), as per BCC Standard Drawing BSD-3008, and occasional access by a 10.7m Large Rigid Vehicle (LRVs).

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	 0.9 space per unit 2 spaces per unit	 275 units	 248 spaces (min) 550 spaces (max)	435 spaces
Multiple Dwelling (Visitor)	0.15 spaces per unit	275 units	42 spaces (min)	34 spaces Incl. 4 PWD spaces
PWD Parking	0.02 spaces per unit	275 units	6 spaces	
Retail • 7 x Tenancies (Shops) Incl: – Greengrocer – Barber – Liquor – Café x 2 – Restaurant – Retail (TBC) – TOTAL	 Max 1 space per 100m² GFA Max 2 space per 100m² GFA Max 2 space per 100m² GFA Max 1 space per 100m² GFA Max 1 space per 100m² GFA Max 1 space per 100m² GFA	 661 m²	 6 to 14 spaces (max)	
Total			**302 to 612 spaces**	**469 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 435 residential car parking spaces which achieves compliance within the specified range of parking as per the Northshore Hamilton PDA.

The provision of 34 spaces of public parking to cater for visitors is less than that recommended under the NSH PDA Planning Scheme (recommended 42 spaces). However, the 34 space provision for visitor parking is considered appropriate based on the following.

The site is located within an area that benefits from a substantial supply of publicly available on-street parking. In particular, approximately 19 on-street parking spaces are provided directly along the site frontage, with additional on-street parking available throughout the surrounding Northshore Hamilton precinct. Given their close proximity and convenient access to the residential buildings, it is reasonable to expect that a proportion of visitors to the development will utilise these on-street spaces in preference to accessing the visitor parking area within the development. For short-term visits, the use of frontage parking represents a convenient and intuitive parking option, particularly for visitors attending residential apartments.

Accordingly, the effective supply of parking available to visitors extends beyond the dedicated visitor parking provision proposed on site. When considered in combination with the accessible on-street parking opportunities surrounding the development, the proposed visitor parking provision is considered sufficient to accommodate expected demand.

While a component of retail floor space is proposed within the development, the NSH PDA Planning Scheme identifies parking rates for these uses as maximum provisions rather than minimum requirements. No dedicated parking is proposed for the retail uses, as these tenancies are expected to primarily serve residents of the development and the wider Northshore Hamilton community, many of whom are anticipated to access the site by walking, cycling or as part of linked-trip journeys. Consequently, vehicle-based trips generated solely by the retail uses are expected to be limited.

In addition, any parking demand associated with the retail component is expected to occur predominantly during daytime periods, when demand for residential visitor parking is typically lower. By contrast, residential visitor parking demand generally increases during the evening period when retail activity is reduced. As such, the temporal separation in demand provides additional confidence that the proposed visitor parking provision will adequately accommodate both user groups.

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

4.1.2. PWD Parking

Under the Northshore Hamilton PDA Development Scheme, PWD parking is required at a rate of 0.02 spaces per dwelling, to be provided in addition to both resident and visitor parking provisions. For a development comprising 275 units, this equates to 5.5 spaces, rounded up to 6 PWD bays. The practical application of this requirement is, however, challenging in the context of a residential building where parking bays are either allocated to individual units (as part of sales and title arrangements) or form part of the visitor parking supply. If PWD bays were allocated on the secured residential side, they would need to be tied to specific units irrespective of whether those households require accessible parking. Conversely, if all PWD bays were delivered within the visitor supply and reserved exclusively for visitor use, this would represent a considerably higher provision than is typically required.

Within residential developments, accessible visitor parking is generally provided at a rate of 1 PWD space per 50 visitor parking spaces. Applying this approach to the proposed development, which provides 34 visitor parking spaces, would generate a requirement for a single PWD visitor parking bay. The proposed provision of 4 PWD parking spaces therefore substantially exceeds this benchmark and is considered more than sufficient to accommodate anticipated demand from both residents and visitors requiring accessible parking.

Overall, the proposed parking provision, including the supply of accessible parking spaces, is considered appropriate for the scale and nature of the development and will adequately cater for the anticipated parking demands of the site.

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. Consideration has also been given to alternative supply rates identified in the Cycling Aspects of Austroads Guide have also been considered.

Table 4.2 outlines the comparative bicycle parking requirements for the development based on both Council's TAPS PSP and Austroads , including resident and visitor components.

Table 4.2: Council's TAPS PSP and Austroads Bicycle Parking Requirements

User	TAPS PSP Rates	Extent	TAPS PSP Recommendations	Austroads Recommendations	Extent	Austroads Recommendations
Resident	1 space/unit	275 units	275 spaces	1 space per 4 bedrooms	688 bedrooms	172 spaces
Visitor	1 space/4 units		69 spaces	1 space per 16 bedrooms		43 spaces
Total			**344 spaces**	**Total**		**215 spaces**

A summary of the proposed bicycle parking provision against both Council and Austroads requirements is provided in Table 4.3.

Table 4.3: Council and Austroads Requirements Comparison to Proposed Provision

User	TAPS PSP Requirement	Austroads Requirement	Proposed Provision
Resident	275 spaces	172 spaces	226 spaces
Visitor	69 spaces	43 spaces	50 spaces
Total	**344 spaces**	**215 spaces**	**276 spaces**

While the proposed resident and visitor bicycle parking provisions are below the rates nominated within Council's TAPS PSP, they exceed the corresponding recommendations contained within the Austroads Guide and provide a level of bicycle parking supply that sits between the two assessment frameworks. The proposed provision therefore represents a balanced and practical outcome and is expected to meet the anticipated demand for bicycle parking.

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

Visitor Bicycle Parking

A total of 50 visitor bicycle parking spaces (ground racks) will be provided at ground level, positioned at the northern, southern and western site frontages.

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.

Table 4-4 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 4-4: 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	1:8 (12.5%) 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 (min)	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)	To be 1.8m (min)	To be AS2890.3 Compliant
Rack spacing – Horizontal (Standard)	0.5m (min)	To be 0.5m (min)	To be AS2890.3 Compliant
Rack spacing – Horizontal (Dynamic)	0.4m (min)	To be 0.4m (min)	To be AS2890.3 Compliant
Rack spacing – Vertical (Dynamic)	0.4m (min)	To be 0.4m (min)	To be AS2890.3 Compliant
Maneuvering/Access Paths	1.5m (min)	To be 1.5m (min)	To be AS2890.3 Compliant
Height Clearance (General)	2.2m (min)	To be 2.2m (min)	To be AS2890.3 Compliant
Height Clearance (Multi-Tier)	2.7m (min)	To be 2.7m (min)	To be 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).

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.

Bicycle Parking

Bicycle storage areas have been identified across the Ground, Basement and Podium levels for residential use. The bicycle parking provision will meet the minimum quantities specified in Section 4.1.3, with the final quantum, layout and configuration to be confirmed during the detailed design phase. Based on current information, Colliers understands that a combination of floor mounted and wall-mounted bicycle racks is proposed. All bicycle parking facilities are to be designed and provided in accordance with the requirements of AS 2890.3: 2015.

5. Access Arrangements

5.1. Vehicular Access

Primary vehicle access to the development is proposed via Karakul Road. The proposed access arrangement is consistent with the Northshore Hamilton PDA Development Scheme, which identifies Karakul Road as an appropriate location for driveway access to adjoining development sites on both the northern and southern sides of the street. Accordingly, the proposed access aligns with the planned function and design intent of the road network envisaged by the Development Scheme.

The development proposes two access points:

- General vehicle access via a 6.2m Type B2 crossover on Karakul Road. This access will accommodate general passenger vehicles with all movements permitted.
- Service vehicle access vas 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. 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)	13m – Barcham Road >3m	TAPS PSP Compliant TAPS PSP Compliant
Sight Distance[12]	90m (desirable) 70 (minimum)	East: >72m to the intersection West: >~20m clear to intersection	TAPS PSP Compliant Further information below
Visibility Sight Splays	2.0m wide x 5.0m deep (on each side)	2.0m wide x 5.0m deep (on both sides)	TAPS PSP Compliant
Minimum Queuing Provisions [2]	9 vehicles / 48m	1 vehicle / 6m	Performance Solution
Maximum Driveway grade	1:20 (5%) maximum within first 6m	1:8 (12.5%) maximum within first 6m	Further Details Below

[1] Based on Barcham Road being classed as a 'minor road' and speed limit of 50km/h.
[2] Based on the access servicing between 251 and 500 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 20m of sight distance to the Karakul Road / Barcham Road intersection. While this is less than the 70m minimum sight distance specified in the TAPS PSP, drivers will have a clear unobstructed view of the intersection. The speed of traffic turning from Barcham 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.

Minimum Queuing Provisions

The TAPS PSP nominates a queueing requirement of 8 vehicles for the proposed parking area. The development provides storage for 1 queued vehicle within the site boundary, together with storage for a further vehicle between the property boundary and the Karakul Road kerb. Accordingly, up to two queued vehicles can be accommodated before a queue has the potential to extend onto Karakul Road.

Notwithstanding that the proposed provision is less than the prescriptive requirement of the TAPS PSP, the operational characteristics of the development indicate that the likelihood of a queue extending onto Karakul Road is low.

The peak hour traffic generation associated with the residential component of the development is estimated at approximately 157 vehicles per hour (refer Section 7). Assuming 65% of peak hour movements occur in the inbound direction during the PM peak, this equates to an arrival rate of approximately 103 vehicles per hour. Using Equation 3.5 of the *Austroads Guide to Traffic Management – Part 2: Traffic Theory*, the probability of multiple vehicles arriving at the site access during a 25 second period was assessed. The 25 second assessment period represents an estimate of the duration for which a vehicle may temporarily impede following vehicles while undertaking parking related manoeuvres (e.g., entering or exiting a parking space).

The assessment indicates there is approximately an 84% probability that no more than one vehicle will arrive during a 25 second period and a 96% probability that no more than two vehicles will arrive during the same period. However, these probabilities represent vehicle arrivals only and do not represent the likelihood of queueing. For a queue to extend beyond the available two vehicle storage, multiple vehicles must arrive within the assessment period while a parking manoeuvre is simultaneously occurring in one of the first few visitor parking spaces.

The visitor parking area contains 34 spaces. Assuming parking activity is broadly distributed throughout the visitor parking area, only approximately 5.6% of parking manoeuvres would be expected to occur within these two spaces. Combining this with the approximately 16% probability of two or more vehicles arriving within the 25 second assessment period indicates that the simultaneous occurrence of both events would be expected to occur less than 1% of the time. In other words, there is greater than a 99% likelihood that the conditions required to generate a queue exceeding the available storage will not occur.

The assessment is also conservative as it assumes all inbound traffic has the potential to be affected by a parking manoeuvre delay. In practice, the majority of site traffic will comprise resident vehicle movements and the visitor parking turnover is expected to be relatively low. As a result, any queueing events that do occur are expected to be infrequent and short in duration.

Furthermore, in the unlikely event that a queue were to extend beyond the available two vehicle storage and momentarily reach Karakul Road, the operational impacts would be minor. Karakul Road is intended to function as a low speed local access street, servicing adjoining development parcels rather than as a key through route within the Northshore Hamilton precinct. Traffic volumes are therefore expected to remain relatively low, even under ultimate development conditions. During the PM peak period, when inbound traffic demand to the development is highest, vehicle movements within the precinct are also expected to exhibit a predominantly eastbound travel pattern (approaching from the CBD). As a result, opportunities for a queue to materially affect opposing traffic movements (westbound) on Karakul Road are expected to be limited.

On balance, the proposed queue storage is considered appropriate for the anticipated traffic demands of the development. The probability of the combination of events required to generate a queue extending beyond the available storage is low and, should such an occurrence arise, any impacts on the surrounding road network would be minor and brief in nature. Accordingly, the proposed arrangement is considered acceptable from both a traffic engineering and operational perspective.

Maximum Driveway Grade

The TAPS PSP identifies a maximum driveway grade of 1:20 (5%) within the first 6m of a driveway as the desirable outcome. The proposed development instead provides a maximum grade of 1:8 (12.5%) within the first 6m of the driveway inside the property boundary.

Notwithstanding this variation, the proposed arrangement is considered acceptable having regard to BCC Standard Drawing BSD-2025 *Vehicle Crossing (Driveway) Grades*, which applies to non-residential vehicular entrances and residential developments other than single dwellings. The standard drawing recognises that steeper driveway grades may be necessary in certain circumstances and specifically illustrates a maximum permissible downgrade of 1:6 (16.7%) approaching the property boundary.

Accordingly, the proposed 1:8 (12.5%) driveway grade is materially flatter than the maximum grade contemplated by Council's standard drawing and is therefore considered consistent with the intent of Council's driveway design guidance.

The driveway is to be constructed in accordance with BSD-2025, including the required verge and footpath grading treatments.

Accordingly, the proposed driveway grade is considered acceptable from both a traffic engineering and operational perspective.

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	5.5m / Type B2 (including modified flares)	Performance Solution
Distance from: • minor intersection[1] • adjacent driveway[1]	10m (min) 3m (min)	13m – MacArthur Avenue to the south >3m on development side	TAPS PSP Compliant TAPS PSP Compliant
Sight Distance[12]	90m (desirable)	South: Approx. 13m – to intersection North: >90m	Performance Solution
Visibility Sight Splays	2.0m wide x 5.0m deep (on each side)	2.0m wide x 5.0m deep (on both sides)	TAPS PSP Compliant
Maximum Driveway grade	1:20 (5%) maximum within first 6m	1:25 (4%) 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

BCC's TAPS PSP identifies a 7.0m wide Type B2 crossover for the proposed development based on the largest design service vehicle, being a Large Rigid Vehicle (LRV). This width is intended to facilitate two-way vehicle movements through a driveway. In this instance, the crossover provides direct access to a dedicated service bay which accommodates only one service vehicle at a time. Accordingly, a reduced crossover width of 5.5m is considered appropriate. The reduced width also minimises the pedestrian conflict area across the driveway, which is particularly beneficial within a higher-density environment with moderate to high pedestrian activity.

The crossover is generally based on the standard Type B2 configuration, with the standard flare retained on the northern side. On the southern side, a modified flare is proposed to provide clearance to the existing Water Sensitive Urban Design (WSUD) infrastructure adjacent to the crossover. This modification avoids impacts to the existing WSUD treatment while maintaining an appropriate crossover arrangement for service vehicle access.

Swept path analysis included in **Appendix B** demonstrates that the proposed 5.5m crossover width and modified southern flare can satisfactorily accommodate entry and exit movements by a 10.7m LRV, being the largest design vehicle proposed to access the development.

On this basis, the proposed 5.5m wide Type B2 crossover, incorporating the modified southern flare, is considered acceptable.

Sight Distance

There is approximately 13m of sight distance to the Barcham Road / MacArthur Avenue intersection. While this is less than the desirable sight distance specified in the TAPS PSP, drivers will have a clear unobstructed view of the intersection. The speed of traffic turning from Barcham Road 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.

Maximum Driveway Grade

The TAPS PSP identifies a maximum driveway grade of 1:20 (5%) within the first 6m of a driveway as the desirable outcome. The proposed development provides a 1:20 (5%) grade within the property boundary and therefore achieves this requirement.

The adjoining verge and vehicle crossing are to be constructed in accordance with BCC Standard Drawing BSD-2025 *Vehicle Crossing (Driveway) Grades*, including the nominated verge and footpath grading treatments.

Accordingly, the proposed driveway grading is considered acceptable from a traffic engineering and operational perspective.

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 indented 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 and MacArthur Avenue Road footpaths.

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

- Ride up access to the bicycle parking via the Karakul Road vehicular access.
- Use of the pedestrian access points and internal building lifts to access bicycle parking on the various building levels.
- 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.

Table 6-1 details the design vehicle and loading bay requirements for the respective land uses.

Table 6-1: BCC Service Vehicle Requirements

Land Use	Design Vehicle	
	Regular Access	Occasional Access
Multiple Dwelling	RCV	LRV
Retail Tenancies	Refer to Table 3 of TAPS PSP	RCV

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).

Table 3 of BCC's TAPS PSP specifies the number and type of service bays required for various shop uses. Based on a total retail GFA of 661m^2, the development could be required to provide 1 x Van, 1 x Small Rigid Vehicle (SRV) and 1 x Medium Rigid vehicle (MRV). No dedicated loading provisions are required under the TAPS PSP for Residential use.

6.2. Proposed Loading Provisions

Notwithstanding the abovementioned TAPS PSP requirements, the development is considered to provide an appropriate level of servicing infrastructure having regard to the relatively modest retail GFA (661m^2).

The loading area located off Barcham Road is capable of accommodating service vehicles up to the size of an 11.7 m Large Rigid Vehicle (LRV), thereby exceeding the dimensional requirements associated with SRV and MRV service vehicles.

Given the scale and nature of the proposed retail tenancies, it is considered unlikely that simultaneous servicing by multiple larger vehicles would occur. Accordingly, the single loading/service bay is considered sufficient capacity to accommodate the anticipated servicing demand.

To support the efficient operation of the main loading area from Barcham Road, a site management plan can be implemented to coordinate loading activities. This may include a booking system for larger deliveries and operational controls to prevent conflicts between loading activities and scheduled refuse collection. Such measures will ensure the loading bay remains available when required and that servicing activities can occur without adversely affecting the operation of the development or surrounding road network.

6.2.1. Refuse Collection

Refuse collection is to occur by a rear loading RCV which is up to 10.235m long. Swept paths for an RCV are shown 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 4.5m, which exceeds 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 comprises 275 residential dwellings together with a ground-floor retail component. While the residential yield is slightly lower than the 280 dwellings contemplated under the IPBR scenario, the proposal contains a greater retail component and no commercial floor space. To allow a direct comparison, the same traffic generation assumptions adopted above have been applied to the proposed development. The results are summarised in Table 7-3.

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	39 units	0.29vph / unit	11vph
Medium Units	80 units	0.5vph / unit	40vph
Large Units	156 units	0.65vph / unit	101vph
Commercial	0 m^2 GFA	2vph / 100m^2 GFA	0vph
Retail	661 m^2 GFA	See comments below	5vph
Total			**157vph**

Based on this assessment, the proposed development is estimated to generate approximately 157 vph during the peak hour, compared with 161 vph under the IPBR scenario.

For the purposes of this assessment, the retail component has been assigned a nominal allowance of 5 vph, rather than applying a GFA based traffic generation rate. As discussed previously, no dedicated parking is provided for the retail component. The proposed retail tenancies are expected to primarily serve residents of the development and the surrounding Northshore Hamilton precinct, with a significant proportion of patronage anticipated to occur via walking, cycling and linked trips. Any vehicle-based demand associated with the retail uses is expected to be limited and likely to be accommodated via on-street parking opportunities.

Accordingly, a nominal allowance of 5 vph has been adopted to recognise that a small number of retail customers may still arrive by private vehicle, while avoiding the overstatement of traffic impacts that would result from applying a conventional GFA-based traffic generation rate.

It is also noted that retail related activity is unlikely to coincide with the peak traffic demands generated by the residential component. Residential traffic generation is generally characterised by commuter related movements, with peak outbound movements occurring during the morning peak and peak inbound movements occurring during the afternoon peak. Retail activity, by comparison, is typically more dispersed

throughout the day. As a result, any retail-related traffic demand is unlikely to materially increase peak period traffic volumes associated with the residential component of the development.

Overall, the assessment demonstrates that the proposed development is not expected to result in a greater traffic generation outcome than that previously assumed for the subject site as part of the PDA wide transport planning process. On this basis, Colliers considers that the traffic impacts associated with the development have effectively been accounted for in the broader transport assessments undertaken for the Northshore Hamilton PDA and that no further network impact assessment is warranted.

8. Summary and Conclusions

8.1. Parking Arrangements

The development provides a total of 469 car parking spaces. This includes 435 resident car parking spaces and 34 visitor car parking spaces (including 4 PWD spaces).

The proposed parking supply complies with the residential parking provisions of the Northshore Hamilton PDA Development Scheme. While the visitor parking provision is less than the recommended rate, the shortfall is offset by the substantial supply of unrestricted on-street parking located immediately adjacent to the site.

The development also provides 276 bicycle parking spaces, comprising 226 resident spaces and 50 visitor spaces. While this is less than the rates specified by the TAPS PSP, it exceeds Austroads recommendations and is considered sufficient to cater for anticipated demand.

The parking layout generally complies with the TAPS PSP requirements, aside from performance solutions relating to parking envelope clearances and blind aisle extensions, which are considered fit for purpose.

Overall, Colliers considers the 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 Karakul Road.

Service vehicle access to the development is provided via a 5.5m wide Type B2 crossover to Barcham Road.

The 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 arrangements generally meet the requirements of the TAPS PSP. However, the crossover widths, available sight distances and queueing provisions are proposed as performance solutions. These are considered acceptable based on the anticipated traffic volumes and operating environment.

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

8.3. Service Vehicle Arrangements

The development scheme makes allowance for regular access by a 10.235m rear-loading RCV and occasional access by a 10.7m LRV.

The development provides a dedicated loading and servicing area accessed via Barcham Road, which is suitable to accommodate the servicing requirements of both the residential and retail components.

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 276 bicycle parking spaces distributed throughout the site, including 50 visitor bicycle spaces located at ground level.

8.5. Potential Traffic Impacts

The proposed development is estimated to generate approximately 157vph during the peak hour, which is consistent with the 161vph contemplated under the IPBR yield scenario. Accordingly, the proposed development is not expected to generate more traffic than previously assumed as part of the broader Northshore Hamilton PDA transport planning process and no further traffic impact assessment 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

DEVELOPMENT SUMMARY

AREA SUMMARY	
SITE AREA	6623
GFA ABOVE GROUND	29928.8
PLOT RATIO	4.52

TOTAL NLA	661

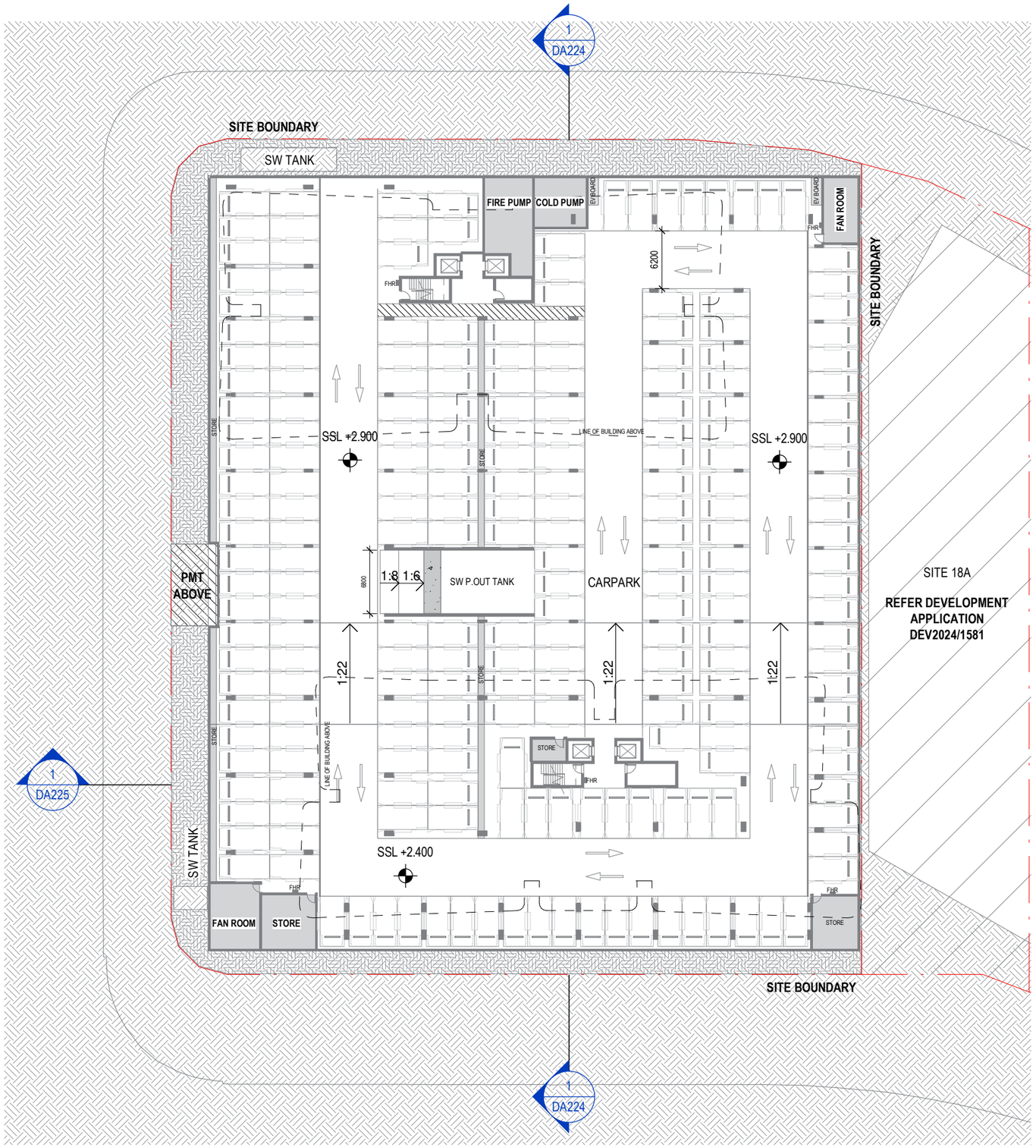
TOTAL INDOOR AMENITIES	518
TOTAL OUTDOOR AMENITIES	2402

TOTAL CARSPACES	469
TOTAL BIKE SPACES	276

		AREA PER LEVEL			PODIUM			BUILDING 1			BUILDING 2			TOTAL APARTMENTS				APARTMENTS		RECREATION & AMENITIES		CIRCULATION	SERVICE / PLANT / STORE	CARPARKING		BICYCLE	
LEVEL	TYPE	Gross Floor Area (GFA)	PRIVATE OPEN SPACE (POS)	Net Letting Area (NLA)	1B	2B	3B	1B	2B	3B	1B	2B	3B	1B	2B	3B	TOTAL	Area Internal	Area External	Area Internal	Area External			Area	No. of Spaces	Area	No. of Spaces
		sqm	sqm	sqm	no.	no.	no.	no.	no.	no.	no.	no.	no.	no.	no.	no.		sqm	sqm	sqm	sqm	sqm	sqm	sqm	qty	sqm	qty
Basement 01	CAR PARKING	-		-																		36	460.8	5435	224		
Ground Level	RESIDENTIAL / RETAIL	856	90	661		5		0	0	0	0	0	0	0	5	0	5	491	90			365	546.7	2770	95	200	222
Level 01	RESIDENTIAL	1267	212			9	1	0	0	0	0	0	0	0	9	1	10	998	212	199	8	269	160	3545	150	61	54
Level 02	RESIDENTIAL	2117	531					1	3	6	4	0	6	5	3	12	20	1950	531		2176	167	159.1				
Level 03	RESIDENTIAL	2124	402.5					1	3	6	2	2	6	3	5	12	20	1972	402.5			152	127.4				
Level 04	RESIDENTIAL	2124	402.5					1	3	6	2	2	6	3	5	12	20	1972	402.5			152	127.4				
Level 05	RESIDENTIAL	2124	402.5					1	3	6	2	2	6	3	5	12	20	1972	402.5			152	127.4				
Level 06	RESIDENTIAL	2124	402.5					1	3	6	2	2	6	3	5	12	20	1972	402.5			152	127.4				
Level 07	RESIDENTIAL	2124	402.5					1	3	6	2	2	6	3	5	12	20	1972	402.5			152	127.4				
Level 08	RESIDENTIAL	2124	402.5					1	3	6	2	2	6	3	5	12	20	1972	402.5			152	127.4				
Level 09	RESIDENTIAL	2124	402.5					1	3	6	2	2	6	3	5	12	20	1972	402.5			152	127.4				
Level 10	RESIDENTIAL	2124	402.5					1	3	6	2	2	6	3	5	12	20	1972	402.5			152	127.4				
Level 11	RESIDENTIAL	2124	402.5					1	3	6	2	2	6	3	5	12	20	1972	402.5			152	127.4				
Level 12	RESIDENTIAL	2124	402.5					1	3	6	2	2	6	3	5	12	20	1972	402.5			152	127.4				
Level 13 / Building 2 Rooftop	RESIDENTIAL / COMMUNUAL / PLANT	1169.2	197.9					1	3	6	0	0	0	1	3	6	10	1014.2	197.9	319	218	155	338				
Level 14	RESIDENTIAL	1093.2	197.9					1	3	6	0	0	0	1	3	6	10	1014.2	197.9			79	71.9				
Level 15	RESIDENTIAL	1093.2	197.9					1	3	6	0	0	0	1	3	6	10	1014.2	197.9			79	71.9				
Level 16	RESIDENTIAL	1093.2	197.9					1	3	6	0	0	0	1	3	6	10	1014.2	197.9			79	71.9				
Building 1 Rooftop	COMMUNUAL / PLANT	82						0	0	0	0	0	0	0	0	0	0			299	147	82	446.5				
								0	0	0	0	0	0	0	0	0	0										
Totals		29928.8		661	0	14	1	15	45	90	24	20	66	39	79	157	275	27215.8	5649.6	518	2402	2749	3154.3	11750	469	261	276

Mix Breakdown			
1B	2B	3B	TOTAL
39	79	157	275
14%	29%	57%	

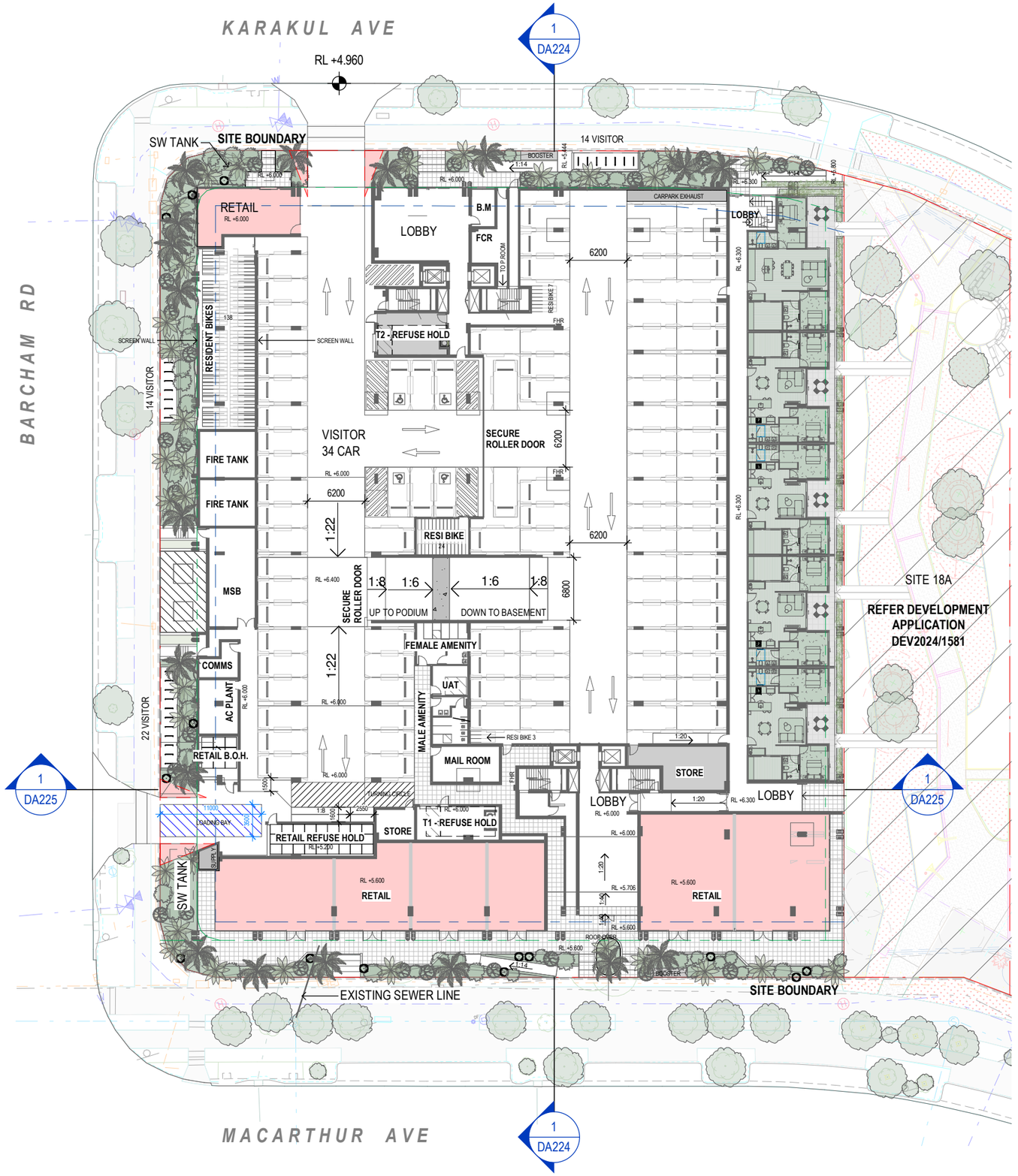
OVERALL FLOOR PLANS - BASEMENT 01



0 2 4 6 8 10m

SCALE 1:500 @ A3 SIZE

OVERALL FLOOR PLANS - GROUND



SCALE 1:500 @ A3 SIZE

PLUS STUDIO

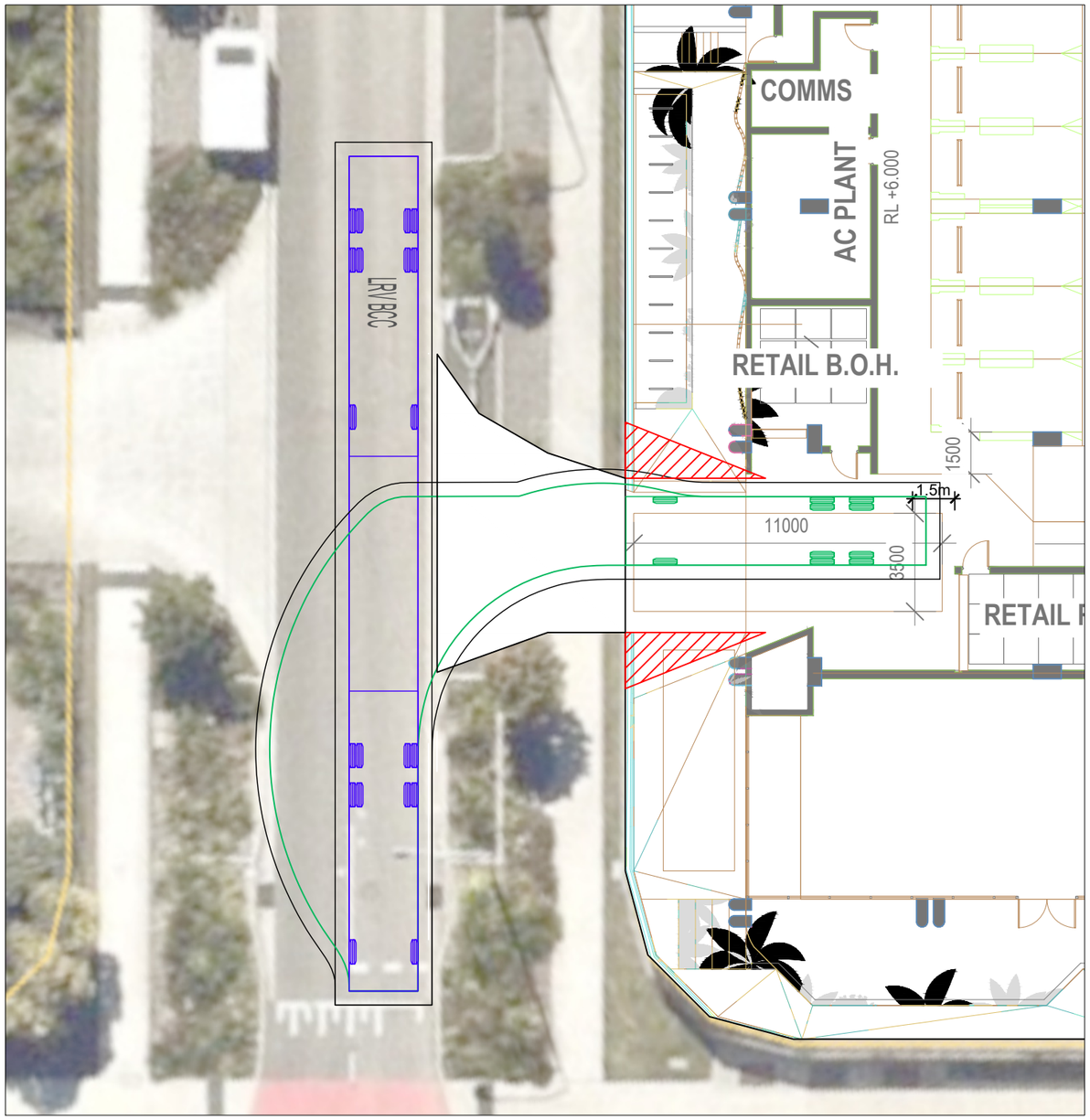
OVERALL FLOOR PLANS - LEVEL 01



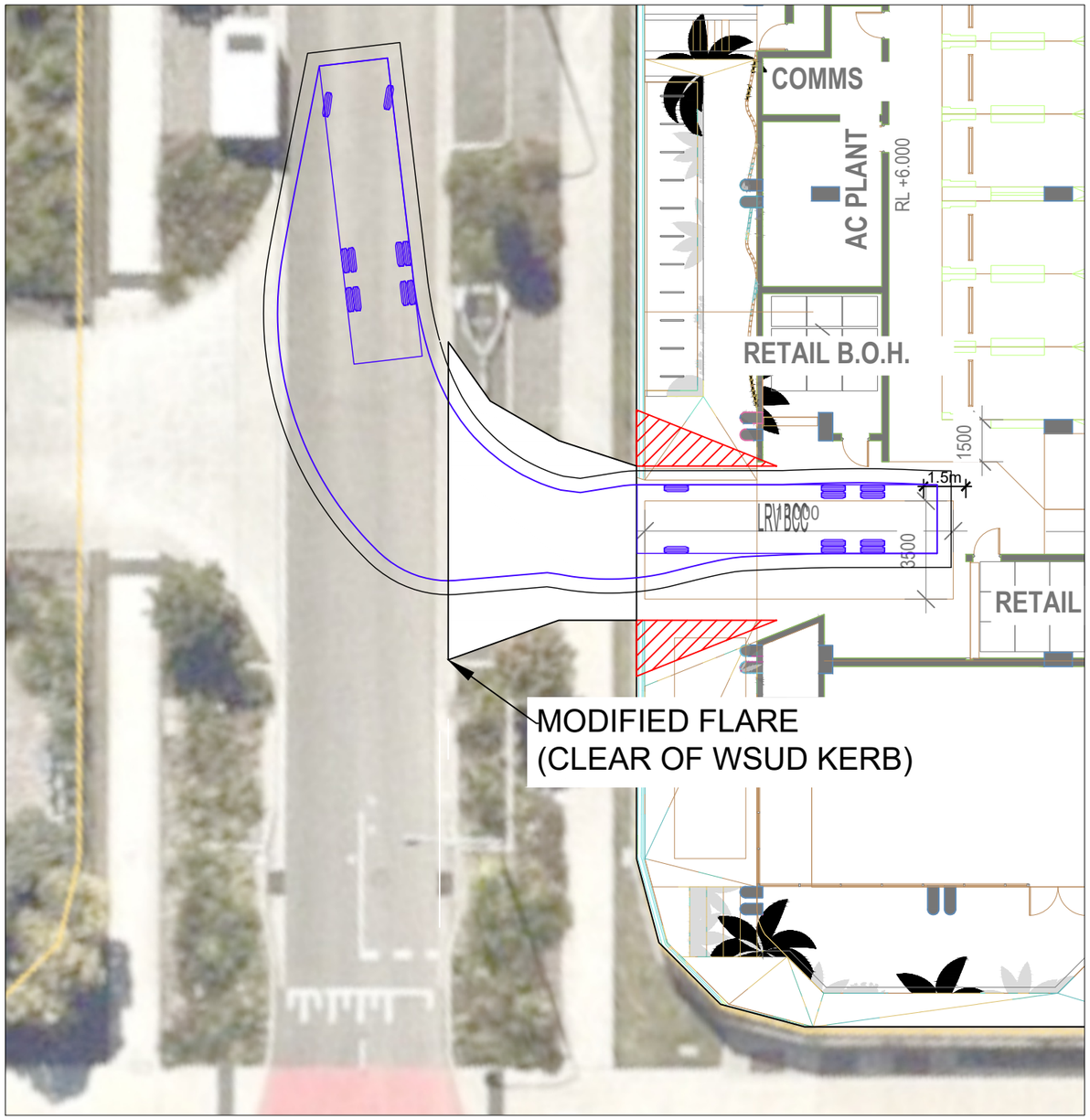
0 2 4 6 8 10m

SCALE 1:500 @ A3 SIZE

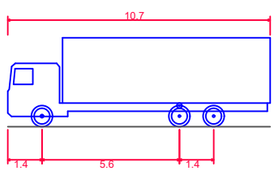
Appendix B Colliers Drawings



LARGE RIGID VEHICLE INGRESS MANOEUVRE
1:200



LARGE RIGID VEHICLE EGRESS MANOEUVRE
1:200



LRV BCC

Overall Length	10.700m
Overall Width	2.450m
Overall Body Height	3.623m
Min Body Ground Clearance	0.150m
Track Width	2.450m
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	12.50m
Design Speed Forward	5.00km/h
Clearance Envelope	0.500m

PRELIMINARY ADVICE ONLY
22 September 2026

REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
C	22-09-26	UPDATE	JH	SC	SC
B	28-08-26	UPDATE	JH	SC	SC
A	09-07-26	ORIGINAL ISSUE	JH	SC	SC

SCALE 0 2 4 6 8 10m
SCALE 1:200 AT ORIGINAL SIZE

NORTH

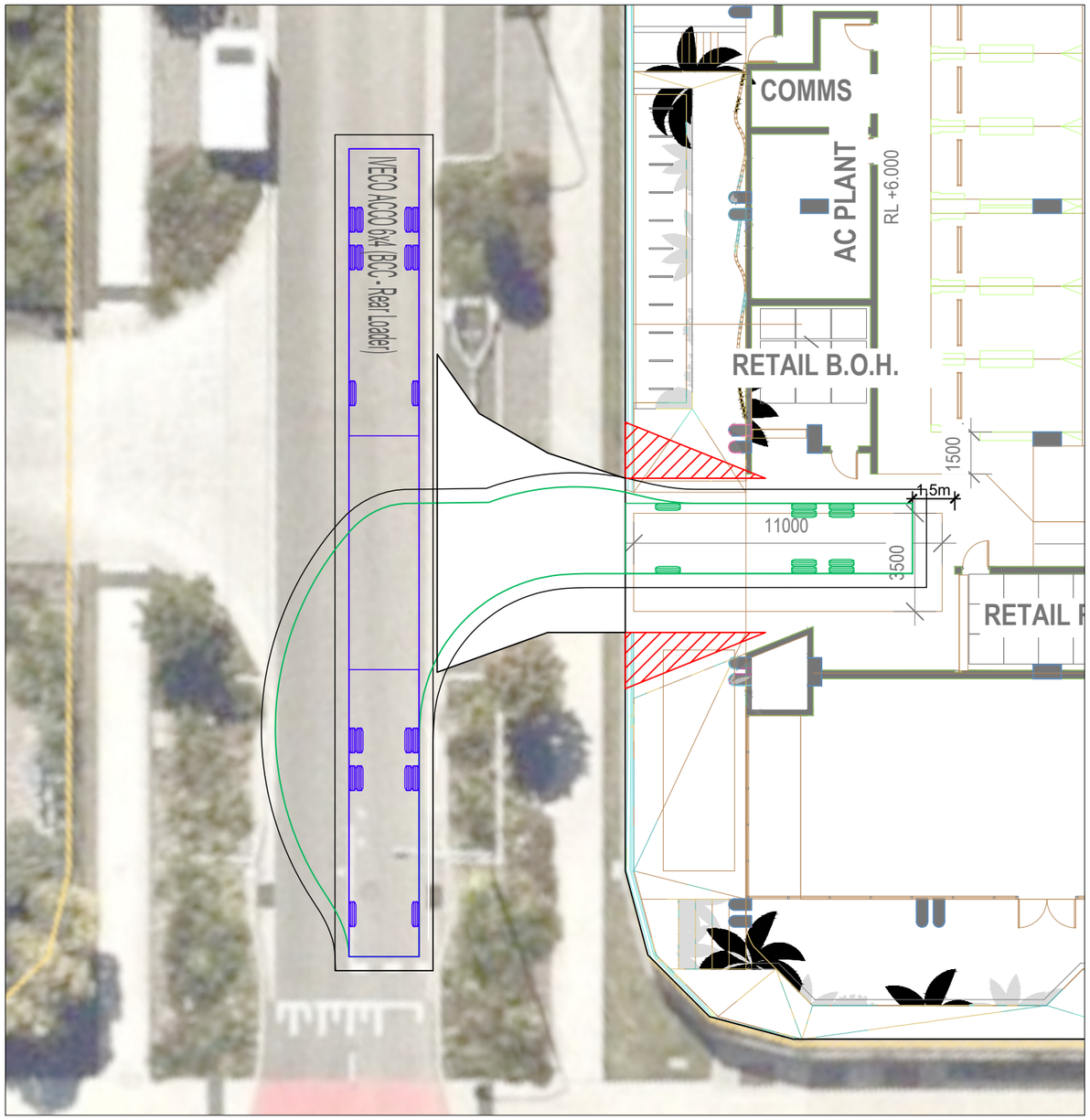
CLIENT
SILVERSTONE

Colliers International Engineering & Design (TTMC) Pty Ltd
ABN 65 010 868 621
LEVEL 8, 369 Ann Street, BRISBANE QLD 4000
P.O. BOX 12015, BRISBANE QLD 4003
T: (07) 3327 9500 F: (07) 3327 9501
E: ttmbris@ttmgroup.com.au W: www.ttmgroup.com.au

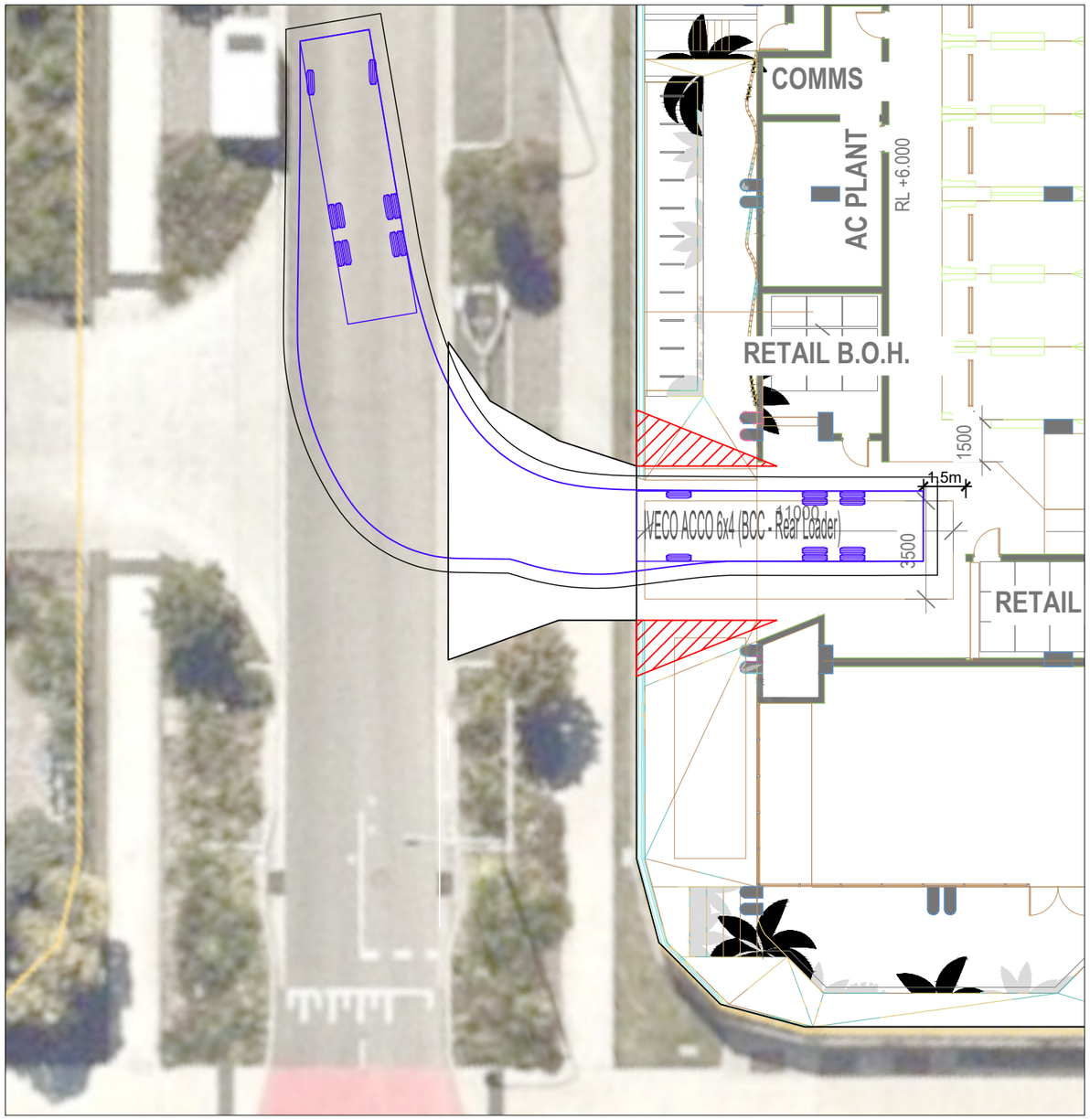
PROJECT
PROJECT: LOT 18B, 260 MACARTHUR AVENUE, HAMILTON

DRAWING TITLE
DRAWING TITLE
10.700m LARGE RIGID VEHICLE

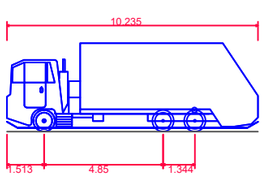
PROJECT NUMBER	26BRT0353
ORIGINAL SIZE	A3
DRAWING NUMBER	26BRT0353-01
REVISION	C
DATE	22 Sep 2026
SHEET	1 OF 1



REFUSE COLLECTION VEHICLE INGRESS MANOEUVRE
1:200



REFUSE COLLECTION VEHICLE EGRESS MANOEUVRE
1:200



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

DIRECTOR
SIMON CRANK RPEQ 18360
APPROVED 22 Sep 2026

PRELIMINARY ADVICE ONLY
22 September 2026

REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
C	22-09-26	UPDATE	JH	SC	SC
B	28-08-26	UPDATE	JH	SC	SC
A	10-02-23	ORIGINAL ISSUE	TK	AR	AR

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

Colliers International Engineering & Design (TTMC) Pty Ltd
ABN 65 010 868 621
LEVEL 8, 369 Ann Street, BRISBANE QLD 4000
P.O. BOX 12015, BRISBANE QLD 4003
T: (07) 3327 9500 F: (07) 3327 9501
E: ttmbris@ttmgroup.com.au W: www.ttmgroup.com.au

PROJECT: **PROJECT: LOT 18B, 260 MACARTHUR AVENUE, HAMILTON**
DRAWING TITLE: **DRAWING TITLE**
10.235m REFUSE COLLECTION VEHICLE

PROJECT NUMBER	26BRT0353
ORIGINAL SIZE	A3
DRAWING NUMBER	26BRT0353-01
REVISION	C
DATE	22 Sep 2026
SHEET	1 OF 1