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Queensland Government

Traffic Engineering Report

Proposed Mixed-Use Development at 11-23 MacArthur Avenue, Hamilton

Brookfield Portside East Pty Ltd

About TTM

For 30 years, we've been at the centre of the Australian development and infrastructure industry. Our unique combination of acoustics, data, traffic and waste services is fundamental to the success of any architectural or development project.

We have over 50 staff, with an unrivalled depth of experience. Our industry knowledge, technical expertise and commercial insight allow us to deliver an exceptional and reliable service.

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Acoustics Data Traffic Waste

Revision Record

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1 Introduction

1.1 Background

TTM Consulting has been engaged by Brookfield Portside East Pty Ltd to prepare an updated traffic engineering report investigating a proposed mixed-use development at 11-23 MacArthur Avenue, Hamilton. A Development Application was previously lodged with Economic Development Queensland (EDQ).

This updated traffic engineering report has been prepared taking cognisance of the traffic engineering items raised by EDQ in the Request for Further Information (RFI) dated 27 June 2023 and TTM's subsequent response to the RFI dated 28 July 2023. The traffic engineering items that TTM are responding to and the location of relevant responses are identified below in Table 1.1.

Table 1.1: RFI – Traffic Engineering Items Raised by EDQ

Item		Response Location
8	*A review of the Traffic Engineering Report, dated 11 May 2023 and prepared by TTM Consulting has identified the following issues for further clarification:*	
8a	*Section 2.3.2.3 of the report indicated that additional pedestrian and cyclist connections will be provided in the vicinity of the subject site. Demonstrate how the development will comply with the pedestrian pathways and cross block links requirements in accordance with Map 4: Active Transport of the PDA Scheme.*	Refer to Section 6.1 & the Town Planning Report prepared by the Saunders Havill Group
8b	*Section 3.1 of the report indicated that reassess the suitability of the access arrangements is not deemed required, as the existing driveway crossovers on Wharf Street and MacArthur Avenue have been in operation for many years and were previously approved by EDQ (to facilitate vehicular access to a comparable number of parking spaces). Submit a swept path analysis to demonstrate that the existing and the proposed driveway crossovers are suitable for the operation of the largest design vehicle.*	Refer to Section 3.1
8c	*As per the required parking rates stated in Schedule 2 of the Northshore Hamilton PDA Development Scheme, minimum 516 residential parking (including 84 visitors and 12 PWD) is required, while Table 4.1 of the traffic engineering report presented 504 spaces. Contrary to the required spaces, 411 residential parking spaces (including 81 visitor and 16 PWD) are proposed. It is noted that no shared parking or motorcycle parking requirements are exclusively stated in the Development Scheme, but 16 shared parking and 65 motorcycle parking (45 for residents and 20 for visitors) are proposed and these numbers are also deducted from the required total number of parking calculations. Further, the 9 car parking spaces are proposed for the commercial land-uses components, contrary to the required 16 spaces.*	Refer to Section 4.1

Action Items	
Provide justification as to why the shared parking and motorcycle parking are considered in the total parking number calculation.	Refer to Section 4.1
Demonstrate on plans/in TTM Report how the carparking spaces provided within the ramp can be safely accessed and can meet the appropriate standards.	Refer to Section 4.3.4.2
Provide reference / guidelines to justify the feasibility in favour of considering all proposed 560 units under BTR.	Refer to Section 4.2.5
Demonstrate if the reduced carparking and any associated management for the residential and commercial land uses would be executed by the same or different management entity.	Refer to Section 4.2.5
Any shortfall in parking should be reviewed by a Registered Professional Engineer of Queensland (RPEQ) to confirm the development will not result in overflow parking to surrounding streets and properties.	Refer to Section 4.2.3 & 4.2.6
As the transport intent of the development accentuates active and public transport over private vehicle use, it is recommended visitor bicycle parking spaces be maximized where possible.	Refer to Section 6.2.1

A copy of TTM's response to EDQ's RFI is included in Appendix A.

1.2 Scope

This report investigates the transport aspects associated with the proposed development. The scope of the transport aspects investigated includes:

- Access configuration;
- Parking supply;
- Internal car park design;
- Service vehicle provisions and on-site manoeuvring;
- Suitability of active transport provisions; &
- Identification of likely traffic volumes generated by the development and possible impacts on the surrounding road network.

To assess the transport aspects, the proposed development have been assessed against the following guidelines and planning documents:

- Northshore Hamilton Priority Development Area Development Scheme (Amendment No. 1, October 2022);
- Brisbane City Council's (BCC's) Transport, Access, Parking & Servicing Planning Scheme Policy (TAPS PSP);
- Australian Standard AS2890 Series; &

- Austroads Guide to Traffic Management (AGTM).

1.3 Site Location

The subject site is located at 11-23 MacArthur Avenue, Hamilton and is situated in the eastern portion of the wider Portside Wharf precinct and is contained within the Northshore Hamilton Priority Development Area (PDA). The location of subject site in the context of the wider Portside Wharf precinct is shown in Figure 1.1 and Figure 1.2. The subject site was previously used as a parking area and check-in facility for the Brisbane Cruise Terminal (BCT), which has now ceased operation.

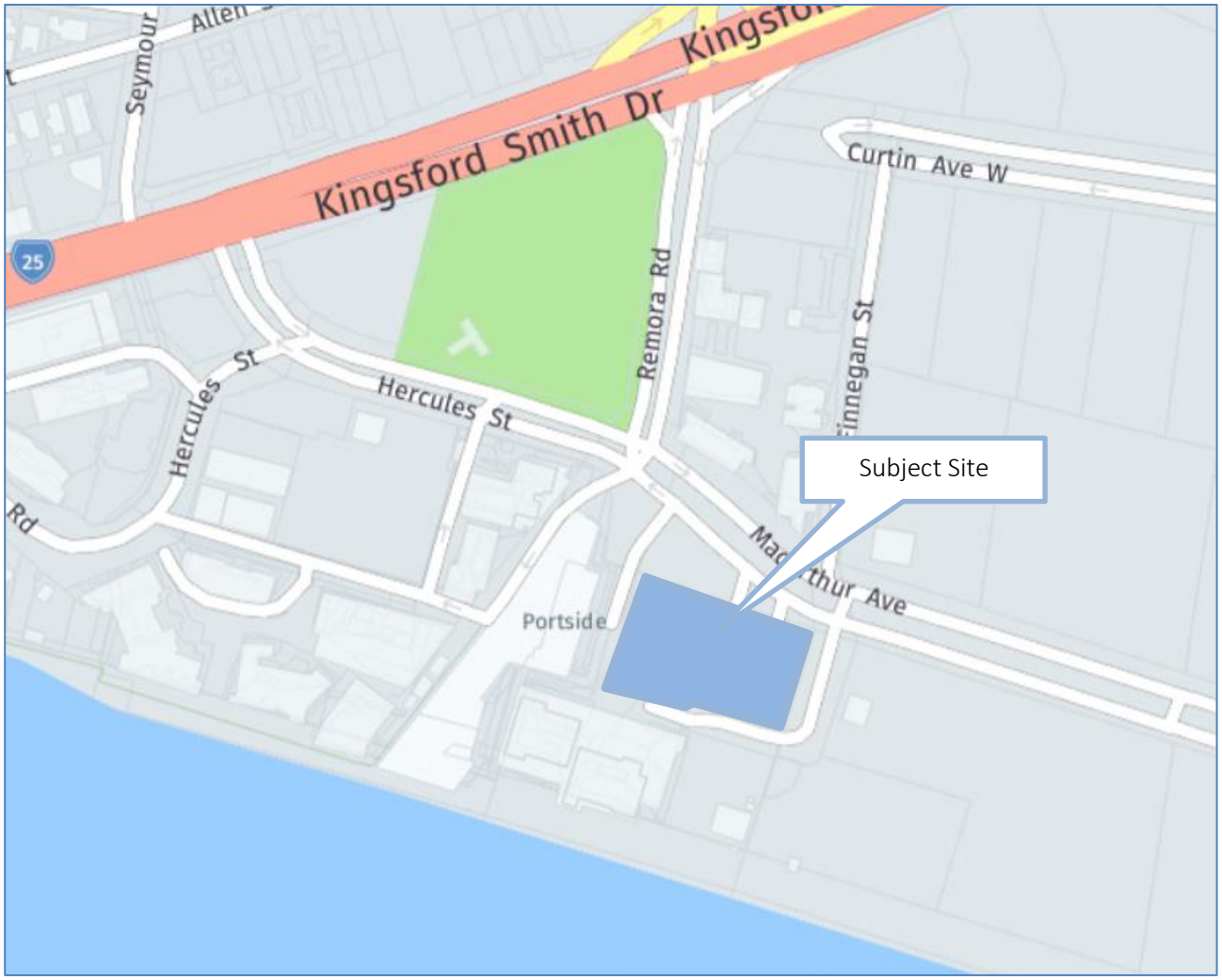

Figure 1.1: Site Location (Source: Nearmap Aerial Imaging)

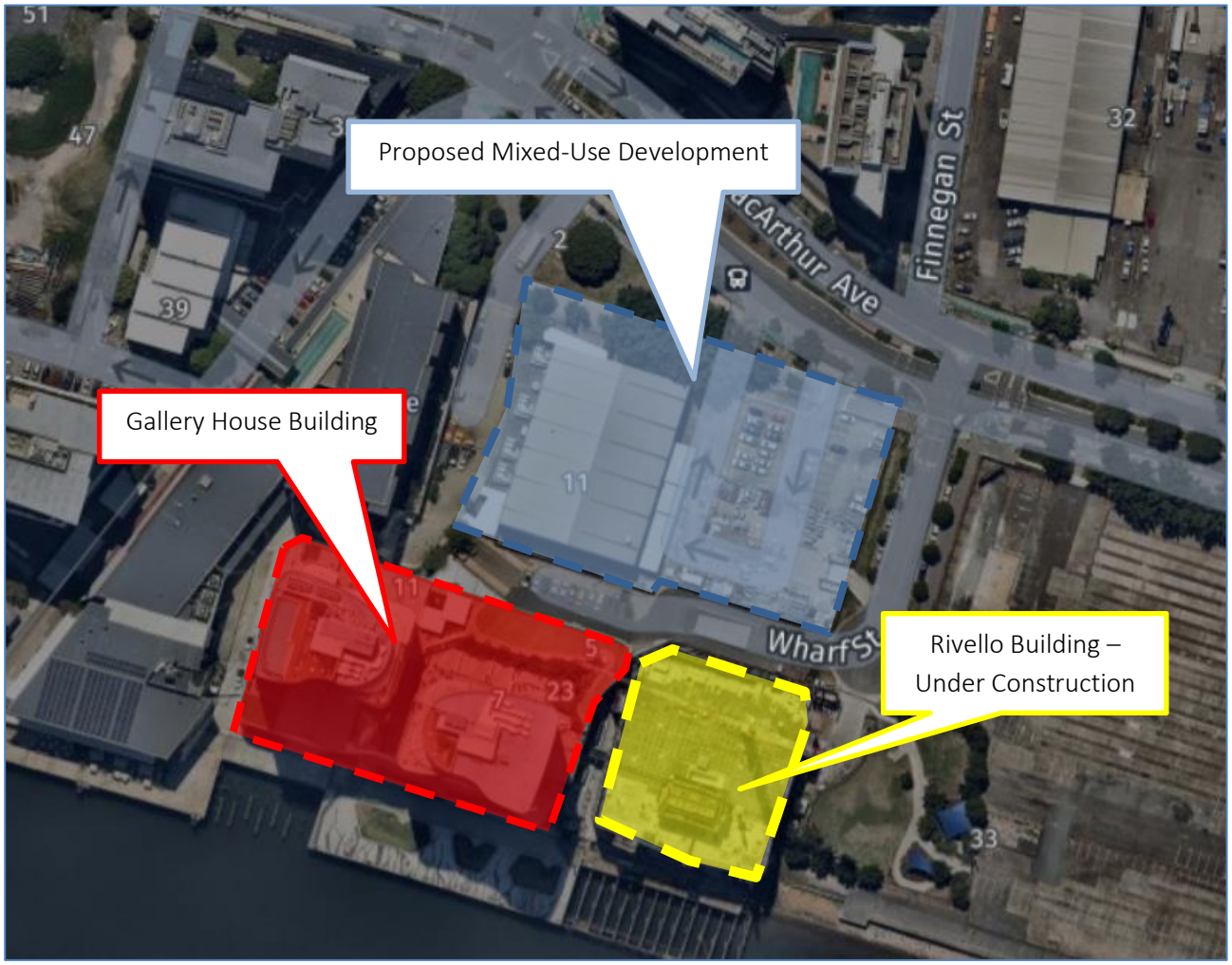

Figure 1.2: Site Aerial (Source: Nearmap Aerial Imaging)

1.4 Development Profile

1.4.1 Type & Scale of Land-Uses

The proposed development involves the construction of a mixed-use development comprising a Build-To-Rent (BTR) residential building with office, shop/food and drink outlet and indoor recreation land-uses provided at the ground and mezzanine levels. The development summary is provided in Table 1.2.

Table 1.2: Development Summary

Land-Use	Area/Qty
Multiple Unit Dwellings (MUD): – Studio – 1 bedroom – 2 bedroom – 3 bedroom **Total:**	 51 251 222 36 **560**
Shop (Dog Grooming) / Food & Drink Outlet	142m²
Office (Co-Working Space)	639m²
Indoor Sport & Recreation (Gymnasium)	275m²

A copy of the development plans is included in Appendix B.

1.4.2 Access

Vehicular access to the basement and podium parking areas will be achieved via the existing portal ramp branching from the existing driveway crossover on Wharf Street.

Vehicular access to the set down area will be achieved via the one-way internal circulation roads branching from the existing driveway crossover on Wharf Street.

Vehicular access to the service vehicle area will be achieved via the existing servicing aisle branching from the existing driveway crossover on MacArthur Avenue.

Further details in relation to the proposed vehicular access arrangements is included in Section 3.

1.4.3 Parking

The proposed development includes the following parking supply:

- A total of 420 parking spaces (including 16 PWD parking spaces), 16 car share parking spaces, 65 motorcycle spaces and 640 bicycle parking spaces, including:
  - 327 parking spaces (including 13 PWD parking spaces and 36 tandem parking spaces), 16 car share parking spaces, 45 motorcycle spaces and 586 bicycle parking spaces for residents; &
  - 93 parking spaces (including 3 PWD parking spaces), 20 motorcycle spaces and 54 bicycle spaces for residential visitors.

A set down area for taxi's and rideshare vehicles is also provided at ground level.

Further details regarding the proposed parking provisions are included in Sections 4 and 6, respectively.

1.4.4 Servicing

The proposed development includes the following service vehicle provisions:

- 2 large rigid vehicle (LRV)/refuse collection vehicle (RCV) bays.

Further details in relation to the proposed service vehicle provisions is included in Section 5.

2 Existing Transport Infrastructure

2.1 The Road Network

All roads in the immediate vicinity of the subject site are administered by BCC. The hierarchy and characteristics of roads in the immediate vicinity of the site are shown below in Table 2.1.

Table 2.1: Local Road Hierarchy

Road	Speed Limit	Lanes	Classification	Road Authority
Kingsford Smith Drive	60kph	4-lanes	Arterial	BCC
Hercules Street / Harbour Road	50kph*	2-lanes including kerbside parking	Neighbourhood Access	BCC
Remora Road	50kph*	2-lanes including kerbside parking	Neighbourhood Access	BCC
Macarthur Avenue	50kph*	2-lanes plus indented parking	Neighbourhood Access	BCC
Wharf Street	50kph*	2-lanes plus indented parking	Local Access	BCC
Finnegan Street	50kph*	2-lane plus indented parking (on western side)	Local Access	BCC

*Default speed limit on unsigned roads is 50 kph in built-up areas in Queensland.

The majority of the intersections in the vicinity of the subject site operate under traffic signal control.

2.2 Future Road Planning

It is TTM's understanding that there are no future road planning requirements affecting the subject site.

As shown in Figure 2.1, EDQ envisages that a new road connection (riverside loop) will be introduced between MacArthur Avenue and Wharf Street. It is expected that this new road connection will necessitate the introduction of a roundabout on Wharf Street. It is TTM's understanding that the form of the existing cul-de-sac head allows for the introduction of the roundabout.

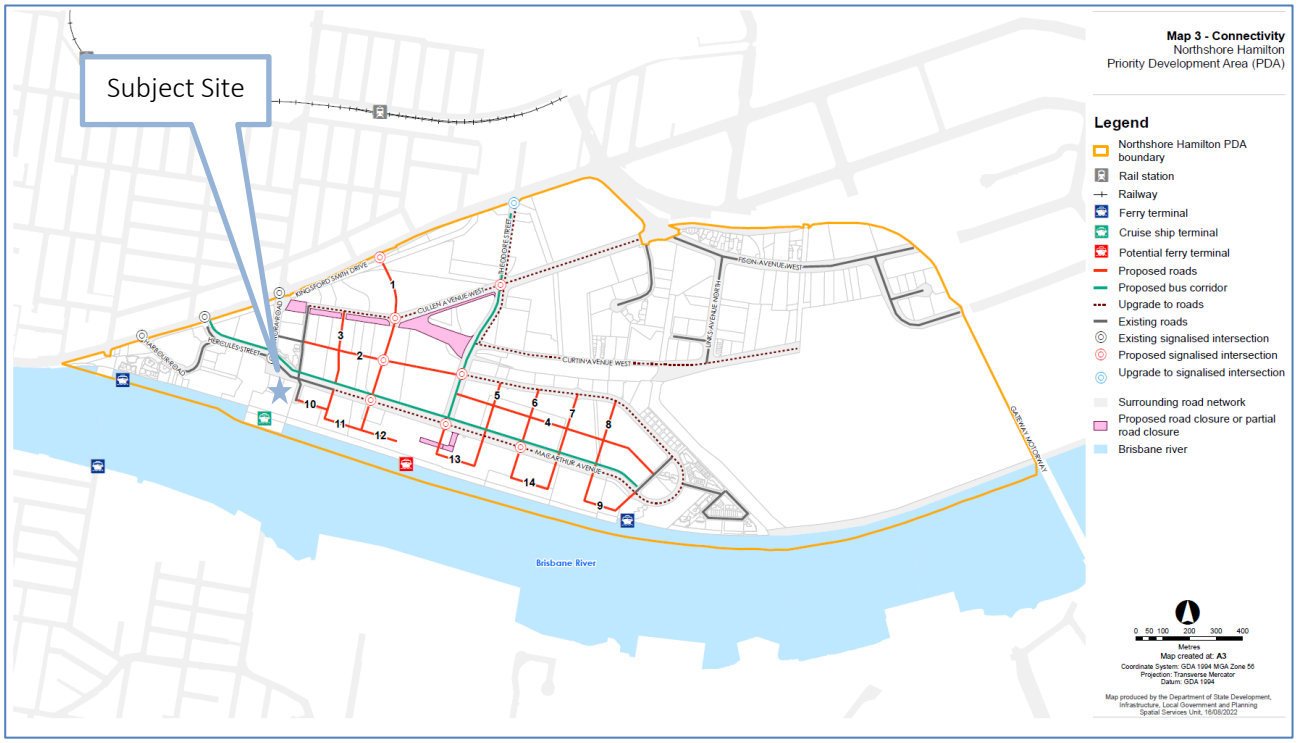

Figure 2.1: Map 3 - Connectivity (Source: Northshore Hamilton Priority Development Area Development Scheme (Amendment No. 1, October 2022)

A standard condition of approval will be the removal of the existing (redundant) driveway crossovers along MacArthur Avenue and the construction/repair, reinstatement of pedestrian footpaths and cycle paths across the frontage of the subject site subsequent to the completion of the construction activity.

2.3 Public Transport and Cyclist & Pedestrian Facilities

2.3.1 Existing

2.3.1.1 Train

The subject site is situated within 1.2km walking distance of the pedestrian entrance to Doomben train station. The station services the Doomben line. The station generally caters for approximately 29 trains on a typical weekday (two-way), with average peak hour frequencies of 1 train every 30 minutes (between 6am and 8pm).

2.3.1.2 Ferry

The subject site is situated within 670m walking distance of the pedestrian entrance to Bretts Wharf ferry terminal, which provides regular CityCat services between Northshore Hamilton and St Lucia. Services run every 15 minutes during peak periods and every 30 minutes in off-peak periods (between 5:30am and 11:15pm).

The benefit of access to the ferry network is that it services major employment and education nodes along the Brisbane River that are not easily accessible by train or bus, e.g., UQ, QUT.

2.3.1.3 Buses

Reviewing the Translink website, it is apparent that the subject site is located in close proximity to a number of bus stops, as shown in Figure 2.2.

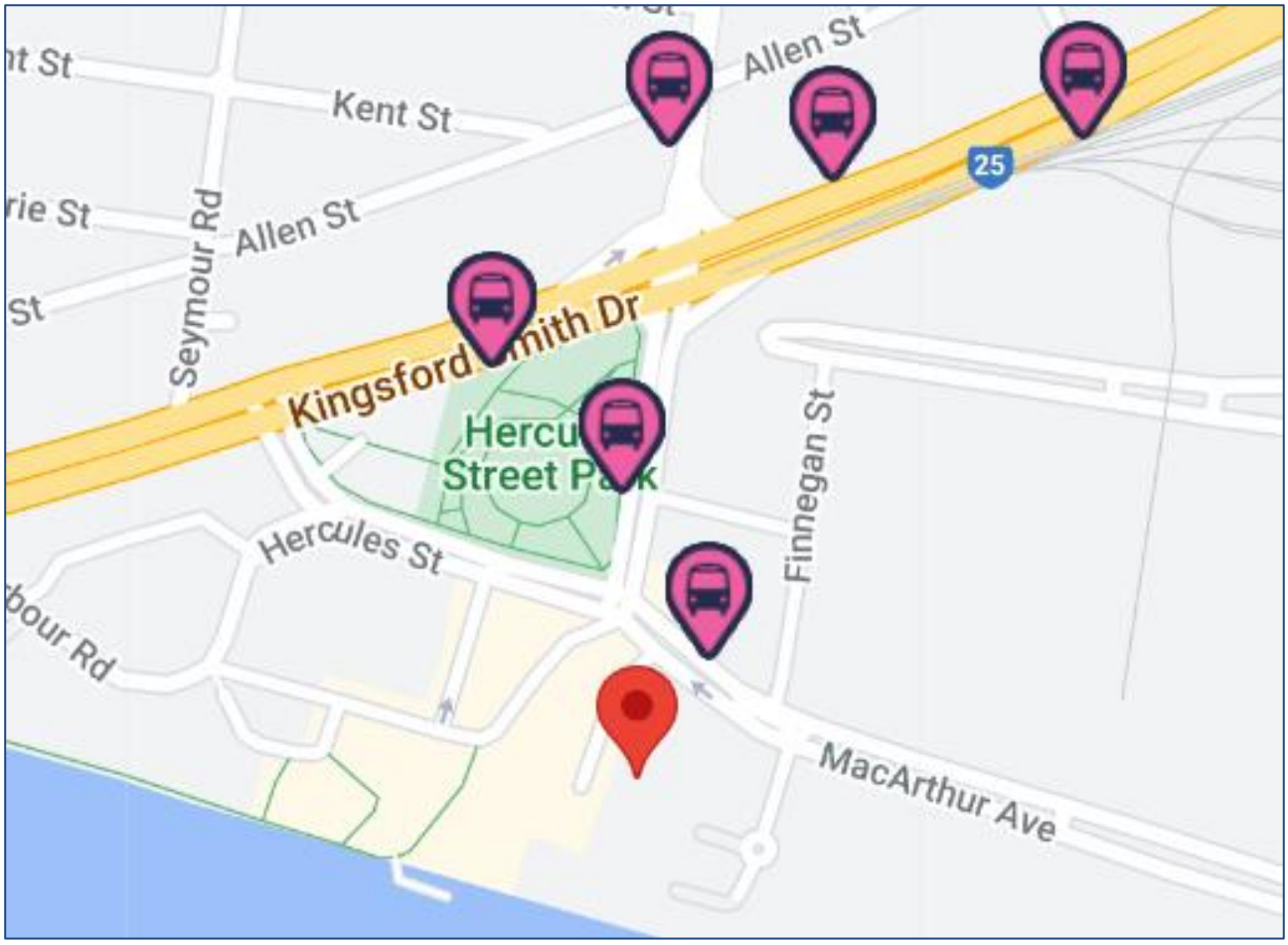

Figure 2.2: Bus Stop Locations (Source: www.translink.com.au)

In combination, these bus stops are serviced by bus routes 300, 302, 303, 305 and 305, connecting the subject site with both the local area, and destinations further afield including Toombul Centro and the CBD. Figure 2.3 shows these bus routes.

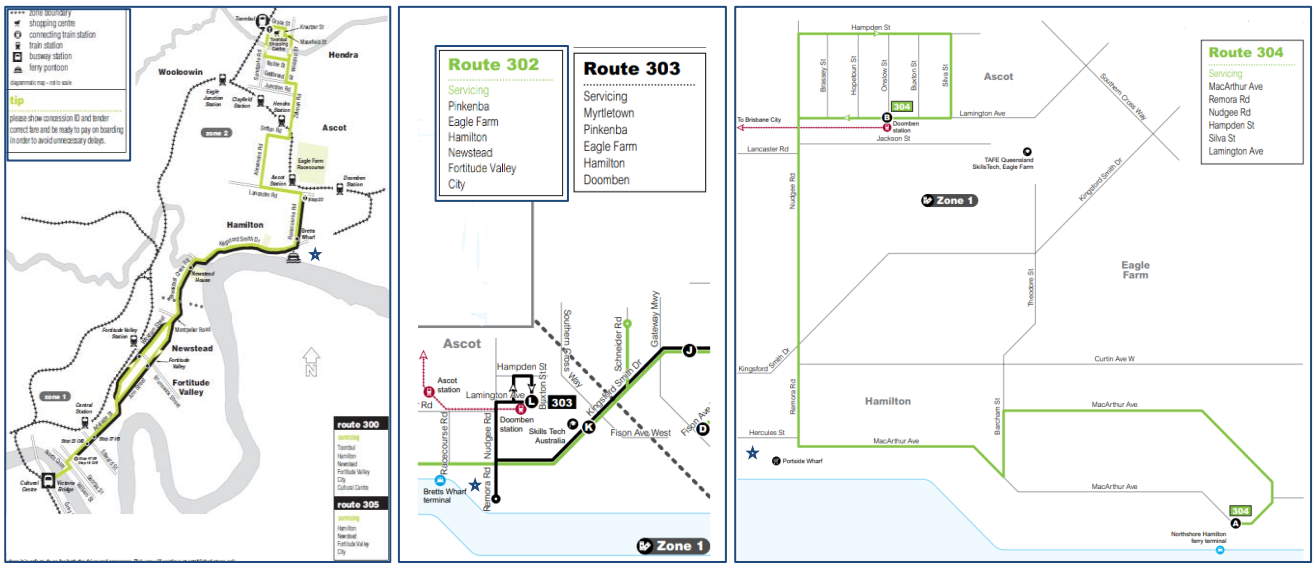

Figure 2.3: Local Bus Routes (Source: www.translink.com.au)

2.3.1.4 Pedestrians

The subject site is adequately served in terms of pedestrian facilities with footpaths provided on both sides of MacArthur Avenue, Remora Road and Hercules Street and on the eastern side of Wharf Street. A footpath will be provided on the western side of Wharf Street as part of the redevelopment of the subject site.

Pedestrian crossing facilities are provided at nearby traffic signal controlled intersections.

2.3.1.5 Cyclists

The BCC Bicycle Network Overlay in the vicinity of the subject site is reproduced Figure 2.4.

Numerous other cycle paths are located in the vicinity of the subject site, including off-road cycle paths on both sides of MacArthur Avenue and a less formal off-road cycle path along the river's edge.

Dedicated cyclist crossing facilities are provided at nearby traffic signal controlled intersections.

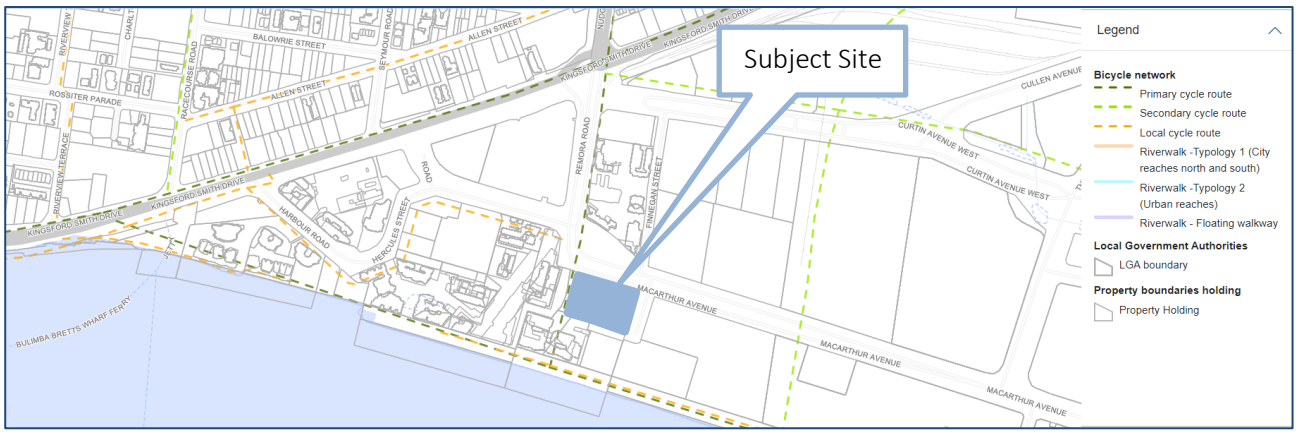

Figure 2.4: Excerpt from BCC's Bicycle Network Overlay (Source: BCC City Plan)

2.3.2 Future Planning

2.3.2.1 Ferry

A shown in Figure 2.1, EDQ envisages that a new ferry terminal will be constructed between the existing Bretts Wharf and Northshore Hamilton ferry terminals.

2.3.2.2 Buses

EDQ envisages that new bus stops will be provided along Kingsford Smith Drive, Macarthur Avenue and Theodore Street as redevelopment occurs within the wider Northshore Hamilton area. In addition, BCC has proposed to introduce a new high frequency Gold CityGlider bus route between the Portside Wharf precinct and Woolloongabba busway station. It is anticipated that service, which will also service the RNA and the CBD) will run every 10 minutes during peak periods and every 15 minutes in off-peak periods.

The indicative route of the Gold CityGlider bus route is shown in Figure 2.5.

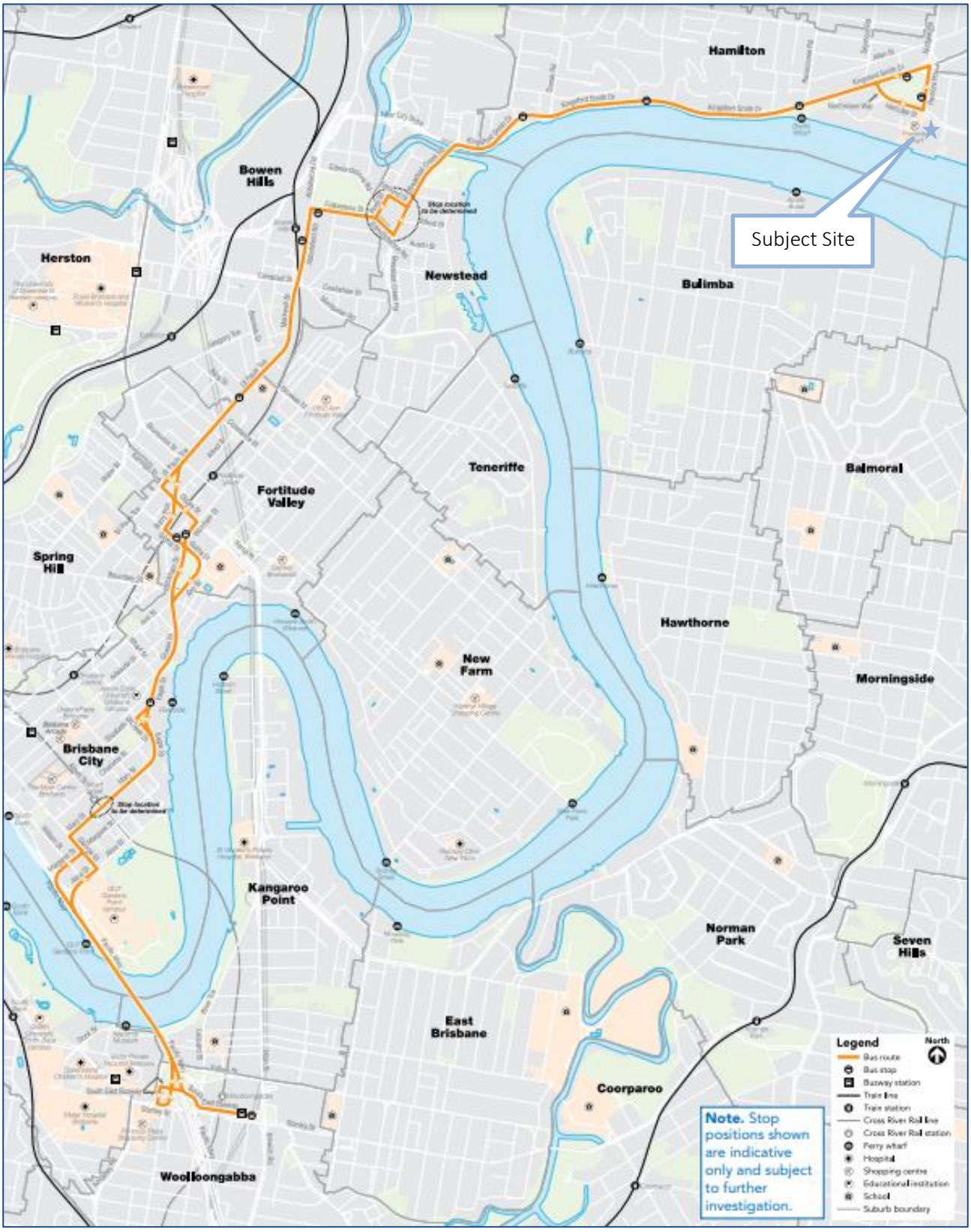

Figure 2.5: Indicative Route of Gold CityGlider (Source: BCC)

The bus stop on Remora Road will be within 200m walking distance of the subject site.

2.3.2.3 Pedestrians & Cyclists

The Breakfast Creek Green Bridge, which is currently under construction, will improve connectivity for cyclists travelling between the subject site and the CBD.

As shown in Figure 2.6, EDQ envisages that additional pedestrian and cyclist connections will be provided in the vicinity of the subject site. Consistent with EDQ's requirements, multiple pedestrian connections (running north to south) are proposed as part of the scheme. These are provided to the west along the servicing aisle (laneway), through the middle of the site as part of the foyer and to the east. Improved pedestrian connectivity is proposed as part of the proposed development between Wharf Street and the established Portside Wharf precinct.

Figure 2.6: Map 4 - Accessibility (Source: Northshore Hamilton Priority Development Area Development Scheme (Amendment No. 1, October 2022)

Overall, the site is located ideally in close proximity to a significant volume and range of existing and proposed public and active transport facilities.

3 Site Access Arrangements

3.1 Proposed Access Arrangements & Their Suitability

The proposed access arrangements are summarised below.

- Vehicular access to the basement and podium parking areas will be achieved via the existing portal ramp branching from the existing driveway crossover on Wharf Street.
- Vehicular access to the set down area will be achieved via the one-way circulation roads branching from the existing driveway crossover on Wharf Street.
- Vehicular access to the service vehicle area will be achieved via the existing servicing aisle branching from the existing driveway crossover on MacArthur Avenue.

Given that the existing driveway crossovers on Wharf Street and MacArthur Avenue have been in operation for many years and were previously approved by EDQ (to facilitate vehicular access to a comparable number of parking spaces), it is not considered necessary to reassess the suitability of the access arrangements.

Drawing No.'s 21BRT0771-02 and 04 included in Appendix C demonstrate (using Autotrack) that the existing access arrangements on Wharf Street and MacArthur Avenue are suitable to facilitate vehicular access by the nominated design vehicles.

In order to mitigate conflict at the exit from the set down area and at the interface between the portal ramp and the one-way circulation road (facilitating vehicular egress from the basement and podium parking areas within the Rivello Building and the ground level parking area within Gallery House) modifications are proposed to the existing line marking to improve intervisibility between vehicles. Furthermore, the one-way circulation road adjacent to the set down area has been widened to allow for improved circulation by the nominated design vehicles.

3.1.1 Queuing

With respect to queuing, given that the first internal intersection at the bottom of the portal ramp (facilitating vehicular access to the basement and podium parking areas for the proposed development) is the first conflict point for traffic entering the eastern portion of the Portside Wharf precinct via Wharf Street, the following assessment specifically addresses the suitability of the queuing provision at this location to ensure that vehicular access to the basement and podium parking areas for the Rivello Building and the ground level parking area for Gallery House is not restricted and that queuing does not extend back onto the adjacent road network.

The portal ramp will ultimately facilitate vehicular access to the basement and podium parking areas for Gallery House and the basement and podium parking areas for the proposed development. The respective parking supplies within these buildings is summarised as follows:

- Gallery House – 472 parking spaces

- Proposed Development – 436 parking spaces (including 16 car share spaces)
- Total - 908 parking spaces

Approximately 42m is provided between the first internal intersection (facilitating vehicular access to the basement and podium parking areas for the proposed development) and the top of the portal ramp prior to restricting vehicular access to the basement and podium parking areas for the Rivello Building and the ground level car parking area for Gallery House. This equates to a queuing capacity for 7 vehicles.

Whilst the 42m queuing distance is less than the 14 vehicle queuing provision (i.e. 7 vehicle queuing provision for first 250 spaces and 7 vehicle queuing provision for the remaining 658 spaces at 1% of capacity) required in accordance Table 10 of BCC's TAPS PSP, it should be noted that BCC's queue capacity requirement is based solely on the number of parking spaces. It ignores the type of user and the likely turnover/traffic generation of the parking facility. In effect, BCC's queue capacity requirement for a given number of (for instance) parking spaces within a supermarket, is identical to that of the same number of parking spaces within a multiple unit dwelling development.

Further to the above, the peak inflow at the portal ramp is estimated to between 98 and 119vph (based on a traffic generation rates of 0.12vph/space or 0.15vph/unit as sourced from the Transport Maritime & Roads Service (TMRS) Guide to Traffic Generating Developments – Updated Traffic Surveys and a 90/10 split in terms of arrivals/departures for the 875 units and 908 parking spaces within the proposed development and Gallery House) during the weekday PM peak-hour. This equates to between 8.6 and 10.5% of that generated by 908 supermarket spaces (i.e. peak inflow of 1,135vph in the weekday PM peak-hour assuming 2.5vph per spaces and a 50/50 split in terms of arrivals/departures). As such, the potential for queuing and the need for queue capacity or storage is correspondingly lower than the requirements specified in BCC's TAPS PSP. As mentioned previously, BCC's queue capacity requirement for a given number of (for instance) supermarket spaces, is identical to that of the same number of residential spaces within a multiple dwelling development.

In effect and as a "worst case" scenario, the traffic generation, potential for queuing and the need for queue storage of the 908 parking spaces provided within the basement and podium parking areas for Gallery House and the proposed development is equivalent to that of 95 parking spaces within a supermarket. BCC's requirement for queuing capacity for 95 parking spaces within a supermarket is 4 vehicle lengths, or 24m. This practical requirement is adequately satisfied by the 7 vehicle (of 42m) queuing provision between the first internal intersection and the top of the portal ramp. On this basis, the queuing provision on the portal ramp is considered acceptable and any queuing at the first internal intersection is unlikely to extend back and restrict vehicular access to the basement and podium parking areas for the Rivello Building and the ground level parking area for Gallery House and result in queuing extending back onto the adjacent road network.

3.2 Conclusion

Given that the existing driveway crossovers on Wharf Street and MacArthur Avenue have been operation for many years and were previously approved by EDQ (to facilitate vehicular access to a comparable number of parking spaces), it is not considered necessary to reassess the suitability of the access arrangements. The

queueing capacity provided on the portal ramp is considered sufficient to cater for the estimated traffic generation and will not result in queuing extending back onto the adjacent road network.

Overall, the proposed access arrangements are considered suitable.

4 Car Parking Arrangements

4.1 EDQ Parking Supply Requirement

EDQ's parking requirements for the proposed development are identified in Table 4.1.

Table 4.1: Parking Supply Requirement

Land-Use	EDQ Requirement	Extent	Requirement	Provision
Multiple Unit Dwellings (MUD): – Studio, 1 bedroom 2 bedroom & 3 bedroom	0.75 (min) – 2 (max) spaces/unit	560 units	420 spaces (min) – 1,120 spaces (max)	327 parking spaces (including 13 PWD parking), 16 car share parking spaces and 45 motorcycle spaces
– Visitor	0.15 spaces/unit		84 spaces	84 spaces (including 3 PWD spaces) & 20 motorcycle spaces
Sub-Total			**504 spaces (min) – 1,204 spaces (max)**	**411 parking spaces (including 16 PWD parking spaces), 16 car share parking spaces and 65 motorcycle spaces**
Shop/Food & Drink Outlet & Office	2 spaces/100m² (max)	417m²	0 spaces (min) - 8 spaces (max)	9 parking spaces
Indoor Sport & Recreation	1 space/100m² (max) *	639m²	0 spaces (min) - 6 spaces (max)	
Sub-Total			**0 spaces (min) - 14 spaces (max)**	**9 parking spaces**
Total			504 spaces (min) -1,218 spaces (max)	420 parking spaces (including 16 PWD parking spaces), 16 car share parking spaces and 65 motorcycle spaces

*Subject to a maximum rate of 1 space per 100m² as per BCC's TAPS PSP for the 'City Frame'.

The discrepancy in the number of parking spaces required (i.e. 516 parking spaces as specified by EDQ compared to the 504 parking spaces indicated by TTM) relates to the fact that the proposed development comprises a Build-To-Rent (BTR) residential building where the parking spaces will be de-coupled from the units. Consequently, the parking spaces can be allocated to tenants on an as needs basis taking into consideration any disabilities they may have. Consequently, whilst PWD parking for residents is provided in accordance with EDQ's requirements (i.e. at a rate of 0.02 PWD parking spaces per unit) it is not provided in addition to the standard resident parking supply.

Given that a single entity will have ongoing control over both the leasing of the units within the BTR facility and the allocation of resident parking spaces this provides a unique opportunity to manage parking supply (inclusive of PWD parking) more effectively.

The PWD parking provision within the visitor parking area exceeds that required under BCC's TAPS PSP, i.e. 1 PWD parking space per 50 standard parking spaces. Based on the provision of 84 visitor parking spaces, 2 PWD parking spaces would normally be required, however, 3 PWD parking spaces are provided.

Given that maximum parking rates are outlined in the Northshore Hamilton Priority Development Area Development Scheme (Amendment No. 1, October 2022) for the non-residential land-uses (i.e. a maximum of 2 spaces per 100m² for the Shop/Food & Drink Outlet & Office land-uses and a maximum of 1 space per 100m² for the indoor recreation land-use as per BCC's requirements for the 'City Frame' outlined in the TAPS PSP), there is no minimum parking requirement for these land-uses and the extent of parking provided (up to the maximum permitted) is at the applicant's discretion.

Whilst the visitor parking supply (and parking spaces for the non-residential land-uses) satisfies EDQ's requirements, a performance solution is proposed in relation to the resident parking supply, which is provided at rate of 0.58 spaces per unit, representing a shortfall of 93 parking spaces when compared to EDQ's minimum requirements. The performance solution revolves around the BTR strategy and the additional provisions proposed with respect to alternative and innovative modes of transport and building management which are available to this form of development as opposed to a traditional multiple unit dwelling development. It should be noted that EDQ requirement to sleeve the parking areas at podium level with units has limited the number of parking spaces provided for residents (at podium level). Furthermore, the costs associated with constructing an additional basement level would be prohibitive and likely to affect the feasibility of the project.

As per Table 4.1, the car share facility and the motorcycle parking spaces have not been included in the "total parking number calculation". As discussed in further detail below, the car share facility and the motorcycle parking spaces are just some of the measures of the Sustainable Green Travel Plan (SGTP) to be implemented at the facility with the aim of instilling a culture that encourages tenants to adopt sustainable travel choices and to offset the shortfall in the resident parking supply.

The following sections provide supporting information in relation to the performance solution sought with regard to the resident parking supply.

4.2 Parking Performance Solution

4.2.1 General Transport Planning Principles

Transport policy globally is focused on travel demand management - with a key objective to reduce the reliance on the use of private vehicles and promote the use of alternative forms of transport. This is considered crucial to achieve the objectives of climate change policy through reduced emissions.

EDQ's parking policy as outlined in the Northshore Hamilton Priority Development Area Development Scheme (Amendment No. 1, October 2022) generally reflects this objective for non-residential land-uses, with maximum parking rates specified, however the parking policy for residential land-uses is not strictly aligned with the objective of reducing reliance on private vehicle use. Whilst it is acknowledged that parking for residential land-uses, which should be provided at a minimum rate of 0.75 spaces per unit and a maximum rate of 2 spaces per unit, is significantly less than that required by BCC for residential land-uses outside the City Core, EDQ's parking policy still requires a "minimum" parking supply focused on ensuring parking demands are accommodated within development, thus minimizing the potential for overflow parking onto the adjacent road network.

Whilst this may be appropriate for some types of residential development, it is considered somewhat inflexible and inconsistent with the overall transport policy. Essentially the policy lacks recognition of the variety of residential markets – particularly the BTR market – which offers a new paradigm in residential development, particularly the ongoing management of the building.

BTR is a new concept in residential development that provides an opportunity for EDQ to re-align the residential parking policy with fundamental transport planning objectives, as well as providing consistency with parking policy for non-residential development. Whilst in its infancy, the BTR concept has already been recognised by other States and local authorities who have re-aligned their residential parking policies to suit. For example, the updated Housing Diversity State Environmental Planning Policy (SEPP) released by the NSW Planning, Industry & Environment Department states that the "SEPP proposes to introduce three new definitions in the Standard Instrument Local Environmental Plan (LEP) that will improve stability in the rental sector and provide more clarity for stakeholders. BTR housing will provide large scale apartment development with long term leases and on-site management".

Table 4.2 sets out the key requirements for the new housing types.

Table 4.2: Comparison of Development Standards for New Housing Types (Source: Updated Housing Diversity SEPP)

	BTR Housing	Co-Living	Student Housing	Boarding Housing
Tenant	No restriction for market rent dwellings	No restriction	Students	Eligibility based on income
Affordable	Local provisions apply	No minimum requirement	No minimum requirement	Yes – 100%
Tenancy	3 years or more	Minimum 3 months	No minimum	Minimum 3 months
Communal Living Area	New design guidance will be developed	Required	Required	Required
Room/Apartment Size	New design guidance will be developed	30-35m²	10m²	12-25m²
Minimum Car Parking Provision	0.5 spaces per dwelling	0.5 spaces per room	No minimum requirement	0.5 spaces per room; *or* 0.2 spaces per room for social housing providers

4.2.2 Parking Policy

Whilst it is acknowledged that parking for residential land-uses within the wider Northshore Hamilton precinct is typically required at a minimum rate of 0.75 spaces per unit, the performance solution adopted in this instance generally aligns with the intent of the parking policy outlined in Northshore Hamilton Priority Development Area Development Scheme (Amendment No. 1, October 2022) whereby parking does not:

- Unreasonably burden the operation of the local road network and external connections;
- Prejudice the viability of future public transport services; &
- Compromise the envisaged outcomes for urban design, building form, the public realm or sustainability identified in the development scheme.

It is generally accepted that limiting car ownership (through limiting the parking supply for residential developments) is the most effective means to discourage private vehicle use and encourage use of public transport or alternative transportation options. Furthermore, the location of the subject site and the alternative transport strategy to be adopted (as discussed below) will encourage lower private vehicle mode share in lieu of public transport, walking and cycling due to alternative transport provisions (and the complementary land-uses) provided in the vicinity of the subject site.

Furthermore, the requirement to sleeve the parking areas at podium level with units in order to achieve EDQ desired outcomes in terms of urban design and building form has limited the number of parking spaces that provided for residents (at podium level).

4.2.3 On-Street Parking

A key characteristic of the strategy to reduce the resident parking supply for a BTR project is to ensure that there is limited ability for the residents to create overflow parking onto the adjacent road network. Whilst a significant amount of on-street parking is currently available on MacArthur Avenue to the east of the subject site (including centre-of-road parking), this will be rationalised as part of the urban design upgrades proposed by EDQ. Furthermore, it is anticipated that parking restrictions similar to those already in place along Hercules Street, Harbour Road and Finnegan Street (as illustrated in Figure 1 included in Appendix D) will be introduced along MacArthur Avenue (and the adjoining streets), which will severely limit the ability for resident parking to overflow onto the adjacent road network. It should be noted that the introduction of these parking restrictions is considered critical given the maximum parking rate applicable for non-residential land-uses within the wider Northshore Hamilton precinct to ensure that adequate short-term on-street parking is available for customers and visitors to these non-residential land-uses.

Assuming that parking restrictions are introduced along MacArthur Avenue (and the adjoining streets) similar to that already in place along Hercules Street, Harbour Road and Finnegan Street; that the operator of the facility is selective in leasing units to potential tenants based on car ownership (i.e. if all the parking spaces are leased, the selection process for new tenants can be filtered in a manner that only attracts tenants without cars); and the measures outlined in the SGTP (as discussed in further detail below) are successfully implemented, resident parking demand should not result in adverse impacts on the adjacent road network.

4.2.4 Target Market

The market for the BTR project is specifically targeted at a demographic that are sensitive to affordability and sustainability. That is, residents that generally do not want to pay for a parking space and / or are attracted to using alternative modes of transport from either a cost saving or sustainability perspective.

This is a clear differentiation from the traditional residential market. Whilst the traditional multiple unit dwelling development can vary its price point, there is little control over rental versus owner occupier. Furthermore, there is also little control over the demographic that live within a traditional multiple unit dwelling development.

4.2.5 Building Management and Operation

The BTR facility will be held under single ownership and managed/operated by a single entity. The development is not a mixed tenure project or a traditional market/Build-To-Sell (BTS) product. Whilst the number of units is large, the scale of the facility is still at a level that is comfortable for a single operating entity.

A single entity will have ongoing control over both the leasing of the units and the allocation of parking spaces, which provides opportunity to manage parking demands more effectively, particularly given the target market. A key aspect of this holistic management of the units and the parking areas is that parking spaces will be de-coupled from the units and leased to tenants on an as needs basis. This arrangement ensures that all parking spaces are effectively utilised, unlike traditional multiple unit dwelling developments with allocated parking. It is not uncommon in multiple unit dwelling developments with allocated parking that a proportion of the residents do not own cars yet have an allocated parking space – which sits vacant.

With a single entity controlling the leasing, it also provides the ability to be selective in leasing units to potential tenants based on car ownership. If all the parking spaces are leased, the selection process for new tenants can be filtered in a manner that only attracts tenants without cars.

Whilst there is no shortfall in parking associated with the non-residential land-use, it is expected that the management of the visitor parking spaces (inclusive of those parking spaces allocated to the non-residential land-uses) will also be managed by the same entity as the BTR facility.

Another key aspect of the ongoing management and operation of the proposed development will be the implementation of a SGTP.

4.2.6 Sustainable Green Travel Plan

The implementation of a SGTP (which will be developed during the detailed design stage) will instil a culture within the building that encourages tenants to adopt sustainable travel choices.

The key objectives of the SGTP include:

- Actively promote alternative modes of travel such as public transport, cycling, walking and car sharing for residents;
- Reducing the dependency on travel by private cars which subsequently reduces greenhouse gas emissions and congestion on the surrounding road network;
- Manage parking supply to ensure parking demand does not exceed supply; &
- Improve opportunities for those without access to a car.

The SGTP to be prepared will consist of a package of measures to be implemented and is considered as a dynamic document to be monitored on an on-going basis. The measures which will be considered for the proposed development include:

4.2.6.1 Car Share Scheme

A car share scheme with a minimum of 16 vehicles provided of varying types to suit user's needs. The provision of the car share scheme is considered a significant benefit in attracting tenants that do not own a car but do require a car for incidental trips e.g. recreational trip to the Gold Coast on the weekend.

It is intended that the 16 car share parking spaces will offset the shortfall in the resident parking supply identified in Table 1 (i.e. 93 parking spaces) with each car share space accounting for a 6 parking space reduction in the resident parking supply. This allowance has been previously accepted by EDQ and BCC for other multiple unit dwelling developments (e.g. at 20 Walsh Street, Milton (BCC Ref: A004922533) BCC accepted that a shortfall of 30 parking spaces for residents could be offset by the provision of a car share scheme containing 5 vehicles). This is much lower than that accepted in other major urban centres around Australia. For instance, the Land & Environmental Court of NSW previously accepted that each car share scheme can replace between 10 and 12 private vehicles in multiple unit dwelling developments.

4.2.6.2 Bicycle Parking

Bicycle parking for residents will be provided in excess of EDQ's requirements (as outlined in BCC's TAPS PSP).

It is intended that a bicycle mechanic will attend the site on a regular basis in order to undertake maintenance.

4.2.6.3 Motorcycle Parking

45 motorcycle spaces for residents will be provided.

4.2.6.4 Public Transport Accessibility

The building will incorporate "real time" information in relation to the public transport services available in close proximity to the site, including the future Gold CityGlider and CityCat (Bretts Wharf).

4.2.6.5 Set Down Area

A set down area for taxi's and rideshare vehicles will be provided at ground level.

4.2.6.6 Welcome Pack

Each resident will be provided with a welcome pack in order to encourage sustainable travel from the outset. The welcome pack will include;

- Public transport information (including maps), explaining what buses and trains operate in the vicinity of the site;
- Walking and cycling maps showing local walking and cycling routes; &
- Information about the SGTP and any other measures (including the car share scheme) provided to support sustainable travel.

The strategies outlined above to manage resident parking demand have been endorsed by Brian Camilleri (RPEQ – 7577).

4.2.7 Site Location - Surrounding Development

Whilst the availability of alternative forms of active and public transport is critical in terms of reducing reliance on private vehicle use, the location of the site in the context of facilities and services is also critical. Proximity to complimentary land-uses, i.e. employment, retail, and entertainment (and recreation), is critical in terms of the appropriateness if using the alternative modes of transport.

The proposed development is located alongside Portside Wharf which provides a provides a variety of land-uses that reduces the need to travel outside the precinct on a regular basis. It is expected that this variety will be further enhanced as redevelopment occurs within the wider Northshore Hamilton area in line with the ultimate intent of the PDA.

4.2.8 Public Transport, Pedestrian & Cyclist Facilities

The accessibility of the subject site to the existing and future ferry and bus networks will provide residents with a high level of accessibility to public transport services. The frequency and coverage of these services provides residents with a viable form of alternative transport.

4.2.9 Conclusion

Based on the target market for the proposed development, combined with the ongoing management of the building (including the parking spaces which will be de-coupled from the apartments) and the implementation of a comprehensive SGTP, it is concluded that the proposed resident parking supply is suitable, which will subsequently reduce the reliance on the use of private vehicles and resulting parking demand.

4.3 Design of Parking Areas

4.3.1 Introduction

The design of the parking areas is discussed below.

4.3.2 Tandem Parking Space Provision

Excluding the car share spaces, 36 out of the 327 parking spaces will be provided in a tandem arrangement. All tandem spaces parking will be allocated to a single unit/tenant. As the parking space allocation will be de-coupled from units under the BTR model of operation, this will allow these tandem parking space arrangements to be assigned as necessary to tenants who desire to rent them, ensuring maximum efficiency in utilisation of the resident parking supply.

4.3.3 Small Parking Space Provision

Within the resident parking areas (and excluding the car share spaces), 58 out of the 327 parking spaces have been provided as small parking spaces. This provision equates to 17.7% of the overall resident parking supply, which satisfies the requirements outlined in BCC's TAPS PSP. It should be noted that 10 out of the 58 small parking spaces are provided in a tandem arrangement. These tandem parking spaces typically measure

2.4m wide x 10.4m long, which is adequate to facilitate two Australian Standard B85 design vehicles parking 'nose-to-tail' with suitable clearance maintained at the front of the space, between the vehicles and also to the adjacent parking aisle. Excluding the small parking spaces provided in the tandem arrangement, the proportion of small parking spaces within the resident parking areas reduces 14.6%.

Given the desire to maximise efficiency, 6 out of the 84 parking spaces within the visitor parking area have been provided as small parking spaces. Whilst this provision equates to 7.1% of the overall visitor parking provision, it is considered suitable based on the dominant shift towards usage/ownership of vehicles in inner city areas; given both the cost savings from the vehicles being more economical to run in a city environment and also that they are easier to drive and park in inner city areas.

4.3.4 Car Park Design

4.3.4.1 Introduction

BCC's TAPS PSP is adopted as the design standard for parking areas in developments under the assessment of EDQ.

4.3.4.2 Internal Circulation – Ramp Design

The ramp facilitating vehicular access to the parking areas at podium level is provided as a modified circular ramp. The ramp is comprised of two short east-to-west straight sections (measuring 6.7m between kerbs) which are connected via two semicircle sections. As per the requirements outlined in AS2890.1:2004: Part 1: Off-Street Car Parking (AS2890.1), a minimum 0.3m wide kerb is provided on the inside of the ramp and 0.5m wide kerb is provided on the outside of the ramp.

Drawing No. 21BRT0771-01 (included in Appendix C) demonstrates (using Autotrack software) that a minimum clearance of 0.9m is provided circulating vehicles on the ramp (i.e. an Australian Standard B99 design vehicle on the inside and an Australian Standard B85 design vehicle on the outside), which satisfies the requirements outlined in AS2890.1.

Typical manoeuvring to/from the parking spaces provided adjacent to the circulation road/ramp/aisle at podium levels 2 and 3 is demonstrated (using Autotrack software) on Drawing No. 21BRT0771-03 (3 of 3) included in Appendix C. Given that vehicular speed within the parking areas will be restricted to 10kph it is anticipated that any potential road safety issues due to conflict between circulating traffic and vehicles manoeuvring to/from these parking spaces will be negligible. The level of circulating traffic at this location at podium level 2 is estimated to be in the order of 27vph (or 1 vehicle every 2-3 minutes) whereas at podium level 3 it is estimated to be 14vph (or 1 vehicle every 4-5 minutes). It should be noted that these estimates for circulating traffic at podium levels 2 and 3 are based on the number of parking spaces provided at the upper podium levels (i.e. 180 parking spaces above podium level 2 and 91 parking spaces above podium level 3) and the application of a traffic generation rate of 0.15vph/space in the weekday AM peak-hour as sourced from the Transport Maritime & Roads Service (TMRS) Guide to Traffic Generating Developments – Updated Traffic Surveys.

Based on the estimated levels of circulating traffic at these locations at podium levels 2 and 3, it is anticipated that potential for conflict will be minimal. Whilst the gradients provided on the inside and outside of the circulation ramp at these locations, which vary between 1:7 (14.3%) and 1:11 (9.1%), are quite gentle when compared to the maximum gradient of 1:6 (16.7%) permitted under BCC's TAPS PSP, as shown on Drawing No. 21BRT0771-03 (3 of 3) to enhance driver to driver visibility it is intended that the parking spaces provided on the inside of the circulation road/ramp/aisle will be signed as "REVERSE-IN" only. As a supplementary measure it is intended that "WATCH FOR TRAFFIC ENTERING" signage and convex mirrors will be installed.

4.3.4.3 Set Down Area

A set down area for taxi's and rideshare vehicles is also provided at ground level. The set down area has been designed to accommodate two vehicles with the first space designed in accordance with the requirements outlined in AS2890.6:2022: Part 6: Off-Street Car Parking for People with Disabilities (AS2890.6) in order to address equitable access.

Drawing No. 21BRT0771-02 (included in Appendix C) demonstrates (using Autotrack software) that the design of the set down area is adequate to facilitate an Australian Standard B99 design vehicle.

In order to mitigate conflict at the exit from the set down area and at the interface between the portal ramp and the one-way circulation road (facilitating vehicular egress from the basement and podium parking areas within the Rivello Building and the ground level parking area within Gallery House) modifications are proposed to the existing line marking to improve intervisibility between vehicles.

4.3.4.4 Car Park Layout

Table 4.3 identifies the characteristics of the proposed parking areas with respect to BCC's TAPS PSP requirements. The last column identifies the compliance of each design aspect. Where compliance with BCC's TAPS PSP is not achieved, further information is provided below.

Table 4.3: Parking Design Requirements

Design Aspect	TAPS PSP Requirement	Proposed Provision	Compliance
Parking space length:			
• General bay	5.4m (min)	5.4m	TAPS PSP Compliant
• PWD bay	5.4m (min)	5.4m	TAPS PSP Compliant
• Small car bay	5.0m (min)	5.0m	TAPS PSP Compliant
• Tandem bay	10.8m (min)	10.4-10.8m	Performance Solution
• Parallel bay	5.4-7.2m (min)	5.4-7.3m	Performance Solution
• Motorcycle bay	2.5m (min)	2.5m	TAPS PSP Compliant
Parking space width:			
• Resident bay	2.6m (min)	2.4m	Performance Solution
• Visitor bay	2.6m (min)	2.4m	Performance Solution
• Retail bay	2.6m(min)	2.6m	TAPS PSP Compliant
• PWD bay	2.4m (plus 2.4m 'shared space')	2.4m (plus 2.4m 'shared space')	TAPS PSP Compliant
• Small car bay	2.3m (min)	2.3m	TAPS PSP Compliant
• Parallel bay	2.4m (min)	2.1m	Performance Solution
• Motorcycle bay	1.35m (min)	1.2m	TAPS PSP Compliant
Parking envelope clearance – Column adjacent to bay	Located between 0.8m and 1.8m of aisle	Generally, located between 0.75m and 1.75m of aisle *	Performance Solution
Parking envelope clearance – space adjacent to wall	Spaces 0.3m clear of wall	Generally, spaces 0.3m clear of wall **	TAPS PSP Compliant
Aisle Width:			
• Parking aisle	6.2m (min)	6.2m	TAPS PSP Compliant
• Circulation aisle / ramp (one-way, one-lane, <20m long)	3.0m (min) plus kerbs	4.0m plus kerbs	TAPS PSP Compliant
• Circulation aisle / ramp (two-way, one-lane, <25vph)	5.0m (min) plus kerbs	5.9-6.2m plus kerbs	TAPS PSP Compliant
• Circulation aisle / ramp (two-way, one-lane, <100vph)	6.2m (min), plus kerbs	6.2-7.5m, plus kerbs	TAPS PSP Compliant
Parking Aisle Extension	2m beyond last bay or 8.0m aisle width	Varies	Performance Solution
Maximum Gradient:			
• PWD parking	1:40 (2.5%)	Flat	TAPS PSP Compliant
• Parking bay	1:14 (7.1%)	1:22 (4.5%)	TAPS PSP Compliant
• Parking aisle	1:14 (7.1%)	1:20 (5%)	TAPS PSP Compliant
• Ramp	1:6 (16.7%)	1:6 (20%)	TAPS PSP Compliant
Maximum Change in Grade	1:12 (8.3%) summit & sag	1:10 (10%) summit & sag	Performance Solution
Height Clearance			
• General Min.	2.3m	2.3m	TAPS PSP Compliant
• Over PWD bay	2.5m	2.5m	TAPS PSP Compliant

*Whilst there are a number of instances of slight column encroachment in the adjacent parking envelopes, it is expected that this will be resolved as part of the detailed design stage.

In general, the proposed design provisions for the parking areas generally comply with the requirements outlined in BCC's TAPS PSP. Whilst the design of the parking areas will be further refined as the project progresses, the following issues will be resolved with performance solutions.

4.3.4.4.1 Length of Tandem Parking Spaces

26 out of 36 tandem parking spaces measure 2.4-2.5m wide x 10.4m long, which is adequate to facilitate two Australian Standard B85 design vehicles parking 'nose-to-tail' with suitable clearance maintained at the front of the space, between the vehicles and also to the adjacent parking aisle.

4.3.4.4.2 Length of Parallel Parking Spaces

The parallel parking spaces measure a minimum of 7.1m long between structure, which satisfies the minimum requirements outlined in AS2890.1. Typical manouevring to/from the parallel parking spaces is demonstrated (using Autotrack software) on Drawing No. 21BRT0771-03 (1 of 3) included in Appendix C.

4.3.4.4.3 Width of Parking Spaces for Residents & Visitors

Inspection of the development plans confirms that the resident parking spaces are 2.4m wide, which have been provided in order to maximise efficiency. It should be noted that the width of the resident parking spaces complies with the requirements set out in AS2890.1 and is considered appropriate for an inner-city apartment building such as this one, where the average size of tenant's cars are likely to be smaller than that owned by the general populace. For instance, as the proposed development comprises largely of smaller studio, 1 and 2-bedroom units from a practical viewpoint it is expected that most residents will own smaller vehicles. As there is little scope for more traditional larger families to reside in these units, the expectation of residents owning larger 'family' sized vehicles (e.g. people movers or 4WDs) will be significantly lower. In short, most residents of this building will be singles or couples, and will generally only own smaller hatchbacks or sedans. The need for loading and unloading of significant numbers of passengers or goods from these vehicles will be lower (i.e. parents not escorting children in/out of vehicles), which is the primary reason as to why Table 16 of BCC's TAPS PSP indicates that 2.6m wide parking bays are necessary for resident parking.

The minimum width of the resident parking spaces provided is also consistent with that provided at developments of a similar scale granted recent approval by EDQ and BCC within the CBD/fringe areas.

The 2.4m wide parking spaces are accessed via parking aisles measuring a minimum of 6.2m wide, which exceeds the 5.8m minimum requirement specified within AS2890.1. It is considered that manoeuvrability to/from the resident (and visitor) parking spaces from the 6.2m wide parking aisles will not be compromised as a result of the provision of the 2.4m wide parking spaces. In addition, given that the parking spaces will be allocated to specific residents, the resident parking areas will generally only be accessed by regular users, all of which who will become familiar with the easiest way to manoeuvre into/out of their parking spaces given the vehicle they own and location of the space.

Whilst the spaces allocated for visitors have also been provided at 2.4m wide it should be noted that this provision has again been dictated by the desire to maximise efficiency.

Interestingly, BCC's TAPS PSP does not differentiate between low turnover visitor parking spaces at multiple unit dwelling developments and moderate/high turnover car parking spaces at suburban shops. It is considered that the required door opening for visitors is significantly less than that for customers at suburban shops. Given that the visitor parking spaces are relatively low turnover and only utilised for short discrete periods during the week it is considered that the provision of 2.4m wide parking spaces is an acceptable outcome.

4.3.4.4.4 Width of Parallel Parking Spaces

The parallel parking spaces measure a minimum of 2.1m wide, which satisfies the minimum requirements outlined in AS2890.1. It should be noted that additional clearance (varying between 0.4-1m) is provided to the adjacent structure. Typical manouevring to/from the parallel parking spaces is demonstrated (using Autotrack software) on Drawing No. 21BRT0771-03 (1 of 2) included in Appendix C.

4.3.4.4.5 Width of Motorcycle Spaces

The 1.2m width provided for the motorcycle spaces is a negligible reduction on the 1.35m requirement under BCC's TAPS PSP, and is compliant with the provisions set out in AS2890.1.

4.3.4.4.6 Location of Columns

BCC's TAPS PSP specifies that columns should be located at least 0.8m away from the parking aisle and no further than 1.8m from the parking aisle. The development plans includes for columns located 0.75m away from the parking aisle. Empirical testing has confirmed that the 0.05m difference in column locations will not impact manoeuvrability to/from adjacent parking spaces given the provision of the 6.2m wide parking aisle. Furthermore, a 0.75m column setback from the parking aisle is compliant with the provisions outlined in AS2890.1.

4.3.4.4.7 Parking Aisle Extension

Inspection of the development plans confirms that the blind aisle extensions and/or widening provided adjacent to the end car parking spaces throughout the parking areas do not strictly comply with the requirements set out in BCC's TAPS PSP.

Typical manoeuvrability to/from the end car parking spaces, using Autotrack software, is demonstrated on Drawing No. 21BRT0771-03 (1 of 3 and 2 of 3) included in Appendix C.

4.3.4.4.8 Ramp Gradients & Transitions

BCC's TAPS PSP specifies that at any change in grade does not exceed 1:12 (8.3%). Maximum transitions of 1:10 (10%) are provided on the ramp facilitating vehicular access to the parking areas at podium level, which satisfy the requirements outlined in AS2890.1 and is comparable to that accepted by EDQ for the ramps within the basement and podium parking areas serving Gallery House and the Rivello Building. Empirical testing has confirmed that the provision of 1:10 (10%) transitions as being adequate to prevent ground clearance issues (i.e. scraping/bottoming out) for both Australian Standard B99 and B85 design vehicles.

4.3.4.5 Summary

Based on the information provided above, TTM considers the layout of the parking areas acceptable through compliance with a combination of design aspects from BCC's TAPS PSP and AS2890.1.

4.4 Conclusion

Overall, the proposed parking arrangements are considered suitable.

5 Service Vehicle Arrangements

5.1 Introduction

The Northshore Hamilton Priority Development Area Development Scheme (Amendment No. 1, October 2022) provides no commentary regarding the number of service bays required for any particular development. As such, TTM has referred to the requirements outlined in BCC's TAPS PSP.

5.1.1 TAPS PSP Requirements

BCC's TAPS PSP specifies the following requirements in terms of access/design vehicles for the respective land- uses.

5.1.1.1 Multiple Dwelling Uses

- Regular access for an RCV; &
- Occasional access for an LRV.

5.1.1.2 Food and Drink Outlet/Shop

- Regular access for a Van; &
- Occasional access for an RCV.

5.1.1.3 Office (Co-Working Space)

- Regular access for a small rigid vehicle (SRV); &
- Occasional access for an RCV.

5.1.1.4 Indoor Sport and Recreation (Gymnasium)

- Regular and occasional access for an RCV.

5.1.2 Practical Demands

5.1.2.1 Multiple Dwelling Use

The primary servicing demand generated by multiple dwelling type developments is furniture delivery vehicles. As the proposed development comprises largely of smaller studio, 1 and 2-bedroom units from a practical viewpoint, the majority of furniture delivery vehicles requiring access to the site will be much smaller than the LRV design vehicle required under BCC's TAPS PSP. Guidance from furniture removalist companies indicates that such sized units typically require removal of 10-20m³ of furniture. This volume of furniture can be accommodated within delivery vehicles representative of a small rigid (storage capacities typically up to 20m³) or as a worst case a medium rigid (storage capacity up to 35m³). Furthermore, given that the proposed development is a BTR scheme, all of the units will be occupied by renters. Such residents

typically undertake removals themselves using Utes, Vans and SRVs. For reference also, drivers holding an Open C class licence are also only allowed to rent trucks up to the size of an SRV.

Notwithstanding the above, consistent with BCC's TAPS PSP allowance has been made for an LRV to be able to occasionally service the proposed development.

5.1.2.2 Shop/Food & Drink Outlet

Given that the shop/food & drink outlet land-use will comprise a small café tenancy and dog grooming business, it is considered that most regular vehicles servicing these premises will be those delivering stock, equipment and consumables (typically by Vans or SRVs).

5.1.2.3 Office (Co-Working Space)

Service vehicle demands for office land-uses typically include deliveries of stock, equipment and consumables (typically by Vans or SRVs). Given the scale of office land-uses, it is expected that these vehicles will likely access the site a number of times per week.

5.1.2.4 Indoor Sport & Recreation (Gymnasium)

Service vehicle demands for the gymnasium will typically include regular courier deliveries and maintenance vehicles (typically Vans). These vehicles are likely to access the site a number of times per week.

5.1.2.5 Refuse Collection

Whilst it is understood that refuse generated by multiple unit dwelling development land-uses are typically collected by Waste & Resource Recovery Services (WaRRS), with the management structure associated with a BTR style development, it is expected that it would be acceptable for a private refuse contractor to undertake all refuse collection at the proposed development.

Private refuse contractors have a range of vehicles and bin options, however, it is noted that most contractors can service inner-city developments with rear-loading vehicles the same size, if not smaller, than the WaRRS RCVs.

Using a private refuse contractor provides the ability to schedule refuse collection for the multiple dwelling development land-uses at a time that minimises conflicts with other deliveries, hence ensuring safe and efficient operation of the service vehicle area.

5.1.2.6 Summary

Based on the above uses, it is expected that the development will generate regular Van/SRV and RCV service vehicle demands, and occasional LRV service vehicle demands.

5.2 Proposed Service Vehicle Arrangements

5.2.1 Service Vehicle Provisions

As illustrated on the development plans included in Appendix B, it is proposed that 2 service vehicle bays will be provided on-site, including:

- 2 x RCV/LRV bays

The service vehicle provisions satisfy the requirements outlined in BCC's TAPS PSP.

5.2.2 Design for Service Vehicles

The dimensions of the service vehicle bays (i.e. 3.5m wide x 11m long) satisfy the requirements outlined in BCC's TAPS PSP.

The service vehicle areas are generally flat, which satisfies the requirements outlined in BCC's TAPS PSP.

The height clearance over the service vehicle bays (and any associated manoeuvring areas) is a minimum of 4.5m, which satisfies the requirements outlined in BCC's TAPS PSP.

Overall, the design of the service vehicle areas is considered acceptable.

5.2.3 Vehicle Manoeuvrability

Detailed swept path analysis (using Autotrack software) demonstrating manoeuvring to/from the service vehicle bays is shown on Drawing No. 21BRT0771-04 included in Appendix C.

Given the location of the bin storage area on the service laneway for the shop/food & drink outlet land-uses within the established Portside Wharf precinct, service vehicle access to the proposed development (especially by LRVs) will need to be managed so as not to coincide with refuse collection. It should be noted that this already the case for the existing service vehicle area on the opposite side of the service laneway.

For multiple unit dwelling type developments, it is possible to manage access for furniture removalist companies whereby the building manager allocates a specific time period to the tenants to lock off a lift and use the service vehicle bay/s. Consequently, it is expected that service vehicle access (especially by LRVs) can be adequately managed so as not to coincide with refuse collection.

5.3 Conclusion

Overall, TTM consider the proposed servicing arrangements acceptable.

6 Active Transport

6.1 Pedestrian Access

Pedestrian access to the site will be facilitated via MacArthur Avenue and Wharf Street.

The north-south cross-block links through the lobby and along the service laneway align with that indicated in Map 4 of the Northshore Hamilton Priority Development Area Development Scheme (Amendment No. 1, October 2022).

The service laneway being be converted to a shared space was considered, however, given the prevalence of service vehicles and front-lift RCVs using the service laneway (especially when undertaking refuse collection at the shop/food & drink outlet land-uses within the established Portside Wharf precinct), this arrangement is not considered appropriate in this instance. Instead, the north-south cross-block link running parallel to the service laneway has been widened with bollards provided its length to afford pedestrian additional protection at this location. It is proposed that threshold treatment will be provided at the access to the service vehicle area (for the proposed development) in order to notify users of the potential conflict. Signage (and additional traffic control devices) to mitigate potential conflict along the service laneway will be investigated during the detailed design stage. Whilst this north-south cross-block link running parallel to the service laneway has been identified by EDQ in Map 4 of the Northshore Hamilton Priority Development Area Development Scheme (Amendment No. 1, October 2022, given the form of the adjacent road network and anticipated routing, it is not expected that significant pedestrian demand at this location will materialise.

The suitability of the cross-block links is discussed extensively in the Town Planning Report prepared by the Saunders Havill Group.

6.2 Bicycle Parking Arrangements

6.2.1 Bicycle Parking Supply

BCC's TAPS PSP is adopted as a guide for bicycle provisions for developments under the assessment of EDQ.

A summary of the bicycle parking requirements for the proposed development (in line with Table 21 of BCC's TAPS PSP) is provided in Table 6.1.

Table 6.1: Bicycle Parking Requirements

Land-Use	TAPS PSP Requirements	Extent	Requirement
Multiple Unit Dwelling (MUD): – Residents – Visitors	 1 bicycle space per unit 0.25 bicycle space per unit	 560 units 560 units	 560 bicycle spaces 140 bicycle spaces
Total			700 bicycle spaces

The bicycle parking provisions for the proposed development are summarized as follows:

- 586 bicycle parking spaces for residents; &
- 54 bicycle parking spaces for visitors.

Whilst the bicycle parking supply for residents adequately satisfies the requirements outlined in BCC's TAPS PSP, the bicycle parking supply for visitors has been provided in accordance with the requirements outlined in Austroads Guide to Traffic Management Part 11: Parking Management Techniques (AGTM – Part 11), which is considered more appropriate based on expected demand. AGTM – Part 11 specifies that bicycle parking for visitors should be provided at a rate of either 1 space per 16 habitable rooms or 1 space per 12 flats (units), which would necessitate the provision of between 47 and 54 bicycle parking spaces for visitors. It should be noted that the bicycle parking supply for visitors is comparable to that "agreed in principle" with BCC for the BTR facility currently being assessed at 44 Ipswich Road, Woolloongabba (BCC Ref: A006150645).

The bicycle parking provisions are considered suitable to cater for expected demand.

6.2.2 Design of Bicycle Parking Areas

The design of the bicycle parking areas generally satisfies the requirements outlined in AS2890.3:2015: Part 3: Bicycle Parking (AS2890.3). In order to maximise efficiency within the bicycle storage area for residents at ground level, it is necessary for the Cora E3DT-GP multi-tiered bicycle rack (specifications included in Appendix D) to be installed.

6.3 Conclusion

Overall, TTM consider the proposed active transport arrangements acceptable.

7 Development Traffic Impacts

It is understood that traffic modelling was undertaken by Cardno on the behalf of EDQ, which has informed road planning and the extent of road (and intersection) upgrades within the wider Northshore Hamilton precinct. It is TTM's understanding that the scale of the proposed development (inclusive of the number of units) is consistent with EDQ's expectations for the subject site. Furthermore, the quantum of parking provided for the proposed development is significantly less than the maximum permitted by EDQ (i.e. 1,218 parking spaces). On this basis, no additional traffic analysis is considered necessary.

8 Summary and Conclusions

8.1 Site Access Arrangements

Given that the existing driveway crossovers on Wharf Street and MacArthur Avenue have been operation for many years and were previously approved by EDQ (to facilitate vehicular access to a comparable number of parking spaces), it is not considered necessary to reassess the suitability of the access arrangements. The queueing capacity provided on the portal ramp is considered sufficient to cater for the estimated traffic generation and will not result in queuing extending back onto the adjacent road network.

The proposed access arrangements are considered suitable.

8.2 Parking Arrangements

Based on the target market for the proposed development, combined with the ongoing management of the building (including the parking spaces which will be de-coupled from the apartments) and the implementation of a comprehensive SGTP, it is concluded that the proposed resident parking supply is suitable, which will subsequently reduce the reliance on the use of private vehicles and resulting parking demand.

TTM considers the layout of the parking areas acceptable through compliance with a combination of design aspects from BCC's TAPS PSP and AS2890.1.

The proposed parking arrangements are considered suitable.

8.3 Service Vehicle Arrangements

TTM considers that the proposed service vehicle arrangements suitable.

8.4 Active Transport

The north-south cross-block links through the lobby and along the service laneway align with that indicated in Map 4 of the Northshore Hamilton Priority Development Area Development Scheme (Amendment No. 1, October 2022).

Whilst the bicycle parking supply for residents adequately satisfies the requirements outlined in BCC's TAPS PSP, the bicycle parking supply for visitors has been provided in accordance with the requirements outlined AGTM – Part 11. The bicycle parking provisions are considered suitable to cater for expected demand.

The design of the bicycle parking areas generally satisfies the requirements outlined in AS2890.3.

The proposed active transport arrangements are considered suitable.

8.5 Development Traffic Impacts

It is understood that traffic modelling was undertaken by Cardno on the behalf of EDQ, which has informed road planning and the extent of road (and intersection) upgrades within the wider Northshore Hamilton precinct. It is TTM's understanding that the scale of the proposed development (inclusive of the number of units) is consistent with EDQ's expectations for the subject site. Furthermore, the quantum of parking provided for the proposed development is significantly less than the maximum permitted by EDQ. On this basis, no additional traffic analysis is considered necessary.

8.6 Conclusion

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

Appendix A TTM Response to EDQ's RFI

28 July 2023
Our Ref: 20BRT0771
Your Ref: DEV2023/1402

Attention: Michael Stanfield

Brookfield Residential Properties
Level 1, Flare Building, 39 Hercules Street,
Hamilton, QLD, 4007

Dear Michael,

RE: Proposed Mixed-Use Development at 11-23 MacArthur Avenue, Hamilton – Response to Request for Information

TTM Consulting Pty Ltd (TTM) has been engaged to prepare a response to the items relating to traffic engineering raised in Economic Development Queensland's (EDQ's) Further Issues correspondence dated 27 June 2023. This RFI relates to a development application supporting a proposed mixed-use development at 11-23 MacArthur Avenue, Hamilton.

The items relating to traffic engineering raised by EDQ, and TTM's subsequent responses, are outlined as follows:

8. *A review of the Traffic Engineering Report, dated 11 May 2023 and prepared by TTM Consulting has identified the following issues for further clarification:*
   a) *Section 2.3.2.3 of the report indicated that additional pedestrian and cyclist connections will be provided in the vicinity of the subject site. Demonstrate how the development will comply with the pedestrian pathways and cross block links requirements in accordance with Map 4: Active Transport of the PDA Scheme.*

   TTM Response:

   The north-south cross-block links through the lobby and along the service laneway align with that indicated in Map 4 of the Northshore Hamilton Priority Development Area Development Scheme (Amendment No. 1, October 2022).

   The suitability of the cross-block links is discussed extensively in the town planning response prepared by the Saunders Havill Group. For ease of reference, extracts from the town planning response are provided below.

"In order to further strength the 'arrival experience' as well as the 'travelling experience' of the north-south pedestrian spine, the following changes have been made:

- *Entrance to the north plaza at the site's boundary has been widened by approx. 1.5m;*
- *The ramp has been adjusted such that it 'lands' in the north entry plaza for a more direct/equitable experience;*
- *The pavement treatment, which defines the north-south link has been widened/strengthened in its expression;*
- *The entry to and the continuation of the north-south spine occurs between the natural rhythm of columns;*
- *Building entries (door openings) have been widened to approx. 5.0m to provide for larger more accessible entrances; and*
- *Some minor adjustment to furniture placement has been made to ensure there is a min. 5.0m clear path of travel through the building.*

It is also important to recognise that:

- *The lobby through which the north-south link travels is voluminous – being double height for a width of approx. 18m;*
- *There is a minimum 5.0m unimpeded path of travel;*
- *The path of travel within the building is less than 30m in length;*
- *Extensive glazing (for a width of approx. 17.0m) is provided at the north and south ends of the link, providing a clear line of sight from the northern plaza to the southern plaza; and*
- *The curvilinear planted podium above, as well as the break in the towers, also accentuates the building's arrival point and north-south link.*

Lighting, ceiling treatments and surfaces/finishes will be resolved at the detailed design stage of development.

The mix and arrangement of 'active' uses at the ground and mezzanine levels is important to create a sense of community and use of the spaces is encouraged. Whilst it is intended to invite persons into the building and through the building to create a sense of activity/community, it is also important to balance this with building security and weather protection.

The following renders, prepared by Fender Katsalidis, illustrate the northern arrival experience of the building:

Figure 1 - North plaza and building entrance (Render by Fender Katsalidis)

Figure 2 - Northern building entry (Render by Fender Katsalidis)

Overall - we believe that the amendments made result in an improved arrival and through-experience, whilst appropriate balancing building security and other considerations.

<u>Service laneway to the west:</u>

The ability to enhance/change the laneway to the west of the main site is limited by tenure considerations as well as servicing constraints, however the amended plans include a proposed applied graphic pattern to the pavement to provide greater legibility and create a sense of a shared-use space, as shown on the following render and ground floor plan extract –

Figure 3 - Render of western laneway (Fender Katsalidis)

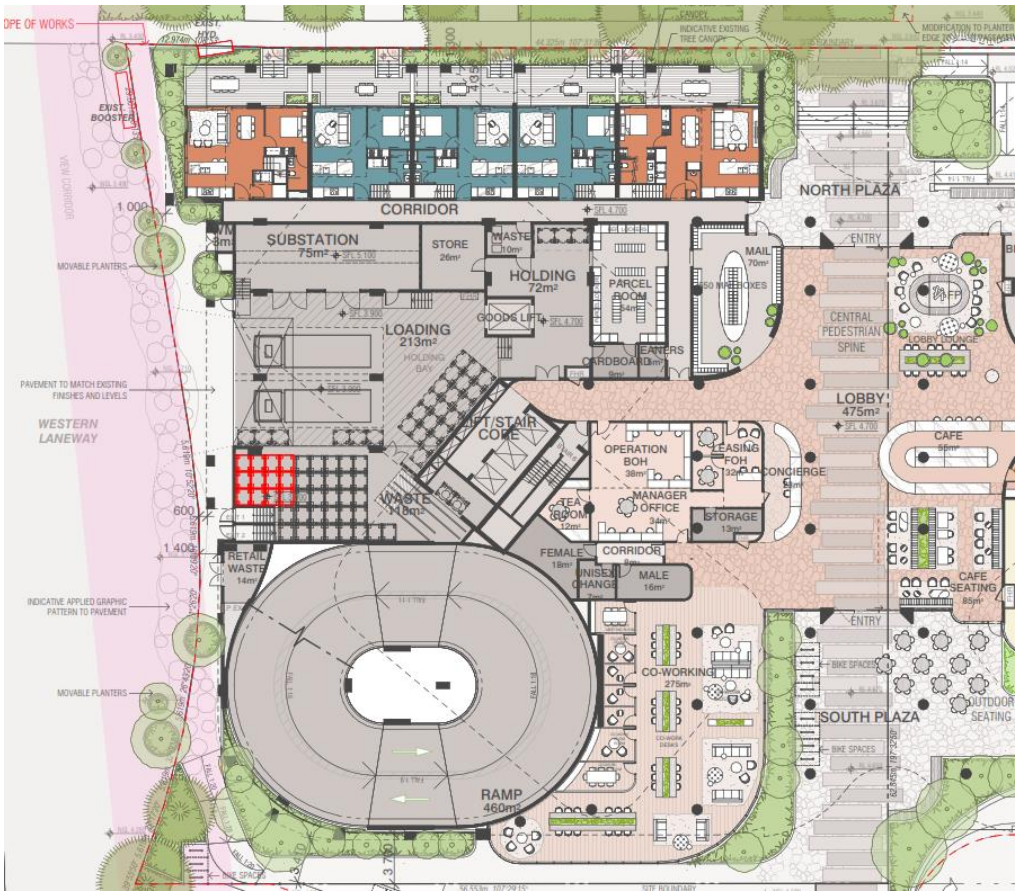

Figure 4 - Ground floor plan extract - showing indicative applied graphic pattern to pavement

EDQ are reminded that a number of changes were made during the pre-application stage to ensure that the laneway as a shared-use space could be adequately overlooked to create a safe pedestrian environment. Units sleeve the car park at western elevation of the building at L2 to L4 and there are also opportunities for overlooking from Flare on the western side of the laneway as well as from Gallery House to the south. The apartments on the northern side of Macarthur Avenue also have a direct line of site to the laneway.

Lighting will be resolved as part of the detail design stage of development but can also be used effectively to enhance the use of the laneway as a shared-use space".

b) ***Section 3.1 of the report indicated that reassess the suitability of the access arrangements is not deemed required, as the existing driveway crossovers on Wharf Street and MacArthur Avenue have***

been in operation for many years and were previously approved by EDQ (to facilitate vehicular access to a comparable number of parking spaces). Submit a swept path analysis to demonstrate that the existing and the proposed driveway crossovers are suitable for the operation of the largest design vehicle.

TTM Response:

Vehicular access to the basement and podium parking areas will be achieved via the existing portal ramp branching from the existing driveway crossover on Wharf Street.

Vehicular access vehicular access to the set down area will be achieved via the one-way internal circulation roads branching from the existing driveway crossover on Wharf Street.

Vehicular access to the service vehicle area will be achieved via the existing servicing aisle branching from the existing driveway crossover on MacArthur Avenue.

Drawing No.'s 21BRT0771-02 and 04 included as **Attachment 1** demonstrate (using Autotrack) that the existing access arrangements on Wharf Street and MacArthur Avenue, which have been previously approved by EDQ and have been operation for many years, are suitable to facilitate vehicular access by the nominated design vehicles.

In order to mitigate conflict at the exit from the set down area and at the interface between the portal ramp and the one-way circulation road (facilitating vehicular egress from the basement and podium parking areas within the Rivello Building and the ground level parking area within Gallery House) modifications are proposed to the existing line marking to improve intervisibility between vehicles. Furthermore, the one-way circulation road adjacent to the set down area has been widened to allow for improved circulationby the nominated design vehicles.

c) *As per the required parking rates stated in Schedule 2 of the Northshore Hamilton PDA Development Scheme, minimum 516 residential parking (including 84 visitors and 12 PWD) is required, while Table 4.1 of the traffic engineering report presented 504 spaces. Contrary to the required spaces, 411 residential parking spaces (including 81 visitor and 16 PWD) are proposed. It is noted that no shared parking or motorcycle parking requirements are exclusively stated in the Development Scheme, but 16 shared parking and 65 motorcycle parking (45 for residents and 20 for visitors) are proposed and these numbers are also deducted from the required total number of parking calculations. Further, the 9 car parking spaces are proposed for the commercial land-uses components, contrary to the required 16 spaces.*

TTM Response:

For ease of reference, Table 4.1 of the Traffic Engineering Report dated 5 May 2023 is replicated in Table 1 below.

Table 1: Parking Supply Requirement

Land-Use	EDQ Requirement	Extent	Requirement	Provision
Multiple Unit Dwellings (MUD): – Studio, 1 bedroom 2 bedroom & 3 bedroom	0.75 (min) – 2 (max) spaces/unit	560 units	420 spaces (min) – 1,120 spaces (max)	327 parking spaces (including 13 PWD parking), 16 car share parking spaces and 45 motorcycle spaces
– Visitor	0.15 spaces/unit		84 spaces	84 spaces (including 3 PWD spaces) & 20 motorcycle spaces
Sub-Total			**504 spaces (min) – 1,204 spaces (max)**	**411 parking spaces (including 16 PWD parking spaces), 16 car share parking spaces and 65 motorcycle spaces**
Shop/Food & Drink Outlet & Office	2 spaces/100m² (max)	417m²	0 spaces (min) - 8 spaces (max)	9 parking spaces
Indoor Sport & Recreation	1 space/100m² (max) **	639m²	0 spaces (min) - 6 spaces (max)	
Sub-Total			**0 spaces (min) - 14 spaces (max)**	**9 parking spaces**
Total			504 spaces (min) -1,218 spaces (max)	420 parking spaces (including 16 PWD parking spaces), 16 car share parking spaces and 65 motorcycle spaces

*Subject to a maximum rate of 1 space per 100m² as per BCC's TAPS PSP for the 'City Frame'.

The discrepancy in the number of parking spaces required (i.e. 516 parking spaces as specified by EDQ compared to the 504 parking spaces indicated by TTM) relates to the fact that the proposed development comprises a Build-To-Rent (BTR) residential building where the parking spaces will be de-coupled from the units. Consequently, the parking spaces can be allocated to tenants on an as needs basis taking into consideration any disabilities they may have. Consequently, whilst PWD parking for residents is provided in accordance with EDQ's requirements (i.e. at a rate of 0.02 PWD parking spaces per unit) it is not provided in addition to the standard resident parking supply.

Given that a single entity will have ongoing control over both the leasing of the units within the BTR facility and the allocation of resident parking spaces this provides a unique opportunity to manage parking supply (inclusive of PWD parking) more effectively.

Given that maximum parking rates are outlined in the Northshore Hamilton Priority Development Area Development Scheme (Amendment No. 1, October 2022) for the non-residential land-uses (i.e. a maximum of 2 spaces per 100m² for the Shop/Food & Drink Outlet & Office land-uses and a maximum of 1 space per 100m² for the indoor recreation land-use as per Brisbane City Council's (BCC's) requirements for the 'City Frame' outlined in the Transport, Access, Parking & Servicing Planning Scheme Policy (TAPS PSP)), there is no minimum parking requirement for these land-uses and the extent of parking provided (up to the maximum permitted) is at the applicant's discretion.

The suitability of the resident parking supply is discussed in further detail below.

Action Required:

- ***Provide justification as to why the shared parking and motorcycle parking are considered in the total parking number calculation.***

  TTM Response:

  As per Table 1 above, the car share facility and the motorcycle parking spaces have not been included in the "total parking number calculation".

  As outlined in the Traffic Engineering Report dated 5 May 2023, the car share facility and the motorcycle parking spaces are just some of the measures of the Sustainable Green Travel Plan (SGTP) to be implemented at the facility with the aim of installing a culture that encourages tenants to adopt sustainable travel choices and to offset the shortfall in the resident parking supply.

The implementation of the SGTP will be a key aspect of the ongoing management and operation of the proposed development.

The key objectives of the SGTP (which will be developed during the detailed design stage) include:

- Actively promote alternative modes of travel such as public transport, cycling, walking and car sharing for residents;
- Reducing the dependency on travel by private cars which subsequently reduces greenhouse gas emissions and congestion on the surrounding road network;
- Manage parking supply to ensure parking demand does not exceed supply; &
- Improve opportunities for those without access to a car.

The SGTP to be prepared will consist of a package of measures to be implemented and is considered as a dynamic document to be monitored on an on-going basis. The measures which will be considered for the proposed development include:

Car Share Scheme

A car share scheme with a minimum of 16 vehicles provided of varying types to suit user's needs. The provision of the car share scheme is considered a significant benefit in attracting tenants that do not own a car but do require a car for incidental trips e.g. recreational trip to the Gold Coast on the weekend. The provision of a car share scheme is a common feature of BTR facilities with mobile applications often developed to manage the booking process for residents.

It is intended that the 16 car share parking spaces will offset the shortfall in the resident parking supply identified in Table 1 (i.e. 93 parking spaces) with each car share space accounting for a 6 parking space reduction in the resident parking supply. This allowance has been previously accepted by EDQ and BCC for other multiple unit dwelling developments (e.g. at 20 Walsh Street, Milton (BCC Ref: A004922533) BCC accepted that a shortfall of 30 parking spaces for residents could be offset by the provision of a car share scheme containing 5 vehicles). This is much lower than that accepted in other major urban centres around Australia. For instance, the Land & Environmental Court of NSW previously accepted that each car share scheme can replace between 10 and 12 private vehicles in multiple unit dwelling developments.

Bicycle Parking

Bicycle parking for residents will be provided in excess of EDQ's requirements (as outlined in BCC's TAPS PSP).

It is intended that a bicycle mechanic will attend the site on a regular basis in order to undertake maintenance.

Motorcycle Parking

45 motorcycle spaces for residents will be provided.

Public Transport Accessibility

The building will incorporate "real time" information in relation to the public transport services available in close proximity to the site, including the future Gold CityGlider and CityCat (Bretts Wharf).

Set Down Area

A set down area for taxi's and rideshare vehicles will be provided at ground level.

Welcome Pack

Each resident will be provided with a welcome pack in order to encourage sustainable travel from the outset. The welcome pack will include:

- Public transport information (including maps), explaining what buses and trains operate in the vicinity of the site;
- Walking and cycling maps showing local walking and cycling routes; &
- Information about the SGTP and any other measures (including the car share scheme) provided to support sustainable travel.

Based on the target market for the proposed development, combined with the ongoing management of the facility and the implementation of a comprehensive SGTP, it is concluded that the proposed resident parking supply is suitable, which will subsequently reduce the reliance on the use of private vehicles and resulting parking demand.

— ***Demonstrate on plans/in TTM Report how the carparking spaces provided within the ramp can be safely accessed and can meet the appropriate standards.***

TTM Response:

Typical manoeuvring to/from the parking spaces provided adjacent to the circulation road/ramp/aisle at podium levels 2 and 3 is demonstrated (using Autotrack software) on Drawing No. 21BRT0771-03 (3 of 3) included as **Attachment 2**. Given that vehicular speed within the parking areas will be restricted to 10kph it is anticipated that any potential road safety issues due to conflict between circulating traffic and vehicles manoeuvring to/from these parking spaces will be negligible. The level of circulating traffic at this location at podium level 2 is estimated to be in the order of 27vph (or 1 vehicle every 2-3 minutes) whereas at podium level 3 it is estimated to be 14vph (or 1 vehicle every 4-5 minutes). It should be noted that these estimates for circulating traffic at podium levels 2 and 3 are based on the number of parking spaces provided at the upper podium levels (i.e. 180 parking spaces above podium level 2 and 91 parking spaces above podium level 3) and the application of a traffic generation rate of 0.15vph/space in the weekday AM peak-hour as sourced from the Transport Maritime & Roads Service (TMRS) Guide to Traffic Generating Developments – Updated Traffic Surveys.

Based on the estimated levels of circulating traffic at these locations at podium levels 2 and 3, it is anticipated that potential for conflict will be minimal. Whilst the gradients provided on the inside and outside of the circulation ramp at these locations, which vary between 1:7 (14.3%) and 1:11 (9.1%), are quite gentle when compared to the maximum gradient of 1:6 (16.7%) permitted under BCC's TAPS PSP, as shown on Drawing No. 21BRT0771-03 (3 of 3) to enhance driver to driver visibility it is intended that the parking spaces provided on the inside of the circulation road/ramp/aisle will be signed as "REVERSE-IN" only. As a supplementary measure it is intended that "WATCH FOR TRAFFIC ENTERING" signage and convex mirrors will be installed.

— *Provide reference / guidelines to justify the feasibility in favour of considering all proposed 560 units under BTR.*

TTM Response:

As discussed in the town planning response prepared by the Saunders Havill Group, the BTR facility will be held under single ownership and managed/operated by a single entity. The development is not a mixed tenure project or a traditional market/Build-To-Sell (BTS) product. Whilst the number of units is large, the scale of the facility is still at a level that is comfortable for a single operating entity.

— *Demonstrate if the reduced carparking and any associated management for the residential and*

commercial land uses would be executed by the same or different management entity.

TTM Response:

As outlined previously, given that maximum parking rates are applicable for the non-residential land-uses (i.e. a maximum of 2 spaces per 100m² for the Shop/Food & Drink Outlet & Office land-uses and a maximum of 1 space per 100m² for the indoor recreation land-use as per BCC's requirements for the 'City Frame' outlined in the TAPS PSP), there is no minimum parking requirement for these land-uses and the extent of parking provided (up to the maximum permitted) is at the applicant's discretion.

A single entity will have ongoing control over both the leasing of the units within the BTR facility and the allocation of resident parking spaces, which provides opportunity to manage parking demands more effectively, particularly given the target market. A key aspect of this holistic management of the units and the parking areas is that parking spaces will be de-coupled from the units and leased to tenants on an as needs basis. This arrangement ensures that all parking spaces are effectively utilised, unlike traditional multiple unit dwelling developments with allocated parking. It is not uncommon in multiple unit dwelling developments with allocated parking that a proportion of the residents do not own cars yet have an allocated parking space – which sits vacant.

Whilst there is no shortfall in parking associated with the non-residential land-use, it is expected that the management of the visitor parking spaces (inclusive of those parking spaces allocated to the non-residential land-uses) will also be managed by the same entity as the BTR facility.

— *Any shortfall in parking should be reviewed by a Registered Professional Engineer of Queensland (RPEQ) to confirm the development will not result in overflow parking to surrounding streets and properties.*

TTM Response:

As outlined in the Traffic Engineering Report dated 5 May 2023, a key characteristic of the strategy to reduce the resident parking supply for a BTR project is to ensure that there is limited ability for the residents to create overflow parking onto the adjacent road network. Whilst a significant amount of on-street parking is currently available on MacArthur Avenue to the east of the subject site (including centre-of-road parking), this will be rationalised as part of the urban design upgrades proposed by EDQ. Furthermore, it is anticipated that parking restrictions similar to those already in place along Hercules Street, Harbour Road and Finnegan Street (as illustrated in Figure 1 included as **Attachment 3**) will be introduced along MacArthur Avenue (and the adjoining streets), which will severely limit the ability for resident parking to overflow onto the adjacent road network. It should be noted that the

introduction of these parking restrictions is considered critical given the maximum parking rate applicable for non-residential land-uses within the wider Northshore Hamilton precinct to ensure that adequate short-term on-street parking is available for customers and visitors to these non-residential land-uses.

Assuming that parking restrictions are introduced along MacArthur Avenue (and the adjoining streets) similar to that already in place along Hercules Street, Harbour Road and Finnegan Street; that the operator of the facility is selective in leasing units to potential tenants based on car ownership (i.e. if all the parking spaces are leased, the selection process for new tenants can be filtered in a manner that only attracts tenants without cars); and the measures outlined in the SGTP are successfully implemented, resident parking demand should not result in adverse impacts on the adjacent road network.

The strategies to manage resident parking demand (as outlined in the Traffic Engineering Report dated 5 May 2023) have been endorsed by Brian Camilleri (RPEQ – 7577).

— ***As the transport intent of the development accentuates active and public transport over private vehicle use, it is recommended visitor bicycle parking spaces be maximized where possible.***

TTM Response:

The bicycle parking provisions for the proposed development are summarized as follows:

- 586 bicycle parking spaces for residents; &
- 54 bicycle parking spaces for visitors.

Whilst the bicycle parking supply for residents adequately satisfies the requirements outlined in BCC's TAPS PSP, the bicycle parking supply for visitors has been provided in accordance with the requirements outlined in Austroads Guide to Traffic Management Part 11: Parking Management Techniques (AGTM – Part 11), which is considered more appropriate based on expected demand. AGTM – Part 11 specifies that bicycle parking for visitors should be provided at a rate of either 1 space per 16 habitable rooms or 1 space per 12 flats (units), which would necessitate the provision of between 47 and 54 bicycle parking spaces for visitors. It should be noted that the bicycle parking supply for visitors is comparable to that "agreed in principle" with BCC for the BTR facility currently being assessed at 44 Ipswich Road, Woolloongabba (BCC Ref: A006150645).

The bicycle parking provisions are considered suitable to cater for expected demand.

The bicycle parking spaces for visitors are all provided at ground level and therefore are easily accessible.

It is TTM's assertion that the above adequately addresses the traffic engineering items raised by EDQ.

Should you have any questions in relation to the content of this letter, please contact Andrew Riddles on (07)33279500.

Yours sincerely,

Andrew Riddles
Senior Associate Director

Reviewed:

Brian Camilleri (RPEQ – 7577)
Principal Director
TTM Consulting Pty Ltd

Appendix B Development Plans

BIMcloud: fkaeprdbim01 - BIMcloud/22136 11-23 MacArthur Avenue Hamilton/00 BIM MODELS/SD_TP-DA/CENTRAL MODELS/22136 General

REVISION				REVISION
01	ISSUE FOR DA	PTR	28.04.2023	
02	INFORMATION REQUEST RESPONSE	ND	21.07.2023	
> 03	INFORMATION REQUEST RESPONSE	ND	06.10.2023	

QUALITY ASSURANCE (FK IS A CERTIFIED COMPANY TO ISO 9001-2015)

THIS PROJECT IS SUBJECT TO THE FK QUALITY ASSURANCE SYSTEM

- [x] SCHEMATIC DESIGN REVIEW FOR THIS PROJECT IS COMPLETE. DATE OF REVIEW: 04.05.2023
- [ ] DESIGN DEVELOPMENT REVIEW FOR THIS PROJECT IS YET TO BE COMPLETED.
- [ ] TENDER DOCUMENTATION REVIEW FOR THIS PROJECT IS YET TO BE COMPLETED.
- [ ] CONSTRUCTION DOCUMENTATION REVIEW FOR THIS DRAWING IS YET TO BE COMPLETED.

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PROJECT
11-23 MACARTHUR AVENUE HAMILTON
11-23 MACARTHUR AVENUE
HAMILTON QUEENSLAND 4007

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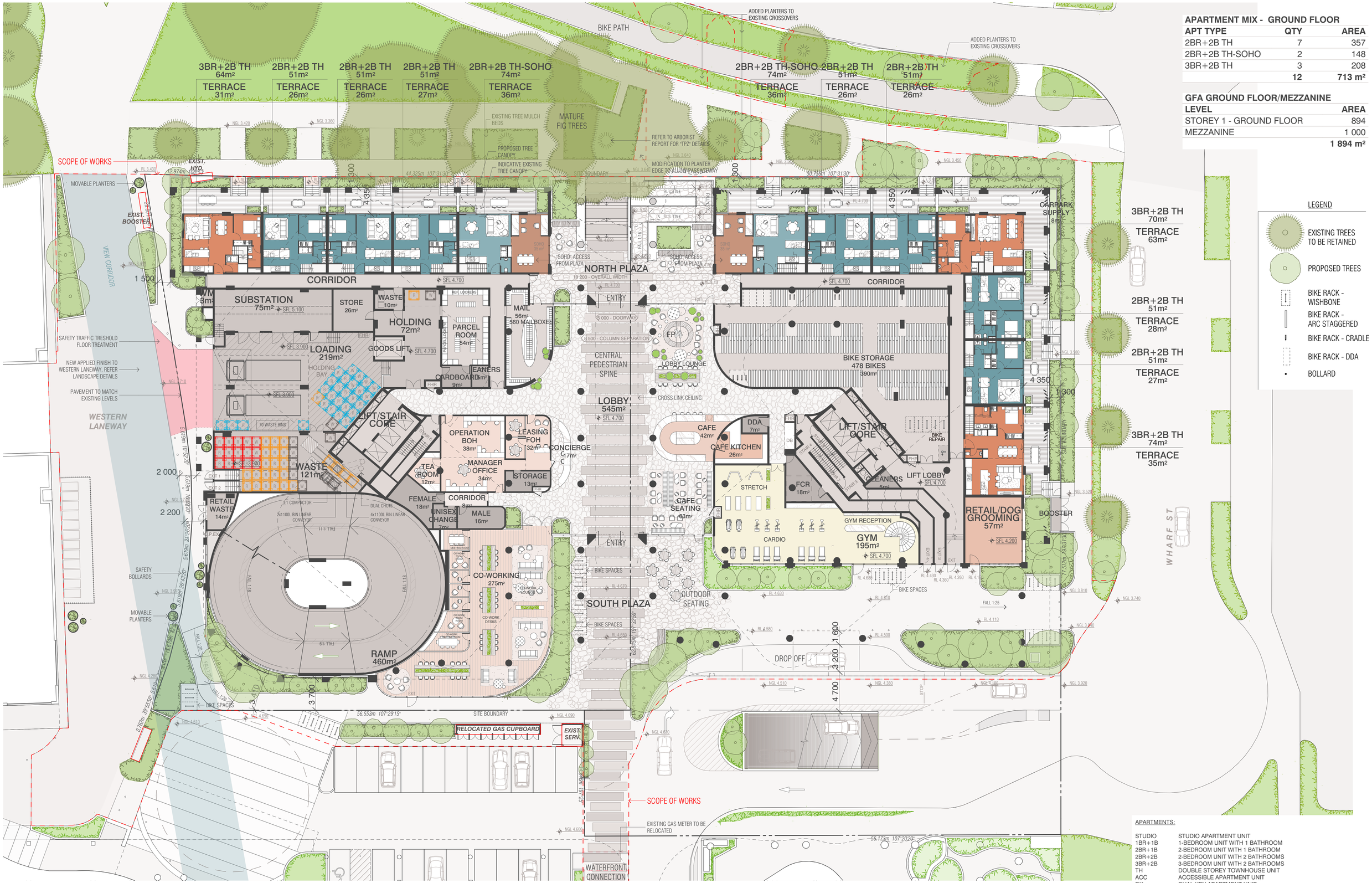
DRAWN	DATE	CHECKED	PLOT DATE	JOB NO.	SCALE	DRAWING TITLE	ISSUE PURPOSE	REV.	DRAWING NO.
PT	06.10.2023	ND	06.10.2023	22136	1:200@A1	BASEMENT FLOOR PLAN	DEVELOPMENT APPLICATION	03	DA0099



APARTMENT MIX - GROUND FLOOR

APT TYPE	QTY	AREA
2BR+2B TH	7	357
2BR+2B TH-SOHO	2	148
3BR+2B TH	3	208
	12	713 m²

GFA GROUND FLOOR/MEZZANINE

LEVEL	AREA
STOREY 1 - GROUND FLOOR	894
MEZZANINE	1 000
	1 894 m²

LEGEND

- EXISTING TREES TO BE RETAINED
- PROPOSED TREES
- BIKE RACK - WISHBONE
- BIKE RACK - ARC STAGGERED
- BIKE RACK - CRADLE
- BIKE RACK - DDA
- BOLLARD

APARTMENTS:

STUDIO	STUDIO APARTMENT UNIT
1BR+1B	1-BEDROOM UNIT WITH 1 BATHROOM
2BR+1B	2-BEDROOM UNIT WITH 1 BATHROOM
2BR+2B	2-BEDROOM UNIT WITH 2 BATHROOMS
3BR+2B	3-BEDROOM UNIT WITH 2 BATHROOMS
TH	DOUBLE STOREY TOWNHOUSE UNIT
ACC	ACCESSIBLE APARTMENT UNIT
DK	DUAL KEY APARTMENT UNIT

BIMcloud: fkaeprdbim01 - BIMcloud/22136 11-23 MacArthur Avenue Hamilton/00 BIM MODELS/SD_TP-DA/CENTRAL MODELS/22136 General

REVISION			REVISION
01	ISSUE FOR DA	PTR	28.04.2023
02	INFORMATION REQUEST RESPONSE	ND	21.07.2023
03	INFORMATION REQUEST RESPONSE	ND	06.10.2023

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PROJECT
11-23 MACARTHUR AVENUE HAMILTON
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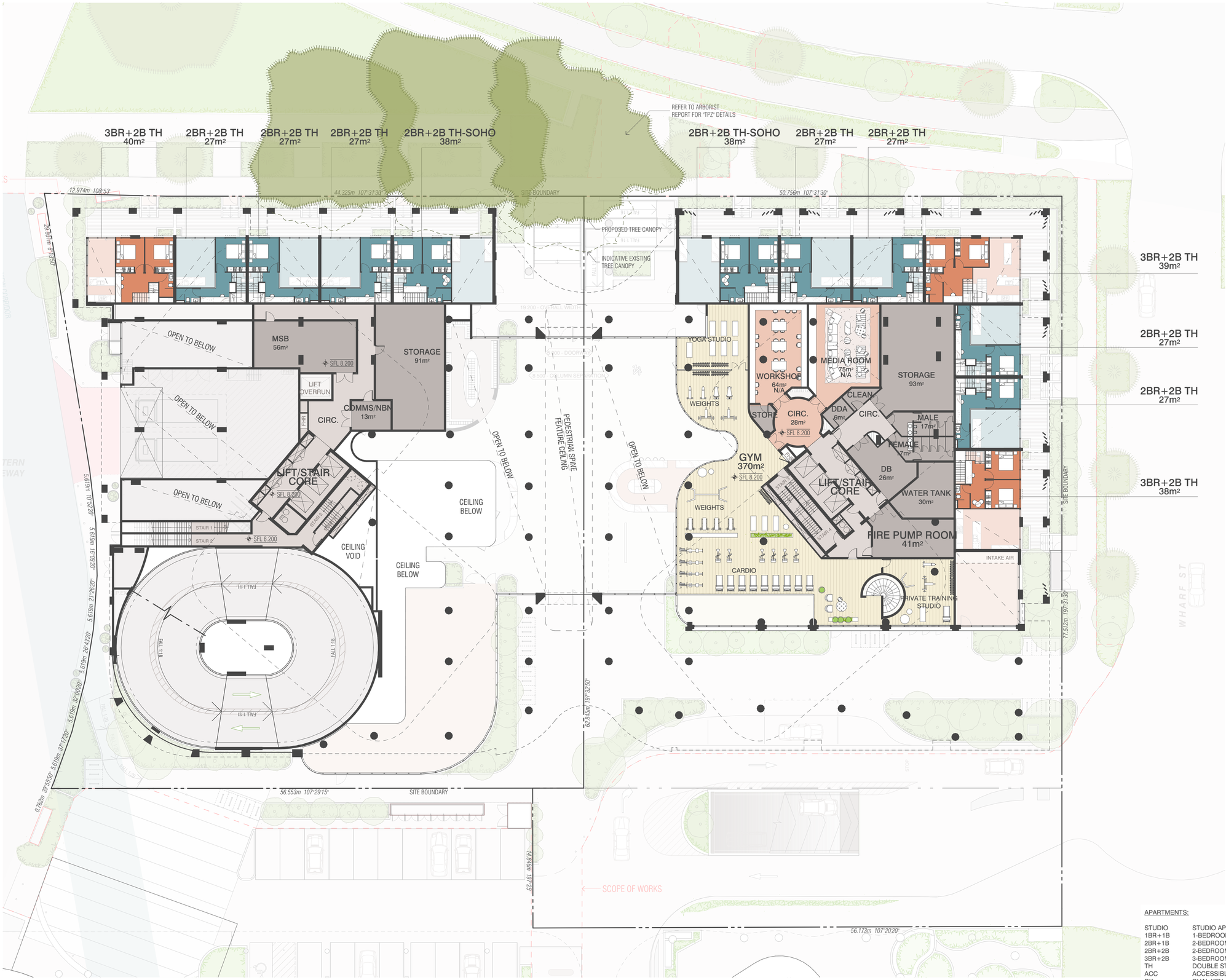
PT	06.10.2023	ND	06.10.2023	22136	1:200@A1	GROUND FLOOR PLAN	DEVELOPMENT APPLICATION	03	DA0100



APARTMENTS:

STUDIO	STUDIO APARTMENT UNIT
1BR+1B	1-BEDROOM UNIT WITH 1 BATHROOM
2BR+1B	2-BEDROOM UNIT WITH 1 BATHROOM
2BR+2B	2-BEDROOM UNIT WITH 2 BATHROOMS
3BR+2B	3-BEDROOM UNIT WITH 2 BATHROOMS
TH	DOUBLE STOREY TOWNHOUSE UNIT
ACC	ACCESSIBLE APARTMENT UNIT
DK	DUAL KEY APARTMENT UNIT

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REVISION

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02	INFORMATION REQUEST RESPONSE	ND	21.07.2023
> 03	INFORMATION REQUEST RESPONSE	ND	06.10.2023

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PROJECT

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FENDER KATSALIDIS (AUST) PTY LTD ACN 092 943 032

DRAWN	DATE	CHECKED	PLOT DATE	JOB NO.	SCALE	DRAWING TITLE
PT	06.10.2023	ND	06.10.2023	22136	1:200@A1	MEZZANINE FLOOR PLAN

ISSUE PURPOSE	REV.	DRAWING NO.
DEVELOPMENT APPLICATION	03	DA0101

APARTMENT MIX - PODIUM LEVELS

APT TYPE	QTY	AREA
1BR+1B ACC	10	540
2BR+2B ACC	7	528
3BR+2B ACC	1	101
STUDIO ACC	1	44
	19	**1 213 m²**

GFA PODIUM

LEVEL	AREA
STOREY 2 - PODIUM	1 487
STOREY 3 - PODIUM	1 487
STOREY 4 - PODIUM	1 487
	4 461 m²

APARTMENTS:

STUDIO	STUDIO APARTMENT UNIT
1BR+1B	1-BEDROOM UNIT WITH 1 BATHROOM
2BR+1B	2-BEDROOM UNIT WITH 1 BATHROOM
2BR+2B	2-BEDROOM UNIT WITH 2 BATHROOMS
3BR+2B	3-BEDROOM UNIT WITH 2 BATHROOMS
TH	DOUBLE STOREY TOWNHOUSE UNIT
ACC	ACCESSIBLE APARTMENT UNIT
DK	DUAL KEY APARTMENT UNIT

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> 03	INFORMATION REQUEST RESPONSE	ND	06.10.2023	

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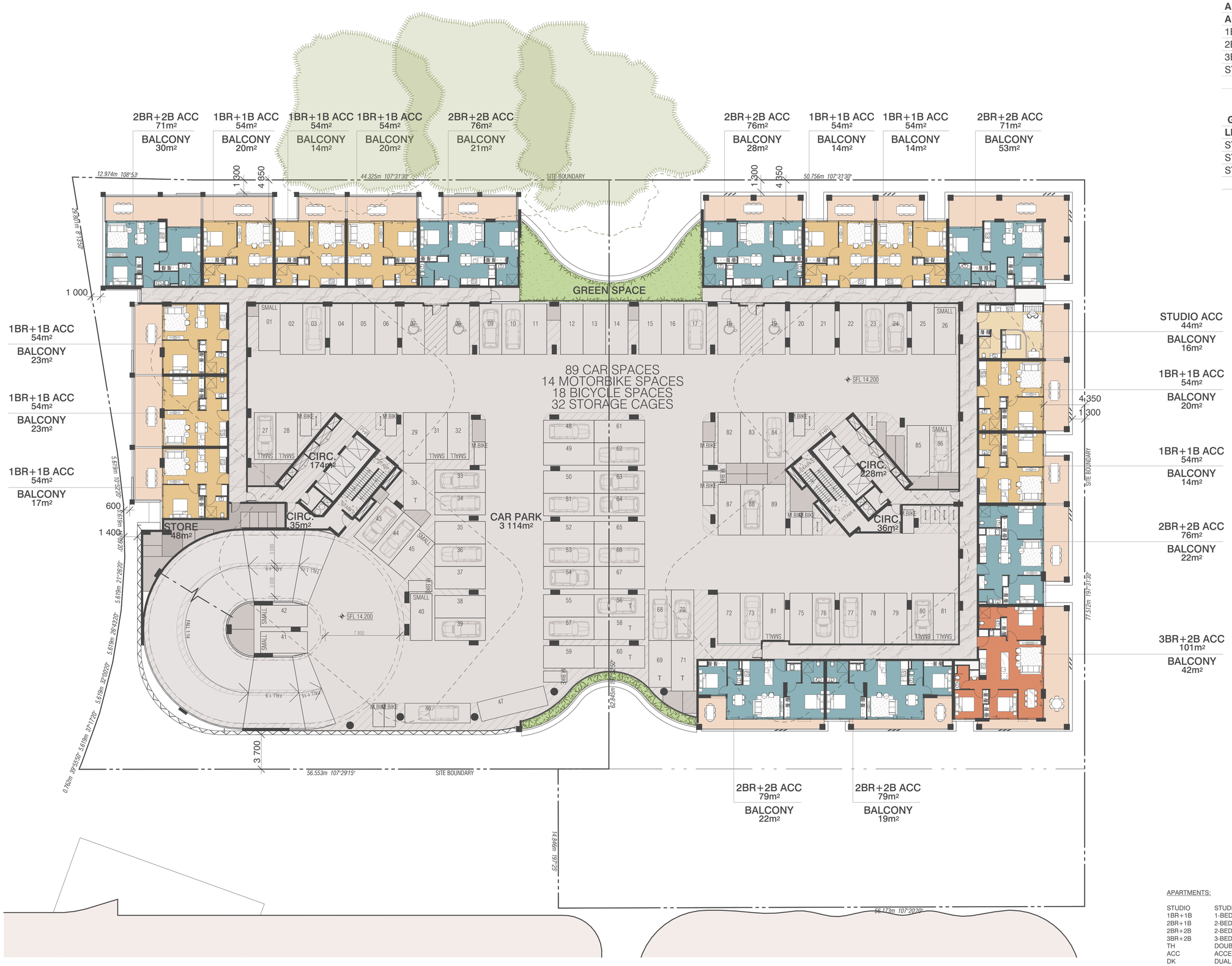
PT	06.10.2023	ND	06.10.2023	22136	1:200@A1	LEVEL 2 FLOOR PLAN	DEVELOPMENT APPLICATION	03	DA0102



APARTMENT MIX - PODIUM LEVELS

APT TYPE	QTY	AREA
1BR+1B ACC	10	540
2BR+2B ACC	7	528
3BR+2B ACC	1	101
STUDIO ACC	1	44
	19	**1 213 m²**

GFA PODIUM

LEVEL	AREA
STOREY 2 - PODIUM	1 487
STOREY 3 - PODIUM	1 487
STOREY 4 - PODIUM	1 487
	4 461 m²

APARTMENTS:

STUDIO	STUDIO APARTMENT UNIT
1BR+1B	1-BEDROOM UNIT WITH 1 BATHROOM
2BR+1B	2-BEDROOM UNIT WITH 1 BATHROOM
2BR+2B	2-BEDROOM UNIT WITH 2 BATHROOMS
3BR+2B	3-BEDROOM UNIT WITH 2 BATHROOMS
TH	DOUBLE STOREY TOWNHOUSE UNIT
ACC	ACCESSIBLE APARTMENT UNIT
DK	DUAL KEY APARTMENT UNIT

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PT	06.10.2023	ND	06.10.2023	22136	1:200@A1	LEVEL 3 FLOOR PLAN	DEVELOPMENT APPLICATION	03	**DA0103**

APARTMENT MIX - PODIUM LEVELS

APT TYPE	QTY	AREA
1BR+1B ACC	10	540
2BR+2B ACC	7	528
3BR+2B ACC	1	101
STUDIO ACC	1	44
	19	**1 213 m²**

GFA PODIUM

LEVEL	AREA
STOREY 2 - PODIUM	1 487
STOREY 3 - PODIUM	1 487
STOREY 4 - PODIUM	1 487
	4 461 m²

APARTMENTS:

STUDIO	STUDIO APARTMENT UNIT
1BR+1B	1-BEDROOM UNIT WITH 1 BATHROOM
2BR+1B	2-BEDROOM UNIT WITH 1 BATHROOM
2BR+2B	2-BEDROOM UNIT WITH 2 BATHROOMS
3BR+2B	3-BEDROOM UNIT WITH 2 BATHROOMS
TH	DOUBLE STOREY TOWNHOUSE UNIT
ACC	ACCESSIBLE APARTMENT UNIT
DK	DUAL KEY APARTMENT UNIT

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03	INFORMATION REQUEST RESPONSE	ND	06.10.2023

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DRAWN	DATE	CHECKED	PLOT DATE	JOB NO.	SCALE	DRAWING TITLE
PT	06.10.2023	ND	06.10.2023	22136	1:200@A1	LEVEL 4 FLOOR PLAN

ISSUE PURPOSE	REV.	DRAWING NO.
DEVELOPMENT APPLICATION	03	**DA0104**

Appendix C Swept Path Diagrams

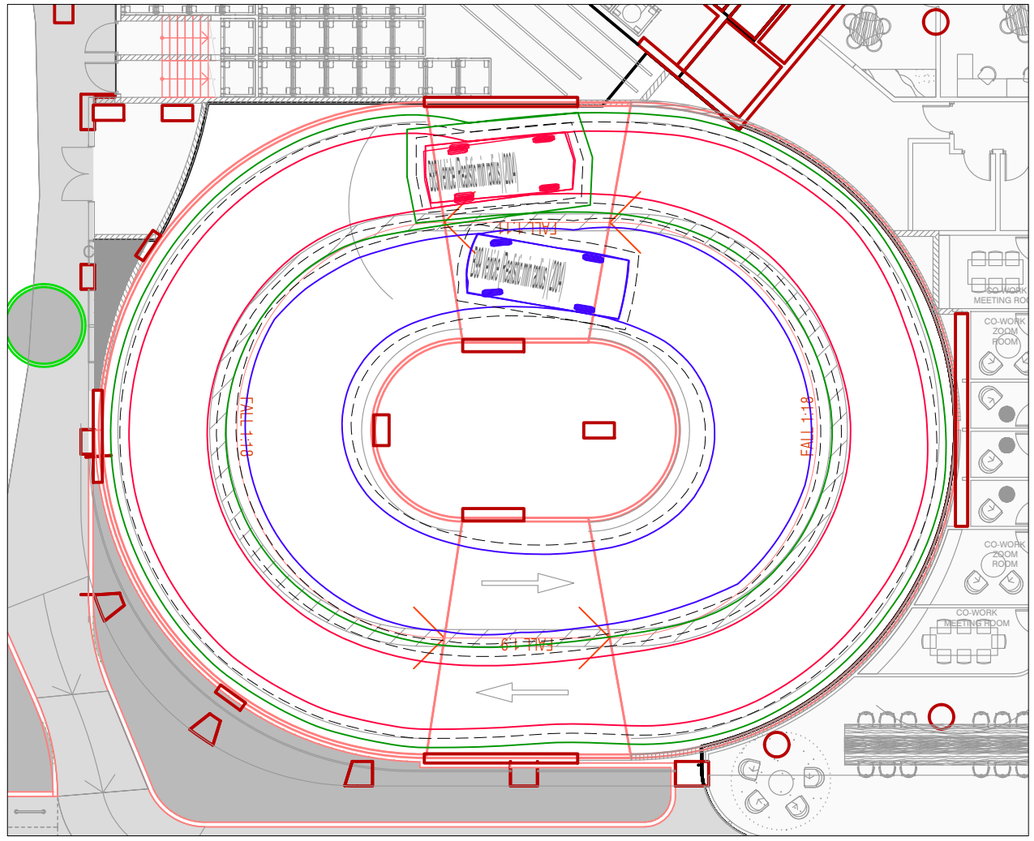


FIGURE 1 - RAMPING CIRCULATION - PODIUM LEVELS

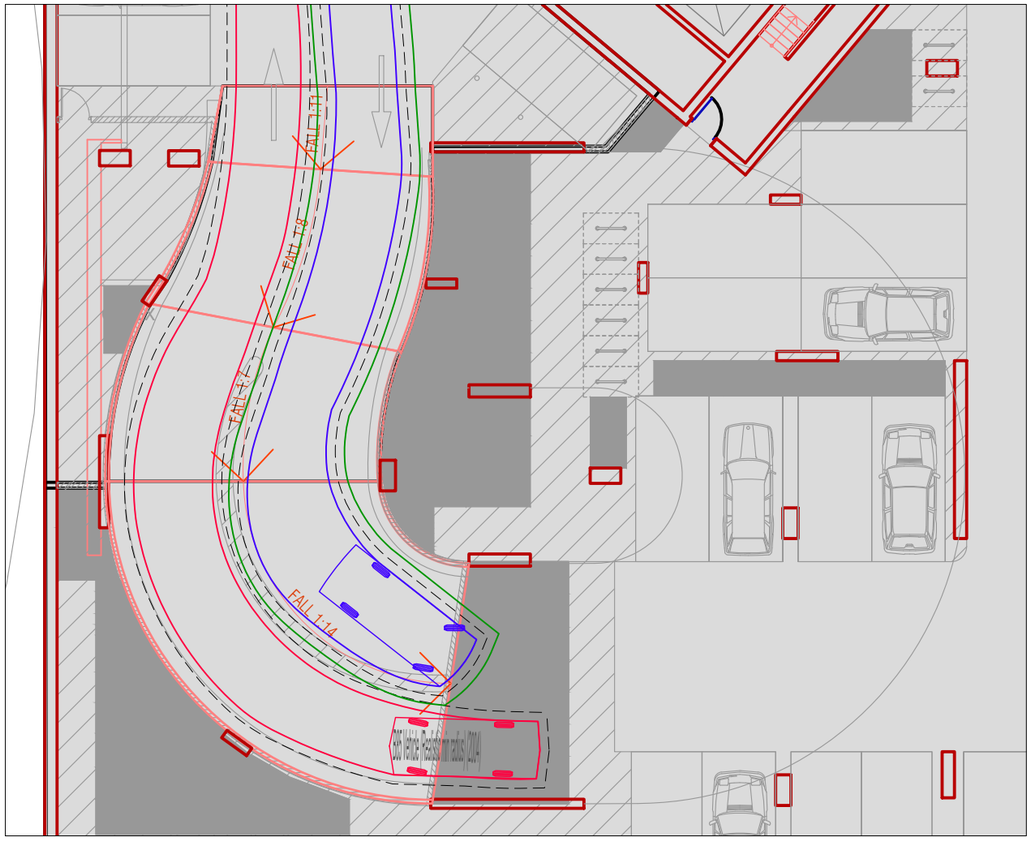
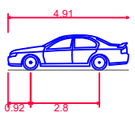


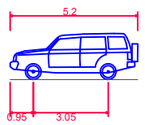
FIGURE 2 - RAMPING CIRCULATION - BASEMENT

NOTES:
1. MINIMUM 0.3M CLEARANCE TO KERB.
2. MINIMUM 0.9M CLEARANCE BETWEEN CIRCULATING VEHICLES.



B85 Vehicle (Realistic min radius) (2004)

Overall Length	4.910m
Overall Width	1.870m
Overall Body Height	1.421m
Min Body Ground Clearance	0.159m
Track Width	1.770m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	5.750m
Design Speed Forward	10.00km/h
Clearance Envelope	0.300m



B99 Vehicle (Realistic min radius) (2004)

Overall Length	5.200m
Overall Width	1.940m
Overall Body Height	1.878m
Min Body Ground Clearance	0.272m
Track Width	1.840m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6.250m
Design Speed Forward	10.00km/h
Clearance Envelope	0.300m

FOR APPROVAL
26 Jul 2023

REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
B	26-07-23	UPDATED BACKGROUND LAYER	ASh	AR	AR
A	08-05-23	ORIGINAL ISSUE	MGe	AR	AR

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

NORTH

CLIENT
BROOKFIELD RESIDENTIAL PROPERTIES

TTM CONSULTING 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
21BRT0771 - PORTSIDE BUILD-TO-RENT DEVELOPMENT

DRAWING TITLE
SWEPT PATH ANALYSIS
REVIEW OF CIRCULATION ON RAMP

PROJECT NUMBER	ORIGINAL SIZE
21BRT0771	A3
DRAWING NUMBER	REVISION
21BRT0771-01	B
DATE	SHEET
26 Jul 2023	1 OF 1

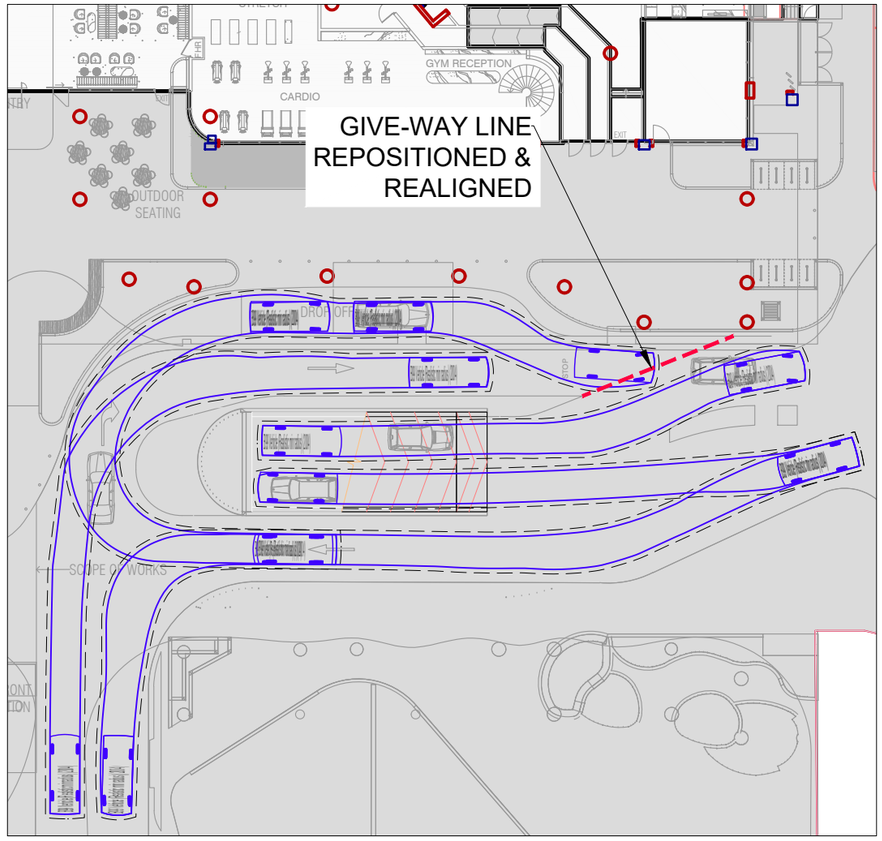


FIGURE 1 - B99 CIRCULATION AT SET DOWN AND PORTAL RAMP

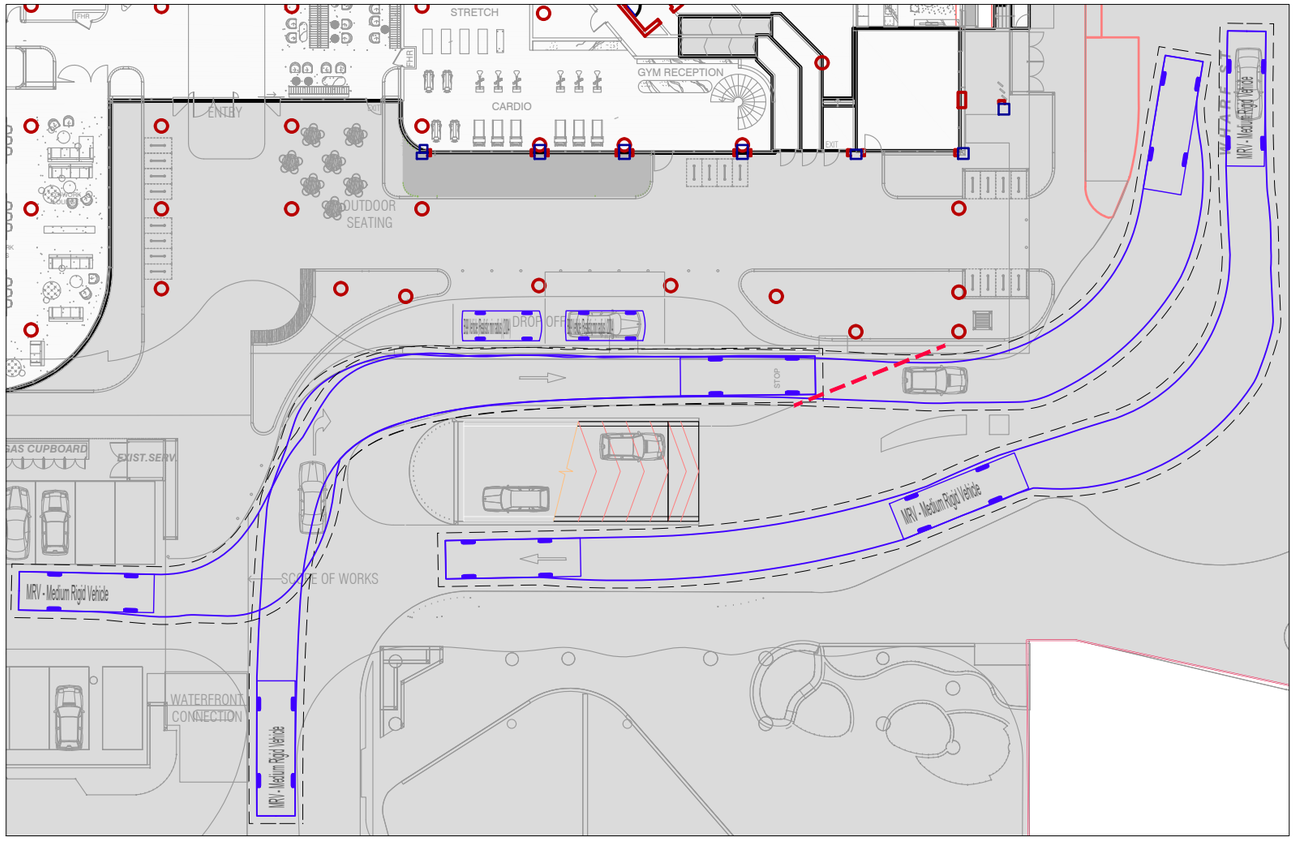
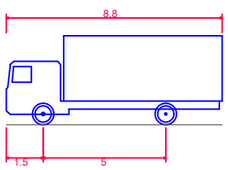


FIGURE 2 - MRV ENTRY/EXIT VIA WHARF STREET & CIRCULATION AT SET DOWN

NOTES:

1. LINEMARKING AND SIGNAGE TO BE RESOLVED AS PART OF THE DETAILED DESIGN PROCESS.

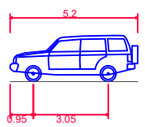


MRV - Medium Rigid Vehicle

Overall Length	8.800m
Overall Width	2.500m
Overall Body Height	3.633m
Min Body Ground Clearance	0.428m
Track Width	2.500m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	10.000m
Design Speed Forward	5.00km/h
Clearance Envelope	0.500m

FOR APPROVAL

6 Oct 2023



B99 Vehicle (Realistic min radius) (2004)

Overall Length	5.200m
Overall Width	1.940m
Overall Body Height	1.878m
Min Body Ground Clearance	0.272m
Track Width	1.840m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6.250m
Design Speed Forward	5.00km/h
Clearance Envelope	0.300m

	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
06-10-23	UPDATED BACKGROUND LAYER	ASh	AR	AR
26-07-23	UPDATED BACKGROUND LAYER	ASh	AR	AR
09-05-23	ORIGINAL ISSUE	MGe	AR	AR

SCALE 0 4 8 12 16 20m

SCALE 1:400 AT ORIGINAL SIZE

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E: ttmbris@ttmgroup.com.au W: www.ttmgroup.com.au

PROJECT
21BRT0771 - PORTSIDE BUILD-TO-RENT DEVELOPMENT

DRAWING TITLE
SWEPT PATH ANALYSIS
CIRCULATION AT SET DOWN AREA - B99 AND MRV MANOEUVRING

PROJECT NUMBER	ORIGINAL SIZE
21BRT0771	A3
DRAWING NUMBER	REVISION
21BRT0771-02	C
DATE	SHEET
6 Oct 2023	1 OF 1

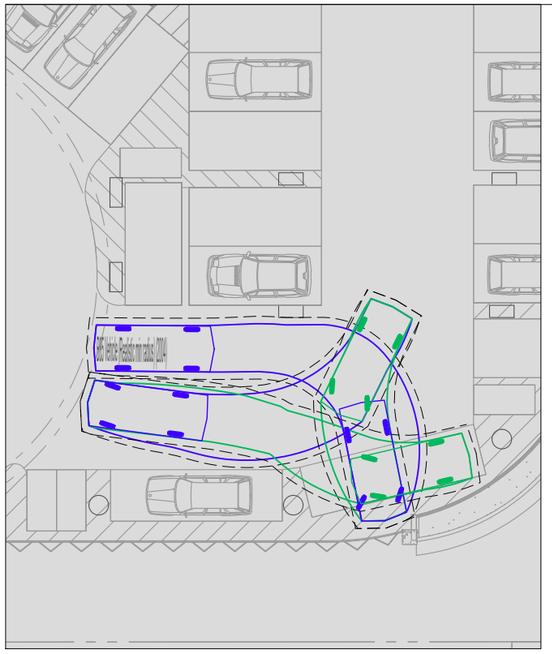


FIGURE 1 - PARALLEL SPACE 1 (L2-4)

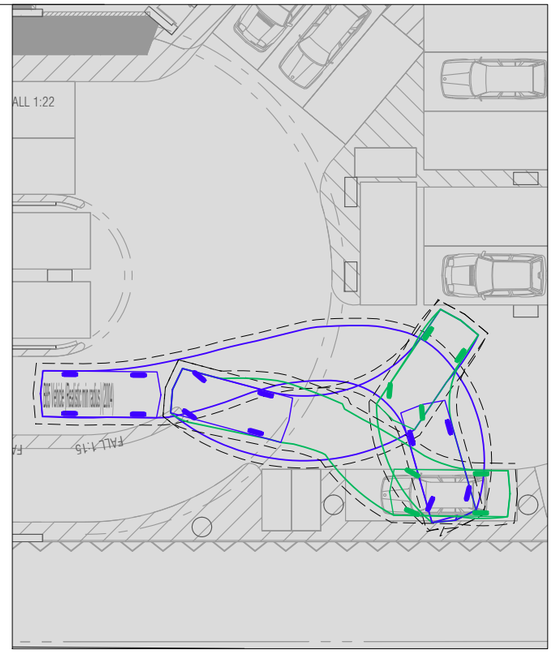


FIGURE 2 - PARALLEL SPACE 2 (L2-4)

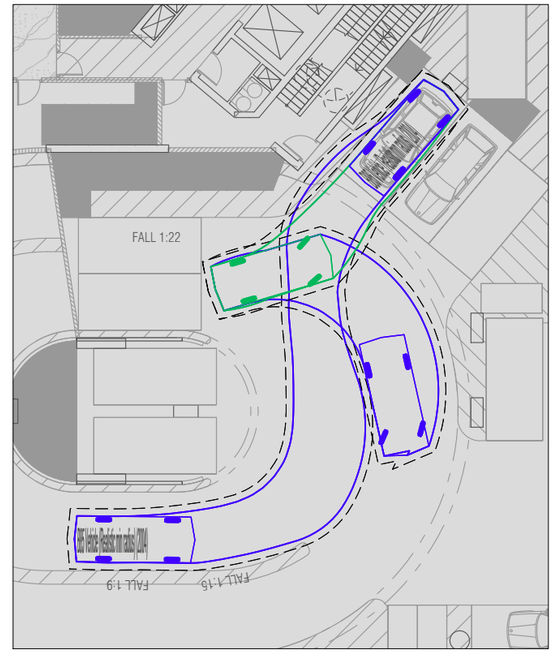


FIGURE 3 - ANGLED RAMPING SPACE (L4)

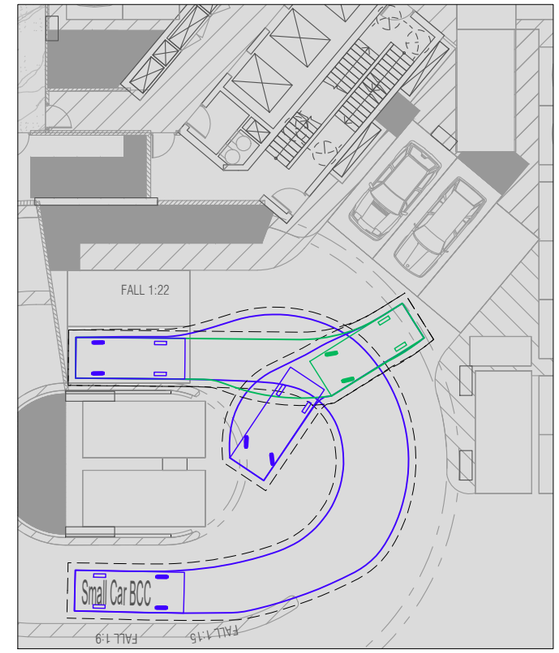


FIGURE 4 - BLIND AISLE AT RAMP 1

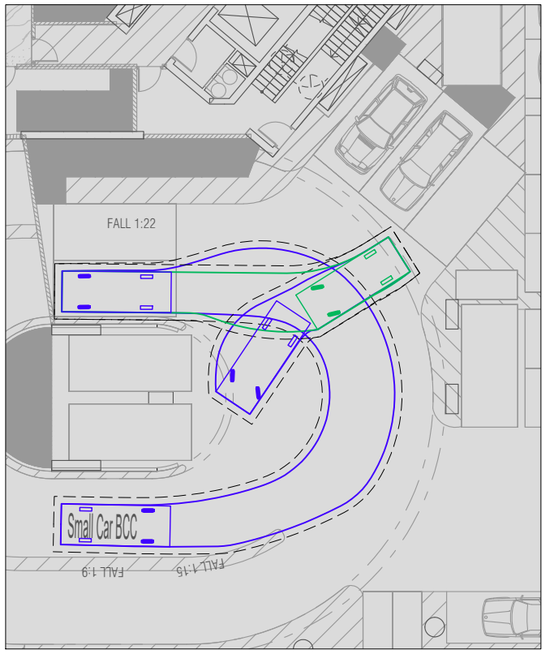
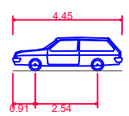
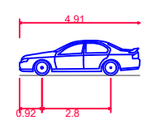


FIGURE 5 - BLIND AISLE AT RAMP (L4)



Small Car BCC

Overall Length	4.450m
Overall Width	1.660m
Overall Body Height	1.354m
Min Body Ground Clearance	0.195m
Track Width	1.400m
Lock-to-lock time	4.00s
Wall to Wall Turning Radius	5.600m
Design Speed Forward	5.00km/h
Clearance Envelope	0.300m



B85 Vehicle (Realistic min radius) (2004)

Overall Length	4.910m
Overall Width	1.870m
Overall Body Height	1.421m
Min Body Ground Clearance	0.159m
Track Width	1.770m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	5.750m
Design Speed Forward	5.00km/h
Clearance Envelope	0.300m

FOR APPROVAL

26 Jul 2023

REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
B	26-07-23	UPDATED BACKGROUND LAYER	ASh	AR	AR
A	08-05-23	ORIGINAL ISSUE	MGe	AR	AR

SCALE 0 2.5 5 7.5 10 12.5m

SCALE 1:250 AT ORIGINAL SIZE

NORTH

CLIENT

BROOKFIELD RESIDENTIAL PROPERTIES

TTM CONSULTING PTY LTD
ABN 65 010 868 621
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E: ttmbris@ttmgroup.com.au W: www.ttmgroup.com.au

PROJECT
21BRT0771 - PORTSIDE BUILD-TO-RENT DEVELOPMENT

DRAWING TITLE
SWEPT PATH ANALYSIS
SMALL CAR AND B85 VEHICLE PARKING SPACE MANOEUVRING

PROJECT NUMBER	ORIGINAL SIZE
21BRT0771	A3
DRAWING NUMBER	REVISION
21BRT0771-03	B
DATE	SHEET
26 Jul 2023	1 OF 3

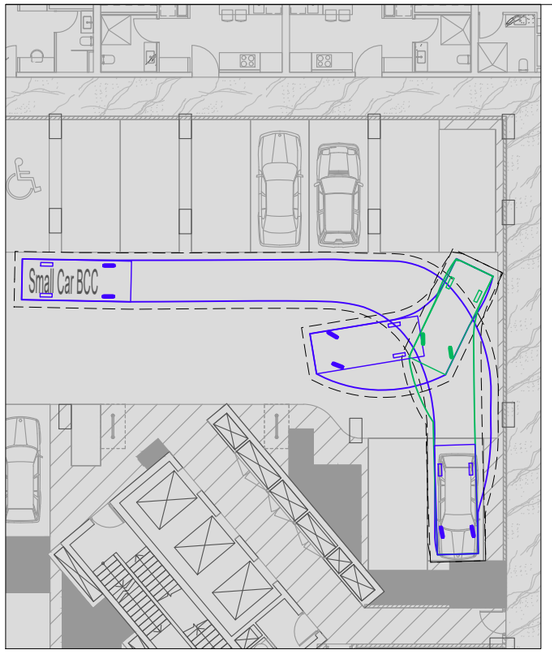


FIGURE 1 - BLIND AISLE EXTENSION 1 (L2-4)

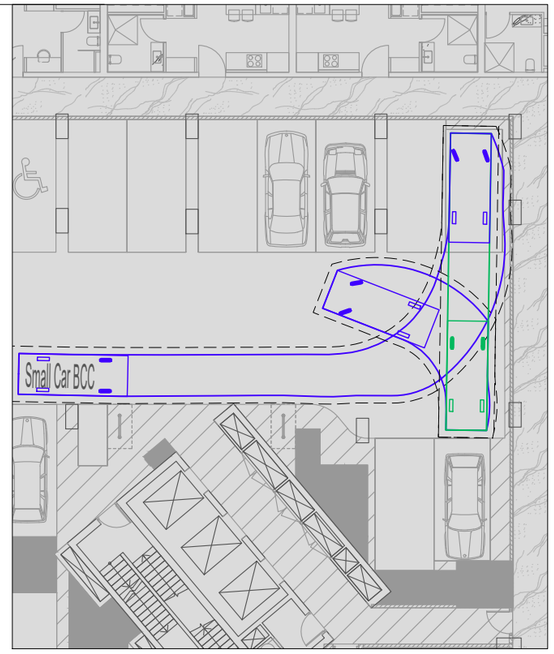


FIGURE 2 - BLIND AISLE EXTENSION 2 (L2-4)

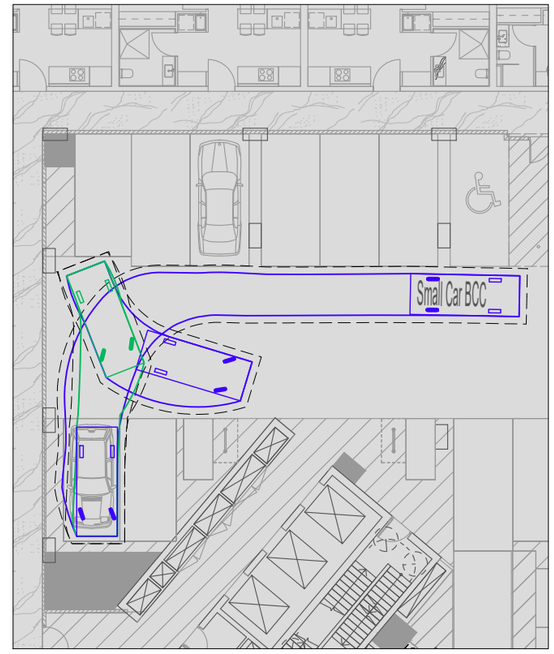


FIGURE 3 - BLIND AISLE EXTENSION 3 (L2-4)

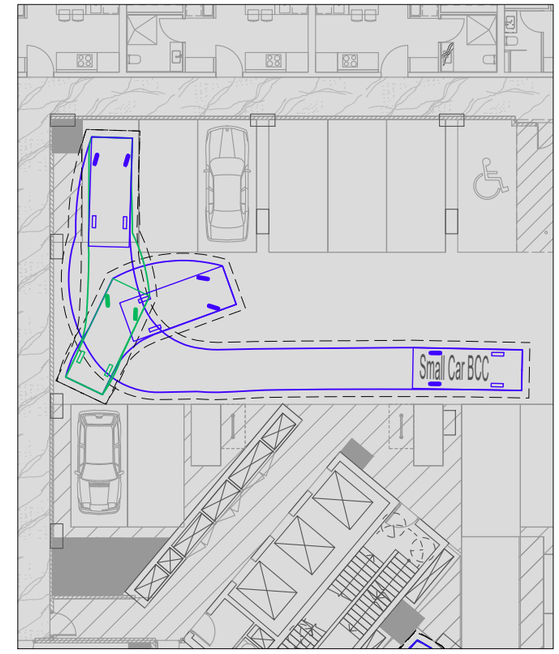


FIGURE 4 - BLIND AISLE EXTENSION 4 (L2-4)

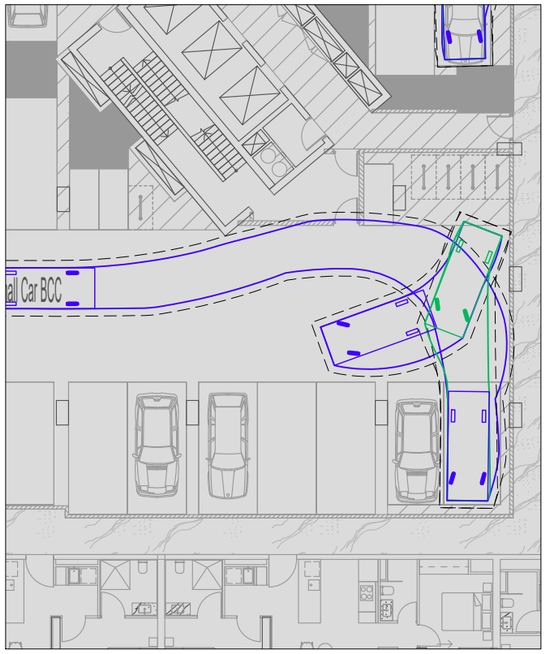


FIGURE 5 - BLIND AISLE EXTENSION 5 (L2-4)

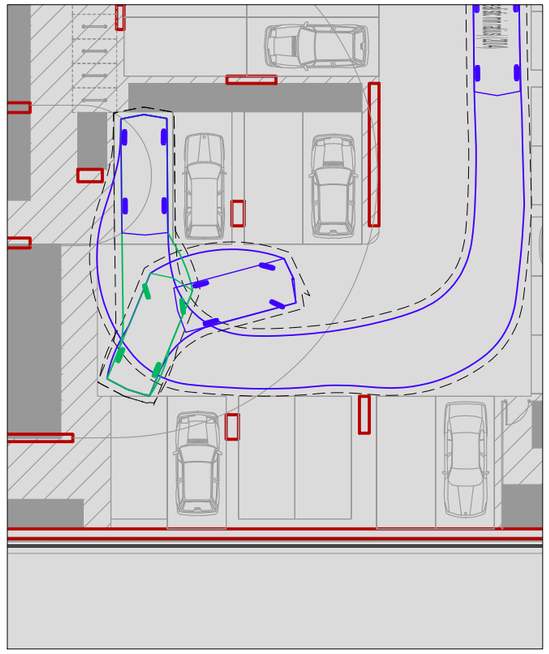


FIGURE 5 - BLIND AISLE EXTENSION 6 (B1)

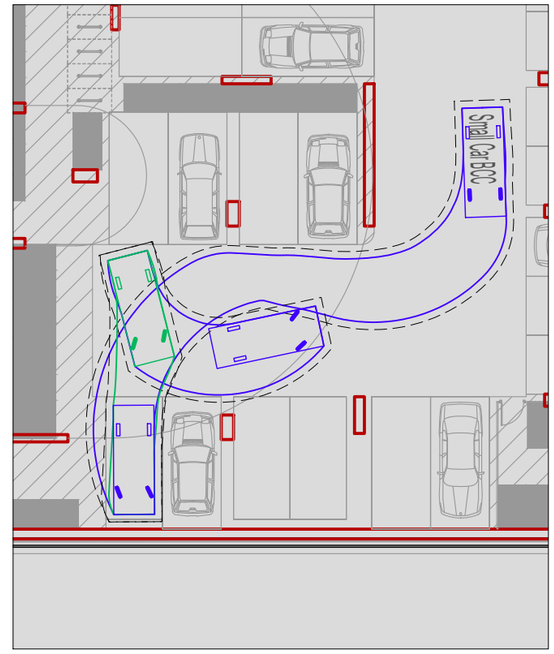
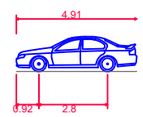
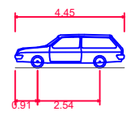


FIGURE 7 - BLIND AISLE EXTENSION 7 (B1)



B85 Vehicle (Realistic min radius) (2004)

Overall Length	4.910m
Overall Width	1.870m
Overall Body Height	1.421m
Min Body Ground Clearance	0.159m
Track Width	1.770m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	5.750m
Design Speed Forward	5.00km/h
Clearance Envelope	0.300m



Small Car BCC

Overall Length	4.450m
Overall Width	1.660m
Overall Body Height	1.354m
Min Body Ground Clearance	0.195m
Track Width	1.400m
Lock-to-lock time	4.00s
Wall to Wall Turning Radius	5.600m
Design Speed Forward	5.00km/h
Clearance Envelope	0.300m

FOR APPROVAL

26 Jul 2023

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A	08-05-23	ORIGINAL ISSUE	MGe	AR	AR

SCALE 0 2.5 5 7.5 10 12.5m

SCALE 1:250 AT ORIGINAL SIZE

NORTH

CLIENT

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PROJECT
21BRT0771 - PORTSIDE BUILD-TO-RENT DEVELOPMENT

DRAWING TITLE
SWEPT PATH ANALYSIS
SMALL CAR AND B85 VEHICLE PARKING SPACE MANOEUVRING

PROJECT NUMBER	ORIGINAL SIZE
21BRT0771	A3
DRAWING NUMBER	REVISION
21BRT0771-03	B
DATE	SHEET
26 Jul 2023	2 OF 3

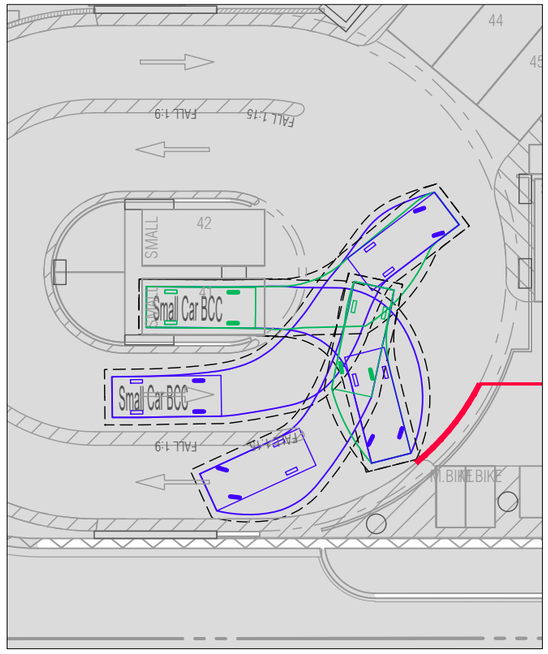


FIGURE 1 - SMALL SPACE 1 (L2-3)

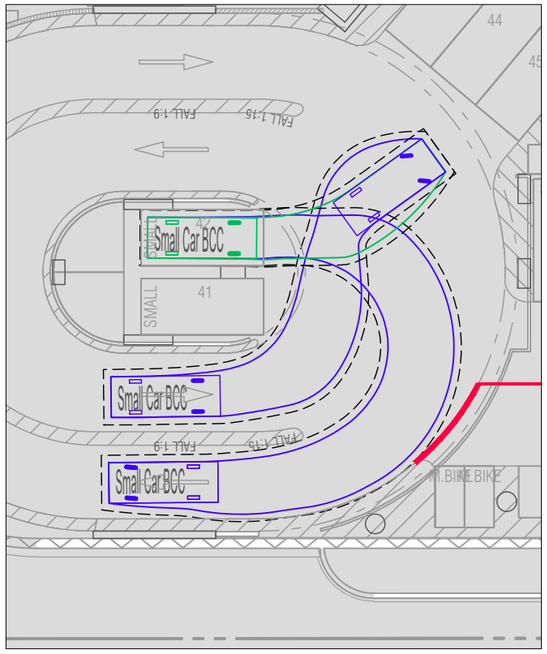


FIGURE 2 - SMALL SPACE 1 (L2-3)

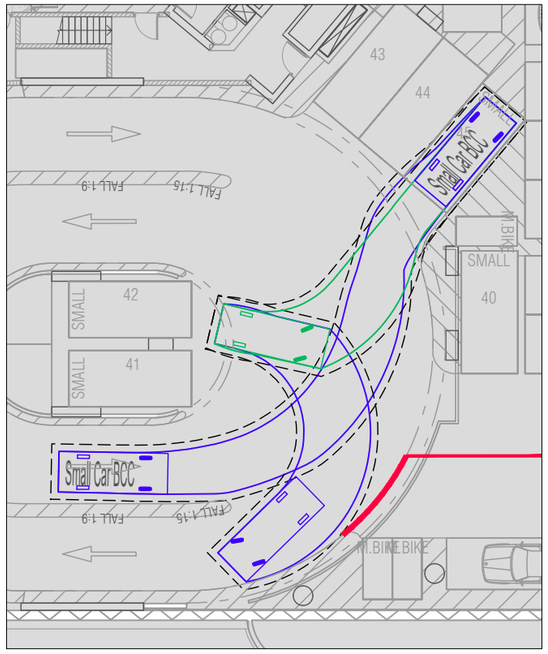


FIGURE 3 - ANGLED SMALL SPACE (L2-3)

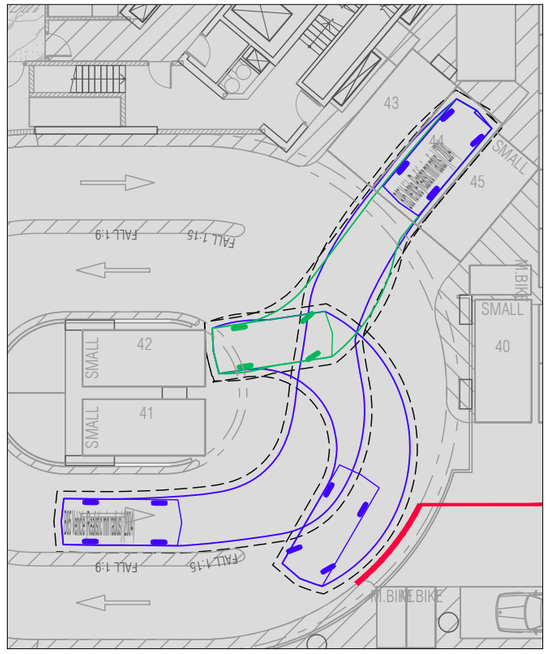


FIGURE 4 - ANGLED SPACE (L2-3)

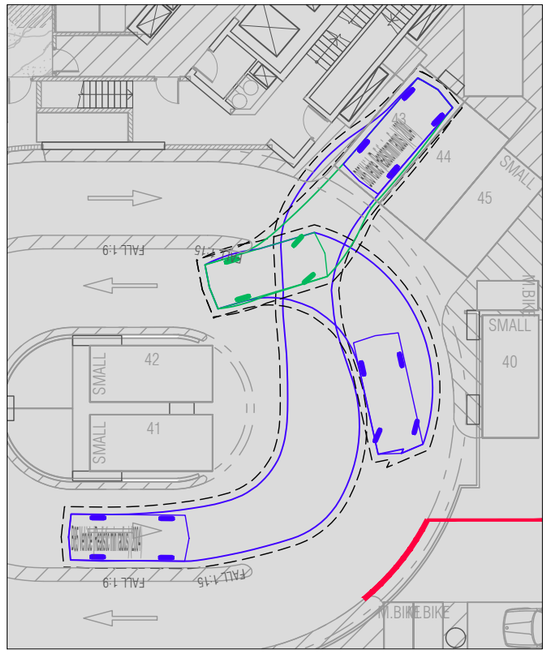


FIGURE 5 - ANGLED SPACE 2 (L2-3)

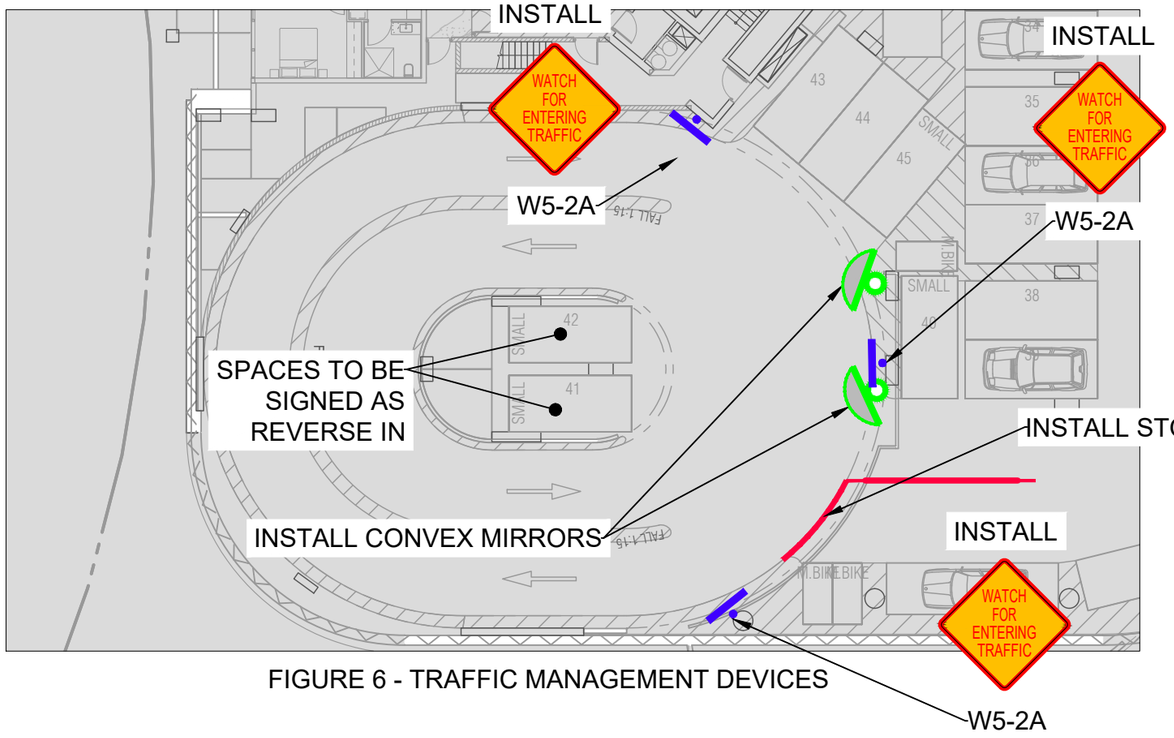
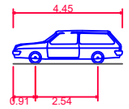


FIGURE 6 - TRAFFIC MANAGEMENT DEVICES



Small Car BCC

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Track Width	1.400m
Lock-to-lock time	4.00s
Wall to Wall Turning Radius	5.600m
Design Speed Forward	5.00km/h
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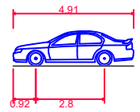

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Curb to Curb Turning Radius	5.750m
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Clearance Envelope	0.300m

NOTES:

1. LINEMARKING AND SIGNAGE TO BE RESOLVED AS PART OF THE DETAILED DESIGN PROCESS.

FOR APPROVAL
26 Jul 2023

REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
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A	08-05-23	ORIGINAL ISSUE	MGe	AR	AR

SCALE 0 2.5 5 7.5 10 12.5m
SCALE 1:250 AT ORIGINAL SIZE

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PROJECT
21BRT0771 - PORTSIDE BUILD-TO-RENT DEVELOPMENT

DRAWING TITLE
SWEPT PATH ANALYSIS
SMALL CAR AND B85 VEHICLE PARKING SPACE MANOEUVRING AT LEVELS 2 & 3

PROJECT NUMBER	ORIGINAL SIZE
21BRT0771	A3
DRAWING NUMBER	REVISION
21BRT0771-03	B
DATE	SHEET
26 Jul 2023	3 OF 3

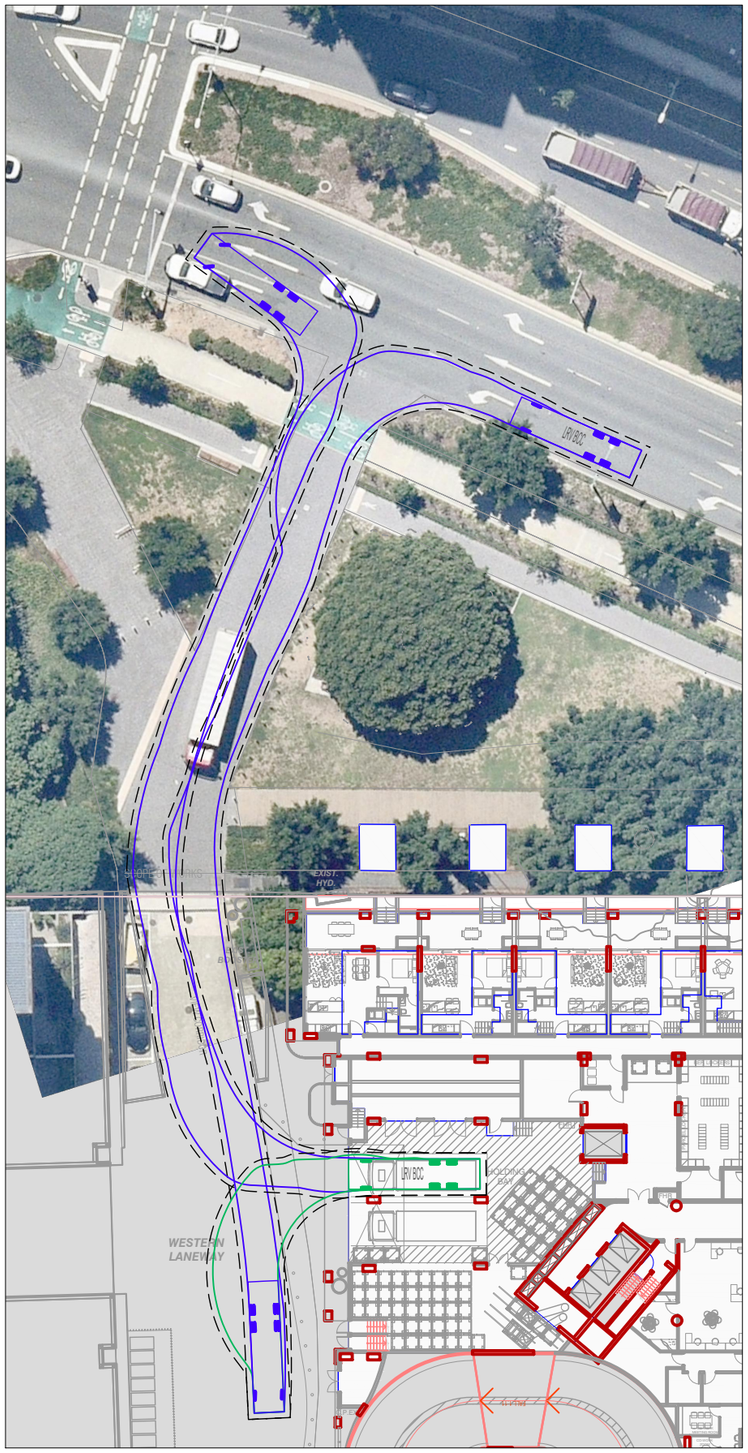


FIGURE 1 - LRV ENTRY & SERVICE BAY 1 MANOEUVRE

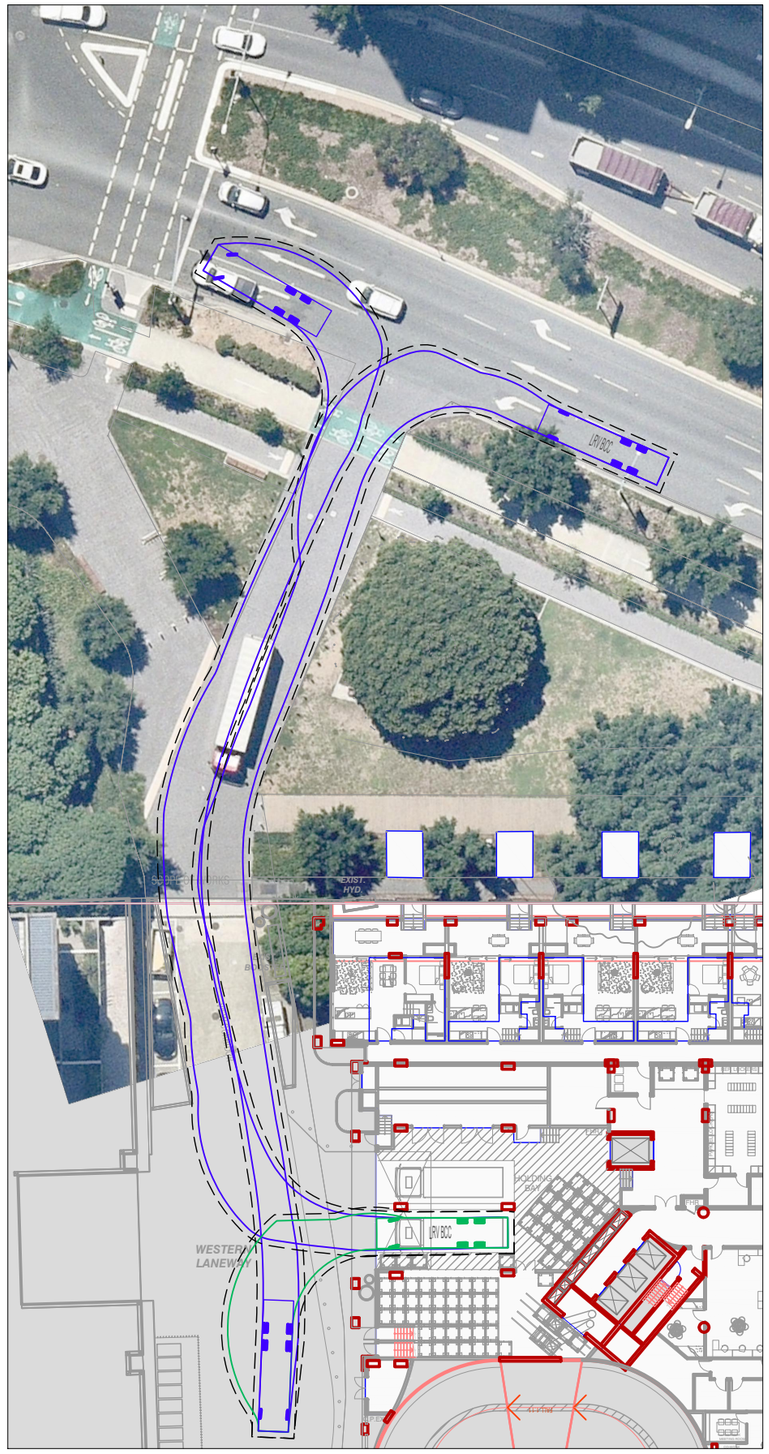
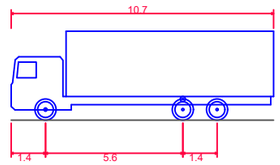


FIGURE 2 - LRV EXIT & SERVICE BAY 2 MANOEUVRE



LRV BCC

Overall Length	10.700m
Overall Width	2.450m
Overall Body Height	3.623m
Min Body Ground Clearance	0.419m
Track Width	2.450m
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	11.000m
Design Speed Forward	5.00km/h
Clearance Envelope	0.500m

FOR APPROVAL

6 Oct 2023

06-10-23	UPDATED BACKGROUND LAYER	ASh	AR	AR
26-07-23	UPDATED BACKGROUND LAYER	ASh	AR	AR
09-05-23	ORIGINAL ISSUE	MGe	AR	AR
	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED

SCALE 0 5 10 15 20 25m

SCALE 1:500 AT ORIGINAL SIZE

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DRAWING TITLE
SWEPT PATH ANALYSIS
LRV SERVICE BAY MANOEUVRING

PROJECT NUMBER	ORIGINAL SIZE
21BRT0771	A3
DRAWING NUMBER	REVISION
21BRT0771-04	C
DATE	SHEET
6 Oct 2023	1 OF 1

Appendix D Existing Kerbside Allocation

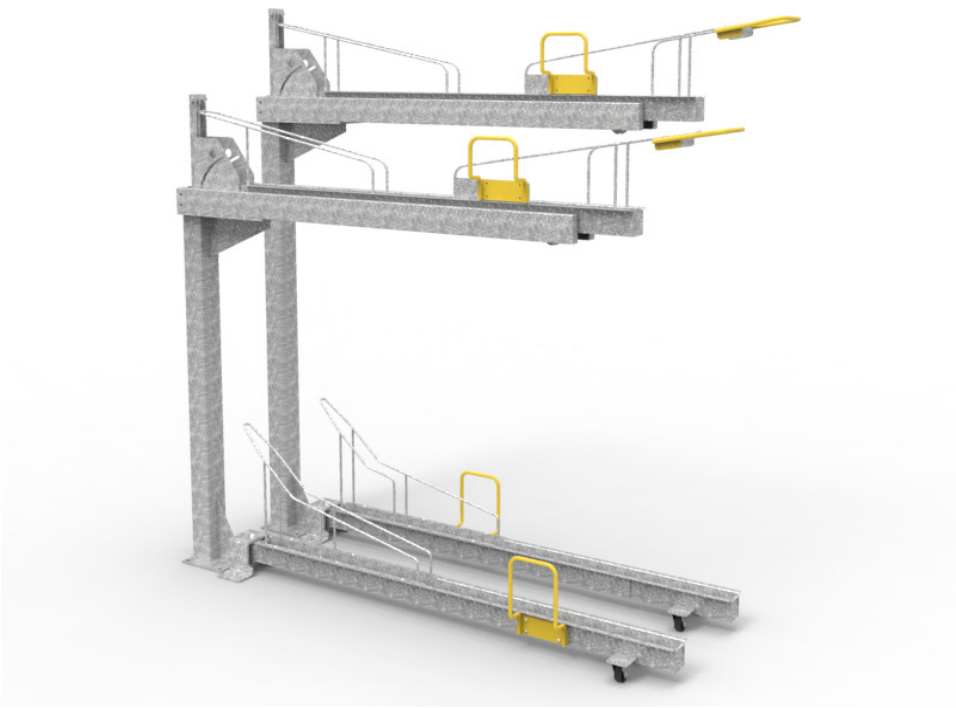
Figure 1

Existing Kerbside Allocation

Appendix E Bicycle Rack Specifications

CORA BIKE RACK

PRODUCT SPECIFICATION SHEET



E3DT SERIES

E3DT-GP

DYNAMIC UPPER TIER

DYNAMIC LOWER TIER

Australia's ONLY fully dynamic 2 tier system to provide reduced AS2890.3 compliant spacing of 400mm on both tiers. A Dynamic upper tier combined with a dynamic lower tier provides the maximum capacity possible. Upper tier includes gas assist lift for ease of use and is available in alternating heights. Lower tier uses the E3GP bike ground pivot rack that allows users to move the rack left or right for ease of access.

Capacity

- E3ST-H: 1 bike
- E3ST-L: 1 bike
- E3GP-F: 1 bike
- E3GP-B: 1 bike

Construction

- Heavy duty high quality steel

Fixings

M10 anchor bolts with security nuts

Finishes

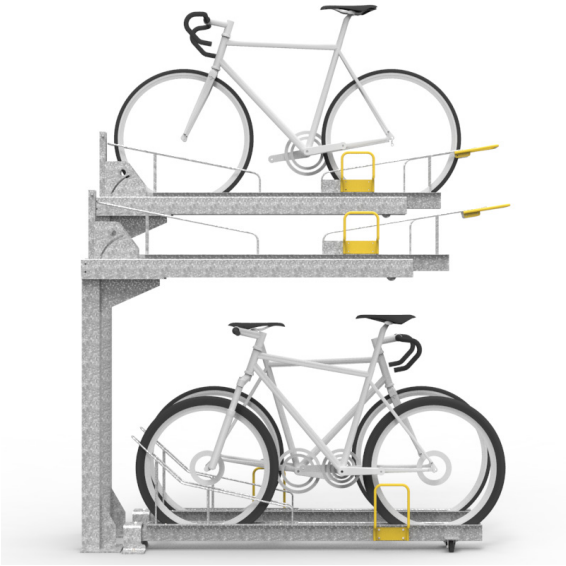
- Galvanised with powder coated accents on handles
- Option - Colour Powder Coat (Cora standard colour range)

Assembly

- Supplied partially assembled for assembly and mounting on site

Compliance

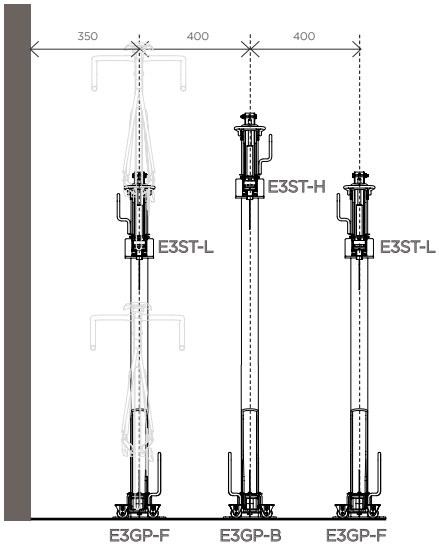
- Rack is AS2890.3 (2015) compliant



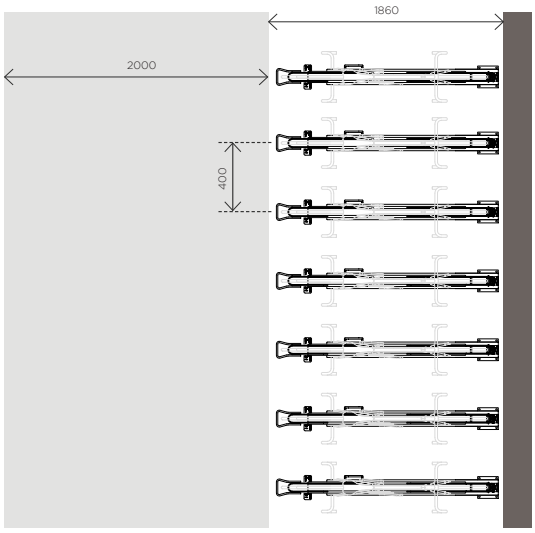
CORA BIKE RACK

PRODUCT SPECIFICATION SHEET

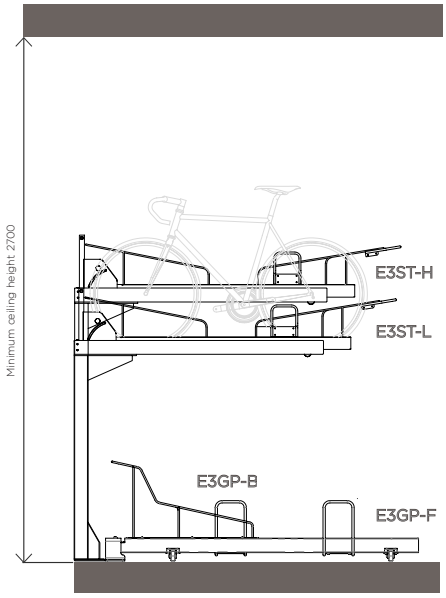
STAGGERED LAYOUT



Front view

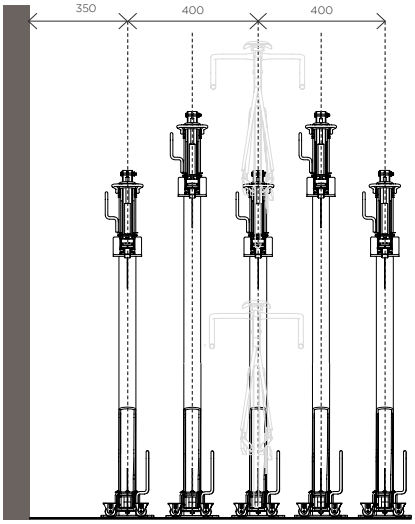


Top view

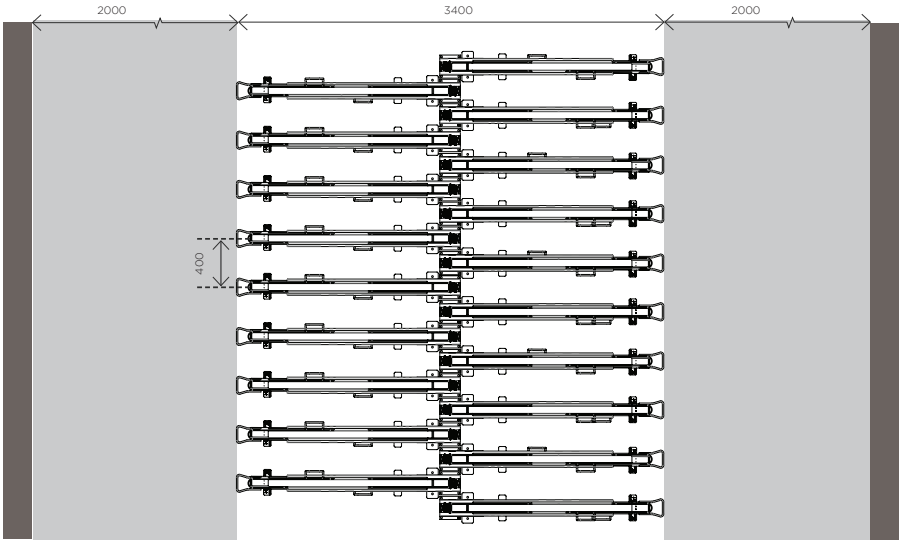


Side view

NESTED LAYOUT



Front view

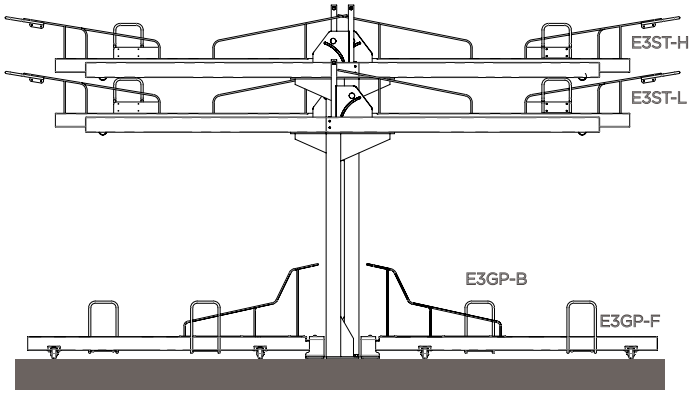


Top view

E3DT-GP DYNAMIC UPPER AND LOWER TIER LAYOUT GUIDE

For specific assembly and installation instructions relating to E3DT-GP series racks, please refer to individual instruction information sheets.

Racks should not be installed, based on the information on this sheet alone.

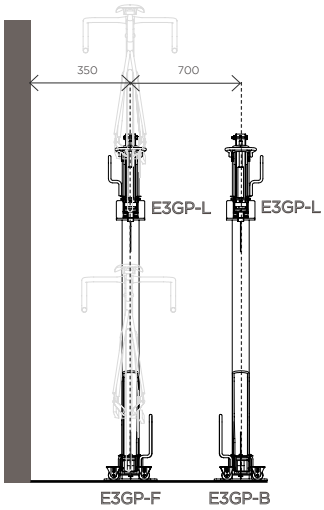


Side view

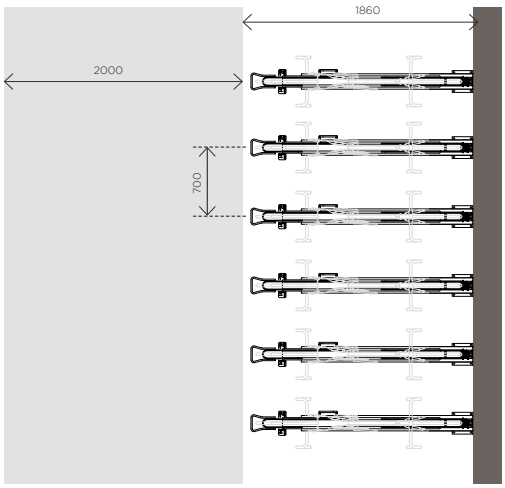
CORA BIKE RACK

PRODUCT SPECIFICATION SHEET

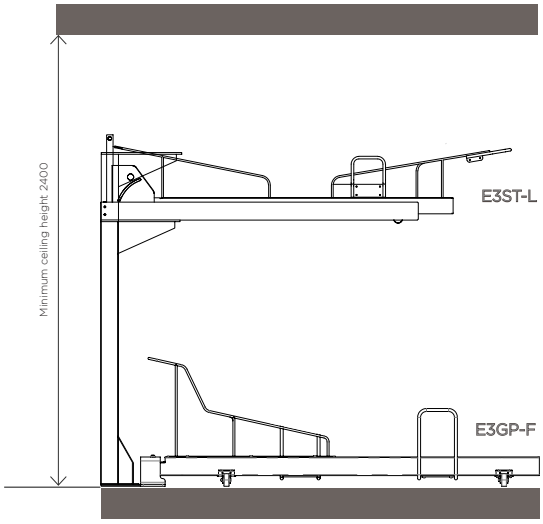
SINGLE LEVEL LAYOUT



Front view



Top view



Side view

E3DT-GP DYNAMIC UPPER AND LOWER TIER LAYOUT GUIDE

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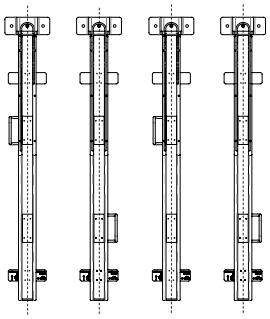
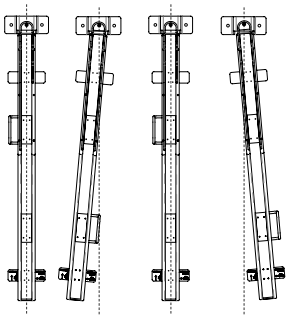
Dynamic side to side movement of lower rack

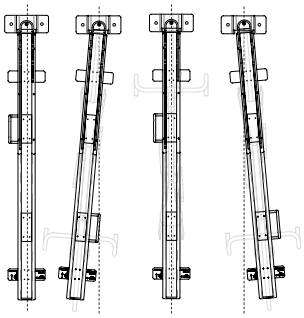


Racks in neutral position



Racks Pivoted

Racks either side of free rack, can be pivoted, to increase access for racking or removal



Bike placed in rack

Bike is wheeled in to rack, either front or rear wheel-in first depending on rack type

CORA BIKERACK

PH 1800 249 878

sales@cora.com.au

www.cora.com.au