Traffic Engineering Report

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

Brookfield Portside East Pty Ltd

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1 Introduction

1.1 Background

TTM Consulting has been engaged by Brookfield Portside East Pty Ltd to prepare a traffic engineering report investigating a proposed mixed-use development at 11-23 MacArthur Avenue, Hamilton. It is understood that a Development Application will be lodged with Economic Development Queensland (EDQ).

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.

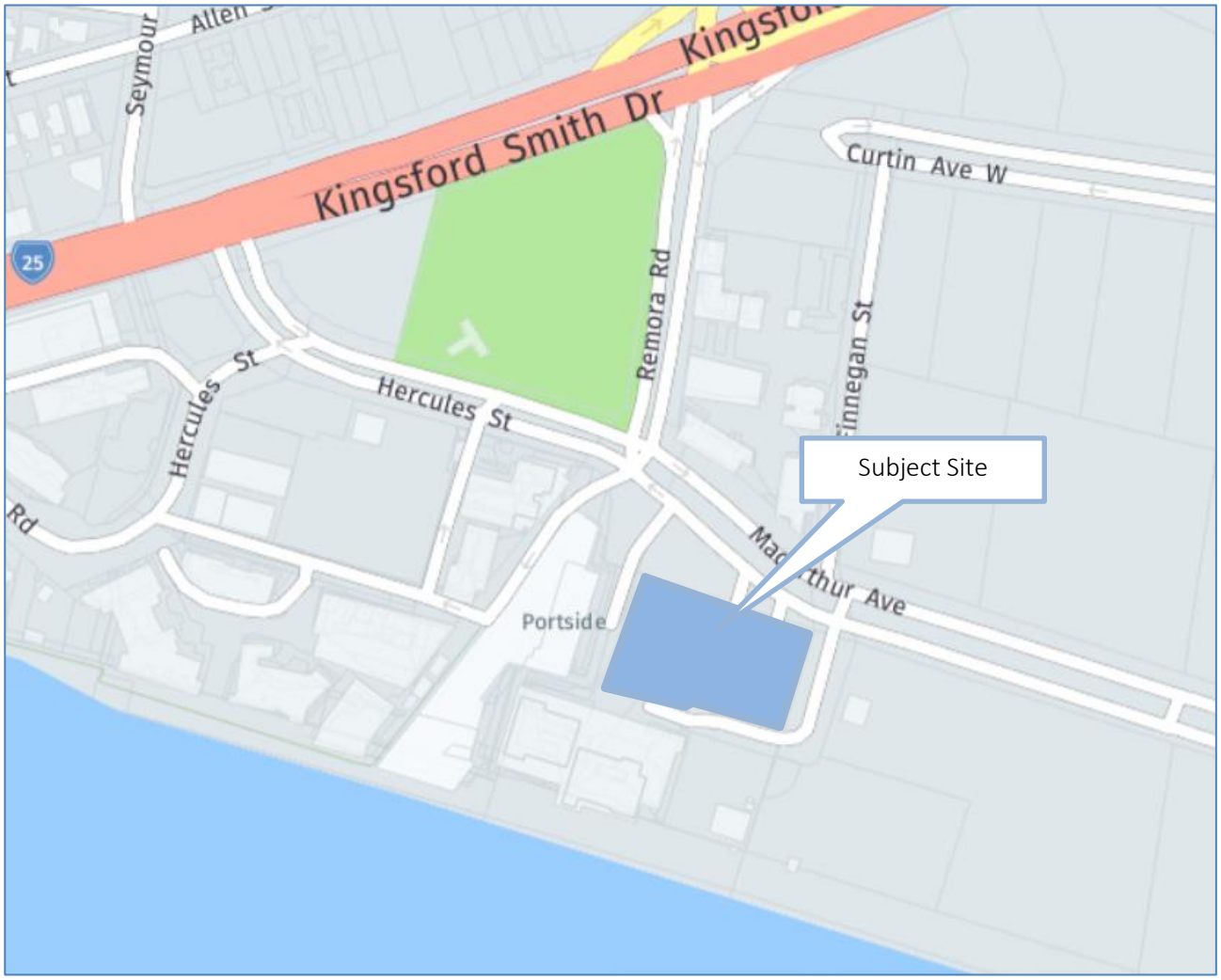


Figure 1.1: Site Location (Source: Nearmap Aerial Imaging)

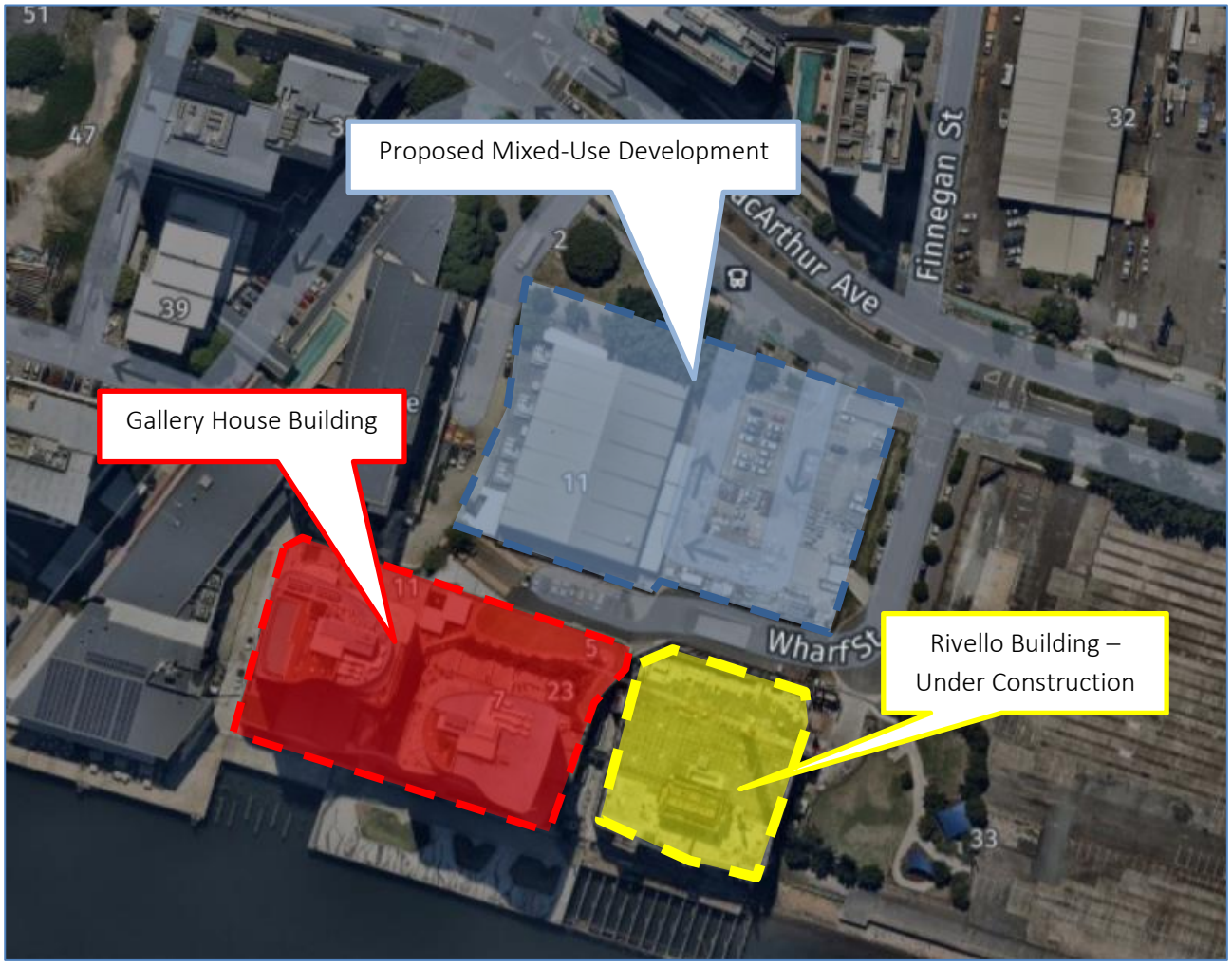


Figure 1.2: Site Aerial (Source: Nearmap Aerial Imaging)

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 1.1.

Table 1.1: 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 A.

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 7.

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.

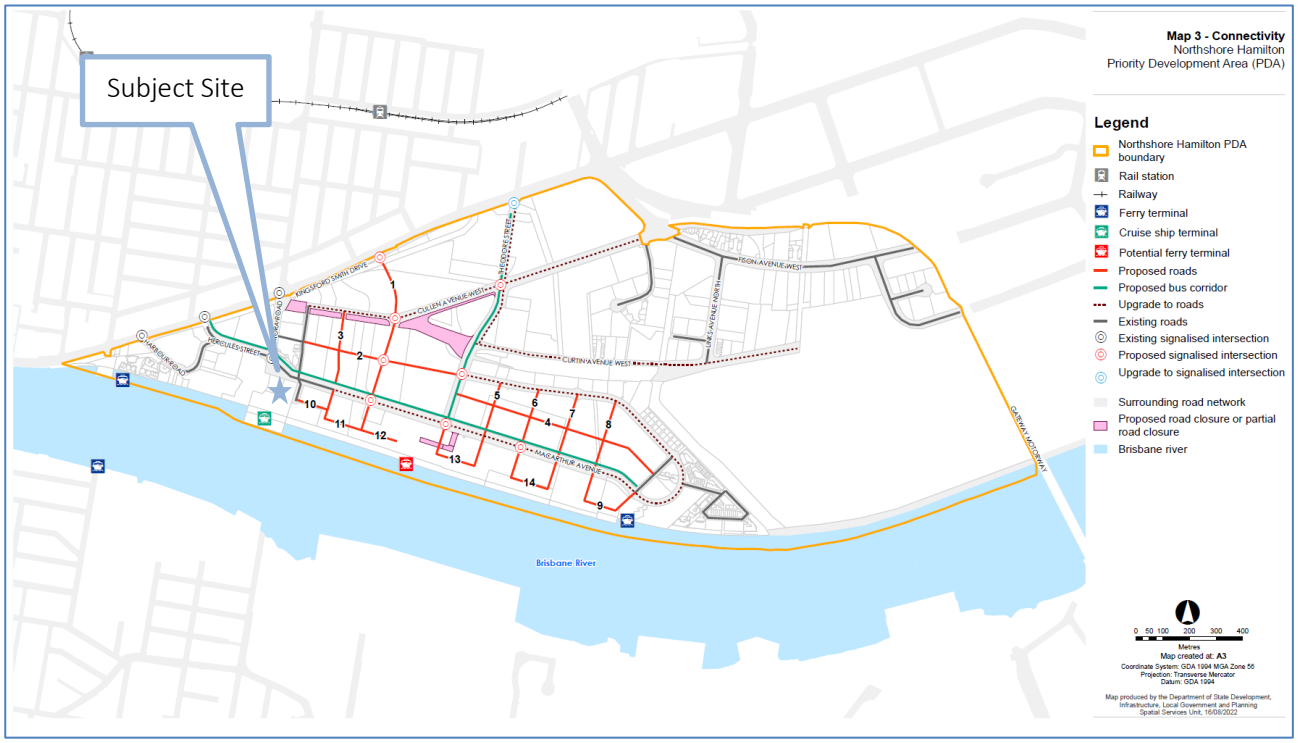


Figure 2.1: Map 3 - Connectivity (Source: Northshore Hamilton Priority Development Area Development Scheme (Amendment No. 1, October 2022)

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.

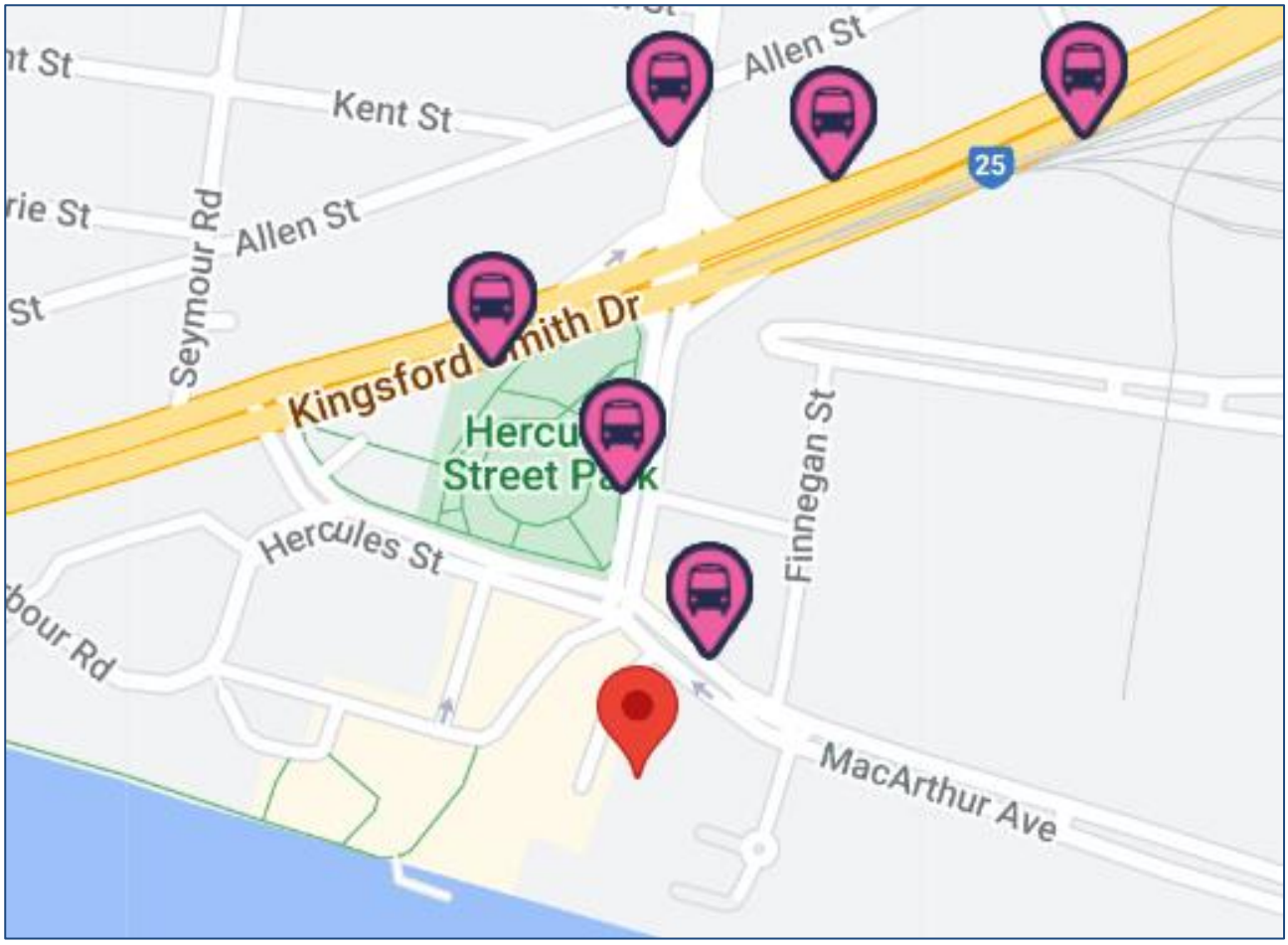


Figure 2.2: Bus Stop Locations (Source: www.translink.com.au)

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.

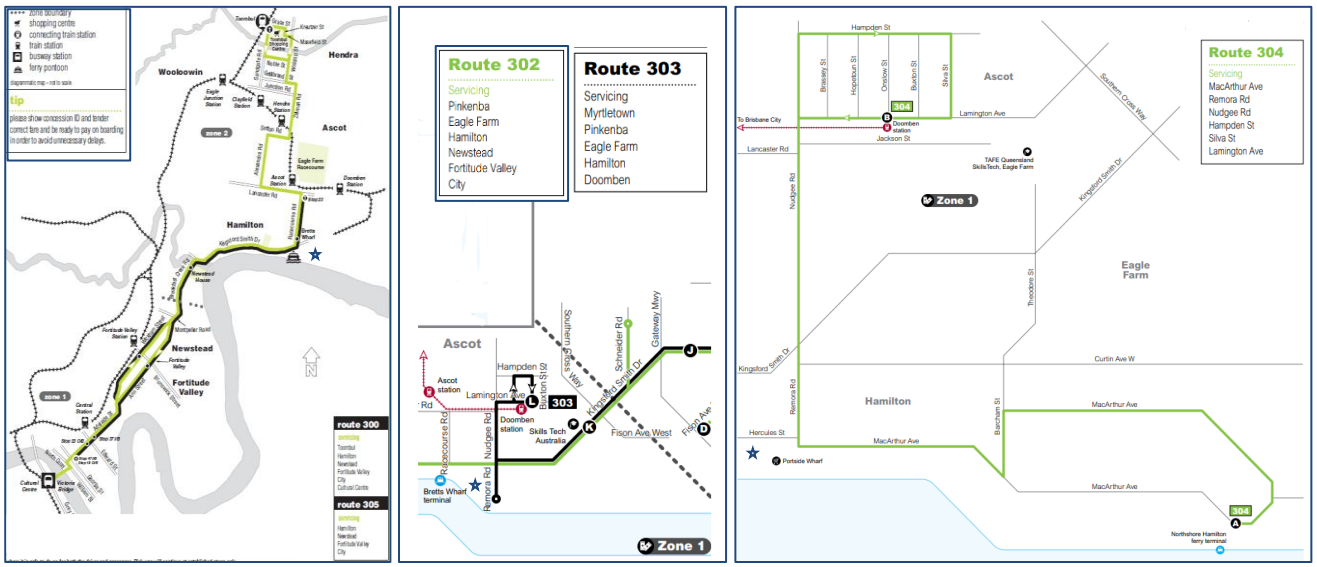


Figure 2.3: Local Bus Routes (Source: www.translink.com.au)

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.

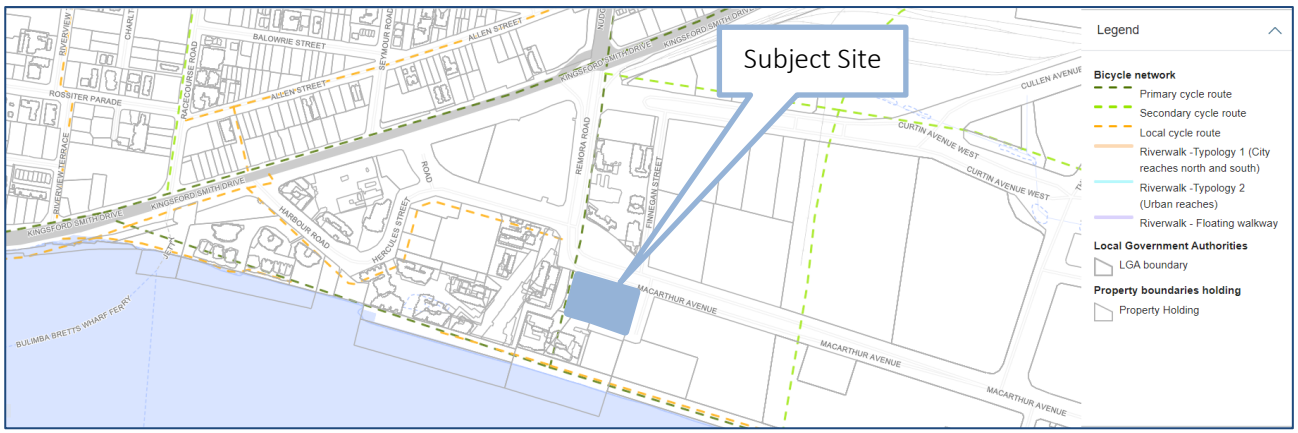


Figure 2.4: Excerpt from BCC's Bicycle Network Overlay (Source: BCC City Plan)

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.

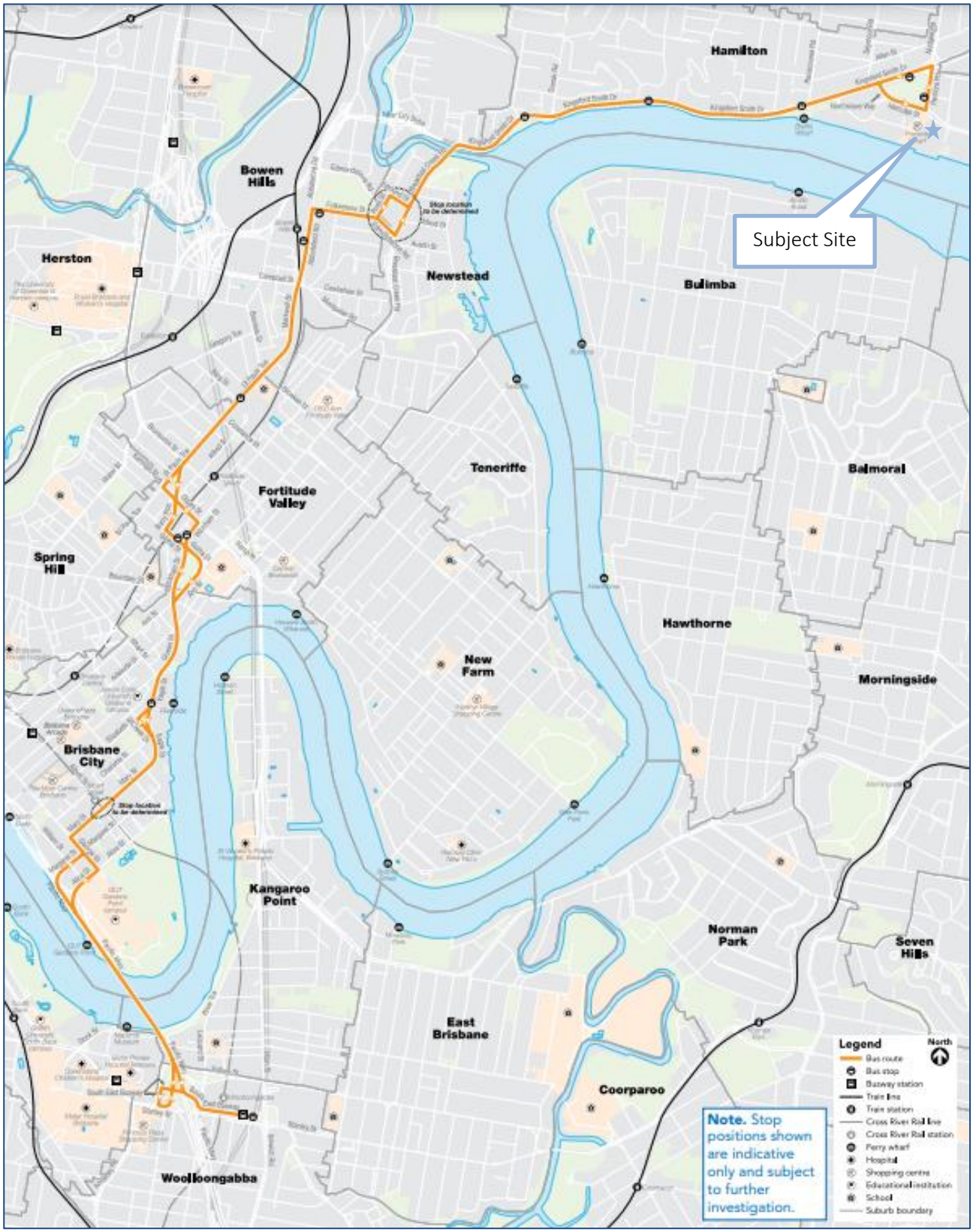


Figure 2.5: Indicative Route of Gold CityGlider (Source: BCC)

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.

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 on the portal is estimated to be only 126vph (based on a traffic generation rate of 0.22vph/unit and 65/35 split in terms of arrivals/departures for the 875 units within the proposed development and Gallery House) during the weekday PM peak-hour or approximately 11.1% 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, 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 100 parking spaces within a supermarket. BCC's requirement for queuing capacity for 100 parking spaces within a supermarket is 5 vehicle lengths, or 30m. 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'.

Given the proposed development comprises a BTR residential building, the parking spaces will be de-coupled from the units. Consequently, the parking spaces can be leased 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.

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.

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.

The following sections provide supporting information in relation to the performance solution.

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 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.

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

A single operator 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 operator 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.

Another key aspect of the ongoing management and operation of the proposed development will be the implementation of a Sustainable Green Travel Plan (SGTP).

4.2.6 Sustainable Green Travel Plan

The implementation of a SGTP (which will be developed during the detailed design stage) will install 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:

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 4.1 (i.e. 93 parking spaces) with each car share space accounting for a 6 parking space reduction in the resident parking supply. This allowance, which has been previously accepted by EDQ and BCC for other multiple unit dwelling developments, 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.

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 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 B) 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.

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 B) 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 the TAPS PSP requirements. The last column identifies the compliance of each design aspect. Where compliance with 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.

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.

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 included in Appendix B.

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.

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 included in Appendix B.

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.

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.

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 included in Appendix B.

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.

5.1.3 Proposed Service Vehicle Arrangements

5.1.3.1 Service Vehicle Provisions

As illustrated on the development plans included in Appendix A, 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.

5.1.3.2 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 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.

5.1.3.3 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 B.

5.1.4 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.

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.

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: 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.

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 C) 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

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

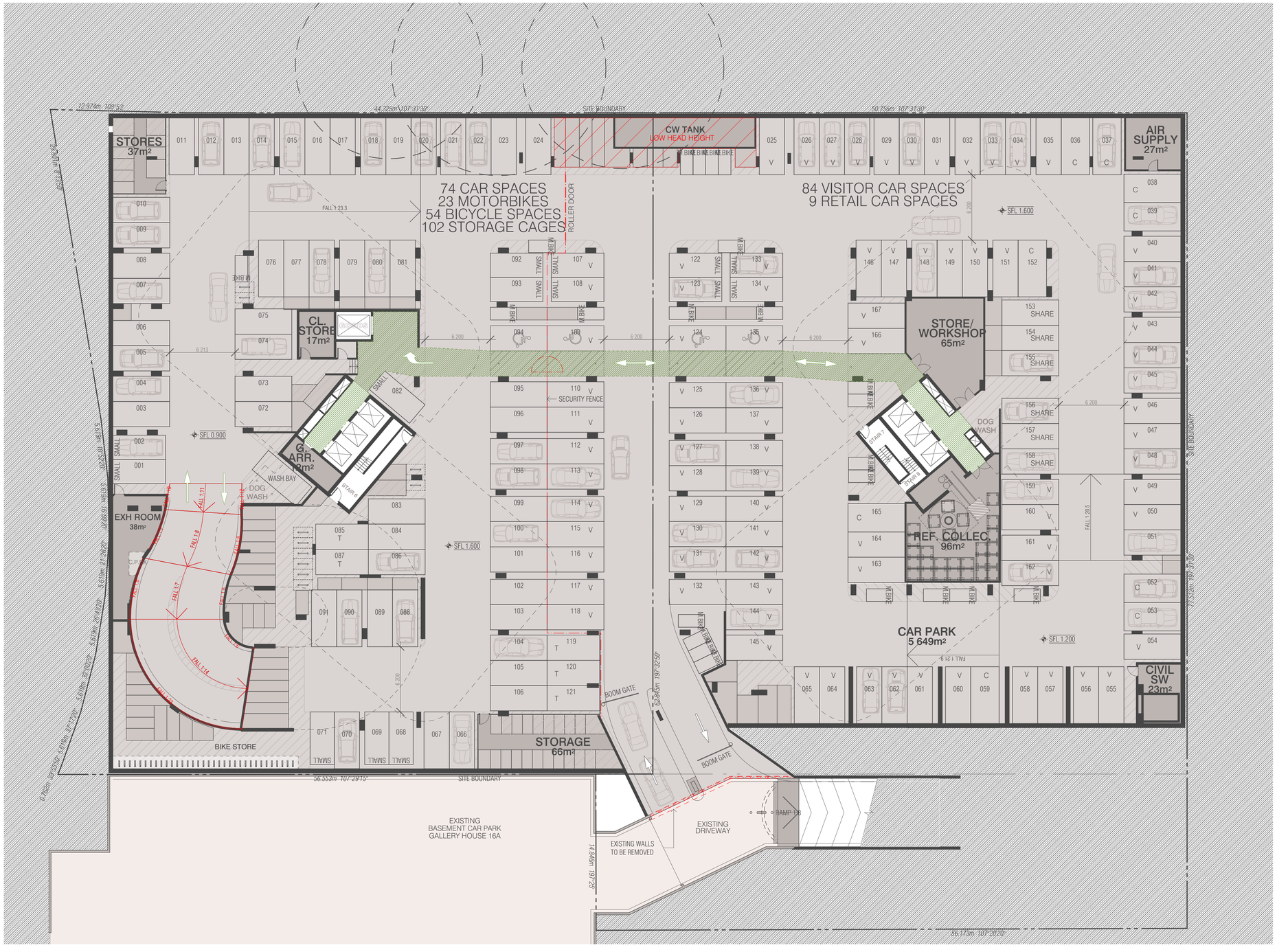
It is understood that traffic modelling was undertaken by Cardno on the behalf of EDQ, which has informed road planning and the extent of road (and intersection) upgrades within the wider Northshore Hamilton precinct. It is TTM's understanding that the scale of the proposed development (inclusive of 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 Development Plans



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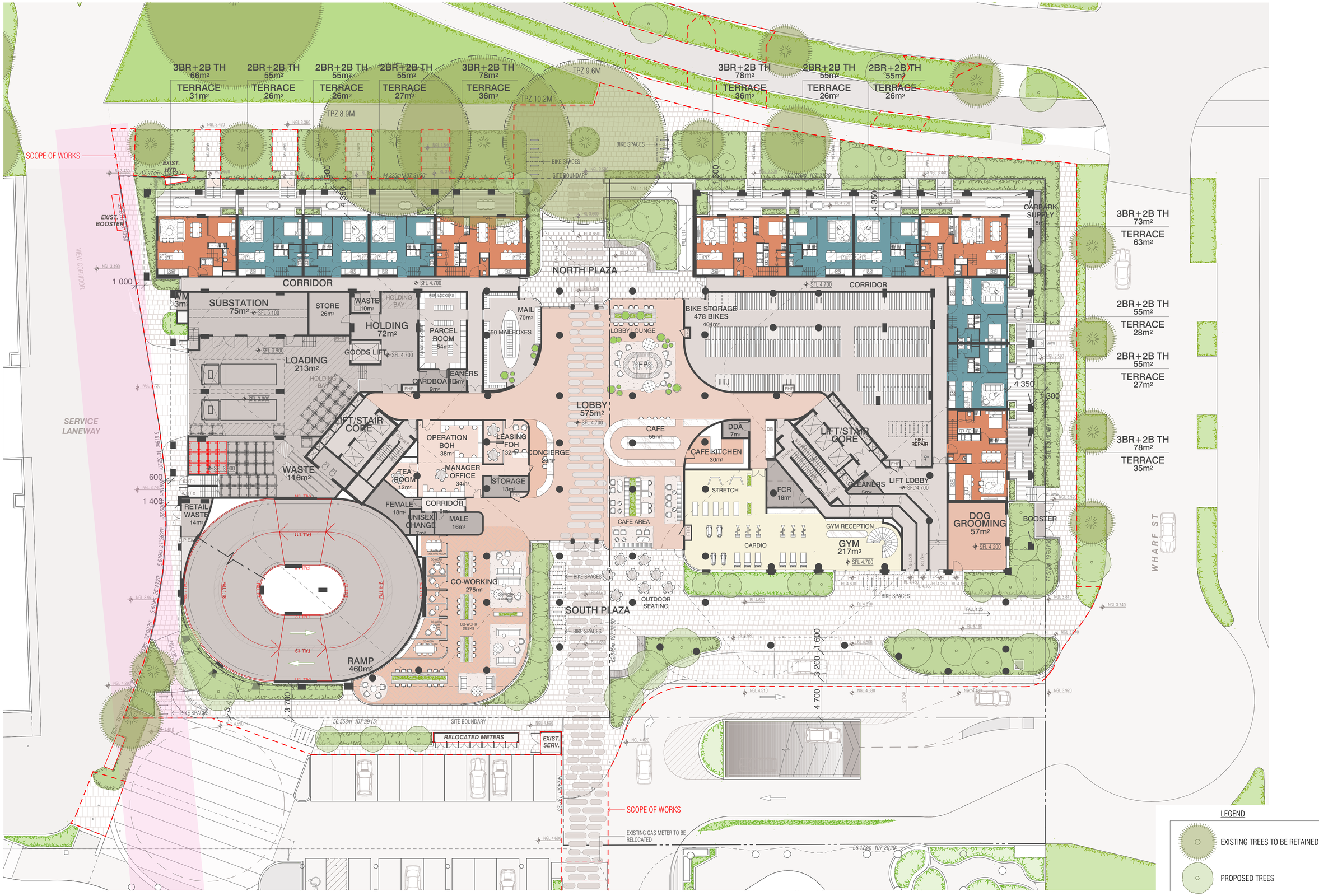
PROJECT 11-23 MACARTHUR AVENUE HAMILTON	DRAWING TITLE BASEMENT FLOOR PLAN	SCALE 1:200@A1 0 M 3 M	DATE 5/05/2023	DRAWING NUMBER SK62-DA0099

FENDER KATSALIDIS



PROJECT 11-23 MACARTHUR AVENUE HAMILTON	DRAWING TITLE GROUND FLOOR PLAN		SCALE 1:200@A1 0 M 3 M	DATE 5/05/2023	DRAWING NUMBER SK62-DA0100

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

FENDER KATSALIDIS

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

PROJECT
11-23 MACARTHUR AVENUE HAMILTON

DRAWING TITLE
STOREY 2-3 PODIUM - FLOOR PLAN

SCALE
1:200@A1
0 M 3 M

DATE
5/05/2023

DRAWING NUMBER
SK62-DA0102

FENDER KATSALIDIS

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

PROJECT
11-23 MACARTHUR AVENUE
HAMILTON

DRAWING TITLE
STOREY 4 PODIUM - FLOOR PLAN

SCALE
1:200@A1
0 M 3 M

DATE
5/05/2023

DRAWING NUMBER
SK62-DA0104

FENDER KATSALIDIS

COMMON AREA

GROUND FLOOR/MEZZANINE COMMON AREA		
	ZONE NAME	AREA
STOREY 1 - GROUND FLOOR		
	CARDBOARD	9
	CLEANERS	5
	CONCIERGE	23
	CORRIDOR	170
	CO-WORKING	275
	DDA	7
	FEMALE	18
	GYM	219
	LEASING_FOH	32
	LIFT/STAIR_CORE	92
	LOBBY	574
	MAIL	70
	MALE	16
	MANAGER_OFFICE	34
	OPERATION_BOH	38
	PARCEL_ROOM	54
	STORAGE	13
	TEA_ROOM	12
	UNISEX_CHANGE	7
		1 668 m²
MEZZANINE		
	CIRC.	28
	DDA	6
	FEMALE	17
	GYM	422
	MALE	18
	MEDIA ROOM	75
		566 m²

COMMON AREA - AMENITIES LEVEL	
ZONE NAME	**AREA**
ALL GENDER_BATHROOM	15
BOH_STORAGE	16
CAT._KITCHEN	21
CLEANER	7
CLR._STORAGE	21
DDA	6
FEMALE_CHANGE ROOMS	31
GAMES	93
LOUNGE	100
MALE_CHANGE ROOMS	31
MASSAGE	16
PRIVATE DINING_MEETING 1	57
PRIVATE DINING_MEETING 2	52
PRIVATE DINING_MEETING 3	41
SAUNA	9
STEAM	10
STORAGE	6
WELLNESS/SPA	87
WINE_LIBRARY	48
TOTAL COMMON AREA	**3 020m²**

CAR/MOTORBIKE PARKING

CARPARKING SCHEDULE		
Carpark Type	**LEVEL**	**QTY**
AusStd 90 Degree		
	BASEMENT	136
	STOREY 2 - PODIUM	69
	STOREY 3 - PODIUM	69
	STOREY 4 - PODIUM	69
		343
AusStd Parallel		
	STOREY 2 - PODIUM	2
	STOREY 3 - PODIUM	2
	STOREY 4 - PODIUM	2
		6
AusStd Public (2.7m wide)		
	BASEMENT	9
		9
AusStd Small		
	BASEMENT	13
	STOREY 2 - PODIUM	8
	STOREY 3 - PODIUM	8
	STOREY 4 - PODIUM	10
		39
Disabled Space		
	BASEMENT	4
	STOREY 2 - PODIUM	4
	STOREY 3 - PODIUM	4
	STOREY 4 - PODIUM	4
		16
Tandem 90 Degrees		
	BASEMENT	5
	STOREY 2 - PODIUM	6
	STOREY 3 - PODIUM	6
	STOREY 4 - PODIUM	6
		23
		436

MOTORBIKE PARKING		
Carpark Type	**LEVEL**	**QTY**
AusStd Motorbike		
	BASEMENT	23
	STOREY 2 - PODIUM	14
	STOREY 3 - PODIUM	14
	STOREY 4 - PODIUM	14
		65

CARPARKING EFFICIENCY		
LEVEL	**AREA**	
BASEMENT	5912m²	34m²
PODIUM	3353m²	34m²

BIKE PARKING

BICYCLE PARKING SCHEDULE		
LEVEL	**TYPE**	**QTY**
BASEMENT		
	CRADLE	34
	WISHBONE	30
STOREY 1 - GROUND FLOOR		
	ARC STAGGERED	454
	CRADLE	10
	DDA	4
	WISHBONE	10
	WISHBONE OUTSIDE	54
STOREY 2 - PODIUM		
	WISHBONE	18
STOREY 3 - PODIUM		
	WISHBONE	18
STOREY 4 - PODIUM		
	WISHBONE	18
		650

RETAIL

GROUND FLOOR RETAIL		
	ZONE NAME	AREA
STOREY 1 - GROUND FLOOR		
	CAFE	55
	CAFE KITCHEN	30
	DOG_GROOMING	57
		142 m²

COMMUNAL OPEN SPACE	
STORY NAME	**AREA**
STOREY 1 - GROUND FLOOR	336
STOREY 2 - PODIUM	86
STOREY 3 - PODIUM	86
STOREY 4 - PODIUM	86
STOREY 5 - PODIUM ROOFT...	3 072
	3 666 m²

STORAGE

STORAGE CAGE SUMMARY		
FLOOR	**QTY**	**AREA**
BASEMENT	102	345
STOREY 2 - PODIUM	33	108
STOREY 3 - PODIUM	39	121
STOREY 4 - PODIUM	44	132
	218	**706 m²**

Appendix B Swept Path Diagrams

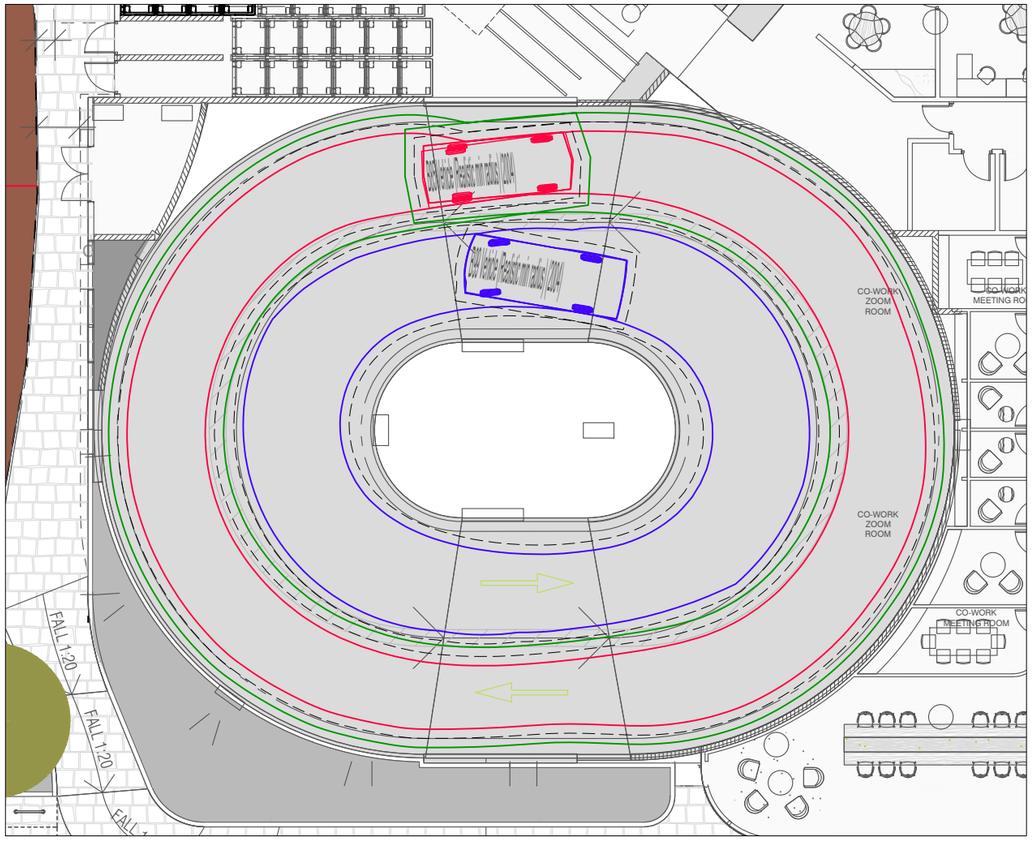


FIGURE 1 - RAMPING CIRCULATION - PODIUM LEVELS

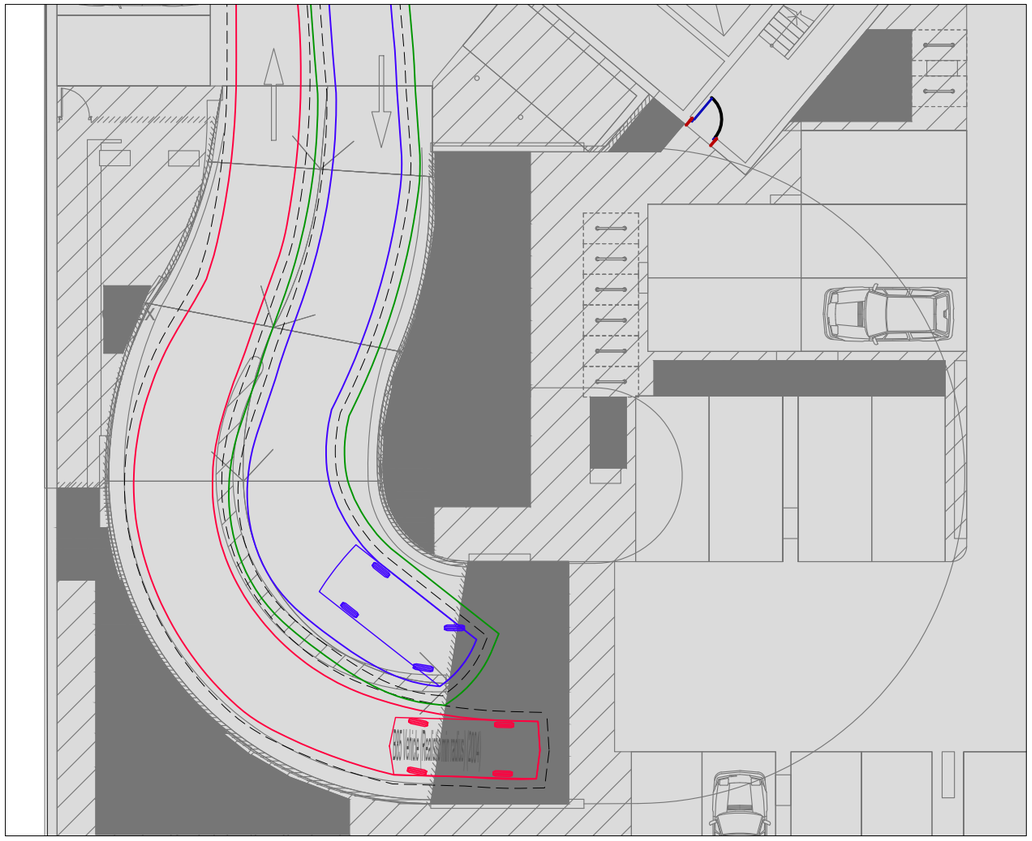
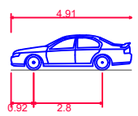


FIGURE 2 - RAMPING CIRCULATION - BASEMENT

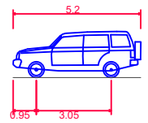
NOTES:
1. MINIMUM 0.3M CLEARANCE TO KERB.
2. MINIMUM 0.9M CLEARANCE BETWEEN CIRCULATING VEHICLES.



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

FOR APPROVAL
12 May 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	10.00km/h
Clearance Envelope	0.300m

REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
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

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PROJECT
21BRT0771 - PORTSIDE BUILD-TO-RENT DEVELOPMENT

DRAWING TITLE
SWEPT PATH ANALYSIS
REVIEW OF CIRCULATION ON RAMP

PROJECT NUMBER	21BRT0771
ORIGINAL SIZE	A3
DRAWING NUMBER	21BRT0771-01
REVISION	A
DATE	11 May 2023
SHEET	1 OF 1

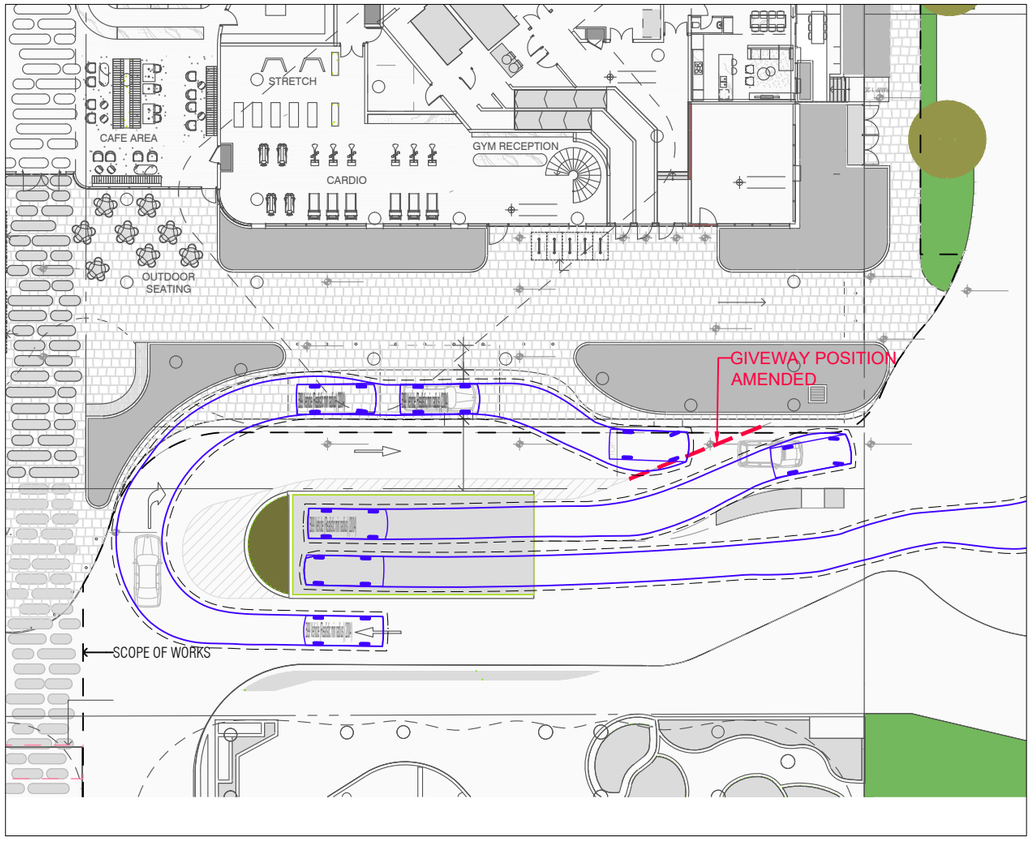


FIGURE 1 - B99 CIRCULATION AT SET DOWN AND PORTAL RAMP

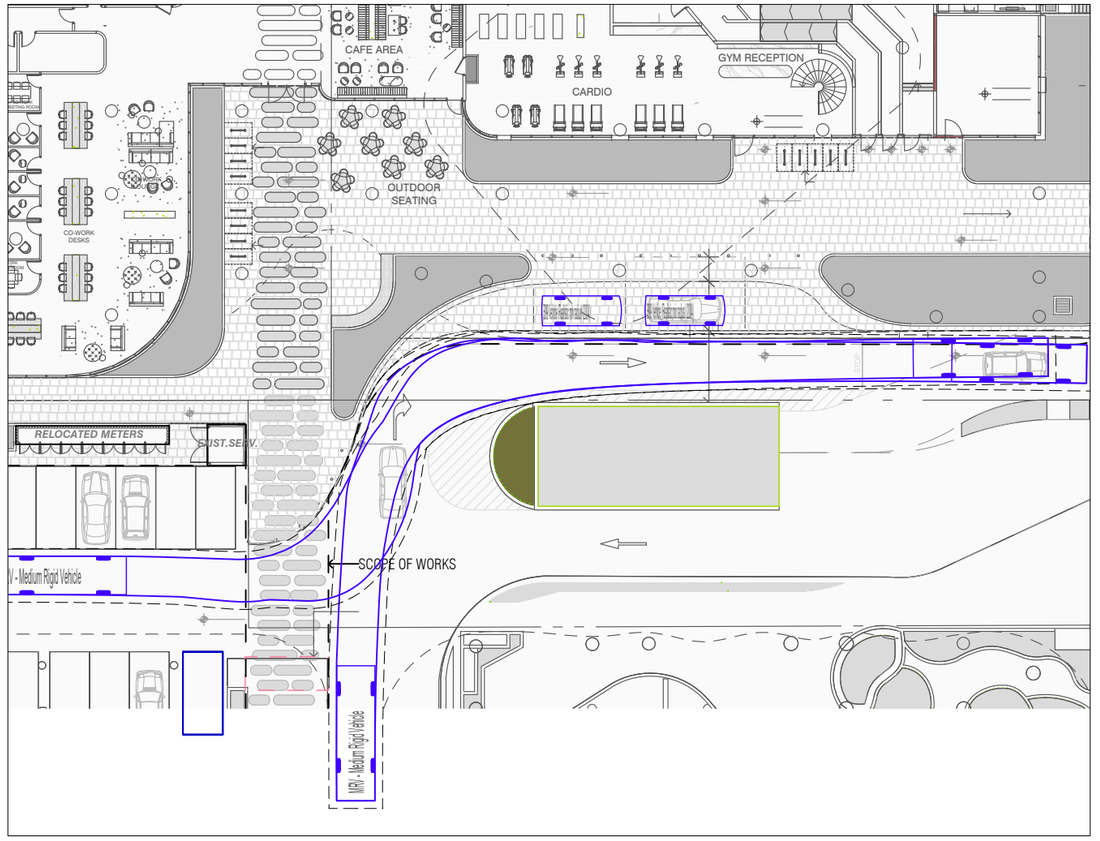
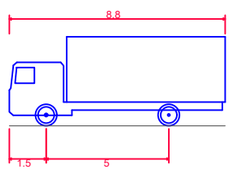


FIGURE 2 - MRV CIRCULATION AT SET DOWN

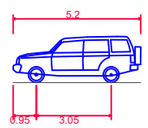
NOTES:
1. LINEMARKING AND SIGNAGE TO BE RESOLVED AS PART OF THE DETAILED DESIGN PROCESS.



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
12 May 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

08-05-23	ORIGINAL ISSUE	MGe	AR	AR
	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED

SCALE 0 4 8 12 16 20m
SCALE 1:400 AT ORIGINAL SIZE
NORTH
CLIENT: BROOKFIELD RESIDENTIAL PROPERTIES

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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	21BRT0771
ORIGINAL SIZE	A3
DRAWING NUMBER	21BRT0771-02
REVISION	A
DATE	11 May 2023
SHEET	1 OF 1

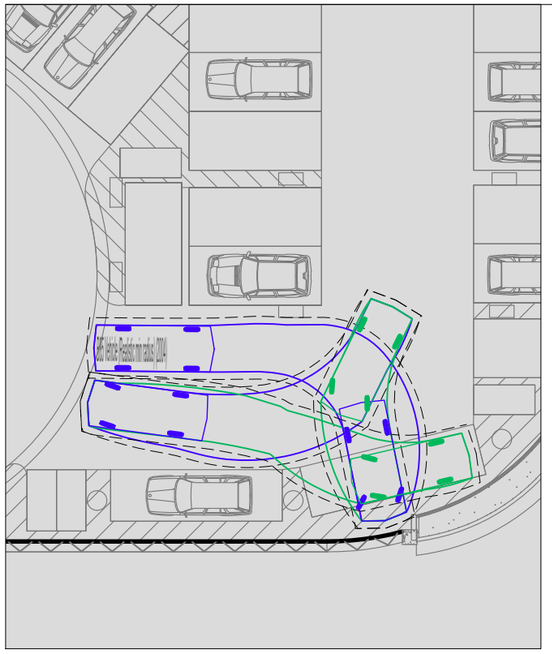


FIGURE 1 - PARALLEL SPACE 1 (L2-4)

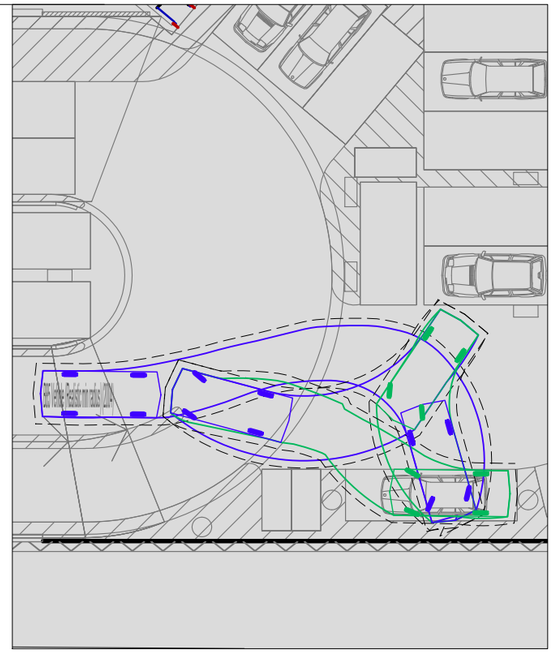


FIGURE 2 - PARALLEL SPACE 2 (L2-4)

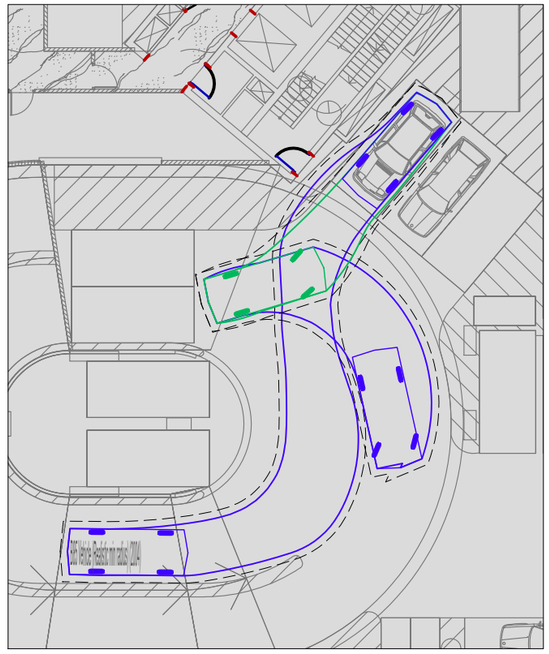


FIGURE 3 - ANGLED RAMPING SPACE (L4)

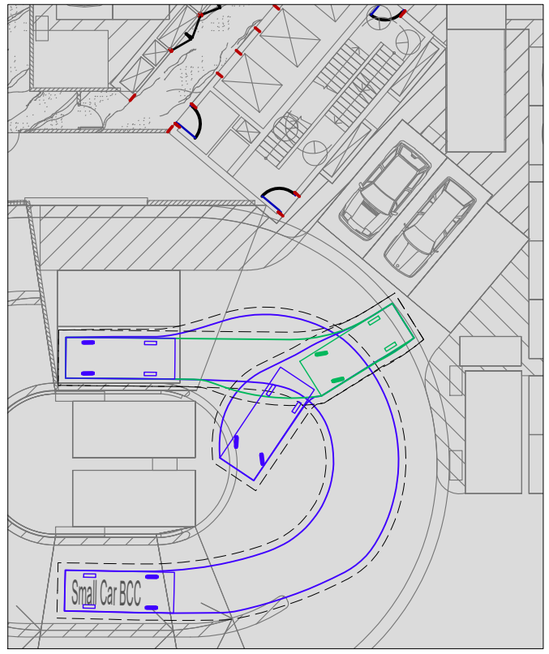


FIGURE 4 - BLIND AISLE AT RAMP 1

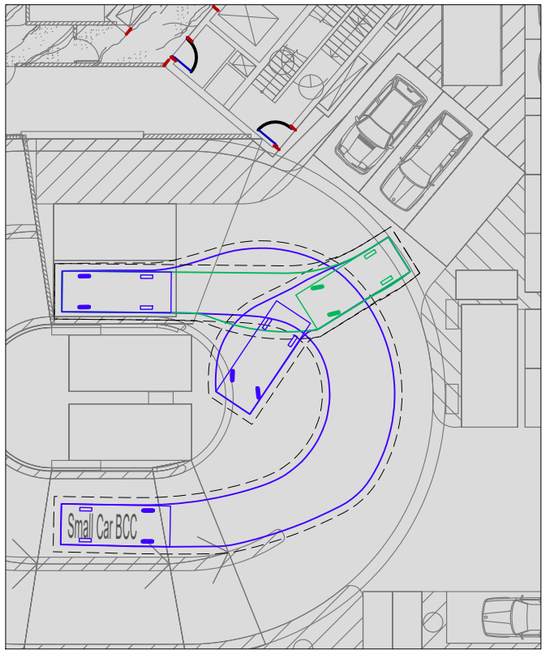
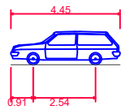
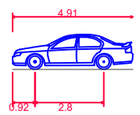


FIGURE 5 - BLIND AISLE AT RAMP (L4)



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

12 May 2023

REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
	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

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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	A
DATE	SHEET
12 May 2023	1 OF 2

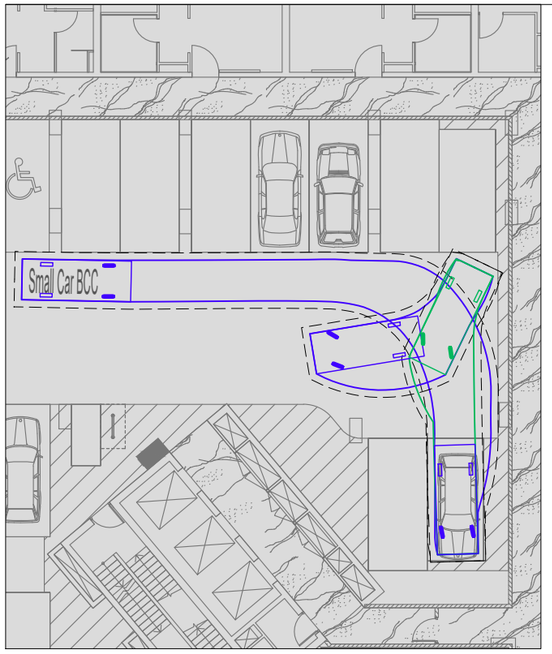


FIGURE 1 - BLIND AISLE EXTENSION 1 (L2-4)

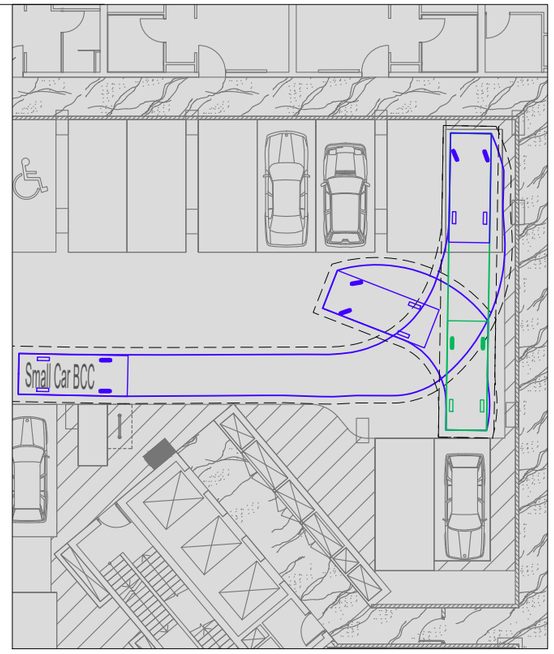


FIGURE 2 - BLIND AISLE EXTENSION 2 (L2-4)

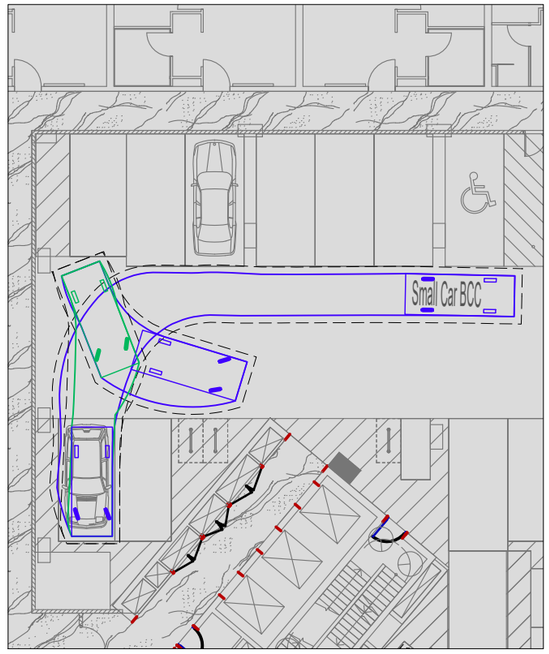


FIGURE 3 - BLIND AISLE EXTENSION 3 (L2-4)

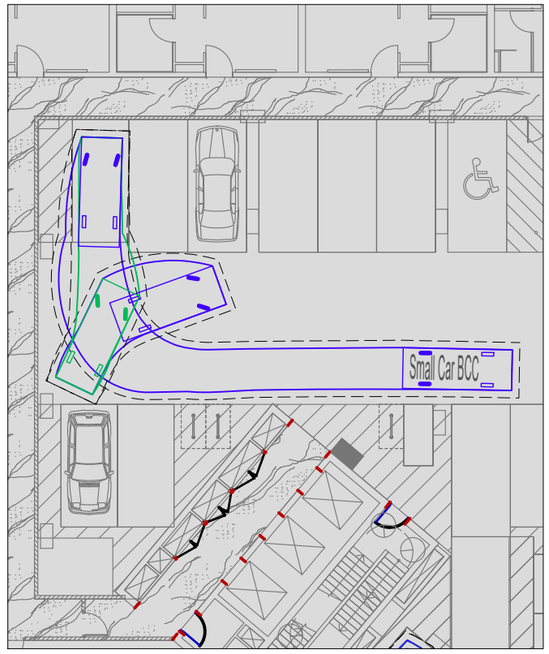


FIGURE 4 - BLIND AISLE EXTENSION 4 (L2-4)

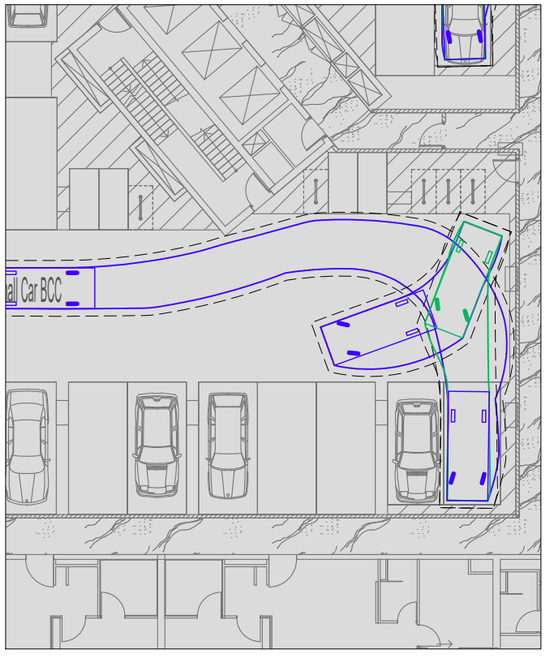


FIGURE 5 - BLIND AISLE EXTENSION 5 (L2-4)

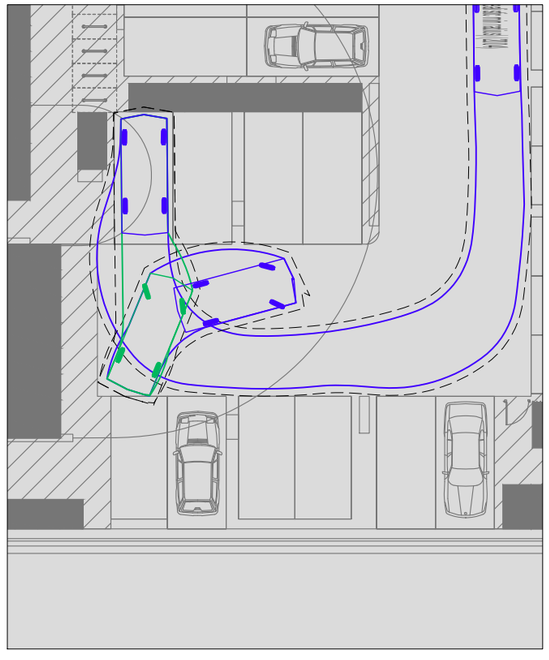


FIGURE 5 - BLIND AISLE EXTENSION 6 (B1)

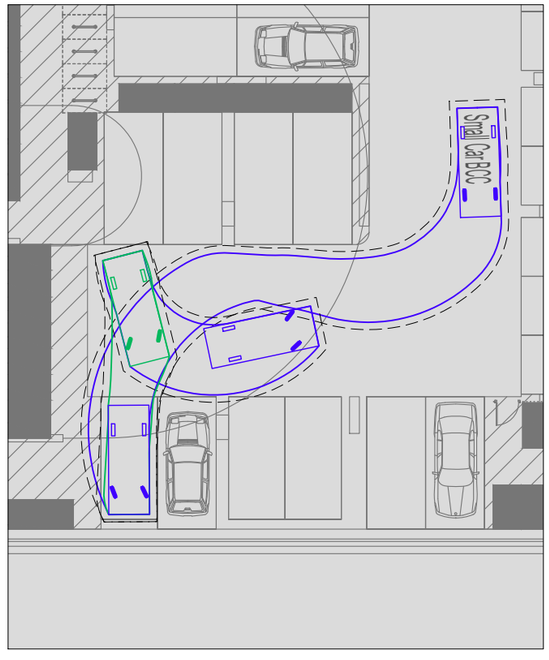
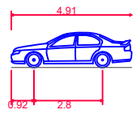
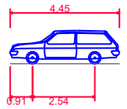


FIGURE 7 - BLIND AISLE EXTENSION 7 (B1)



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
12 May 2023

REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
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

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LEVEL 8, 369 Ann Street, BRISBANE QLD 4000
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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	21BRT0771
ORIGINAL SIZE	A3
DRAWING NUMBER	21BRT0771-03
REVISION	A
DATE	12 May 2023
SHEET	2 OF 2

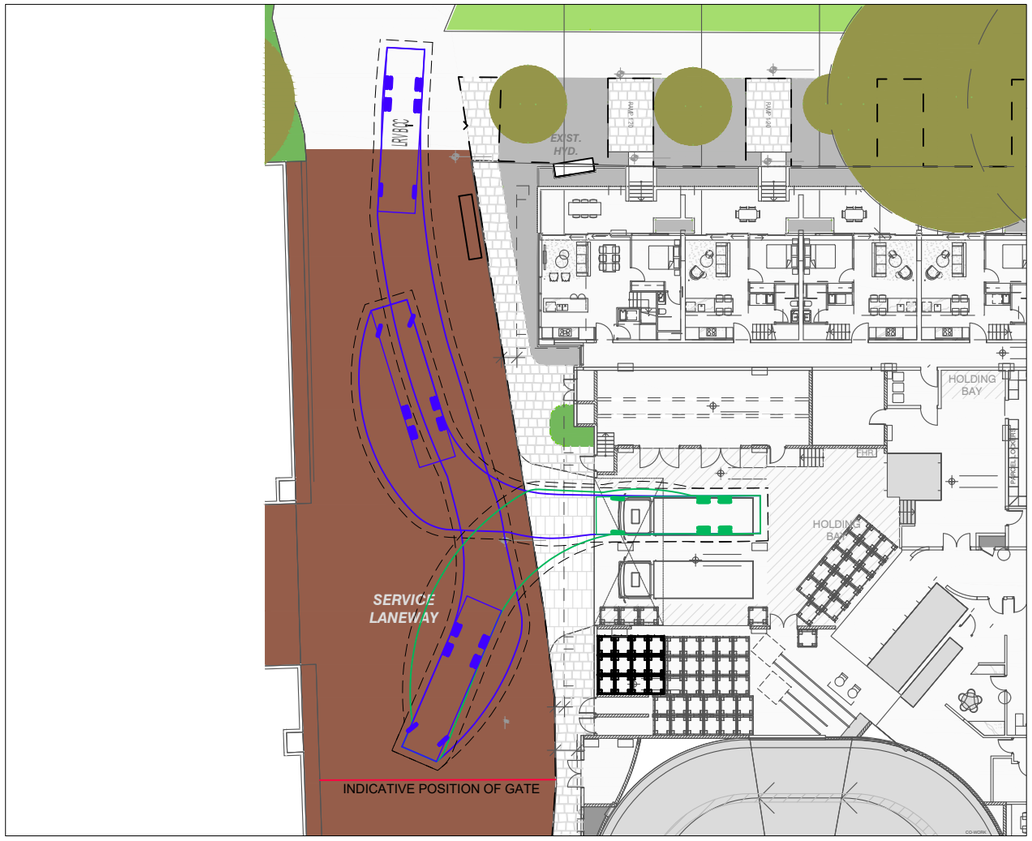


FIGURE 1 - LRV SERVICE BAY 1

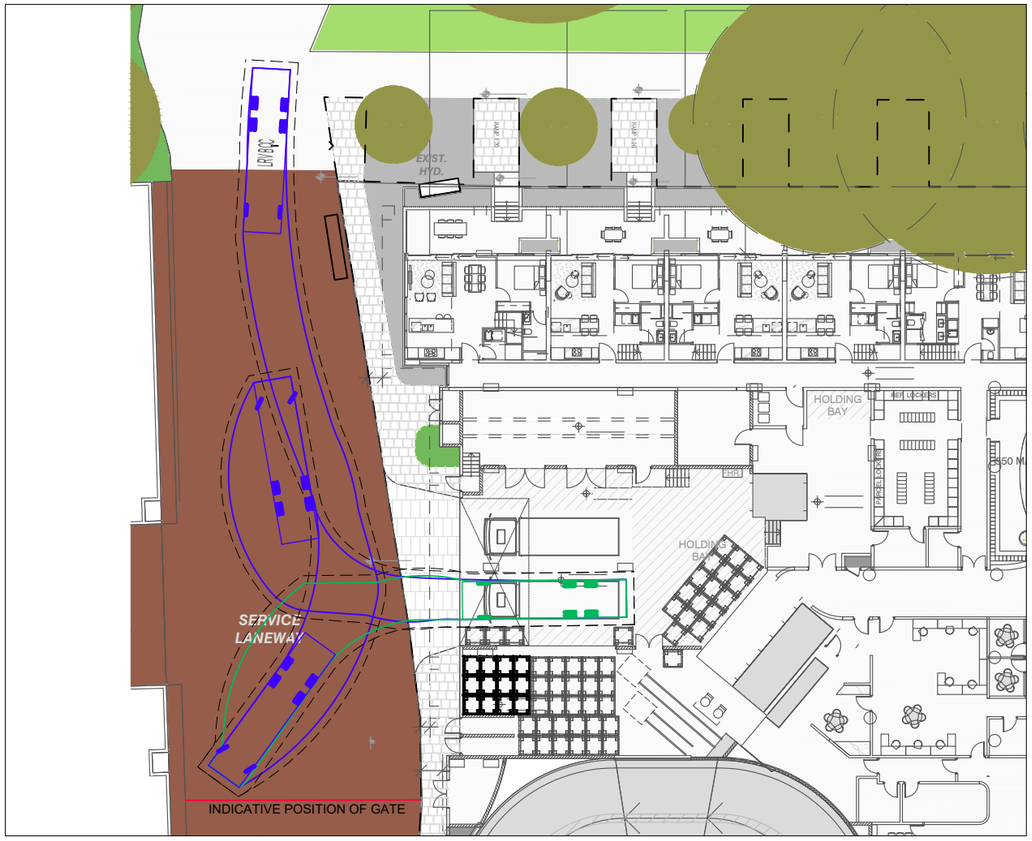
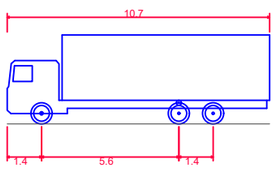


FIGURE 2 - LRV SERVICE BAY 2



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
12 May 2023

08-05-23	ORIGINAL ISSUE	MGe	AR	AR
	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED

SCALE 0 4 8 12 16 20m
SCALE 1:400 AT ORIGINAL SIZE

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CLIENT
BROOKFIELD RESIDENTIAL PROPERTIES

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PROJECT
21BRT0771 - PORTSIDE BUILD-TO-RENT DEVELOPMENT

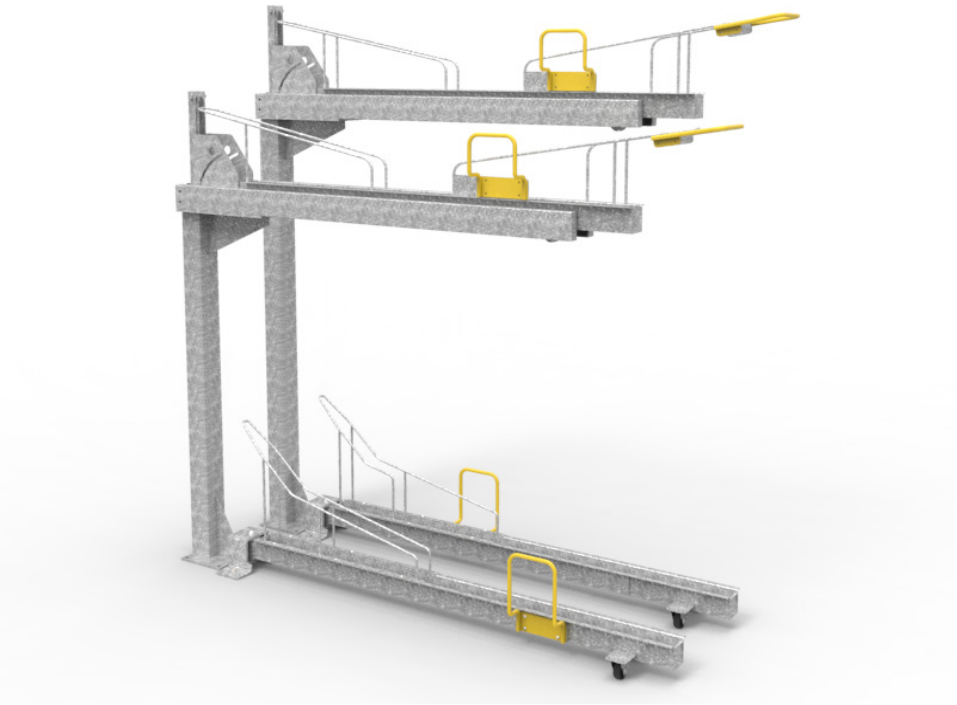
DRAWING TITLE
SWEPT PATH ANALYSIS
LRV SERVICE BAY MANOEUVRING

PROJECT NUMBER	21BRT0771
ORIGINAL SIZE	A3
DRAWING NUMBER	21BRT0771-04
REVISION	A
DATE	12 May 2023
SHEET	1 OF 1

Appendix C 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

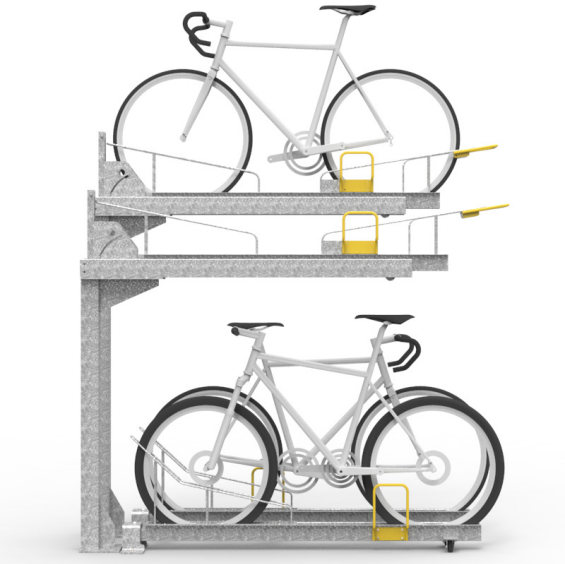
- Galvanised with powder coated accents on handles
- Option - Colour Powder Coat (Cora standard colour range)

Assembly

- Supplied partially assembled for assembly and mounting on site

Compliance

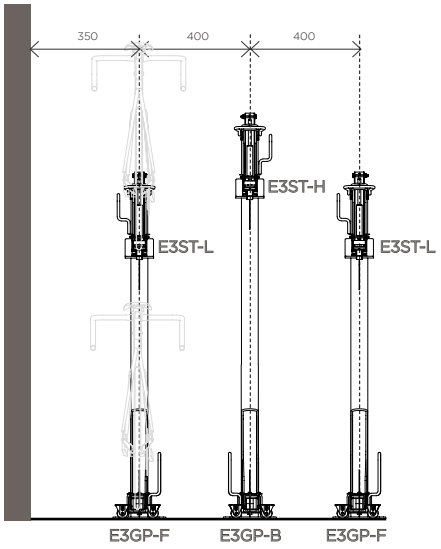
- Rack is AS2890.3 (2015) compliant



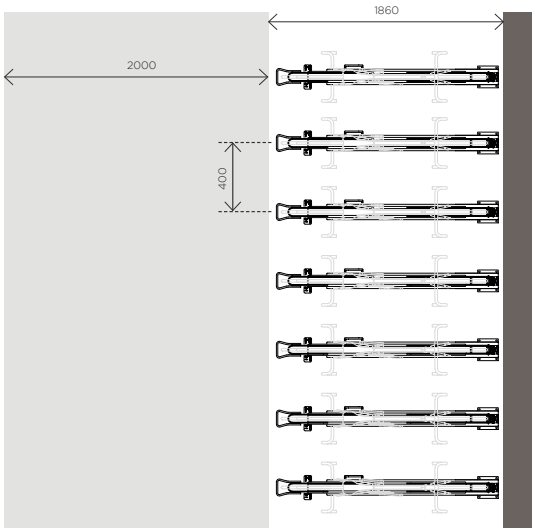
CORA BIKE RACK

PRODUCT SPECIFICATION SHEET

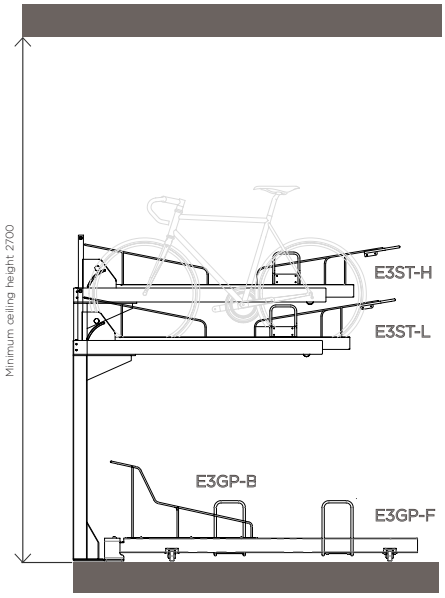
STAGGERED LAYOUT



Front view

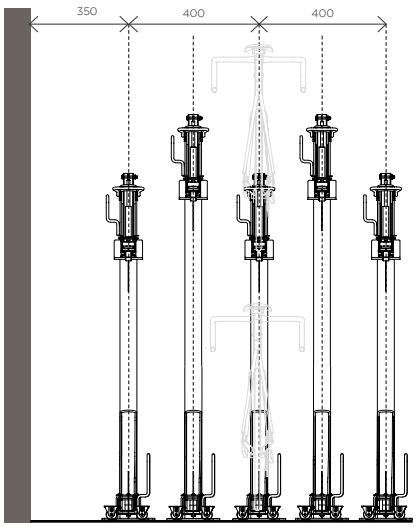


Top view

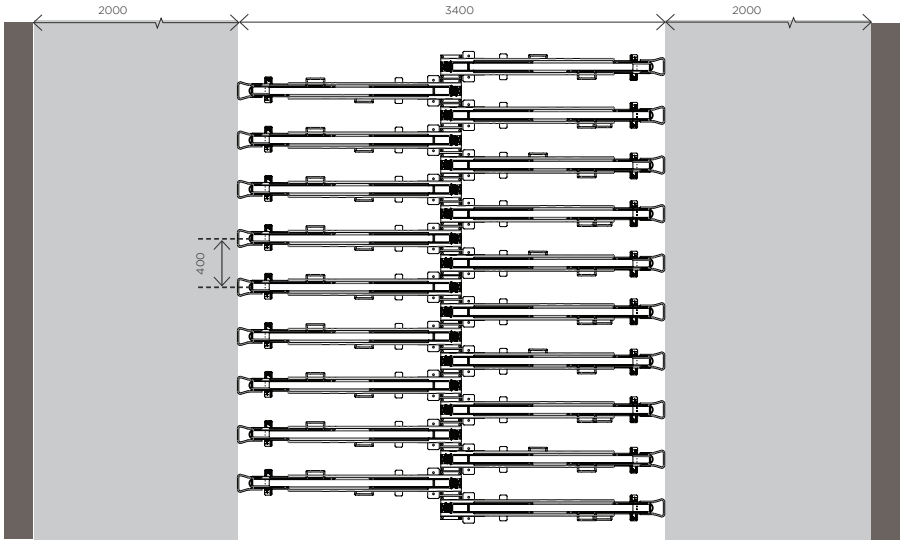


Side view

NESTED LAYOUT



Front view

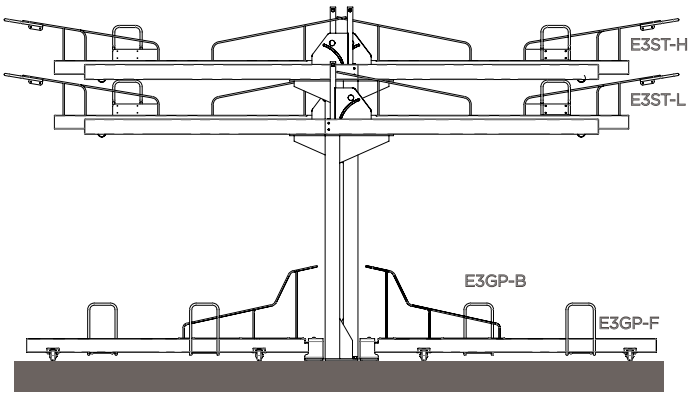


Top view

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.

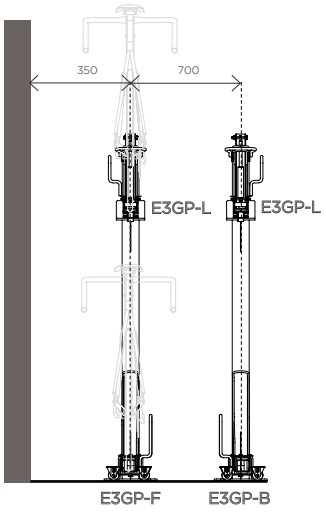


Side view

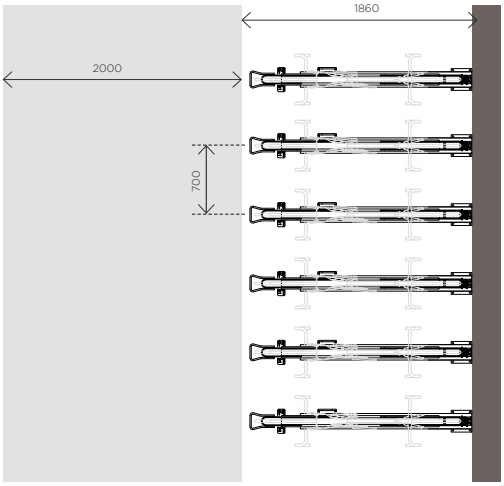
CORA BIKE RACK

PRODUCT SPECIFICATION SHEET

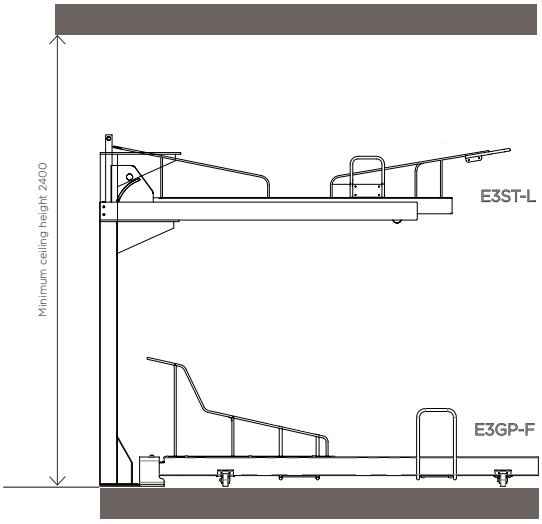
SINGLE LEVEL LAYOUT



Front view



Top view



Side view

E3DT-GP DYNAMIC UPPER AND LOWER TIER LAYOUT GUIDE

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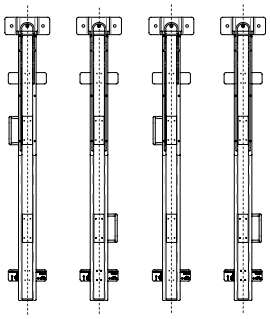
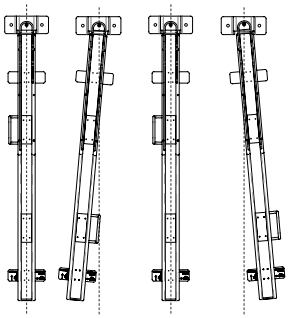
Racks should not be installed, based on the information on this sheet alone.

Dynamic side to side movement of lower rack

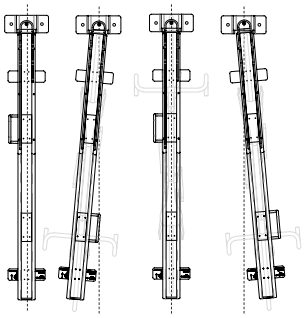


Racks in neutral position



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

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