

214-246 Macaulay Road, North
Melbourne

Transport Impact Assessment

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1 Introduction

1.1 Background and Proposal

A planning permit is being sought for a mixed-use development on land located at 214-246 Macaulay Road, North Melbourne. The development comprises supermarket, commercial (retail) and residential land uses.

The proposed ground floor layout identifying the vehicle access strategy is shown in Figure 1.1 (north runs left to right), with the proposed development schedule presented in Table 1.1.

Figure 1.1: Proposed Development Ground Floor

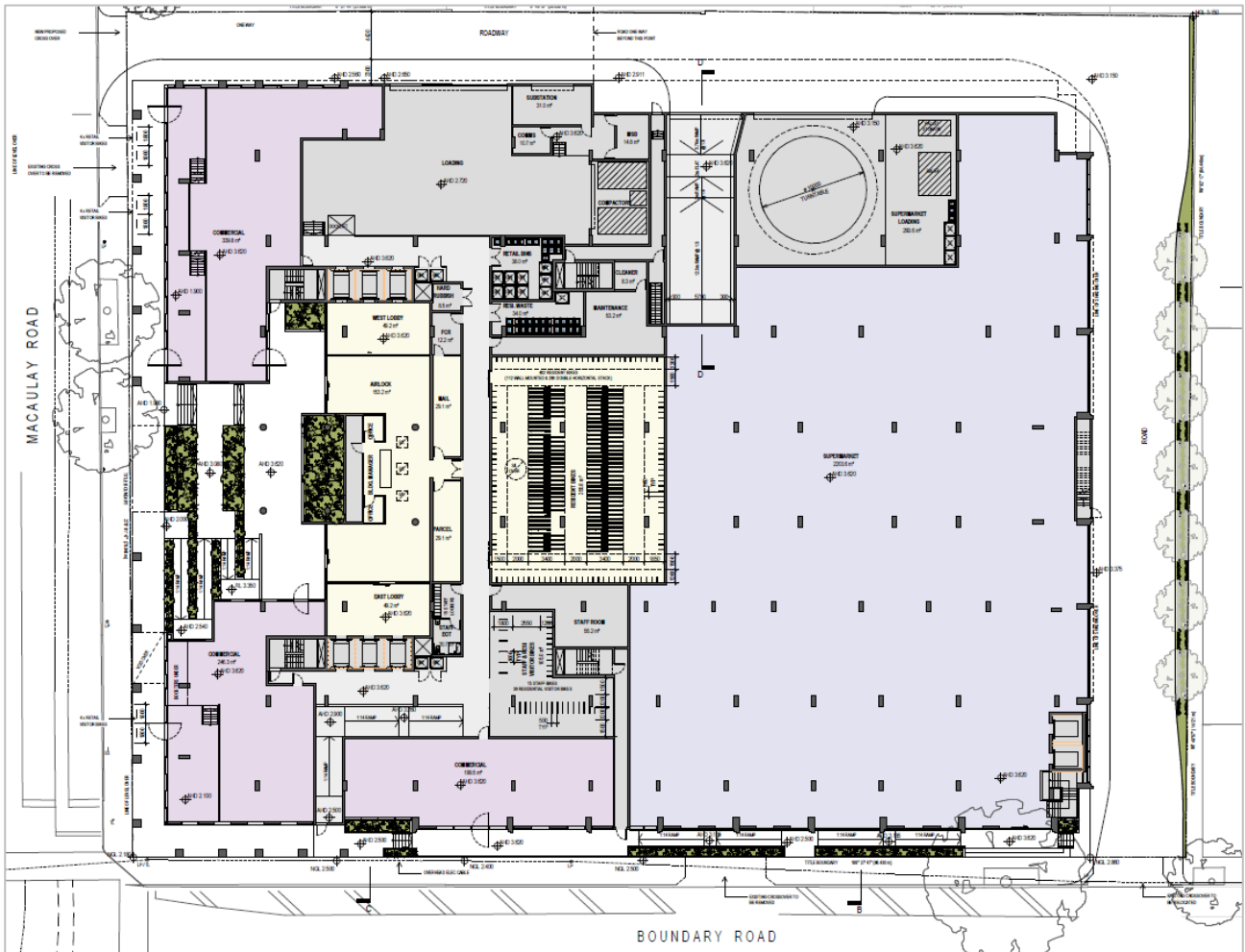


Table 1.1: Proposed Development Schedule

| Description | Size |
|---------------------|--------------------------------|
| Supermarket | 2,203.6sqm leasable floor area |
| Commercial (retail) | 785.6sqm leasable floor area |
| Dwelling | 82 x studio apartments |
| | 156 x one-bedroom apartments |
| | 132 x two-bedroom apartments |
| | 24 x three-bedroom apartments |

Vehicle access to the proposed development will be via two roadways that are identified in the Macaulay Structure Plan.

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The east-west roadway connecting to Boundary Road will be delivered as part of the development proposal with a 9.0m road reserve (it is expected ultimately to be delivered with an 18m road reserve). The roadway will permit two-way movements.

The north-south roadway connecting to Macaulay Road will be delivered as part of the development proposal with a 6.65m road reserve (it is expected ultimately to be delivered with a 12m road reserve). The roadway will permit two-way vehicle movements at its northern end (to the north of the development car park access) and one-way movements (north to south) at its southern end.

It is proposed to provide 190 car parking spaces within one basement level, with 138 resident car spaces, three staff car spaces and 49 supermarket/retail customer car spaces. Access to the residential car parking spaces will be controlled by a security gate system.

There will be 10 resident motorcycle spaces provided in the basement level car park.

It is proposed to provide a total of 468 bicycle parking spaces on ground level, comprising 402 resident bicycle spaces in a secure on-site central location, 39 visitor bicycle spaces and 15 staff bicycle spaces on-site, and 12 customer bicycle spaces located adjacent to the Macaulay Road footpath. The on-site bicycle parking will be accessed via a wide, partially ramped, accessway located on Boundary Road.

Pedestrian access to the supermarket and retail uses will be via entrances located on Boundary Road and Macaulay Road. Resident access will be via secure entrances located on Macaulay Road leading to lobby areas containing lifts providing access between all levels. The secure entrances will be accessible by stairs and a ramp system.

Stantec was commissioned by the Applicant to prepare a Transport Impact Assessment of the proposed development.

1.2 Purpose of this Report

The report sets out an assessment of the transport impacts of the proposed development and how they are being addressed, including consideration of:

1. The adequacy of the proposed pedestrian, bicycle and public transport access arrangements to the site.
2. The adequacy of the proposed bicycle parking arrangements in terms of supply (quantum) and layout.
3. The adequacy of the proposed car parking provision in terms of supply and layout.
4. The adequacy of the proposed arrangements for loading and waste collection.
5. The acceptability of the traffic impacts of the proposed development.

1.3 References

In preparing this report, reference has been made to the following:

- Melbourne planning scheme.
- Macaulay Structure Plan 2021.
- Architectural plans prepared by Rothe Lowman, project number 220068, dated March 2023.
- Australian/New Zealand Standard, Parking Facilities Part 1: Off-Street Car Parking (AS/NZS2890.1:2004).
- Australian Standard, Parking Facilities Part 2: Off-Street Commercial Vehicle Facilities (AS2890.2:2018).
- Australian Standard, Parking Facilities Part 3: Bicycle Parking (AS2890.3:2015).
- Australian Standard, Parking Facilities Part 6: Off-Street Parking for People with Disabilities (AS2890.6:2002).
- Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections.

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- Car parking occupancy surveys of publicly available car parks in the vicinity of the subject site.
- Traffic surveys as referenced in the context of this report.
- Other documents as nominated.

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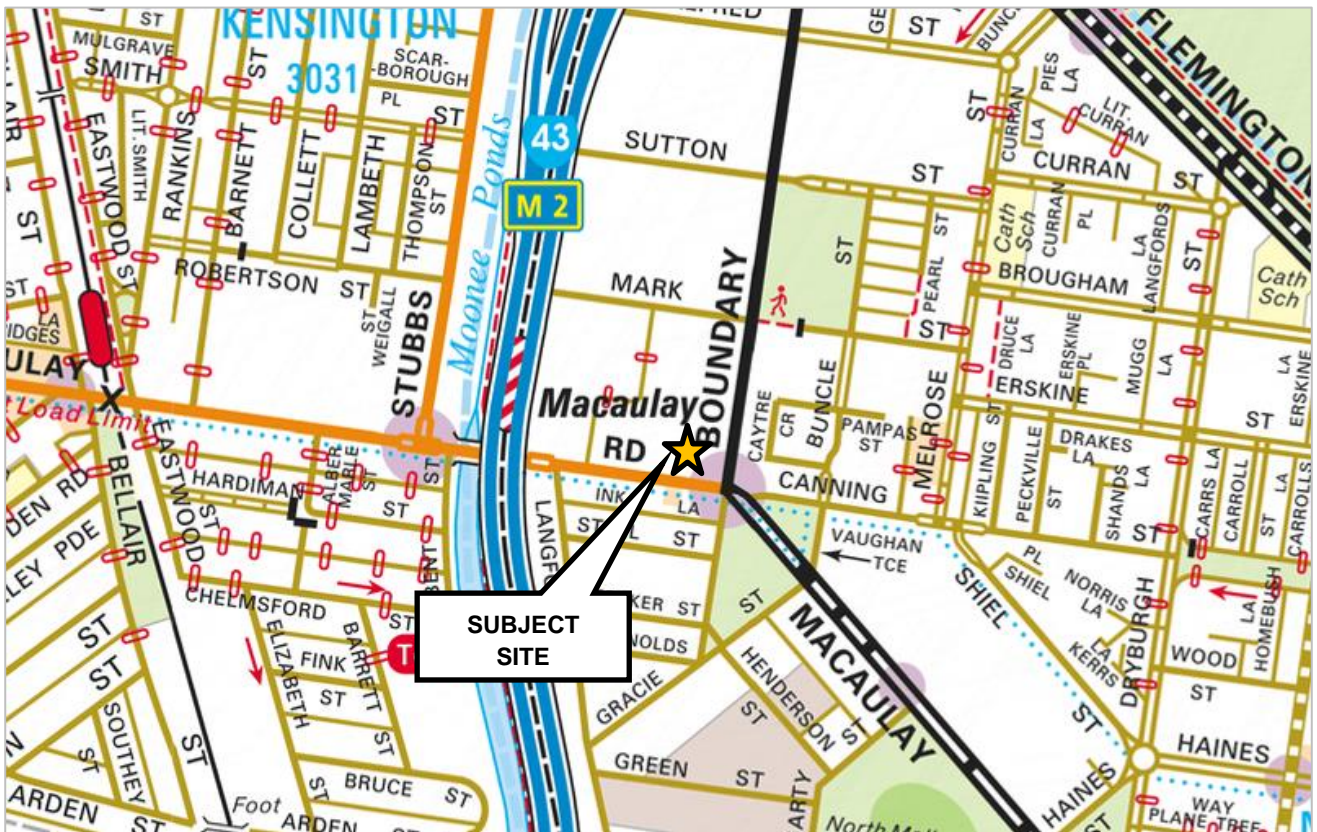
2 Existing Conditions

2.1 Subject Site

The subject site is located at 218-246 Macaulay Rd, North Melbourne. It has an eastern frontage of approximately 90m to Boundary Road and a southern frontage of approximately 75m to Macaulay Road. The site is currently occupied by a warehouse.

The location of the subject site and its surrounds is presented in Figure 2.1. The land use zoning of the subject site is presented in Figure 2.2, which shows that the subject site is zoned Commercial 1 Zone (C1Z) and is surrounded by a mix of land use zones.

Figure 2.1: Subject Site Location and its Surrounds

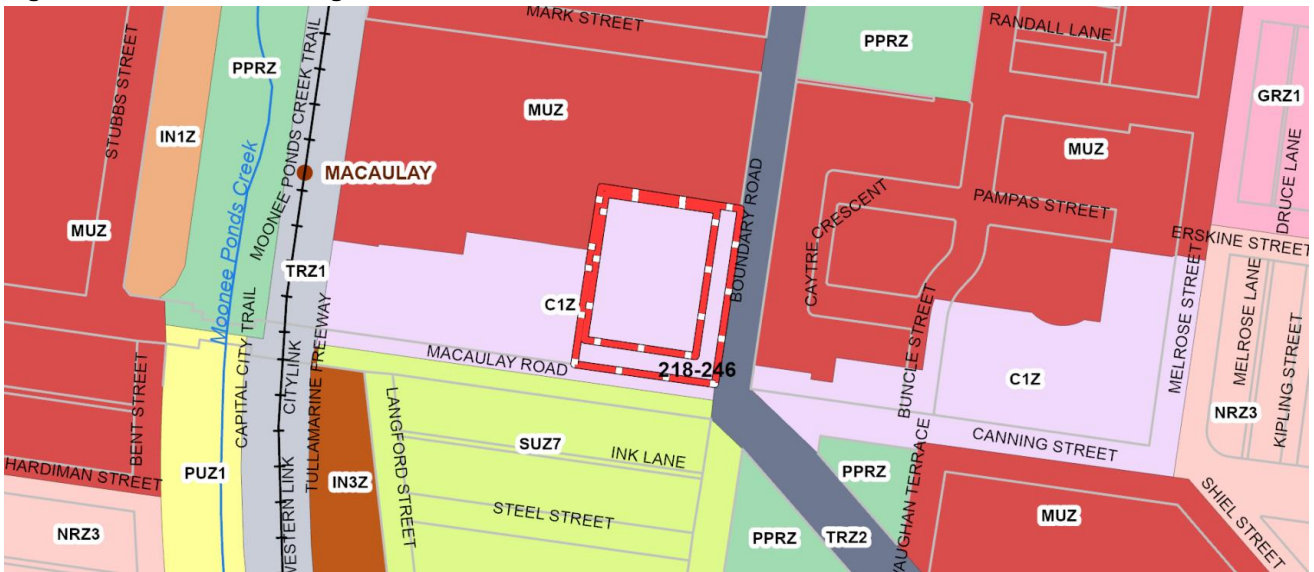


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Figure 2.2: Land Use Zoning



Source: VicPlan (DEWLP)

Figure 2.3: Aerial Image of Subject Site and its Surrounds



Source: Nearmap photography dated 1 January 2023

2.2 Road Network

2.2.1 Overview

Contemporary transport planning considers the use and classification of a road or street in terms of the movement function it provides alongside the place function it serves.



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For major highways and arterial roads, the movement function is paramount, with the place function being of lesser importance. For minor residential streets, there is comparatively low emphasis on both the movement and place functions.

In the immediate vicinity of the subject site, Boundary Road and Macaulay Road operate primarily as significant movement corridors.

2.2.2 Macaulay Road

Macaulay Road is a major road managed by Melbourne City Council (the Council) that abuts the southern frontage of the subject site. It changes to an arterial road to the southeast of the Boundary Road/Macaulay Road signalised intersection and this section is managed by the Department of Transport and Planning (DTP). The road is located within a Transport Zone 2 (TRZ2) in the Planning Scheme.

Macaulay Road is a two-way road and typically provides one-lane in each direction, widening on approaches to key intersections to deliver turn lanes. It has a road reserve of 20m (approximately) The speed limit in the vicinity of the subject site is 50km/h.

Footpaths are located on both sides of the road. Controlled pedestrian crossing facilities are provided at the Boundary Road/Macaulay Road signalised intersection.

Views along Macaulay Road are shown at Figure 2.4 and Figure 2.5.

Figure 2.4: Macaulay Road (Westbound)



Figure 2.5: Macaulay Road (Eastbound)



2.2.3 Boundary Road

Boundary Road is an arterial road managed by the Department of Transport and Planning (DTP) that is located to the east of the subject site with a north-south alignment. The road is located in a Transport Zone 2 (TRZ2) in the Planning Scheme.

It is a two-way road and typically comprises one-lane in each direction, widening on approaches to key intersections to provide turn lanes. It has a road reserve of 20m (approximately) and is subject to a 60km/h speed limit. Parallel car parking is provided on both sides of the road.

Footpaths are located on both sides of the road. Controlled pedestrian crossing facilities are provided at the Boundary Road/Macaulay Road signalised intersection.

Views along Boundary Road are shown at Figure 2.6 and Figure 2.7.

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Figure 2.6: Boundary Road (Northbound)



Figure 2.7: Boundary Road (Southbound)



2.3 Public Transport

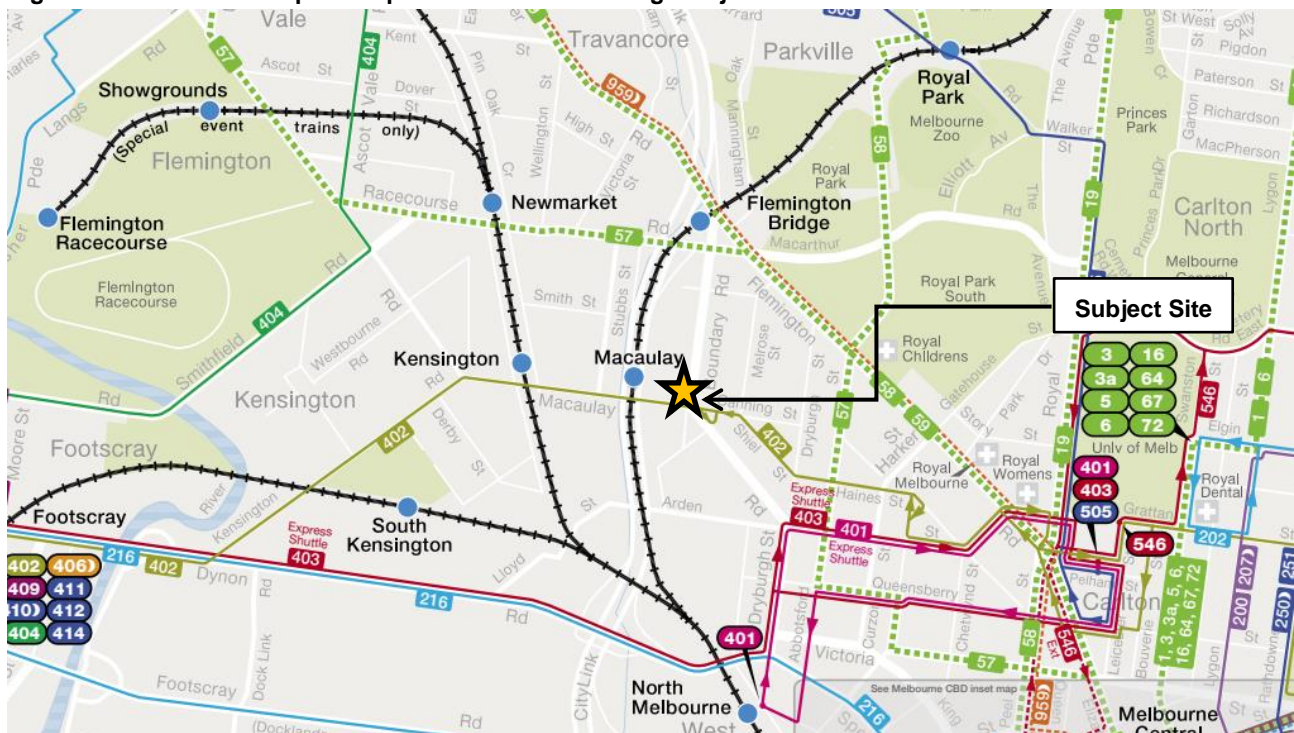
2.3.1 Overview

The subject site is proximate to the following public transport services:

- The Macaulay train station is located to the west of the subject site and can be accessed with a six-minute walk.
- Tram route 57 can be accessed from tram stops on Racecourse Road located to the north of the subject site (eight-minute walk).
- Bus route 402 can be accessed from the bus stops located on Macaulay Road to the west of the subject site (two-minute walk).

The public transport map for the area surrounding the subject site is presented at Figure 2.8.

Figure 2.8: Public Transport Map for Area Surrounding Subject Site



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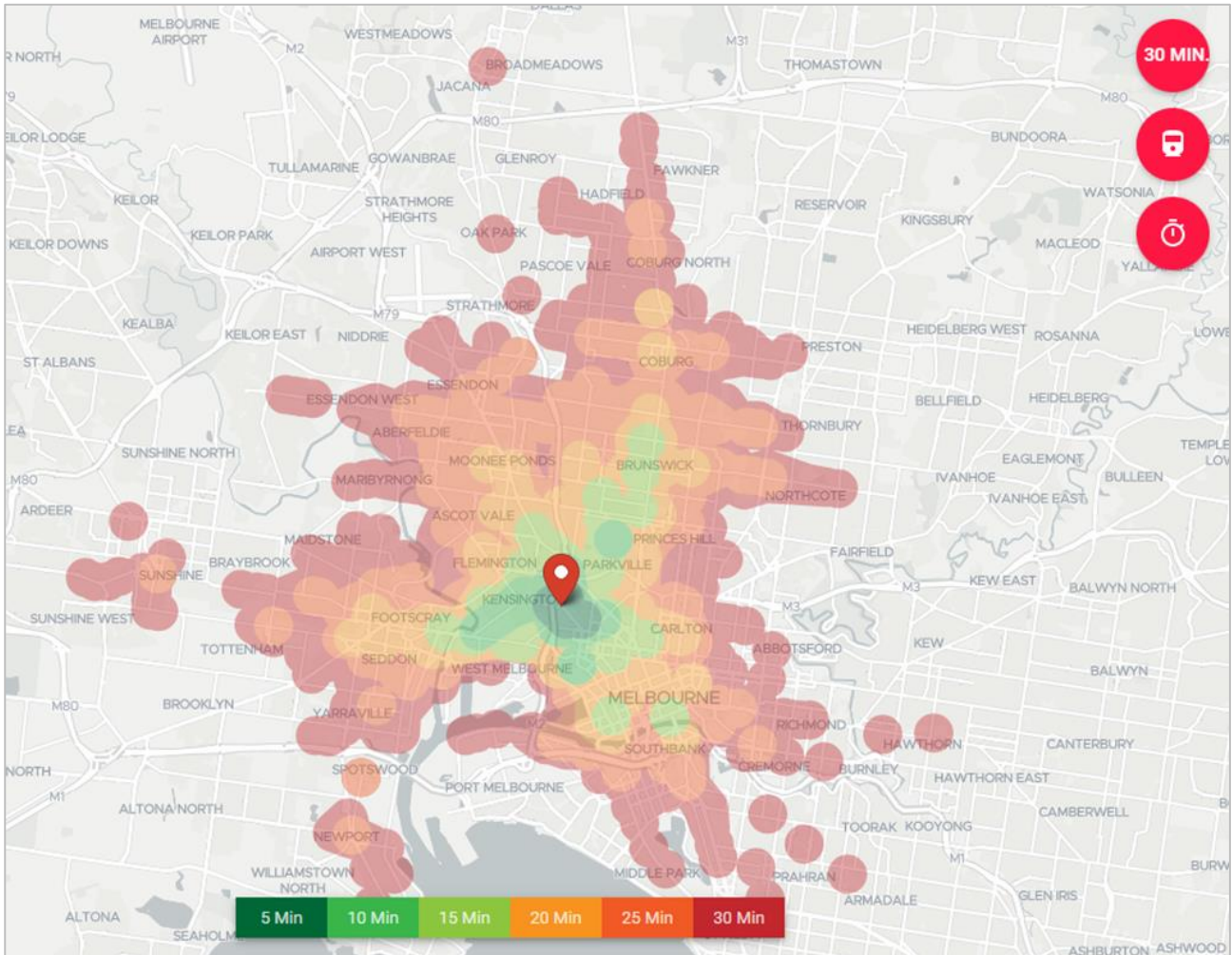
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The subject site has a Transit Score¹ of 76 (out of 100) representing 'excellent transit' where 'transit is convenient for most trips'.

The available public transport catchment within 30 minutes of the subject site at five-minute intervals is provided in the isochrone drawing provided at Figure 2.9. This figure indicates that suburbs such as Carlton, Melbourne, Brunswick and Hawthorn are accessible within a 30-minute journey of the site.

Figure 2.9: Public Transport Catchment Surrounding Subject Site



2.4 Active Travel Network

2.4.1 Pedestrians

Pedestrian paths are provided on both sides of all roads in the vicinity of the subject site. In addition, controlled pedestrian crossings are provided at the following locations:

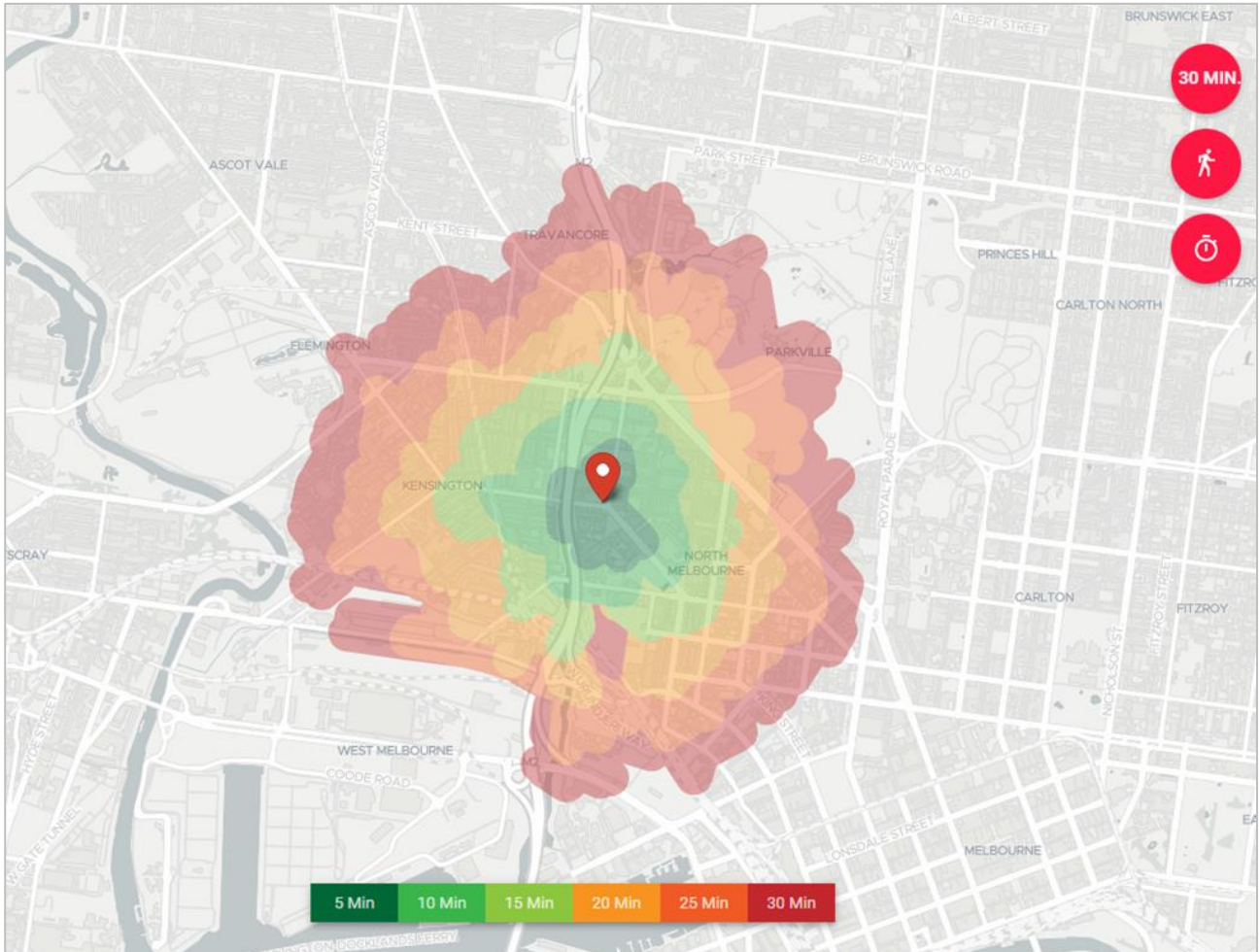
- Boundary Road/Macaulay Road signalised intersection.
- Zebra crossing on Macaulay Road, located approximately 100m west of the subject site.

¹ Obtained from the Walk Score website. Transit Score is a "...patented measure of how well a location is served by public transit. Transit Score is based on data released in a standard format by public transit agencies." A "usefulness" value is assigned to "...nearby transit routes based on the frequency, type of route (rail, bus, etc.), and distance to the nearest stop on the route. The "usefulness" of all nearby routes is summed and normalized to a score between 0 – 100."

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The available walking catchment within 30 minutes of the subject site at five-minute intervals is provided in the isochrone drawing provided at Figure 2.10. This figure indicates a walking catchment of approximately 1.5km to 2km in all compass directions based on the urban structure around the subject site at present.

Figure 2.10: Walking Catchment Surrounding Subject Site



The accessibility of the site via walking can be measured by the Walk Score (www.walkscore.com). The Walk Score is calculated by determining the distance required to walk from an origin to nearby amenities, whilst also assessing block sizes and intersection density to determine the permeability of an area.

The subject site has a Walk Score of 86 (out of 100), which infers that the site is 'very walkable' and that 'most errands can be accomplished on foot.'

2.4.2 Cyclists

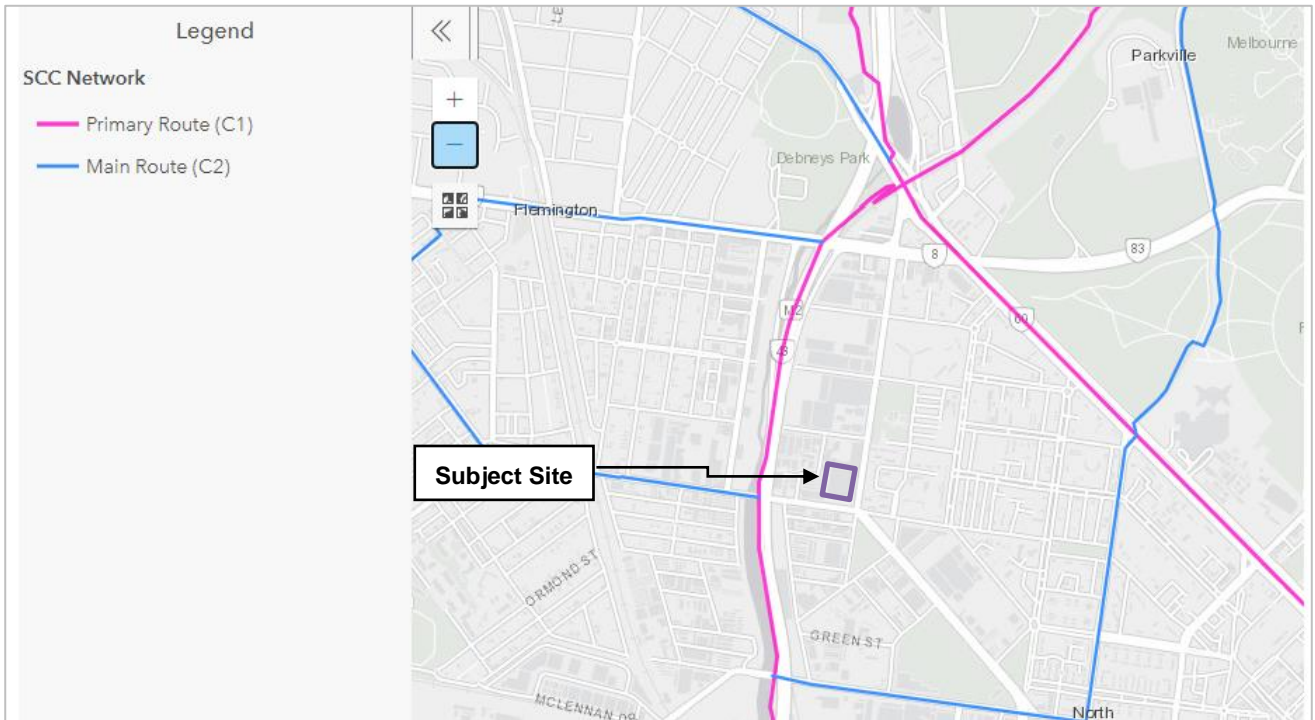
A map showing the Strategic Cycling Corridor (SCC) in the vicinity of the subject site is provided at Figure 2.11. The nearest SCC to the subject site is the C1 route adjacent to the Moonee Ponds Creek to the west of the subject site.

Linemarked on-street bicycle lanes are provided in both directions on Macaulay Road.

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Figure 2.11: Strategic Cycling Corridor



2.5 Car Share Facilities

There are three GoGet car share bays located within 300m to the east of the subject site. These bays are conveniently located for ad-hoc use by residents of the proposed development not owning a car.

2.6 Safety Assessment

A review of the reported casualty crash history for the roads and intersections adjoining the subject site has been sourced from the VicRoads (now DTP) CrashStats database. The database identifies recorded crashes causing injury that have occurred in Victoria and categorises the crashes as Fatal, Serious or Other injury crashes.

A summary of the crashes for the latest available five-year period (November 2015 – November 2020) is presented in Table 2.1. There have been nine casualty crashes at the Boundary Road/Macaulay Road signalised intersection and along Macaulay Road and Boundary Road during this period.

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Table 2.1: Five-Year Casualty Crash History

| Location | Month/Year | DCA | Injury Type | Description |
|--|------------|-----|-------------|--|
| Macaulay Road | 01/16 | 193 | Serious | Struck railway crossing furniture |
| Macaulay Road | 06/16 | 121 | Other | Crashed into vehicle from opposing direction (right thru) |
| Boundary Road | 05/17 | 140 | Other | U-turn manoeuvring |
| Boundary Road/Macaulay Road intersection | 07/17 | 130 | Other | Rear end (vehicles in same lane travelling in same direction) |
| Macaulay Road | 02/18 | 132 | Other | Right end (vehicles in same lane travelling in same direction) |
| Macaulay Road | 06/19 | 113 | Other | Right near (collision of vehicles from adjacent directions at the intersection only) |
| Macaulay Road | 10/19 | 121 | Other | Right thru (vehicles from opposing direction) |
| Macaulay Road | 02/20 | 171 | Other | Off path on straight (left off carriageway into object/parked vehicle) |
| Macaulay Road | 09/17 | 133 | Other | Lane side swipe vehicles in parallel lanes travelling in the same direction |

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3 Planning Policy Context

There are various State and Local Government policies that are considered relevant to the proposed development. These policies provide strategic, State and Local level guidance on land use development. A summary of policy documents is presented at Table 3.1 noting that the summary is not exhaustive, but an outline of those elements considered most relevant to the proposed development.

Table 3.1: Transport Policy Summary





| Document | Image | Key Messages |
|---|---|---|
| <p>Plan Melbourne (Refresh)</p> |  | <ul style="list-style-type: none"> The 35-year Plan Melbourne is a formal planning document to guide planners, councils, developers and the Victorian Civil and Administrative Tribunal (VCAT) Plan Melbourne includes 9 principles, 7 outcomes, 32 directions and 90 policies, including the following aspirations: <ul style="list-style-type: none"> Delivering a pipeline of large scale, city shaping infrastructure and urban renewal projects Delivering a new 'integrated economic triangle', connecting key employment clusters, industrial precincts, and economic gateways. Integrating active transport development into existing and future land use to support a productive city. Supporting 20-minute neighbourhoods by promoting local active transport choices and improving active/public transport infrastructure for the local area. |
| <p>Transport Integration Act</p> |  | <ul style="list-style-type: none"> Victoria's principal transport statute. Establishes a framework for the provision of an integrated and sustainable transport system in Victoria. Identifies six transport system objectives and eight decision-making principles. Establishes a triple bottom line approach – economic prosperity, social and economic inclusion, and being resource efficient and environmentally responsible. |
| <p>Macaulay Structure Plan</p> |  | <ul style="list-style-type: none"> The Macaulay Structure Plan provides a framework for the development of the Macaulay urban renewal area. The Structure Plan contains five key objectives: <ul style="list-style-type: none"> To reinforce and consolidate the vision and framework for the long-term future growth, development and character of Macaulay. To give clarity and certainty about the level and type of development that can occur in the area by establishing a framework for land use and built form. To ensure that the provision of community infrastructure, open space and transport meets the needs of a growing population. To help deliver City of Melbourne and Victorian Government strategies and policies related to Macaulay. To identify actions to deliver the vision and framework for the future development of Macaulay, including amendment to the Melbourne Planning Scheme and capital works projects. Movement and Access objectives and actions are identified which will assist on delivering the vision for the Macaulay area by: |

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| | | <ul style="list-style-type: none"> ○ prioritising active transport by designing streets that are safe and accessible for people walking and riding bikes. ○ helping deliver, public transport that meets the needs of the Macaulay population. ○ improving car parking requirements to support a less car dependent transport system. |
| <p>Clause 18 (Transport) of the Planning Scheme</p> |  | <p>Clause 18.01-1S (Land Use and Transport Integration) – Objective</p> <ul style="list-style-type: none"> ● To facilitate access to social, cultural and economic opportunities by effectively integrating land use and transport. <p>Relevant Strategies</p> <ul style="list-style-type: none"> ● Plan and develop a transport system that facilitates a reduction in the distances people have to travel to access jobs and services. ● Plan movement networks and adjoining land uses to minimise disruption to residential communities and their amenity. ● Support urban development that makes jobs and services more accessible in accordance with forecast demand and by taking advantage of all available modes of transport. ● Design neighbourhoods to better support active living, increase the share of trips made using sustainable transport modes and respond to the safety needs of all users. <p>Clause 18.01-1L (Land Use and Transport Planning) – Strategies</p> <ul style="list-style-type: none"> ● Support development that encourages other transport modes and discourages the use of private motor vehicles ● Support a reduction or waiving of car parking requirements for new use and development that has good access to public transport. ● Ensure development is designed to respond to the cumulative traffic and parking impact of developments on an area. <p>Clause 18.01-2S (Transport System) – Objective</p> <ul style="list-style-type: none"> ● To facilitate the efficient, coordinated and reliable movement of people and goods by developing an integrated and efficient transport system. <p>Relevant Strategies</p> <ul style="list-style-type: none"> ● Plan and develop a transport system integrated across all movement networks that improves local transport options to support 20-minute neighbourhoods in Melbourne’s suburbs and Victoria’s regional cities and towns. <p>Clause 18.01-3S (Sustainable and Safe Transport) – Objective</p> <ul style="list-style-type: none"> ● To facilitate an environmentally sustainable transport system that is safe and supports health and wellbeing. <p>Relevant Strategies</p> <ul style="list-style-type: none"> ● Plan and develop the transport system to prioritise the use of sustainable personal transport. ● Design development to promote walking, cycling and the use of public transport, in that order, and minimise car dependency. <p>Clause 18.02-1S (Walking) – Objective</p> <ul style="list-style-type: none"> ● To facilitate an efficient and safe walking network and increase the proportion of trips made by walking. <p>Clause 18.02-2S (Cycling) – Objective</p> <ul style="list-style-type: none"> ● To facilitate an efficient and safe bicycle network and increase the proportion of trips made by cycling. <p>Clause 18.02-3S (Public Transport) – Objective</p> |

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| | | <ul style="list-style-type: none"> To facilitate an efficient and safe public transport network and increase the proportion of trips made by public transport. <p>Clause 18.02-4S (Roads) – Objective</p> <ul style="list-style-type: none"> To facilitate an efficient and safe road network that integrates all movement networks and makes best use of existing infrastructure. |
| <p>Clause 34.01 (Commercial 1 Zone) of the Planning Scheme</p> |  | <p>Purpose</p> <ul style="list-style-type: none"> To implement the Municipal Planning Strategy and the Planning Policy Framework. To create vibrant mixed use commercial centres for retail, office, business, entertainment and community uses. To provide for residential uses at densities complementary to the role and scale of the commercial centre. |
| <p>Clause 52.06 (Car Parking) of the Planning Scheme</p> |  | <p>Purpose</p> <ul style="list-style-type: none"> To ensure the provision of an appropriate number of car parking spaces having regard to the demand likely to be generated, the activities on the land and the nature of the locality. To support sustainable transport alternatives to the motor car. To ensure that the design and location of car parking is of a high standard, creates a safe environment for users and enables easy and efficient use. |
| <p>Clause 52.34 (Bicycle Facilities) of the Planning Scheme</p> |  | <p>Purpose</p> <ul style="list-style-type: none"> To encourage cycling as a mode of transport. To provide secure, accessible and convenient bicycle parking spaces and associated shower and change facilities. |
| <p>Clause of 65.01 (Approval of an Application or Plan) of the Planning Scheme</p> |  | <p>Approval of an Application or Plan</p> <ul style="list-style-type: none"> The adequacy of loading and unloading facilities and any associated amenity, traffic flow and road safety impacts. |

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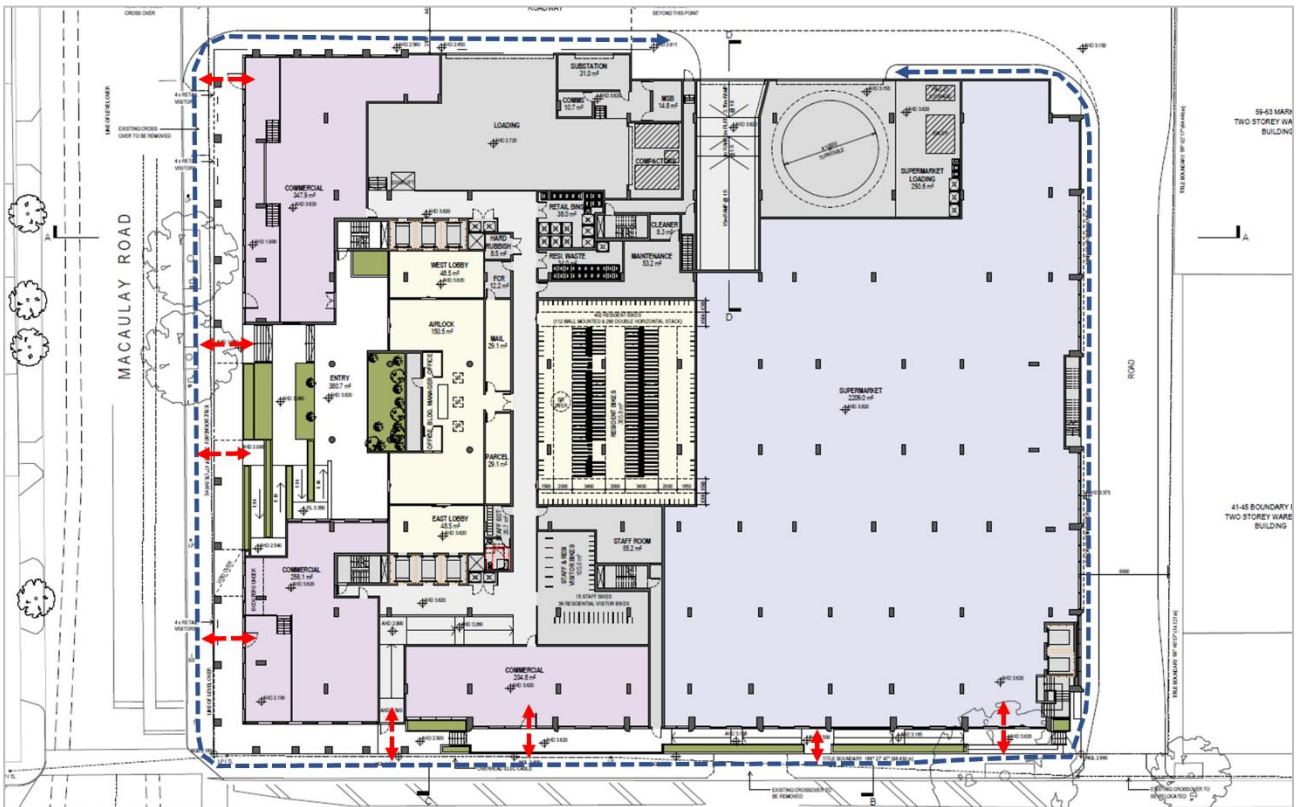
4 Active Transport

4.1 Pedestrian Connectivity

Pedestrian access to the development will be provided via the existing pedestrian footpaths on Boundary Road and Macaulay Road and a pedestrian footpath running on the south side of the proposed east-west roadway abutting the northern edge of the subject site.

Figure 4.1 presents the pedestrian pathways surrounding the subject site (shown in blue) and the pedestrian accesses into the residential, supermarket and retail land uses (shown in red).

Figure 4.1: Proposed Pedestrian Connectivity



4.2 Bicycle Parking & Associated Facilities

4.2.1 Statutory Requirements

The statutory requirements for the provision of bicycle parking are set out in Clause 52.34 of the Melbourne Planning Scheme. The statutory requirements for the provision of bicycle facilities for the development proposal are set out in Table 4.1.

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Table 4.1: Statutory Requirement for Bicycle Facilities

| Description | Land Use | Size | Statutory Rate | | Statutory Requirement | |
|---------------------|-----------------|----------------|---|---|-----------------------|------------------|
| | | | Resident/Employee | Visitor/Shopper | Resident/Employee | Visitor/Shopper |
| Supermarket | Shop | 2,203.6sqm LFA | 1 to each 600sqm of leasable floor area if the leasable floor area exceeds 1,000sqm | 1 to each 500sqm of leasable floor area if the leasable floor area exceeds 1,000sqm | 4 spaces | 4 spaces |
| Commercial (Retail) | Retail premises | 785.6sqm LFA | 1 to each 300sqm of leasable floor area | 1 to each 500sqm of leasable floor area | 3 spaces | 2 spaces |
| Dwelling | Dwelling | 394 dwellings | 1 to each 5 dwellings | 1 to each 10 dwellings | 79 spaces | 39 spaces |
| Total | | | | | 86 spaces | 45 spaces |

LFA denotes leasable floor area.

The proposed development has a statutory requirement of 131 bicycle parking spaces, comprising 86 resident/employee spaces and 45 visitor/shopper spaces.

4.2.2 Proposed Provision

The proposed development will provide 468 bicycle parking spaces, comprising of the following:

- 402 bicycle spaces for residents in a large secure area located on ground level.
- 39 bicycle spaces for residential visitors on ground level.
- 15 staff supermarket/retail spaces in a secure facility on the ground floor.
- 12 supermarket/retail shopper spaces on the ground floor.

The proposed provision comfortably exceeds the statutory requirement.

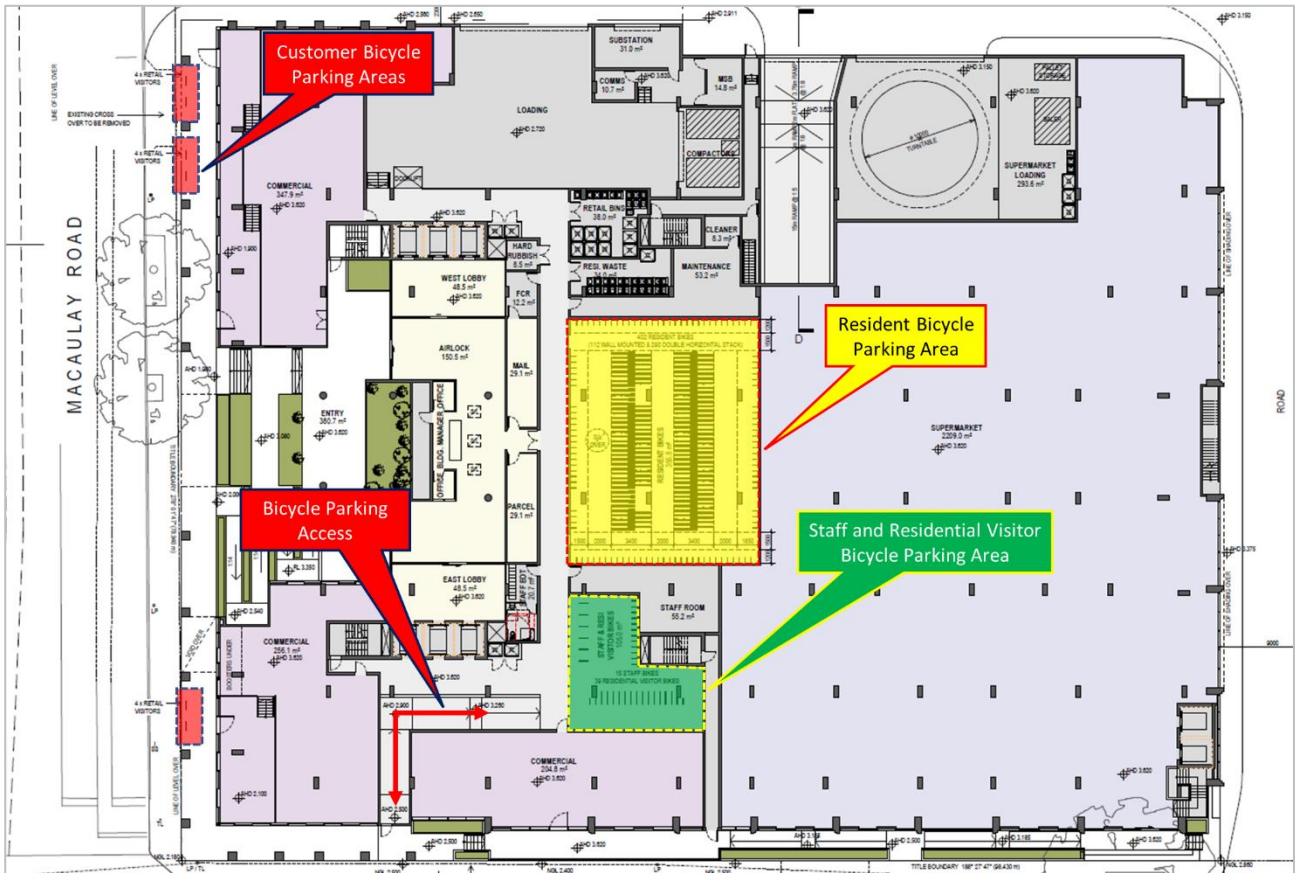
The locations of the bicycle spaces on the ground floor are shown in Figure 4.2.

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Figure 4.2: Ground Floor Bicycle Parking Locations



4.2.3 Associated Facilities

In addition to the requirement for bicycle parking, Clause 52.34-5 of the Melbourne Planning Scheme requires one shower for the first five employee bicycle parking spaces and one shower for each subsequent 10 employee bicycle parking spaces (if five or more employee bicycle parking spaces are required).

Application of the above rates to the statutory employee bicycle parking requirement of seven bicycle spaces results in the proposal having a statutory requirement for one shower and change room. This requirement is being satisfied with the provision of one shower and change room at ground level close to the bicycle parking.

4.2.4 Bicycle Parking Layout & Access

The supermarket/retail staff bicycle spaces will be provided as vertical storage spaces. Each parking space will be 1.2m long and 0.5m wide, with a 1.5m width behind the space. These dimensions satisfy the relevant Australian Standard.

The residential visitor bicycle parking spaces will have a mix of horizontal and vertical storage spaces. The vertical storage spaces will have the aforementioned space dimensions. The horizontal storage spaces will be 1.8m long and 0.5m wide, with a 1.5m width behind the space. These dimensions satisfy the relevant Australian Standard.

The resident bicycle spaces will be provided within a two-tier bicycle storage system. Each parking space will be 1.86m long and 0.4m wide, with a 2.0m width behind the space. The spaces will have a height clearance of 2.7m. These dimensions satisfy supplier standard specifications and are considered satisfactory.

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5 Car Parking Considerations

5.1 Principles of Car Parking Provision

Guidance set out under the State and Local Planning Policy Framework indicates a range of objectives and implementation strategies which seek to guide development within the State of Victoria. The framework includes a range of policies seeking to derive a sustainable transport planning outcome. In this instance, the State and Local Planning Policy Framework Objectives and Strategies which are most relevant to the development proposal have been set out earlier at Section 3 of this report.

A reduced on-site car parking provision, in connection with other development features, responds to a range of sustainable transport objectives set out in identified policies, not only for the subject land but for the surrounding area. This in turn demands a range of outcomes which support more sustainable transport behaviours. It is well recognised that one of a raft of 'tools' or 'levers' available to encourage these behaviours includes a more restrictive approach to car parking provision. This technique is not unlike the car parking limitation policy applied in the Melbourne CBD where car-based travel and consequential storage is identified as having a lower planning importance.

The principle of parking limitation is well researched and represents one of a range of factors which influences more sustainable transportation behaviours.

It is expected that potential occupiers of the residential use will be influenced by a range of factors including:

- An awareness that not all dwellings will be allocated an on-site car parking space.
- The provision of dwellings with no on-site car parking will present as an attractive and affordable option for those residents not owning (or making a conscious decision not to own) a car.
- Car parking limitations in the surrounding area are not conducive to long-stay car parking by residents who do not have access to an on-site car space.

Supermarket/retail staff and customer decisions around private car-based travel to work will be informed by factors, such as:

- An awareness of car parking supply limitations at the destination and on-site.
- The proximity of a range of public transport services which are highly accessible and proximate to the site.

Based on these observations, it is expected that a constrained or limited car parking supply will, for most residents, staff and customers influence their travel habits to and from the site.

With the above context in mind, the following assessment sets out a review of outcomes in accordance with the decision guidelines set out under Clause 52.06 of the Melbourne Planning Scheme.

5.2 Statutory Car Parking Requirements

The statutory requirements for the provision of car parking are set out in Clause 52.06 of the Melbourne Planning Scheme, with parking rates specified in Table 1 to Clause 52.06-5. As the subject site is located adjacent the Principal Public Transport Network (PPTN), Column B rates apply. Accordingly, a statutory car parking assessment is set out in Table 5.1.

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Table 5.1: Statutory Car Parking Requirements

| Land Use | Size | Statutory Rate | Statutory Requirement |
|----------------------|--|---|-----------------------|
| Supermarket | 2,203.6sqm LFA | 5 spaces per 100sqm LFA | 110 car spaces |
| Retail | 785.6sqm LFA | 3.5 spaces per 100sqm LFA | 27 car spaces |
| Dwelling (Residents) | 238 x studio and one-bedroom dwellings | 1 space per one and two-bedroom dwellings | 238 car spaces |
| | 132 x two-bedroom dwellings | | 132 car spaces |
| | 24 x three-bedroom dwellings | 2 spaces per three+ bedroom dwelling | 48 car spaces |
| Dwelling (Visitors) | 394 dwellings | Not applicable | 0 car spaces |
| Total | | | 555 car spaces |

LFA denotes leasable floor area.
GFA denotes gross floor area.

The proposed development generates a statutory car parking requirement of 555 car spaces under a standard statutory assessment. The proposed provision of 190 car spaces, comprising of 138 resident car spaces and 52 supermarket/retail car spaces, does not satisfy the statutory requirement and a planning permit is being sought to reduce this requirement.

5.3 Decision Guidelines for Permit Applications

Clause 52.06-7 of the Planning Scheme contains decision guidelines where a reduction to the statutory car parking requirement is being sought. A two-step approach is used to determine the appropriateness of the car parking reduction.

The first step is a Car Parking Demand Assessment, which has regard to various factors to estimate the peak car parking demand of a development proposal.

The second step is a more strategic, policy-based assessment. There are various factors for the Responsible Authority to consider before granting a permit to reduce the car parking requirement.

5.4 Car Parking Demand Assessment

Clause 52.06-7 states that an application to reduce the number of car parking spaces required under Clause 52.06-5 must be accompanied by a Car Parking Demand Assessment which is to consider the following matters:

- *“The likelihood of multi-purpose trips within the locality which are likely to be combined with a trip to the land in connection with the proposed use.*
- *The variation of car parking demand likely to be generated by the proposed use over time.*
- *The short-stay and long-stay car parking demand likely to be generated by the proposed use.*
- *The availability of public transport in the locality of the land.*
- *The convenience of pedestrian and cyclist access to the land.*
- *The provision of bicycle parking and end of trip facilities for cyclists in the locality of the land.*
- *The anticipated car ownership rates of likely or proposed visitors to or occupants (residents or employees) of the land.*
- *Any empirical assessment or case study.”*

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5.4.1 The Likelihood of Multi-Purpose Trips

Given the land uses within the proposed development and its location, multi-purpose trips are expected between the land uses. With this outcome, sharing of car parking spaces is expected. Residents of the development will also be readily able to access the supermarket and retail uses with no need for private car use.

5.4.2 Variation of Car Parking Demand Over Time

Retail and supermarket staff car parking demands typically show little variance across normal business hours. The long-term car parking demands of residents also typically show little variance during evening periods.

There can be some variance in the short-stay car parking demands of customers to the retail and supermarket uses.

5.4.3 Availability of Public Transport in the Locality

The subject site is well serviced by public transport, with Macaulay train station located approximately 160m to the west of the site and bus route 402 accessible along Macaulay Road.

The subject site has a Transit Score of 74 (out of 100) representing 'excellent transit' where 'transit is convenient for most trips'.

5.4.4 Convenience of Pedestrian and Cyclist Access

Pedestrian paths are provided on both sides of all roads in the vicinity of the site. In addition, controlled pedestrian crossings providing safe access to the nearby bus stops and surrounding uses are provided at the Boundary Road/Macaulay Road signalised intersection and there is a zebra crossing on Macaulay Road approximately 100m to the west of the subject site.

Pedestrian access to the supermarket, retail and residential uses will be provided via various entry points along the Boundary Road and Macaulay Road footpaths.

The subject site has a Walk Score of 87 (out of 100), which infers that the site is 'very walkable,' and that 'most errands can be accomplished on foot.'

5.4.5 Provision of Bicycle Parking and End of Trip Facilities

The proposed development will provide 468 bicycle parking spaces, comprising of the following:

- 402 bicycle spaces for residents in a large secure area located on ground level.
- 39 bicycle spaces for residential visitors on ground level.
- 15 staff supermarket/retail spaces in a secure facility on the ground floor.
- 12 supermarket/retail shopper spaces on the ground floor.

The proposed provision comfortably exceeds the statutory requirement.

A shower and change room facility is proposed for staff use close to the on-site bicycle parking.

5.4.6 Car Ownership Rates

Residential Use

Historic car ownership rates of residents have been sourced from the Australian Bureau of Statistics (ABS) 2021 Census, with the car ownership rates obtained for all privately owned apartment type dwellings within the North Melbourne suburb. The car ownership values are presented in Table 5.2.

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Table 5.2: ABS 2021 Census Car Ownership Rates for Apartment Type Dwellings (North Melbourne)

| Location | No. of Bedrooms | Sample Size | Car Ownership Rate |
|------------------------|-----------------|-----------------|------------------------|
| North Melbourne Suburb | Studio | 73 dwellings | 0.22 cars per dwelling |
| | One-bedroom | 1,386 dwellings | 0.50 cars per dwelling |
| | Two-bedroom | 2,340 dwellings | 0.78 cars per dwelling |
| | Three-bedroom | 522 dwellings | 1.16 cars per dwelling |

Application of the rates recorded for existing development within the North Melbourne suburb to the proposed residential dwelling mix, results in the car parking ownership levels presented at Table 5.3.

Table 5.3: Estimated Car Parking Demands Based on ABS 2021 Census Car Ownership Data

| No. of Bedrooms | No. of Dwellings | Car Parking Rate | Car Parking Demand |
|-----------------|------------------|------------------------|-----------------------|
| Studio | 82 dwellings | 0.22 cars per dwelling | 18 car spaces |
| One-bedroom | 156 dwellings | 0.50 cars per dwelling | 78 car spaces |
| Two-bedroom | 132 dwellings | 0.78 cars per dwelling | 103 car spaces |
| Three-bedroom | 24 dwellings | 1.16 cars per dwelling | 28 car spaces |
| Total | | | 227 car spaces |

The use of ABS car ownership data results in a lower demand for resident car parking than the statutory requirement (227 car spaces versus 418 car spaces).

Additionally, the number (by percentage) of privately owned apartment type dwellings not owning a car in the North Melbourne suburb in 2021 is presented at Table 5.4.

Table 5.4: ABS 2021 Census Apartment Type Dwellings with no Car Ownership (North Melbourne)

| No. of Bedrooms | North Melbourne Suburb |
|-----------------|------------------------|
| Studio | 78% |
| One-bedroom | 54% |
| Two-bedroom | 34% |
| Three-bedroom | 19% |

It is evident that there is a large body of residents in North Melbourne with low car ownership.

It is worth noting that using ABS Census data to predict car ownership is an approach that is 'backward facing' rather than 'forward facing' in that the use of historical car ownership rates to deliver car parking outcomes for future development will not:

- Recognise the emerging trend of reduced licensing and corresponding car ownership.
- Meet policy objectives seeking to influence travel behaviour and bring about desired change to the way people travel.

This secondary principle is well encapsulated in the VCAT Red Dot decision (reference No. P458/2016) *Ronge v Moreland CC*, where Members Bennett and Keddie stated the following:

"Although Ms Dunstan undertook a car parking demand assessment, as called for by Clause 52.06-6 when there is an intention to provide less car parking than that required by Clause 52.06-5, we found the whole discussion around car parking of marginal value given the strong policy imperatives about relying less on motor vehicles and more on public transport, walking and cycling. Census data from 2011 or 2016 is simply a snapshot in time, a base point, but we are not persuaded that such data should be given much weight in determining what number of car spaces should be provided in future, for dwellings with different bedroom numbers. Policy tells us the future must be different. We consider that oversupplying parking, whether or not to comply with Clause 52.06, has the real potential to undermine the encouragement being given to reduce car based travel in favour of public transport, walking and cycling."

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5.4.7 Any Empirical Assessment or Case Study

Stantec has obtained car parking data for an existing supermarket (Coles) located in the Clayton Major Activity Centre with a similar size to that proposed. The supermarket site has a Transit Score of 59, representing 'good transit' (a lower rating compared to the subject site) and a Walk Score of 89 representing a 'very walkable location' (a comparable rating to the subject site).

Based on staff and customer travel demand questionnaire surveys and in-store headcount surveys, the data suggests that the existing supermarket has a peak car parking demand rate of 1.88 car spaces per 100sqm during the Friday PM peak hour and 1.82 car spaces per 100sqm during the Saturday midday peak hour.

In comparison, the proposed supermarket will have car parking provided at a rate of 2.21 car spaces per 100sqm based on a car parking allocation of 49 car spaces (52 spaces less three staff spaces to the smaller retail tenancies).

5.4.8 Short-Stay and Long-Stay Car Parking Demand

Residential Use

The residential use is estimated to generate a peak resident (long-stay) car parking demand of 138 car spaces based on the number of on-site car spaces provided to the use.

There is no statutory requirement to provide any residential visitor car parking as the subject site is located within the PPTN area of Melbourne. The proximity of the proposed development to the Macaulay train station and the nearby bus services will encourage visitors to use these travel modes in lieu of private car use. In the event that any residential visitors to the development travel by car, it is expected that they will use the nearby publicly available off-street car parking.

Supermarket and Retail Uses

The staff car parking demands of supermarket and retail uses typically comprise around 20% of the total car parking demand. On the basis of a car parking supply for the supermarket and retail uses of 52 car spaces, a staff car parking demand of 10 car spaces is derived with an estimated customer car parking demand of 42 car spaces.

5.5 Responsible Authority Considerations

Clause 52.06-7 nominates various factors that must be considered by the Responsible Authority before granting a town planning permit to reduce the number of statutorily required spaces. Those factors considered relevant in this instance are as follows:

- *"The Car Parking Demand Assessment.*
- *Any relevant local planning policy or incorporated plan.*
- *The availability of alternative car parking in the locality of the land, including:*
 - *On street parking in non-residential zones.*
 - *Streets in residential zones specifically managed for non-residential parking.*
- *Access to or provision of alternative transport modes to and from the land.*
- *Any other relevant consideration."*

5.5.1 Car Parking Demand Assessment

Based on the information presented in Section 5.4, it is estimated that the proposed development could generate a total peak car parking demand of up to 190 car spaces, comprising 138 resident car spaces and 52 supermarket/retail car spaces.

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5.5.2 Local Planning Policy

There are various Clauses in the Melbourne Planning Scheme that deal with transport and land use planning. Clauses of note are as follows:

- Clause 18.01-1S (Land Use and Transport Integration) – Contains the objective:
 - *“To facilitate access to social, cultural and economic opportunities by effectively integrating land use and transport.”*
- Clause 18.01-1L (Land Use and Transport Planning) – Contains the strategies:
 - *“Support development that encourages other transport modes and discourages the use of private motor vehicles.*
 - *Support a reduction or waiving of car parking requirements for new use and development that has good access to public transport.*
 - *Ensure development is designed to respond to the cumulative traffic and parking impact of developments on an area.”*
- Clause 18.01-2S (Transport System) – Contains the objective:
 - *“To facilitate the efficient, coordinated and reliable movement of people and goods by developing an integrated and efficient transport system.”*
- Clause 18.01-3S (Sustainable and Safe Transport) – Contains the objective:
 - *“To facilitate an environmentally sustainable transport system that is safe and supports health and wellbeing.”*
- Clause 18.02-1S (Walking) – Contains the objective:
 - *“To facilitate an efficient and safe walking network and increase the proportion of trips made by walking.”*
- Clause 18.02-2S (Cycling) – Contains the objective:
 - *“To facilitate an efficient and safe bicycle network and increase the proportion of trips made by cycling.”*
- Clause 18.02-3S (Public Transport) – Contains the objective:
 - *“To facilitate an efficient and safe public transport network and increase the proportion of trips made by public transport.”*
- Clause 18.02-4S (Roads) – Contains the objective:
 - *“To facilitate an efficient and safe road network that integrates all movement networks and makes best use of existing infrastructure.”*
- Clause 34.01 (Commercial 1 Zone) – Contains the purposes:
 - *“To implement the Municipal Planning Strategy and the Planning Policy Framework.*
 - *To create vibrant mixed use commercial centres for retail, office, business, entertainment and community uses.*
 - *To provide for residential uses at densities complementary to the role and scale of the commercial centre.”*

The Macaulay Structure Plan has been prepared to provide a framework for the development of the Macaulay urban renewal area. It contains the following Movement and Access objectives:



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- Objective 10: Prioritise active transport by designing streets that are safe and accessible for people walking and riding bikes.
- Objective 11: Help to deliver public transport that meets the needs of the Macaulay population.
- Objective 12: Improve car parking requirements to support a less car-dependent transport system.

As it relates to Objective 12 and car parking, the Structure Plan states the following:

“Off-street parking requirements in the planning scheme will be replaced by maximum car parking rates. We will also investigate consolidated parking solutions, including precinct parking facilities and/or ‘unbundling’ of car parking from land titles in private development. These measures will prevent the oversupply of parking and allow floor space in developments to be used more efficiently. This will be further supported by requirements for ample bicycle parking and end-of-trip facilities.

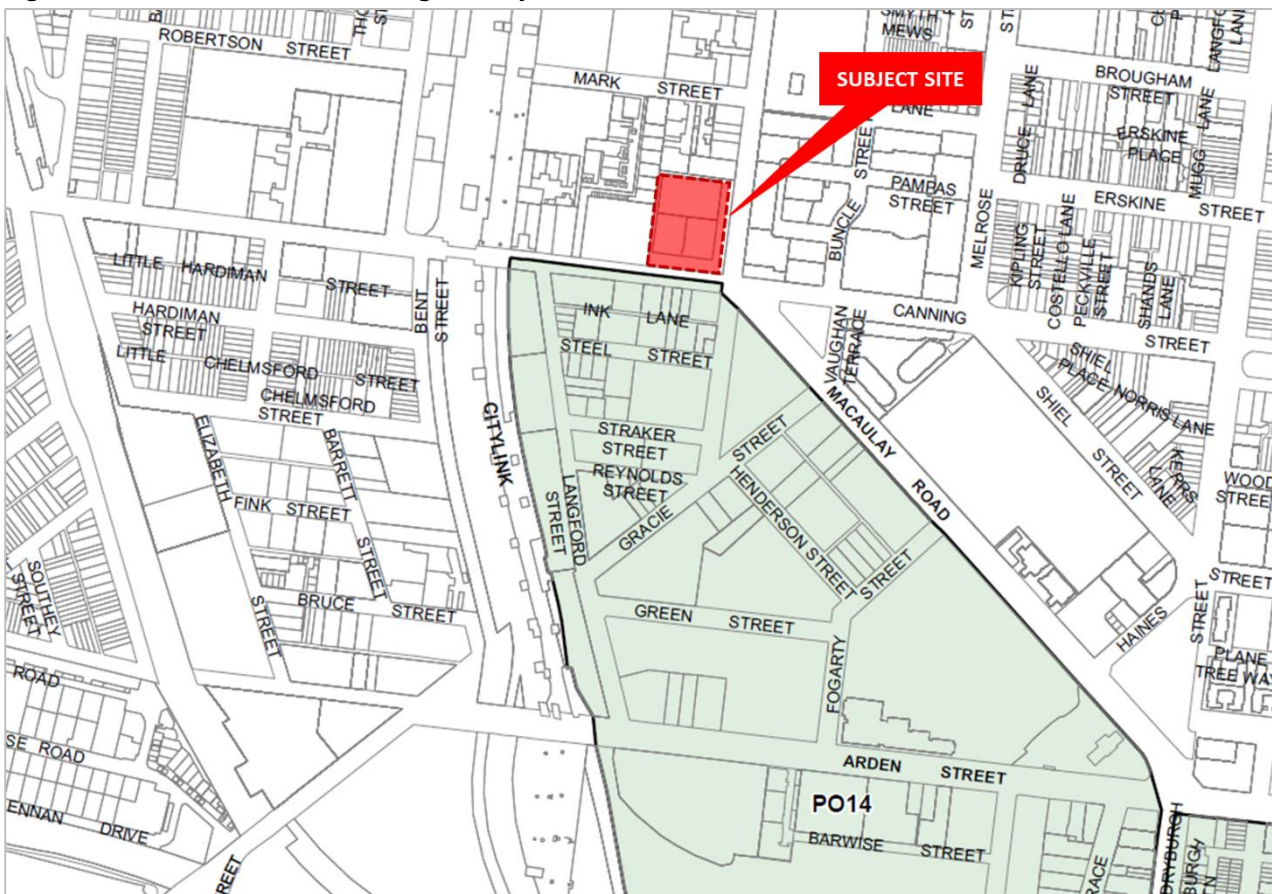
Currently, the Planning Scheme requires developments in Macaulay to provide a minimum number of parking spaces. However, this can be waived at City of Melbourne or the planning authorities’ discretion. Applying a maximum car parking rate in Macaulay and ensuring the appropriate provision of bicycle parking facilities will help optimise the use of space. Bicycle parking facilities should be secure, easy to use and include suitable end-of-trip facilities to ensure cycling is a convenient transport option.”

In this regard, the Structure Plan contains Action 52 which seeks to:

“Apply a maximum off-street parking rate for new development. Benchmark the rate with international best practice and the rates applied in Fishermans Bend, Arden and West Melbourne.”

This West Melbourne area is subject to Parking Overlay – Schedule 14 (PO14). The Parking Overlay lies immediately south of the subject site as presented at Figure 5.1.

Figure 5.1: West Melbourne Parking Overlay – Schedule 14



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The Parking Overlay specifies the following permit requirements:

"A permit is not required to reduce (including reduce to zero) the number of car parking spaces required under Clause 52.06-5 or in the Table to this schedule.

A permit is required to provide car parking spaces in excess of the car parking ratios at clause 3.0 of this schedule."

The maximum car parking rates at Clause 3.0 of the Parking Overlay are as follows:

- One-bedroom dwelling – 0.30 car spaces per dwelling.
- Two-bedroom dwelling – 0.45 car spaces per dwelling.
- Three-bedroom dwelling – 0.60 car spaces per dwelling.
- All other uses – 0.5 car spaces per 100sqm net floor area.

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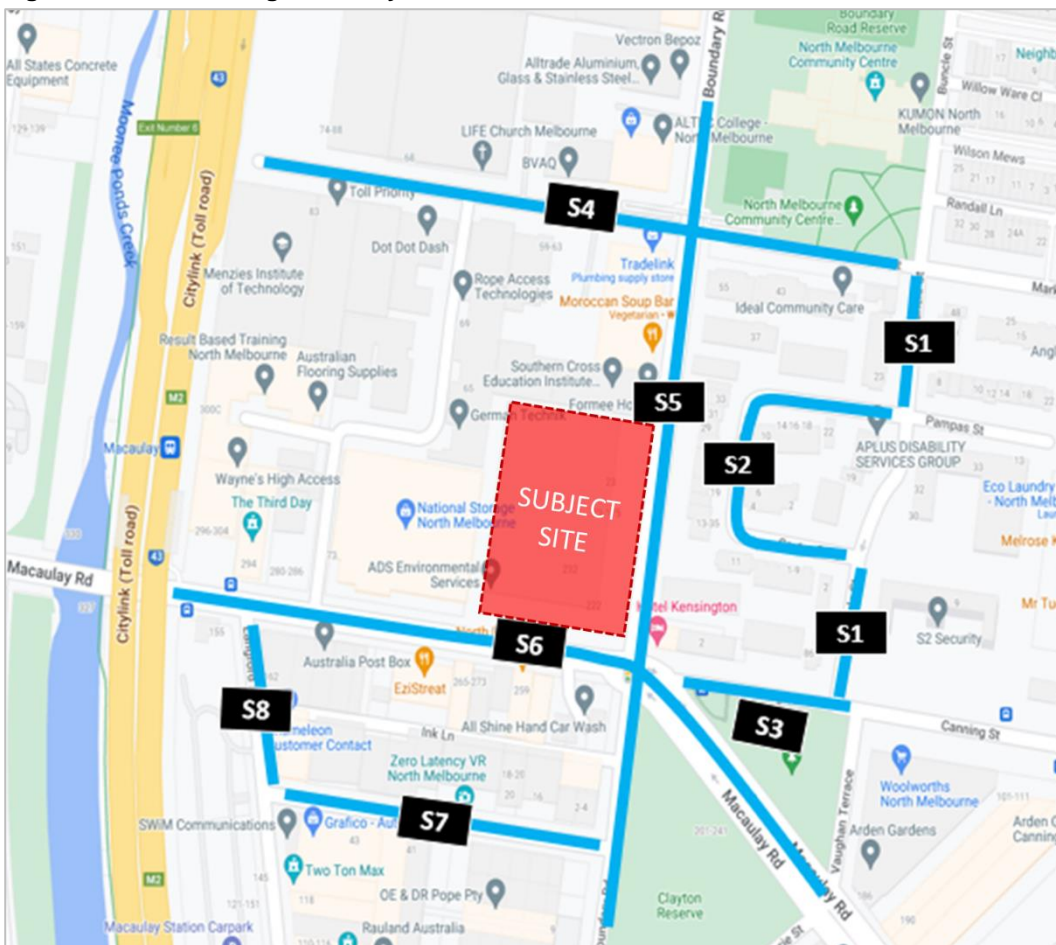
Application of these rates to the proposed development results in the following maximum car parking requirements:

- Dwellings – 144 car spaces.
- Supermarket & retail – 15 car spaces.

5.5.3 Availability of Alternative Car Parking

Stantec compiled an inventory of publicly available off-street car parking within a reasonable walking distance of the subject site. The inventory area is presented in Figure 5.2.

Figure 5.2: Car Parking Inventory Area



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The inventory area contains 319 car parking spaces (excluding disabled car parking spaces), with a mix of time restricted and unrestricted car parking.

Surveys of the inventory area were undertaken on Tuesday 7 February 2023 and Saturday 11 February 2023 at 11:00am, 1:00pm and 3:00pm and 8:00pm. The survey results indicate the following:

- The peak weekday car parking demand period occurred at 11:00am with a demand of 283 car spaces (89% occupancy approximately).
- The second weekday car parking demand period occurred at 1:00pm with a demand of 280 car spaces (88% occupancy approximately).
- The peak Saturday car parking demand period occurred at 1:00pm with a demand of 221 car spaces (69% occupancy approximately).
- The second Saturday car parking demand period occurred at 11:00am with a demand of 211 car spaces (66% occupancy approximately).

5.5.4 Access to or Provision of Alternative Transport Modes

The subject site is well serviced by public transport, with a train station and bus services in close proximity to the site.

A significant level of bicycle parking (especially resident bicycle parking) will be provided as part of the proposed development. The site is also surrounded by a well-connected pedestrian network.

The subject site has a Transit Score of 76 (out of 100) representing 'excellent transit' where 'transit is convenient for most trips' and a Walk Score of 86 (out of 100), which infers that the site is 'very walkable' and that 'most errands can be accomplished on foot.'

5.5.5 Other Relevant Considerations

Demand Management

The standard approach to car parking provision as prescribed by the Planning Scheme, where minimums apply, reflect a historical origin which serves to follow a 'predict and provide' approach.

The Austroads 'Guide to Traffic Management Part 11: Parking Management Techniques (2020)' describes this approach as a technique which readily interprets a 'parking problem' as an issue of 'inadequate supply'. It goes on to note that this problematic ideology is underlined by the premise that:

- "More parking is better,
- Every destination should satisfy its own parking needs (minimum ratios),
- Car parks should never fill,
- Parking should always be free or subsidised or incorporated into buildings costs.

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In more recent times, the 'predict and provide' approach has been steadily replaced by a range of travel demand management techniques which challenge historical travel behaviours and encourage mode change away (reversing the trend) from private motor vehicle travel.

As identified earlier, the site has very good accessibility to public transport and is highly accessible by walking. The adoption of a travel demand management approach (viz. parking limitation on-site) is considered to contain suitable and substantial merit.

Tension exists on the continued application of car parking minimums and more contemporary planning ideologies on the adoption of travel demand management techniques identified both in broader literature (Austroads 2020) as well by Council in its integrated transport plan.



Accordingly, the underlying rates of car parking contained in Clause 52.06 are considered excessive for a development that is located adjacent to a train station, is well positioned to available pedestrian facilities and seeks to deliver bicycle parking well in excess of statutory requirements.

5.6 Adequacy of Proposed Car Parking Provision

The proposed provision of 190 car parking spaces is expected to be able to accommodate the peak car parking demands of the proposed development.

The proposed development car parking provision is considered satisfactory for the following reasons:

- The subject site is accessible by public transport.
- A bicycle parking provision well in excess of the statutory requirements will be provided.
- A reduced car parking provision below the statutory car parking requirement is consistent with objectives contained in relevant planning policy and is consistent with the car parking controls for land immediately south of the subject site.
- The adoption of a travel demand management approach which encourages sustainable travel modes by limiting on-site car parking is consistent with contemporary planning practices.
- It is expected that residents living at the subject site would not need to drive a car to access the supermarket and retail land uses.

5.7 Accessible Car Parking Requirements

In addition to the statutory car parking requirements in the Planning Scheme, the Building Code of Australia (BCA) outlines requirements for the provision of car parking for people with disabilities. The proposed supermarket and retail use components of the development generate a BCA requirement to provide two accessible car spaces.

This requirement is being satisfied with two accessible spaces being provided in the basement level car park.

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6 Car Parking Layout & Vehicle Access

6.1 Vehicle Access

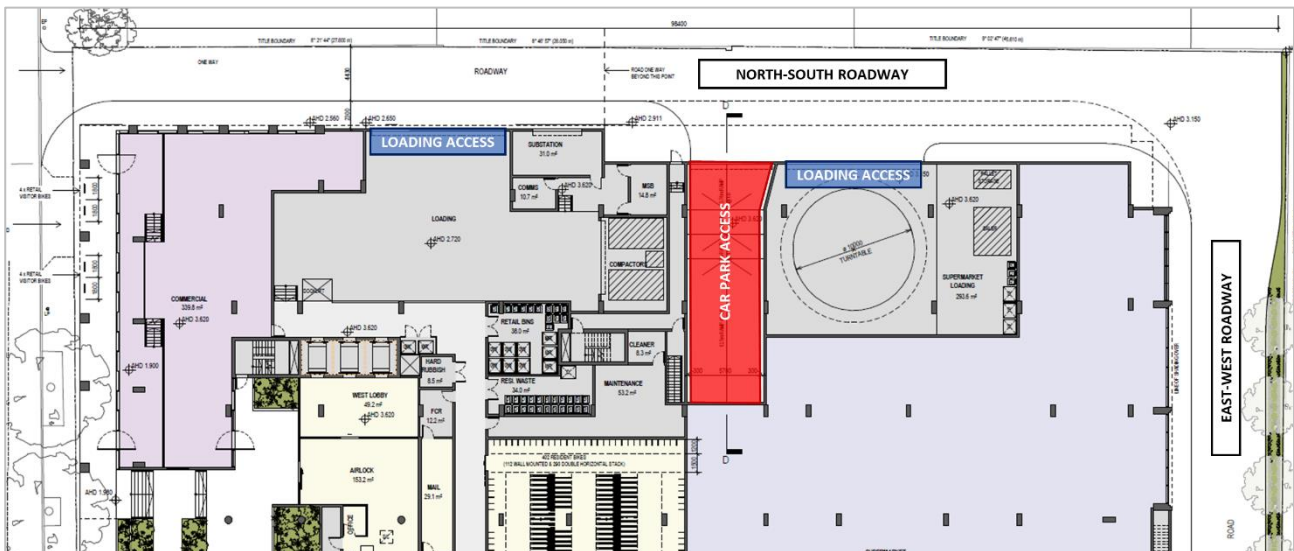
The vehicle access to the basement level car park will be via the proposed north-south roadway. This roadway will have a 7.6m trafficable width between the car park access and the proposed east-west roadway to accommodate concurrent two-way traffic movements. To the south of the car park access the roadway will be provided with a single width and will operate one-way north to south. The roadway will connect to Macaulay Road at its southern end.

The north-south roadway will also provide access to the on-site loading area proposed for the supermarket, and an on-site loading area for the retail uses and residents.

The proposed east-west roadway will link Boundary Road to the proposed north-south roadway. The east-west roadway will have a minimum trafficable width of 6.1m and will accommodate concurrent two-way traffic movements. Full turning movements will be permitted between the roadway and Boundary Road.

The vehicle access locations and layout are shown in Figure 6.1.

Figure 6.1: Vehicle Access Location and Layout



The proposed vehicle access layout has been assessed against the relevant design standards set out in the Planning Scheme, and where appropriate, the relevant Australian Standard. A summary of compliance is set out below:

- The initial 3.76m of the car park access ramp will be provided with an upwards grade of 1:8. This will be followed by a flat section for 2.0m and then a 1:8 downwards grade for 2.0m. The ramp grades will provide a 'bund' type treatment to address flood freeboard requirements. The proposed grades will deliver the initial 5.0m of the car park access with a grade not exceeding 1:10. This provision satisfies the Planning Scheme.
- The car park access ramp will be provided with a maximum grade of 1:5, with a grade of 1:8 for 2.0m provided at the bottom of the ramp. This provision satisfies the Planning Scheme.
- No ramp grade change will exceed 1:8. This provision satisfies the Planning Scheme.
- The car park access ramp will be provided with a trafficable width of 5.7m, with 0.3m clearances located on either side (providing a total width between walls of 6.3m). This width satisfies the Planning Scheme and the relevant Australian Standard.
- The car park access ramp will be flared at its top and bottom to facilitate two-way opposing car movements. Swept paths of a B99 design car passing a B85 design car are provided in Appendix A.



- Security gates will be provided between the resident and retail car parking at basement level.
- A minimum height clearance of 2.2m will be provided on the car park access ramp and within the basement level car park. The exception to this will be the height clearance of 2.5m above the accessible car spaces. This provision exceeds the Planning Scheme and satisfies the relevant Australian Standard.
- A 2.5m (measured along the access ramp) by 2.0m (measured along the property boundary) pedestrian visibility triangle that is at least 50% clear of visual obstructions will be achievable on the southern (exit) side of the car park access ramp measured at the back of the proposed footpath. This provision satisfies the Planning Scheme.

6.2 Car Park Layout Design

The proposed car parking layout has been assessed against the relevant design standards set out in the Planning Scheme, and where appropriate, the relevant Australian Standard. A summary of compliance is set out below:

- The standard car parking spaces will be 4.9m long and 2.6m wide, accessed via a minimum 6.4m wide aisle. These dimensions satisfy the Planning Scheme.
- The parallel car parking spaces in the resident car park will be 6.7m long and 2.3m wide, accessed via a 6.4m wide aisle. These dimensions satisfy the Planning Scheme.
- Sections of the resident car park aisle will be graded at 1:20 perpendicular to the car parking spaces. This grade satisfies the relevant Australian Standard.
- The motorcycle parking spaces will be 2.5m long and 1.2m wide. These dimensions satisfy the relevant Australian Standard.
- Columns adjacent to car parking spaces will be located outside of car door opening zones as prescribed by the Planning Scheme and relevant Australian Standard.
- Car parking spaces adjacent to obstructions will have a total width through the car door opening zone of 2.9m. This provision satisfies the Planning Scheme.
- The accessible car parking spaces will be 5.4m long and 2.6m wide with a shared area of the same dimensions adjacent to the spaces. The car spaces will be accessed via a minimum aisle width of 5.95m. These dimensions satisfy the relevant Australian Standard.

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7 Loading & Waste Collection

7.1 Statutory Requirements

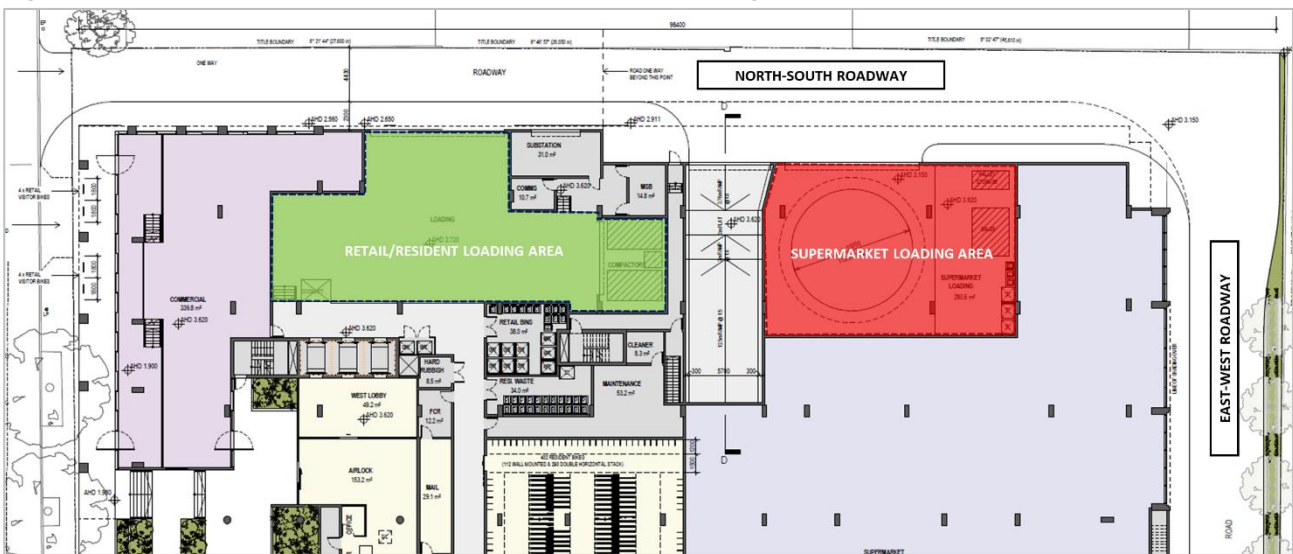
Clause 65.01 of the Planning Scheme states that:

"Before deciding on an application or approval of a plan, the responsible authority must consider, as appropriate: ... The adequacy of loading and unloading facilities ..."

7.2 Loading Area Layout

The locations of the supermarket loading areas and the retail/resident loading areas are shown at Figure 7.1.

Figure 7.1: Proposed Supermarket and Retail/Resident Loading Area Locations



The proposed supermarket will accommodate relatively frequent loading activities. Access to the supermarket loading area will be limited to vehicles of a size up to and including 8.8m medium rigid vehicles. The loading area will accommodate a turntable that will permit the 8.8m long vehicles to enter and exit the loading area in a forward direction. Swept paths of the 8.8m truck accessing the loading area are presented in Appendix A.

The proposed loading area for the retail tenancies and residents will be capable of accommodating vehicles of a size up to and including 9.8m long hooklift trucks – this vehicle will be used to collect/deliver the waste compactors. Swept paths of the 9.8m truck accessing the loading area are presented in Appendix A.

The loading areas will be provided with a height clearance of 4.5m, satisfying the relevant Australian Standard.

The east-west roadway and the northern section of the north-south roadway have been designed to accommodate an 8.8m truck passing a B99 design car. The swept paths of this arrangement are presented in Appendix A.

7.3 Waste Collection

Waste collection for the supermarket will be from the supermarket loading area. Collections will be limited to vehicles of a size up to and including 8.8m long trucks.

Waste collection for the retail uses and the dwellings will be from the retail/resident loading area. The compactors will be collected/delivered by a 9.8m long hooklift truck. Other waste collection will be limited to vehicles of a size up to and including 8.8m long trucks.



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8 Trip Generation Estimates

8.1 Introduction

Consistent with aspirations set out in the Macaulay Structure Plan, consideration has been given to adopting a travel demand management approach which reduces the requirement of occupants and visitors to rely on private motor vehicle travel.

The subject site has good access to public transport and is located close to existing active transport infrastructure which in turn lends the site to walking and cycling modes. The Macaulay Structure Plan also envisages significant changes to the transport network in the vicinity of the subject site, with prioritisation of active transport and the delivery of a high quality and reliable public transport system.

Accordingly, the subject site has been developed as a transit orientated development, whereby a multi-modal travel demand management approach has been adopted for land use intensification. This approach is consistent with various local policies and the site-specific planning controls which recommend that any transport strategy for the subject site encourages access via sustainable transport modes over private vehicles.

A multi-modal transport approach is proposed which prioritises walking, cycling and public transport ahead of private cars and minimises car parking provisions as a strategic means to limit traffic generation.

This response is typically multi-faceted and includes the following measures to promote improved precinct accessibility:

- Reducing the demand for travel (trip containment).
- Encouraging walking, cycling and public transport use.
- Adopting progressive parking rates and controls.
- Making the most of the transport system.

This approach requires the adoption of a modal hierarchy in favour of walking, cycling and public transport generally as identified in Figure 8.1.

Figure 8.1: Proposed Modal Hierarchy



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8.2 Mode Share Targets

For the purposes of this assessment, mode share targets have been assumed based on the site context, active and public transport opportunities (existing and emerging) in the area, the proposed on-site car parking provision and the modal hierarchy identified earlier. The assumed mode shares are shown in Table 8.1. The table identifies a favouring to sustainable transport modes.

Table 8.1: Transport Mode Share Targets

| Mode | Residential | Retail |
|------------------|-------------|-------------|
| Walking | 30% | 20% |
| Cycling | 10% | 5% |
| Public Transport | 40% | 20% |
| Car | 20% | 55% |
| Total | 100% | 100% |

Approximate travel demands have been estimated for each transport mode. The approximate trip values are presented in Table 8.2 and Table 8.3, which present person trip estimates in total and trip estimates by modes respectively.

Table 8.2: Trip Generation Estimates by Use

| Land Use | Size | Peak Hour Person Trip Generation Rate | Peak Hour Person Trip Generation Estimate |
|----------------------|----------------|---------------------------------------|---|
| Residential | 394 dwellings | 0.6 trips per dwelling [1] | 236 trips |
| Supermarket & Retail | 2,989.2sqm LFA | 8 trips per 100sqm [2] | 239 trips |
| Total | | | 475 trips |

[1] Sourced from RMS Guide Technical Direction.

[2] Sourced from RMS Guide Technical Direction.
LFA denotes leasable floor area.

Table 8.3: Trip Generation Estimates by Transport Mode

| Mode | Residential | Retail | Total |
|------------------|------------------|------------------|------------------|
| Walking | 71 trips | 48 trips | 119 trips |
| Cycling | 24 trips | 12 trips | 36 trips |
| Public Transport | 94 trips | 48 trips | 142 trips |
| Car | 47 trips | 131 trips | 178 trips |
| Total | 236 trips | 239 trips | 475 trips |

Some of the walking trips generated by the proposed development would likely have origins and destinations within the site itself (i.e. resident trips to the retail uses). This is commonly referred to as trip containment and is likely to be significant for a mixed-use development. In addition, a proportion of the trips generated are anticipated to be multi-purpose or linked trips to the site (i.e. commuters shopping at the supermarket before or after catching the train), which will further reduce the total number of additional people visiting the development.

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9 Traffic Considerations

9.1 Introduction

As the inner suburban areas of Melbourne continue to grow, the adoption of a travel demand management approach will need to be considered which, amongst other items, encourages the use of walking, cycling and public transport as the preferred mode of travel, and reduces external traffic impacts by reducing car parking provision as far as reasonably practicable. This is based on the premise that it is simply not possible to continually mitigate existing road infrastructure (e.g. by adding traffic lanes to an arterial road) to accommodate increasing traffic volumes.

The travel demand management approach seeks to control traffic generation of new development through minimised car parking provision.

The trip generation assessment (presented in Section 8) estimates that there will in the order of 178 private vehicle trips to and from the proposed development during peak hour periods.

The following section assesses the impact of the proposed development traffic on the existing and planned road network during the weekday PM and Saturday midday peak hours. These are considered the key assessment periods when there is a coincidence of peak traffic demands of the various uses.

9.2 Estimated Traffic Generation

9.2.1 Supermarket and Retail Uses

It is estimated that the proposed supermarket and retail uses with a car parking provision lower than standard statutory requirements, could generate traffic at a rate of around 2.5 vehicle movements per car space. With the provision of 52 car spaces, it is estimated that the supermarket and retail uses could generate 130 vehicle movements during the weekday PM and Saturday midday peak hours. This value is comparable to the private car use estimations presented in Section 8.

The typical directional split of traffic (i.e. the ratio between the inbound and outbound traffic movements) for supermarket and retail uses is as follows:

- Weekday PM Peak Hour: 50% inbound/50% outbound movements.
- Saturday Midday Peak Hour: 50% inbound/50% outbound movements.

9.2.2 Residential Use

A single house on a standard lot in an outer metropolitan area will typically generate up to one trip in the peak hour and eight to 10 trips per day. Medium and high-density dwellings generally exhibit a lower traffic generation rate. In the outer metropolitan areas, where public transport accessibility is relatively low, the rate for medium and high-density units is typically in the order of four to eight trips per day. Closer to the Melbourne CBD the rate reduces to in the order of two to six trips per day depending on dwelling size, parking provisions and accessibility to public transport and local amenities, among other things. Peak hour rates are typically 10% of daily rates.

Having consideration to the subject site location and its accessibility to active and public transport opportunities, a peak hour traffic generation rate of 0.30 vehicle movements per resident car parking space is considered reasonable, if not conservative on the high side. With the provision of 138 car spaces, it is estimated that the residential use could generate 41 vehicle movements during the weekday PM and Saturday midday peak hours. This value is comparable to the private car use estimations presented in Section 8.

The typical directional split of traffic (i.e. the ratio between the inbound and outbound traffic movements) for residential uses is as follows:

- Weekday PM Peak Hour: 60% inbound/40% outbound movements.
- Saturday Midday Peak Hour: 50% inbound/50% outbound movements.

9.2.3 Summary

The estimated additional weekday PM and Saturday midday peak hour traffic generated by the proposed development is presented in Table 9.1.

Table 9.1: Proposed Development Peak Hour Traffic Generation Estimates (New Traffic)

| Land Use | Weekday PM Peak Hour | | Saturday MID Peak Hour | |
|----------------------|----------------------|--------------|------------------------|--------------|
| | Entry | Exit | Entry | Exit |
| Residential | 25vph | 16vph | 20vph | 21vph |
| Supermarket & Retail | 65vph | 65vph | 65vph | 65vph |
| Total | 90vph | 81vph | 85vph | 86vph |

vph denotes vehicles per hour.

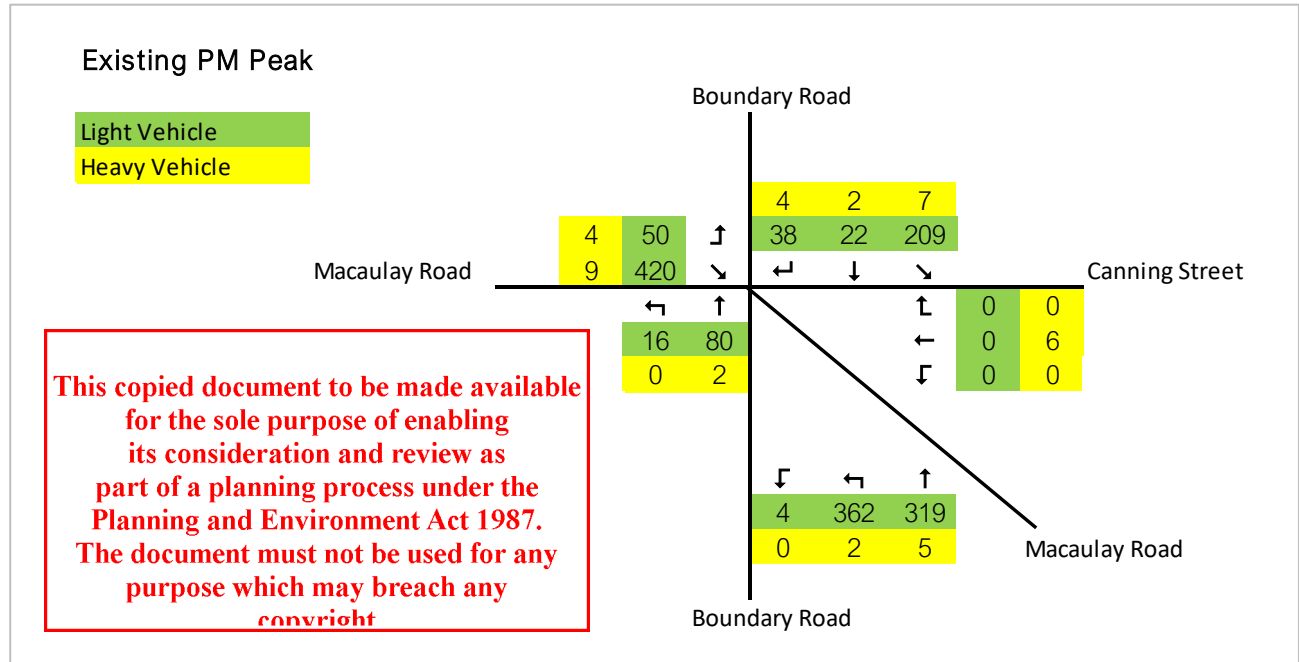
9.3 Existing Traffic Conditions

Stantec commissioned traffic movement and gap acceptance surveys on Tuesday 7 February 2023 from 4:00pm and 6:00pm and Saturday 11 February 2023 from 11:00am to 2:00pm at the following locations:

- Boundary Road/Macaulay Road/Canning Street signalised intersection (traffic movement counts).
- Boundary Road at the location of the proposed east-west roadway (gap acceptance).
- Macaulay Road at the location of the proposed north-south roadway (gap acceptance).

The results of the surveys at the Boundary Road/Macaulay Road/Canning Street signalised intersection are presented at Figure 9.1 and Figure 9.2.

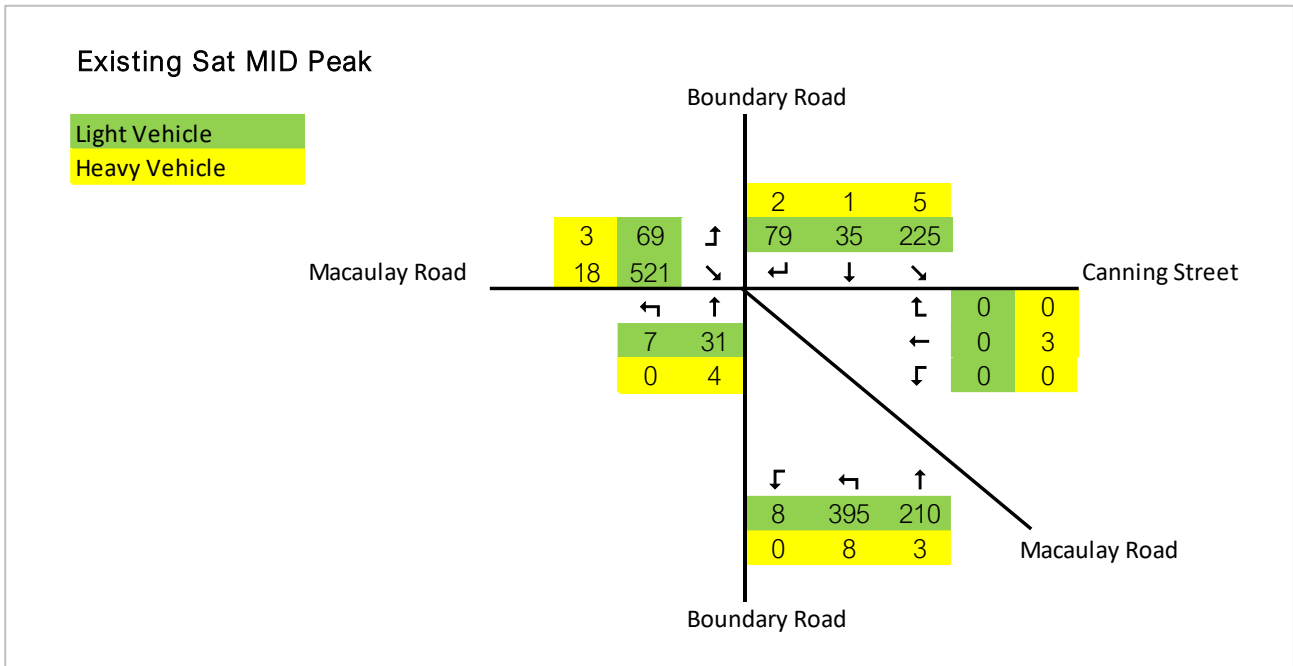
Figure 9.1: Existing Traffic Volumes – Weekday PM Peak Hour



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Figure 9.2: Existing Traffic Volumes – Saturday Midday Peak Hour



9.3.1 Gap Capacity Surveys

The absorption capacity for turn movements at the proposed locations of the east-west and north-south roadways have been determined through surveys carried out on Tuesday 7 February 2023 from 4:00pm to 6:00pm and Saturday 11 February 2023 from 11:00am to 2:00pm.

The absorption capacity values for the critical turn movements to/from Boundary Road and Macaulay Road have been determined using the following critical acceptance gap and follow-up headway values:

- Right turn entry movement from Boundary Road to proposed east-west roadway – 4 second critical gap and 2 second follow-up headway.
- Right turn exit movement from proposed east-west roadway to Boundary Road – 5 second critical gap and 3 second follow-up headway.
- Right turn exit movement from proposed north-south roadway to Macaulay Road – 5 second critical gap and 3 second follow-up headway.
- Left turn exit movement from proposed north-south roadway to Macaulay Road – 5 second critical gap and 3 second follow-up headway.

Based on the selected critical acceptance and follow-up headway values, the weekday PM peak hour and Saturday midday peak hour gap absorption capacity for turn movements at the proposed east-west roadway connection to Boundary Road and the proposed north-south roadway connection to Macaulay Road are identified at Table 9.2.

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Table 9.2: Gap Absorption Capacity for Turn Movements at Boundary Road and Macaulay Road

| Peak Hour Period | Location | Movement | Capacity |
|---------------------------|---------------|---------------------------|----------|
| Weekday PM Peak Hour | Boundary Road | Right turn entry movement | 598vph |
| | | Right turn exit movement | 388vph |
| | Macaulay Road | Left turn exit movement | 148vph |
| | | Right turn exit movement | 114vph |
| Saturday Midday Peak Hour | Boundary Road | Right turn entry movement | 656vph |
| | | Right turn exit movement | 410vph |
| | Macaulay Road | Left turn exit movement | 175vph |
| | | Right turn exit movement | 90vph |

vph denotes vehicles per hour.

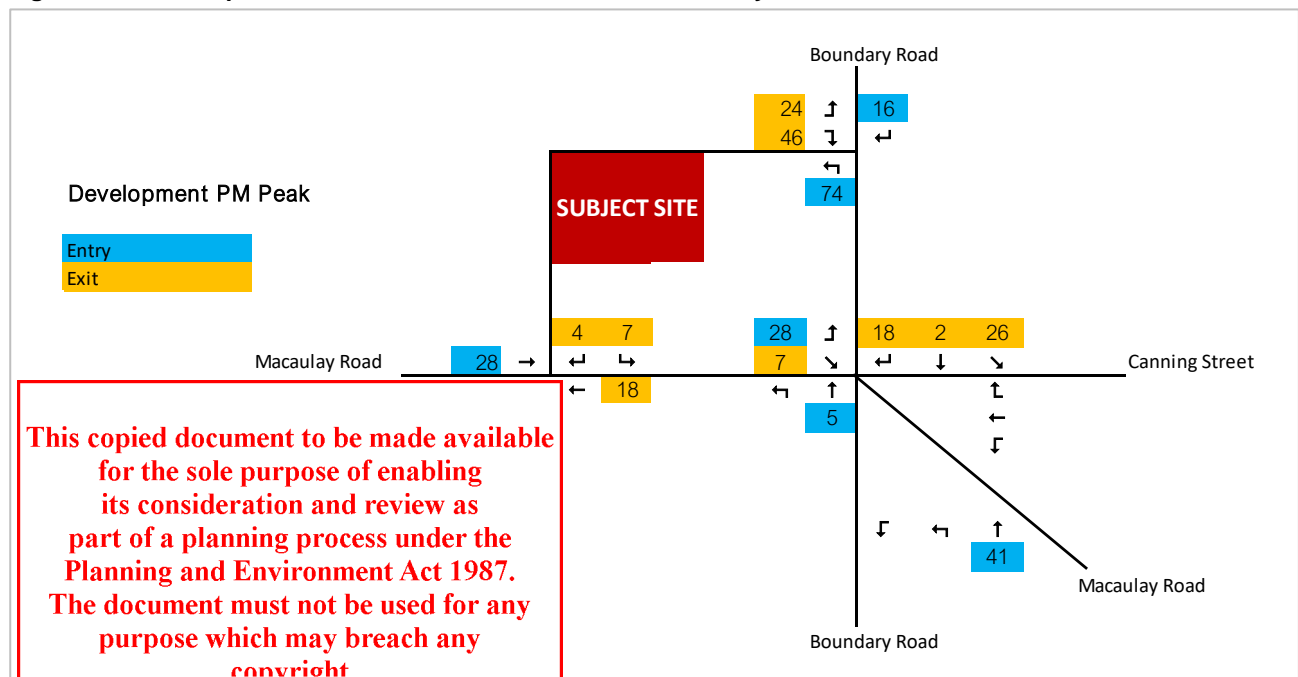
9.4 Traffic Distribution and Assignment

The directional distribution and assignment of traffic generated by the proposed development will be influenced by various factors, including the:

- The configuration of the arterial road network in the immediate vicinity of the site.
- The existing operation of intersections providing access between the local and arterial road network.
- The surrounding land uses in relation to the site.

The proposed development traffic estimates on the surrounding road network are shown in Figure 9.3 and Figure 9.4. It has been assumed that the majority of development traffic will use the proposed east-west roadway, with a lesser reliance on the proposed north-south roadway.

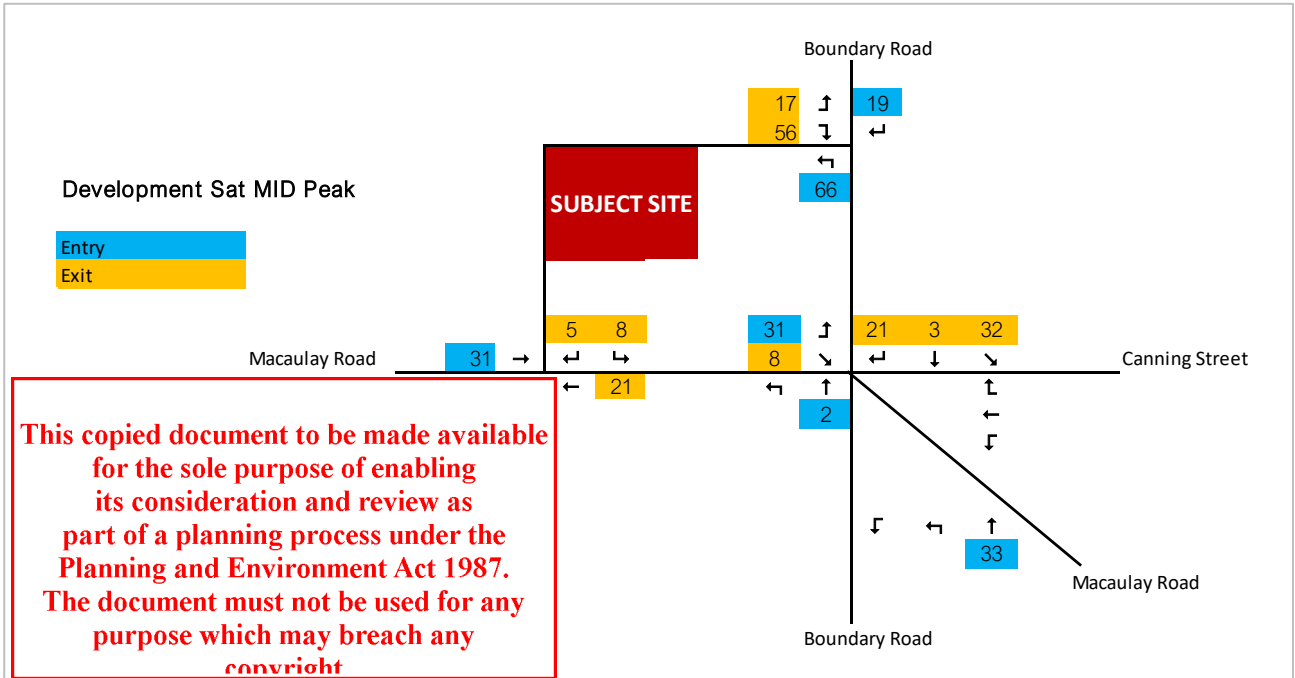
Figure 9.3: Development Generated Traffic Volumes – Weekday PM Peak Hour



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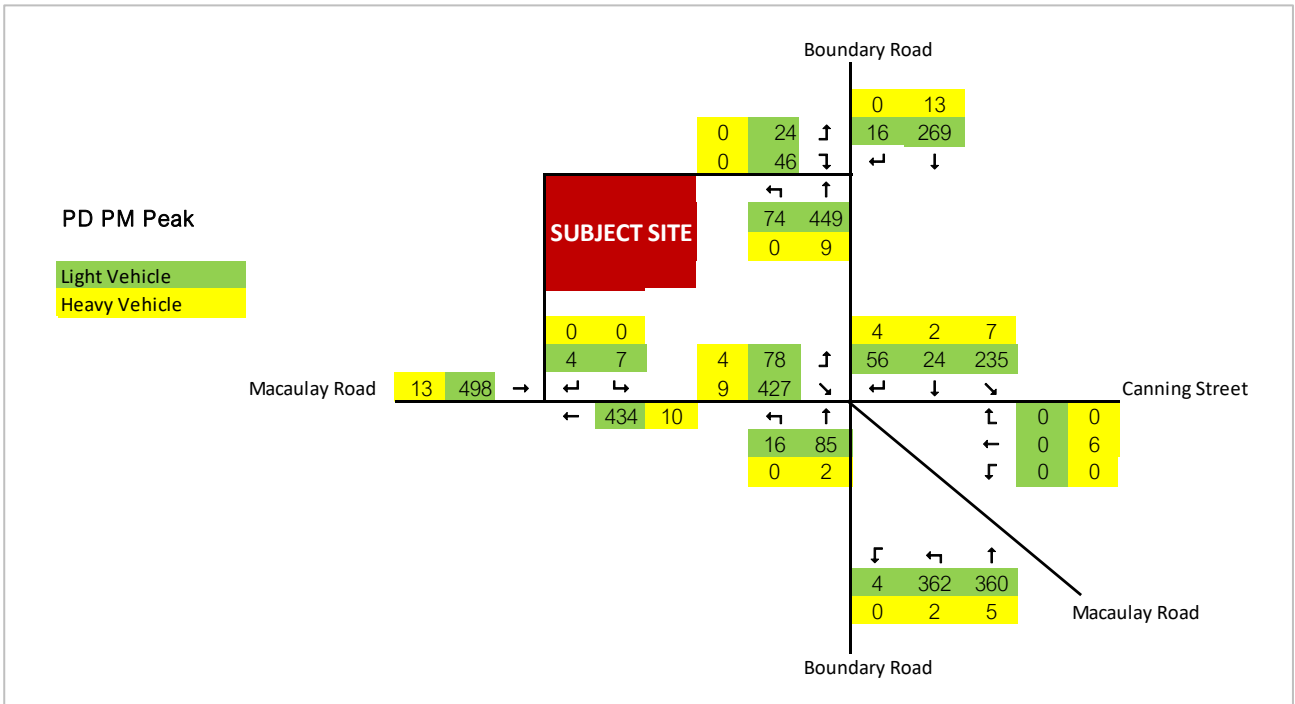
Figure 9.4: Development Generated Traffic Volumes – Saturday Midday Peak Hour



9.5 Post Development Traffic

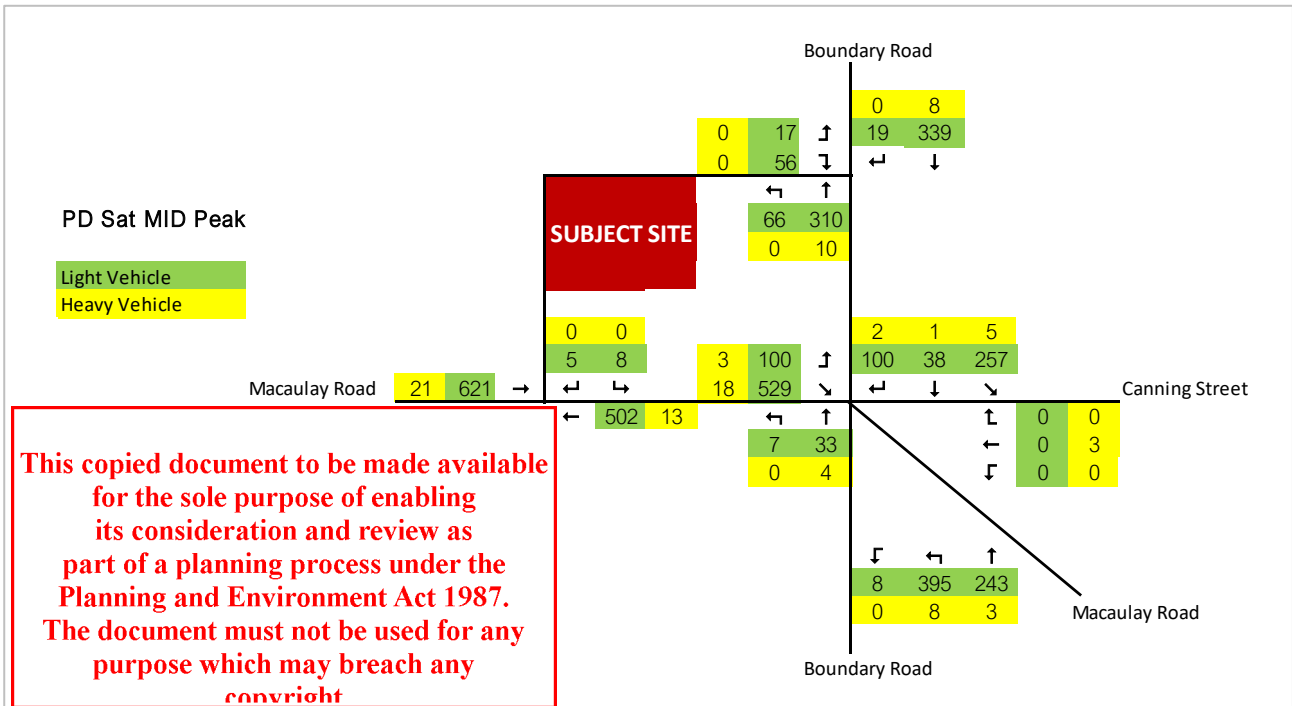
Post development traffic volumes are derived by adding the proposed development traffic volume estimates to the existing traffic volumes. The post development traffic volumes are presented in Figure 9.5 and Figure 9.6.

Figure 9.5: Post Development Traffic Volumes – Weekday PM Peak Hour



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Figure 9.6: Post Development Traffic Volumes – Saturday Midday Peak Hour



9.6 Traffic Impact Analysis

The impact of the proposed development traffic on the performance of the Boundary Road/Macaulay Road signalised intersection has been assessed using the SIDRA Intersection (version 9) computer program.

SIDRA Intersection is a computer-based modelling package used to calculate intersection performance. The commonly used measure of intersection performance is referred to as the Degree of Saturation (DOS). DOS's of around 0.95 are typically considered the 'ideal' limit of performance for signalised intersections.

The SIDRA Intersection models have been calibrated to replicate observed traffic conditions on the surrounding road network and to match Intersection Diagnostics Monitor data obtained from DTP.

The existing and post development performance of the Boundary Road/Macaulay Road signalised intersection is presented in Table 9.3.

Table 9.3: Boundary Road/Macaulay Road Signalised Intersection Performance

| Approach | Peak Hour | Existing | | | Post Development | | |
|---------------------------|--------------|----------|---------------|-----------------------------|------------------|---------------|-----------------------------|
| | | DOS | Average Delay | 95 th %ile Queue | DOS | Average Delay | 95 th %ile Queue |
| Boundary Road (south) | PM Peak | 0.32 | 43s | 28m | 0.34 | 44s | 30m |
| | Sat MID Peak | 0.12 | 36s | 11m | 0.13 | 36s | 11m |
| Macaulay Road (southeast) | PM Peak | 0.78 | 30s | 119m | 0.85 | 33s | 143m |
| | Sat MID Peak | 0.71 | 23s | 70m | 0.77 | 24s | 83m |
| Canning Street (east) | PM Peak | 0.09 | 52s | 4m | 0.09 | 52s | 4m |
| | Sat MID Peak | 0.06 | 49s | 2m | 0.06 | 49s | 2m |
| Boundary Road (north) | PM Peak | 0.40 | 31s | 54m | 0.53 | 32s | 60m |
| | Sat MID Peak | 0.49 | 31s | 54m | 0.60 | 32s | 62m |
| Macaulay Road (west) | PM Peak | 0.78 | 37s | 147m | 0.85 | 42s | 164m |
| | Sat MID Peak | 0.72 | 23s | 140m | 0.77 | 26s | 154m |

The analysis results suggest that the proposed development traffic will have a modest impact on the performance of the signalised intersection, with the intersection estimated to operate satisfactorily post development with a maximum DOS of 0.85 during the weekday PM peak hour and a maximum DOS of 0.77 during the Saturday midday peak hour.

The capacity for the proposed development traffic to turn to and from the proposed east-west roadway connection with Boundary Road and north-south roadway connection with Macaulay Road is presented in Table 9.4.

Table 9.4: Gap Absorption Capacity for Turn Movements at Boundary Road and Macaulay Road

| Peak Hour Period | Location | Movement | Capacity | Demand |
|----------------------|---------------|---------------------------|----------|--------|
| Weekday PM Peak | Boundary Road | Right turn entry movement | 598vph | 16vph |
| | | Right turn exit movement | 388vph | 46vph |
| | Macaulay Road | Left turn exit movement | 148vph | 7vph |
| | | Right turn exit movement | 114vph | 4vph |
| Saturday Midday Peak | Boundary Road | Right turn entry movement | 656vph | 19vph |
| | | Right turn exit movement | 410vph | 56vph |
| | Macaulay Road | Left turn exit movement | 175vph | 8vph |
| | | Right turn exit movement | 90vph | 5vph |

vph denotes vehicles per hour.

It is estimated that the traffic generated by the proposed development can be accommodated on the surrounding road network with no material change to its performance.

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10 Conclusion

Based on the analysis and discussions presented within this report, the following conclusions are made:

- The proposed development generates a statutory car parking requirement of 555 car spaces. The proposed car parking supply of 190 car spaces does not satisfy the statutory requirement and a planning permit is being sought to reduce this requirement.
- The proposed car parking provision is considered reasonable for the following reasons:
 - The subject site is accessible by public transport.
 - A bicycle parking provision well in excess of the statutory requirements will be provided.
 - A reduced car parking provision below the statutory car parking requirement is consistent with objectives contained in relevant planning policy and is consistent with the car parking controls for land immediately south of the subject site.
 - The adoption of a travel demand management approach which encourages sustainable travel modes by limiting on-site car parking is consistent with contemporary planning practices.
 - It is expected that residents living at the subject site would not need to drive a car to access the supermarket and retail land uses.
- The proposed parking and vehicle access layout is consistent with the requirements set out in the Planning Scheme and relevant Australian Standards.
- The proposed development generates a statutory bicycle parking requirement of 131 bicycle spaces, comprising of 86 resident/employee spaces and 45 spaces for visitors/shoppers. It is proposed to provide a total of 468 bicycle spaces, including 402 secure spaces for residents, 39 spaces for residential visitors, 15 spaces for supermarket/retail staff, and 12 spaces for supermarket/retail shoppers. This provision comfortably exceeds the statutory requirements and is considered a good transport design response.
- There is a statutory requirement to provide one shower and change room facility for supermarket and retail use staff. This requirement is being satisfied.
- Loading and waste collection will occur in dedicated facilities on the ground floor of the proposed development. Swept path assessments have been prepared that confirm all expected vehicle movements in/out of the proposed loading areas can be satisfactorily accommodated.
- The proposed development is estimated to generate up to 171 additional vehicle movements on the surrounding road network in the weekday PM peak hour and Saturday midday peak hour.
- Detailed analysis suggests that the proposed development traffic can be accommodated at the existing Boundary Road/Macaulay Road signalised intersection with no material change to its performance.
- Analysis suggests that there are ample gaps in the Boundary Road and Macaulay Road traffic streams to accommodate the proposed development traffic turning to/from the proposed east-west and north-south roadways.
- It is considered that the additional traffic generated by the proposed development can be accommodated on the surrounding road network and is not expected to compromise its safety or functionality.

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Appendix A Swept Path Assessments

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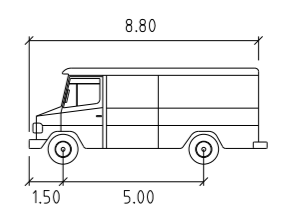
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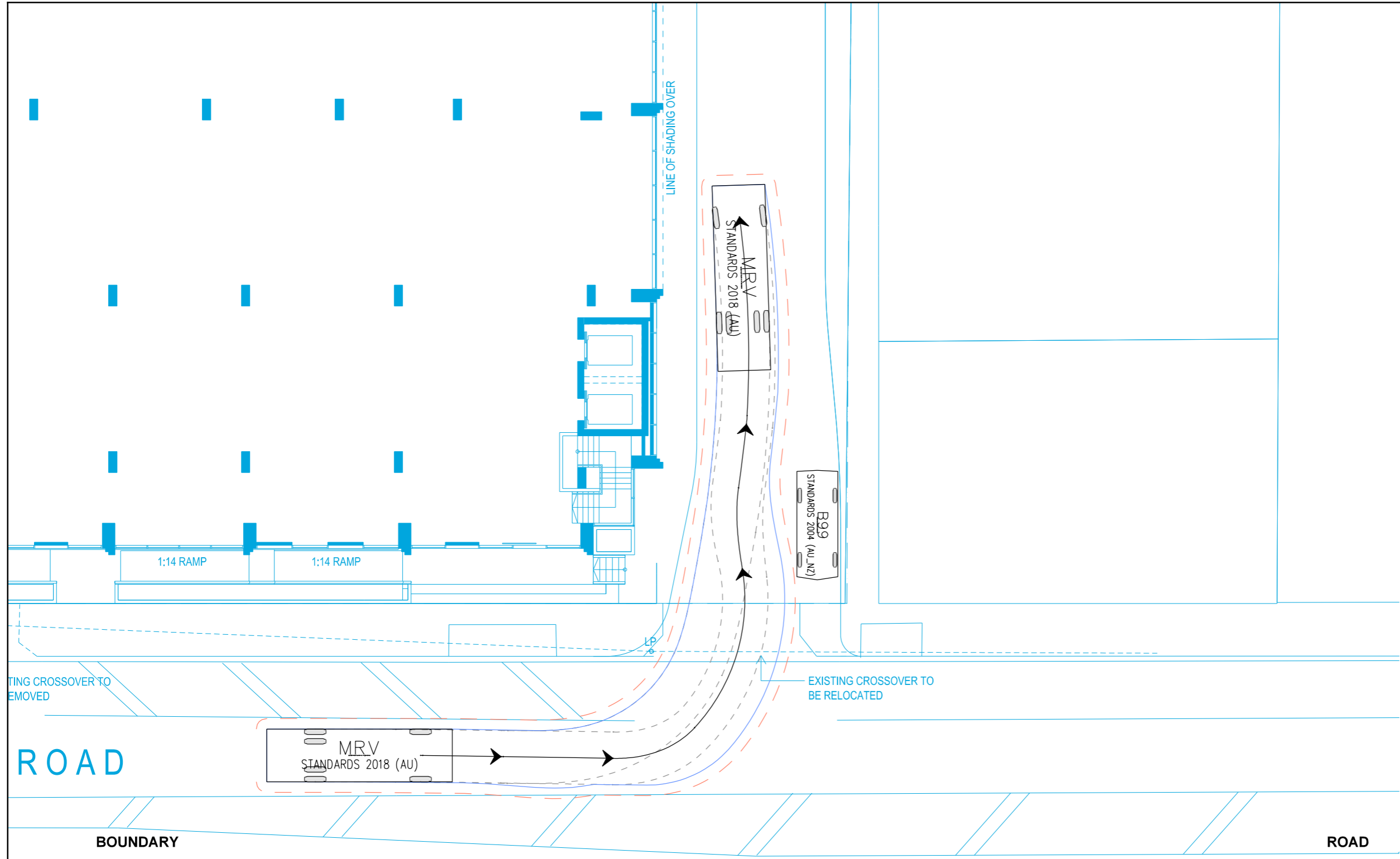
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- - VEHICLE TYRE PATH
- VEHICLE BODY PATH
- - 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 5km/h



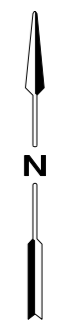
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P. NGUYEN

APPROVED BY
J. SELLARS

DESIGN CHECK
J. SELLARS

DATE ISSUED
20 MARCH 2023

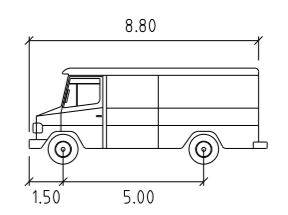
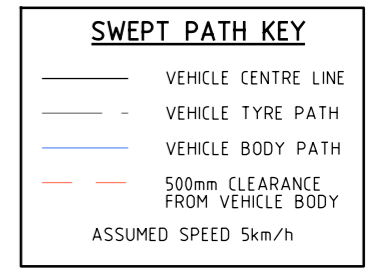
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218-246 MACAULAY ROAD
NORTH MELBOURNE

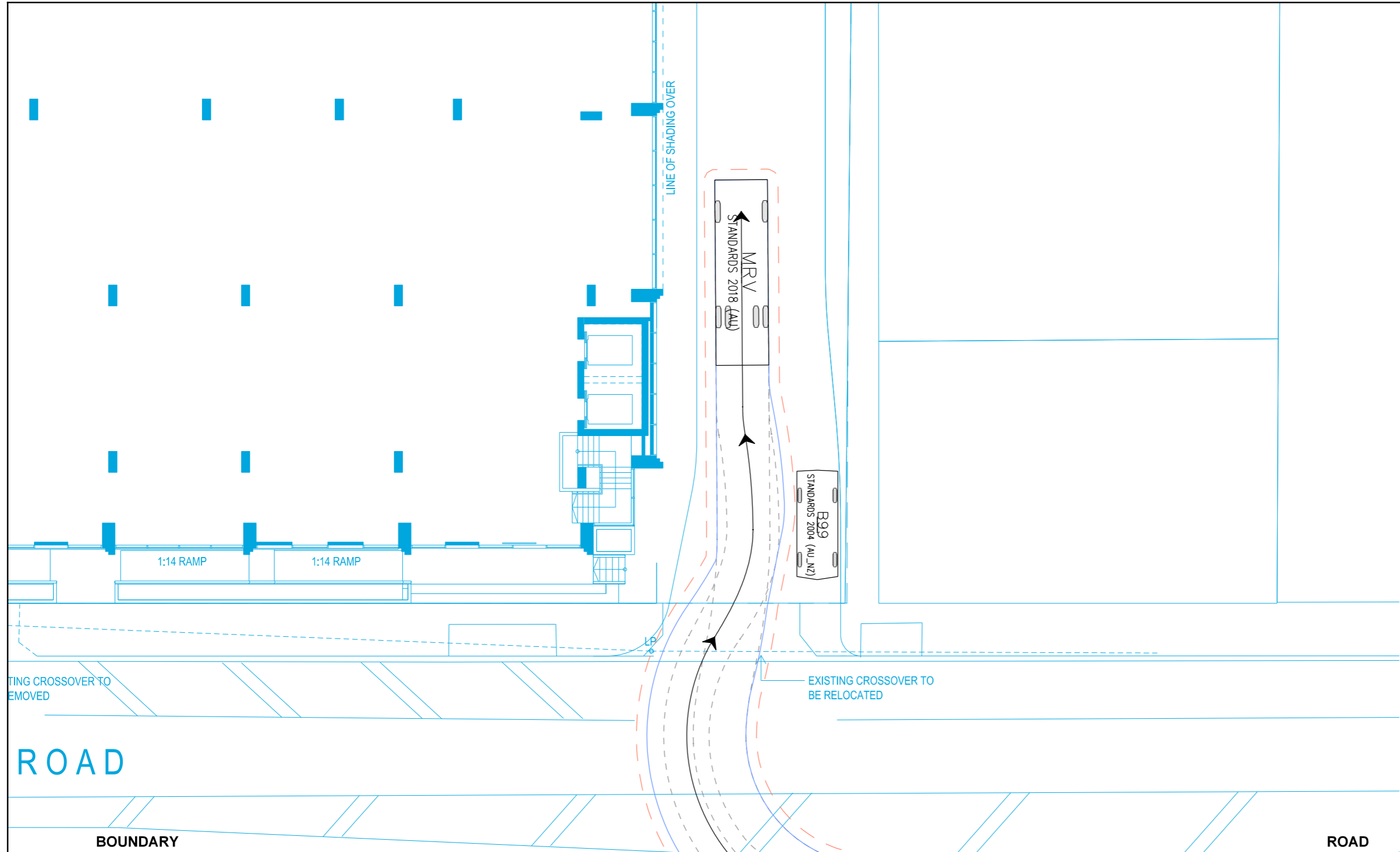
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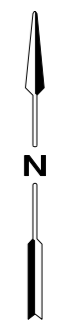
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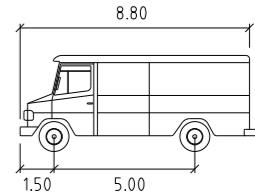
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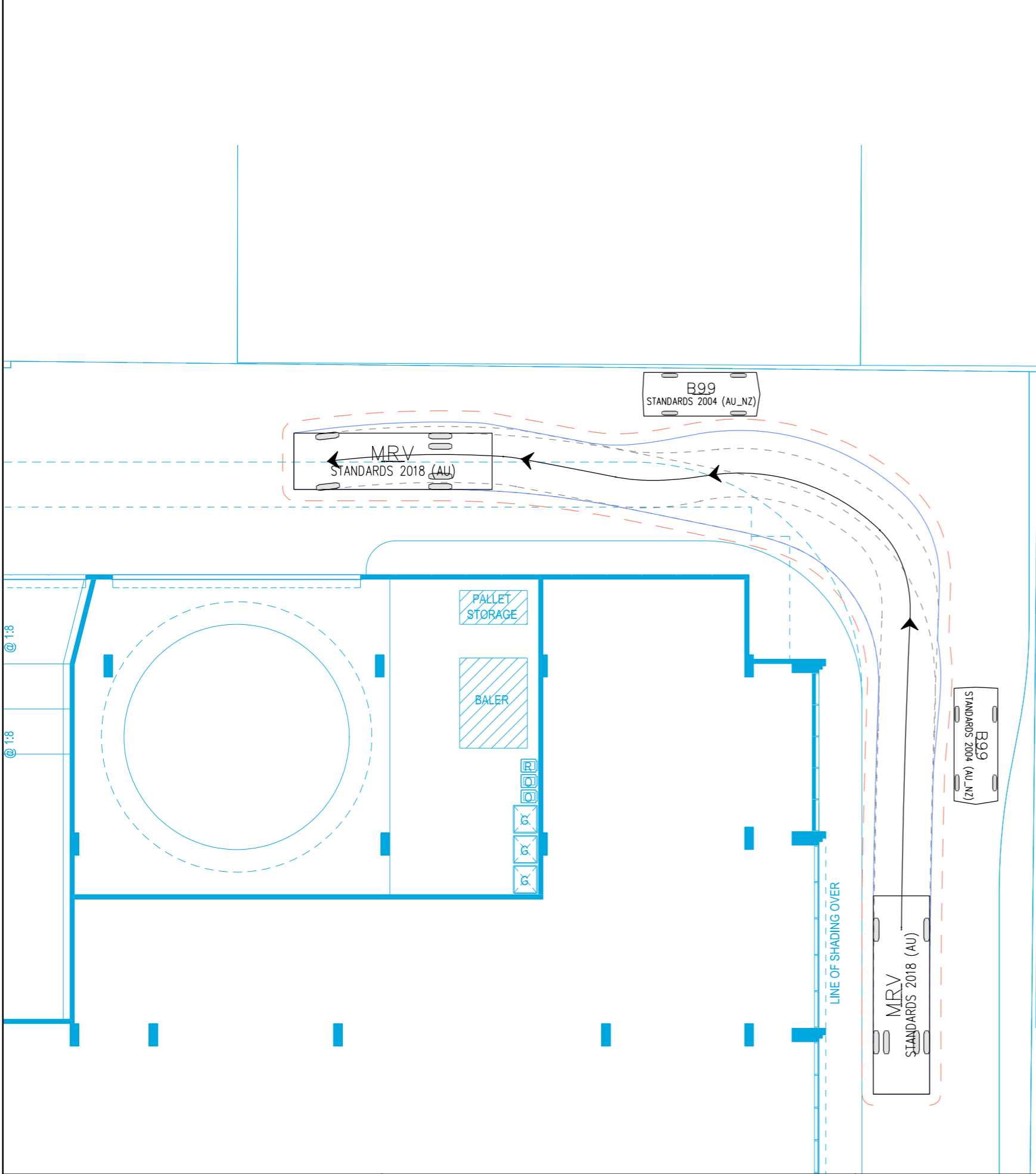
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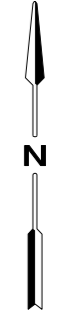
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| ASSUMED SPEED 5km/h | |



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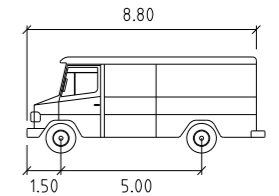
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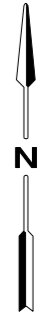
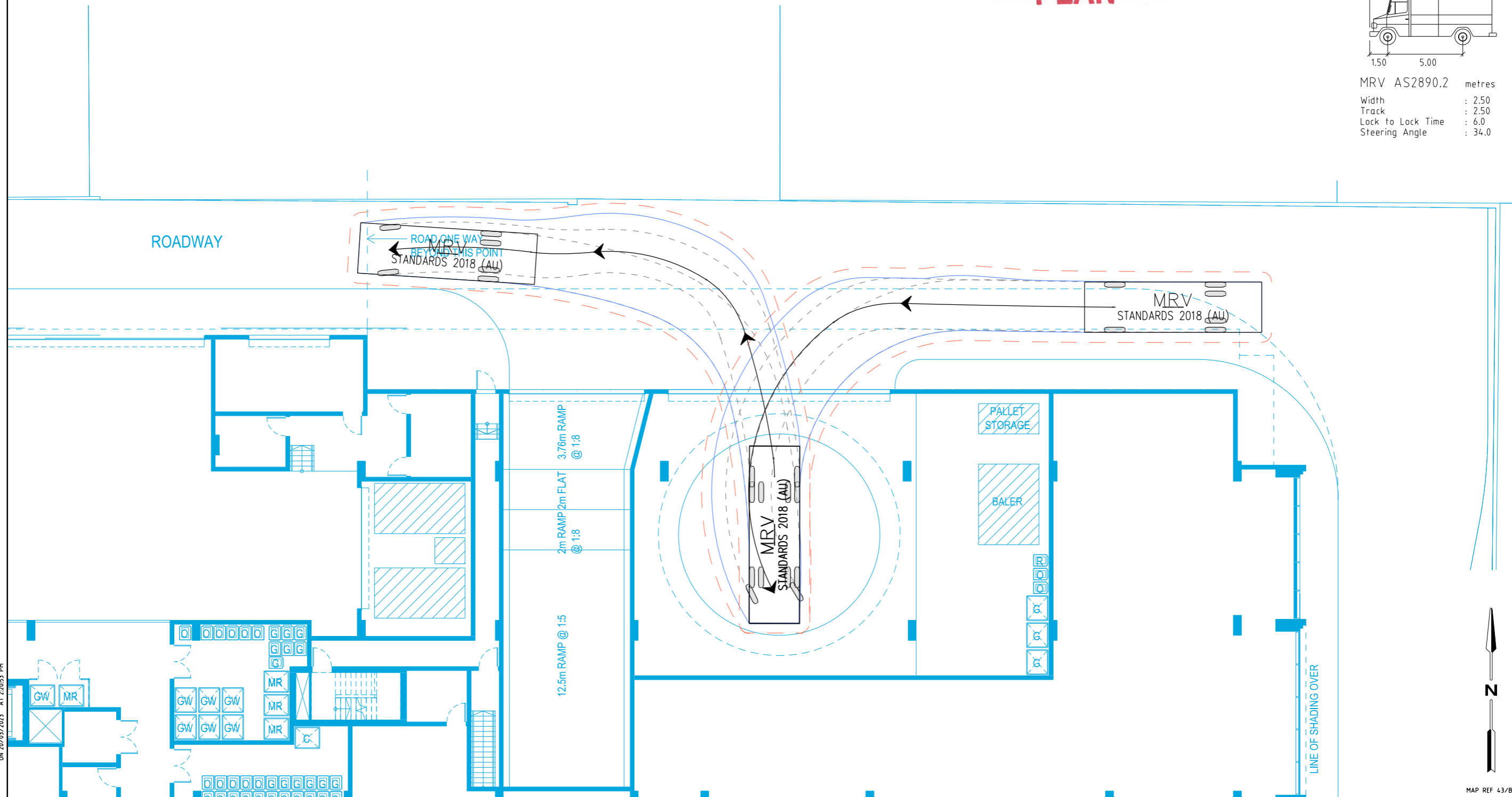
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| | VEHICLE BODY PATH |
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| ASSUMED SPEED 5km/h | |

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|-------------------|--------|
| Width | : 2.50 |
| Track | : 2.50 |
| Lock to Lock Time | : 6.0 |
| Steering Angle | : 34.0 |



MAP REF 43/B3

PLOTTED BY : paulnguyen ON 20/03/2023 AT 2:26:53 PM



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P. NGUYEN

APPROVED BY
J. SELLARS

DESIGN CHECK
J. SELLARS

DATE ISSUED
20 MARCH 2023

SCALE
A3 1:200

CAD FILE NO.
300304476-AT01-P4.dgn

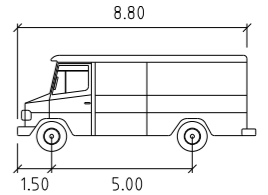
218-246 MACAULAY ROAD
NORTH MELBOURNE

SWEPT PATH ASSESSMENT
DRAWING NO. 300304476-AT01-04

ISSUE P4

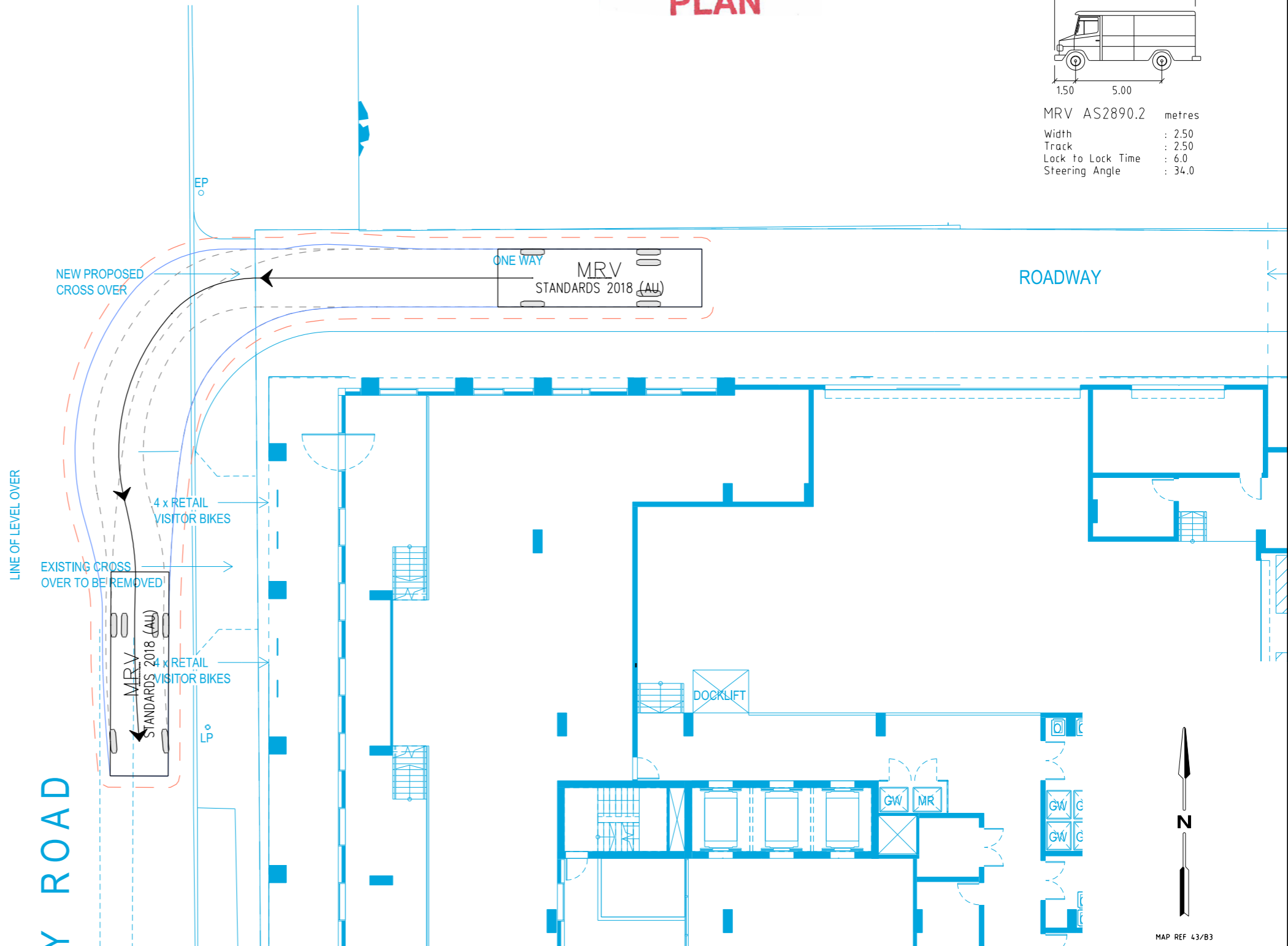
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| SWEPT PATH KEY | |
|---------------------|-----------------------------------|
| | VEHICLE CENTRE LINE |
| | VEHICLE TYRE PATH |
| | VEHICLE BODY PATH |
| | 500mm CLEARANCE FROM VEHICLE BODY |
| ASSUMED SPEED 5km/h | |



MRV AS2890.2 metres
 Width : 2.50
 Track : 2.50
 Lock to Lock Time : 6.0
 Steering Angle : 34.0

ADVERTISED PLAN



MAP REF 43/B3

DN 20/03/2023 AT 2:32:48 PM

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A3 1:200

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218-246 MACAULAY ROAD
NORTH MELBOURNE

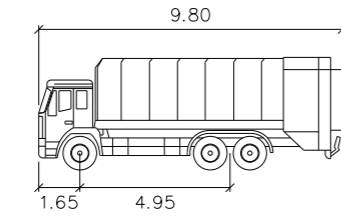
SWEPT PATH ASSESSMENT
DRAWING NO. 300304476-AT01-08

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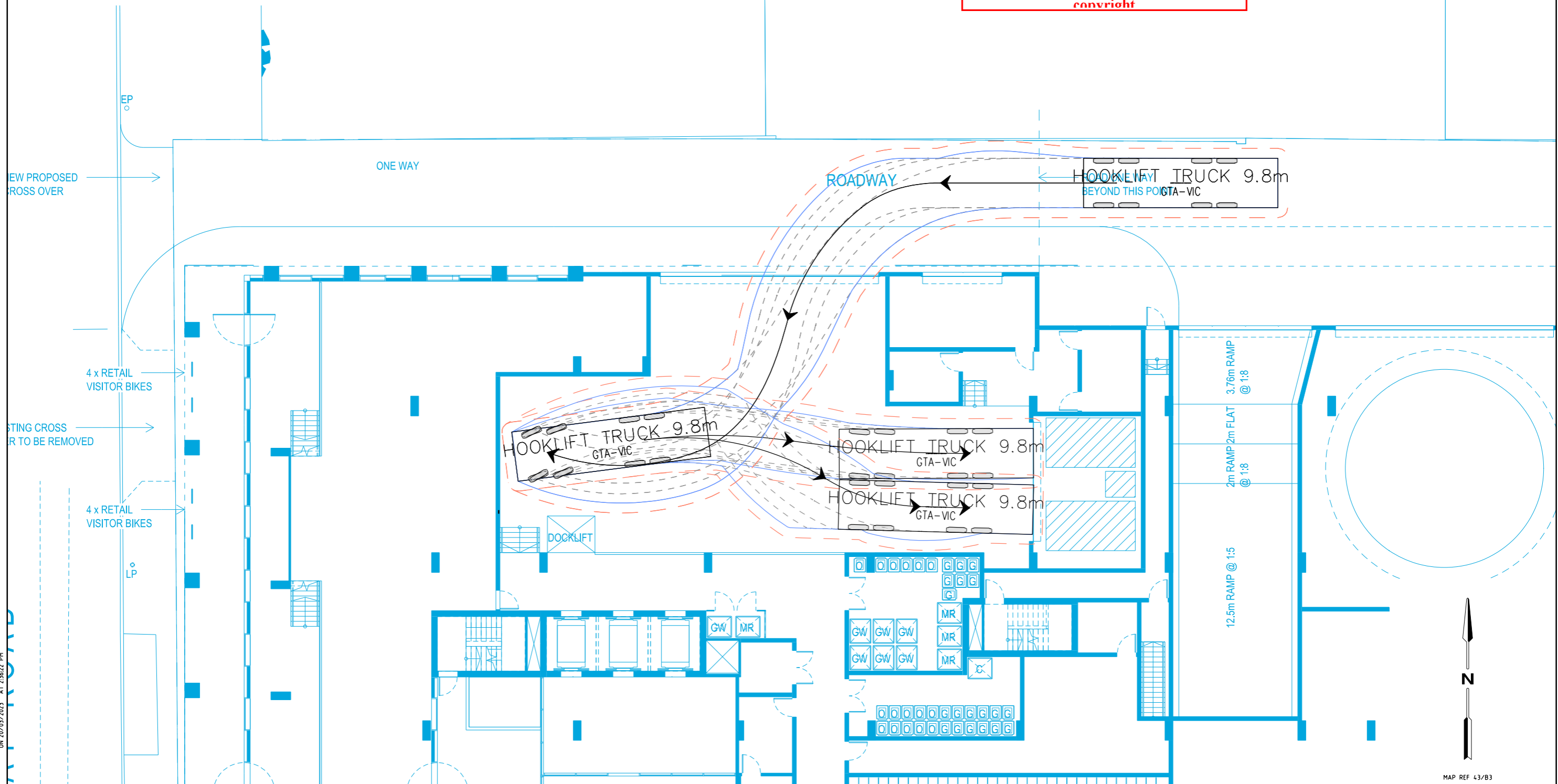
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| SWEPT PATH KEY | |
|---------------------|-----------------------------------|
| | VEHICLE CENTRE LINE |
| | VEHICLE TYRE PATH |
| | VEHICLE BODY PATH |
| | 500mm CLEARANCE FROM VEHICLE BODY |
| ASSUMED SPEED 5km/h | |

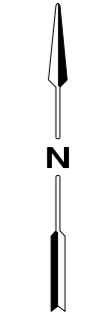


HOOKLIFT TRUCK 9.8m

| | |
|-------------------|--------|
| Width | : 2.50 |
| Track | : 2.50 |
| Lock to Lock Time | : 6.0 |
| Steering Angle | : 27.1 |



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MAP REF 43/B3



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SCALE
A3

1:200

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218-246 MACAULAY ROAD
NORTH MELBOURNE

SWEPT PATH ASSESSMENT
DRAWING NO. 300304476-AT01-09

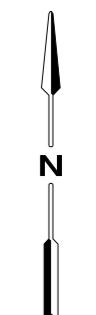
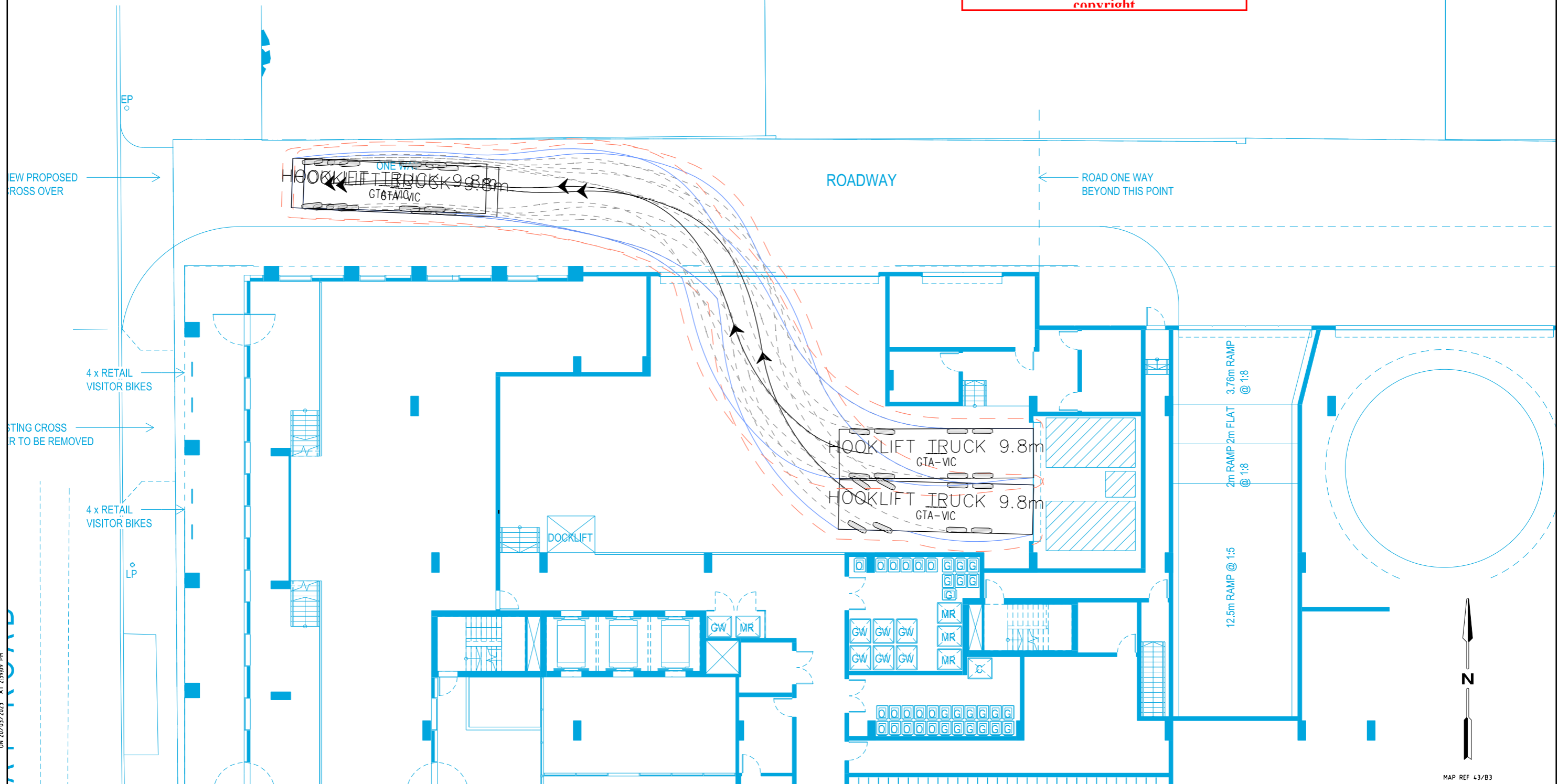
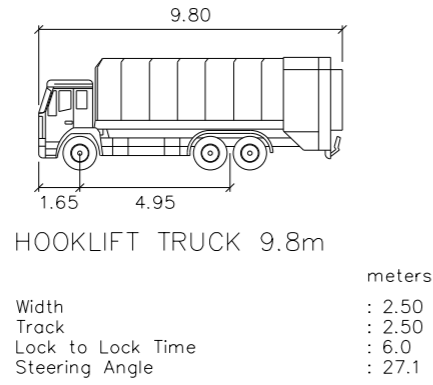
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SWEPT PATH KEY

- VEHICLE CENTRE LINE
- - VEHICLE TYRE PATH
- VEHICLE BODY PATH
- - 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 5km/h



MAP REF 43/B3

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SCALE
A3 0 2 4 1:200

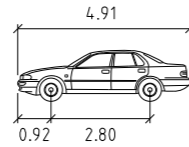
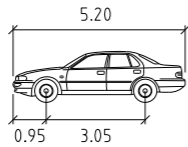
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218-246 MACAULAY ROAD
NORTH MELBOURNE

SWEPT PATH ASSESSMENT
DRAWING NO. 300304476-AT01-10

SWEPT PATH KEY

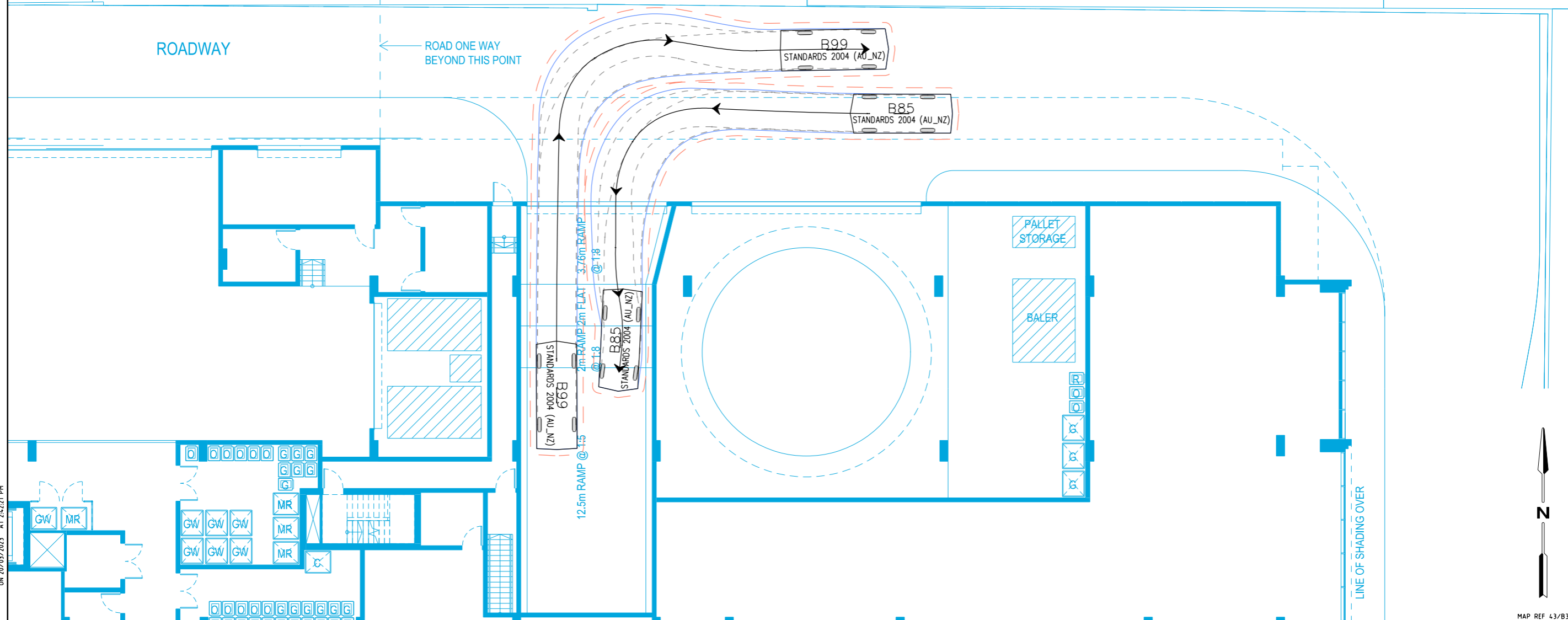
- VEHICLE CENTRE LINE
- - VEHICLE TYRE PATH
- VEHICLE BODY PATH
- - 300mm CLEARANCE FROM VEHICLE BODY
- ASSUMED SPEED 5km/h



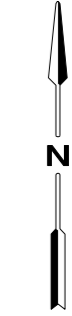
| | | | |
|-------------------|--------|-------------------|--------|
| B99 6.3mR | metres | B85 | metres |
| Width | : 1.94 | Width | : 1.87 |
| Track | : 1.77 | Track | : 1.77 |
| Lock to Lock Time | : 6.0 | Lock to Lock Time | : 6.0 |
| Steering Angle | : 34.0 | Steering Angle | : 34.0 |

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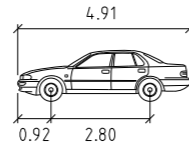
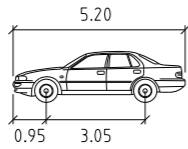
218-246 MACAULAY ROAD
NORTH MELBOURNE

SWEPT PATH ASSESSMENT
DRAWING NO. 300304476-AT01-11

SWEPT PATH KEY

- VEHICLE CENTRE LINE
- - VEHICLE TYRE PATH
- VEHICLE BODY PATH
- - 300mm CLEARANCE FROM VEHICLE BODY

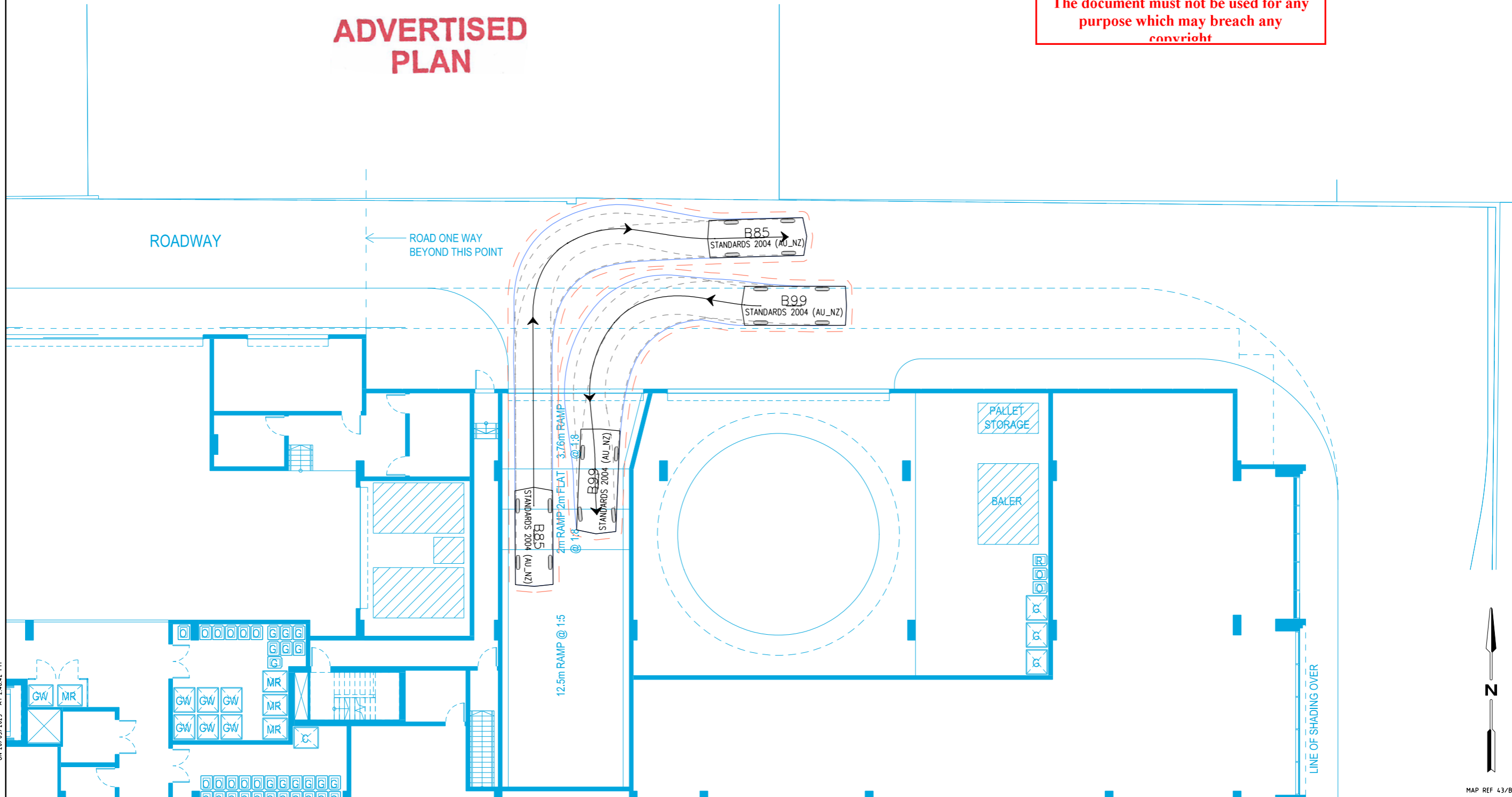
ASSUMED SPEED 5km/h



| Vehicle | metres | Vehicle | metres |
|-----------|-------------------------|---------|-------------------------|
| B99 6.3mR | Width : 1.94 | B85 | Width : 1.87 |
| | Track : 1.77 | | Track : 1.77 |
| | Lock to Lock Time : 6.0 | | Lock to Lock Time : 6.0 |
| | Steering Angle : 34.0 | | Steering Angle : 34.0 |

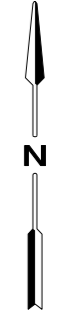
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218-246 MACAULAY ROAD
NORTH MELBOURNE

SWEPT PATH ASSESSMENT
DRAWING NO. 300304476-AT01-12

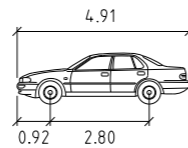
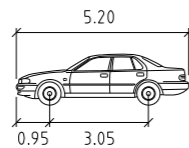
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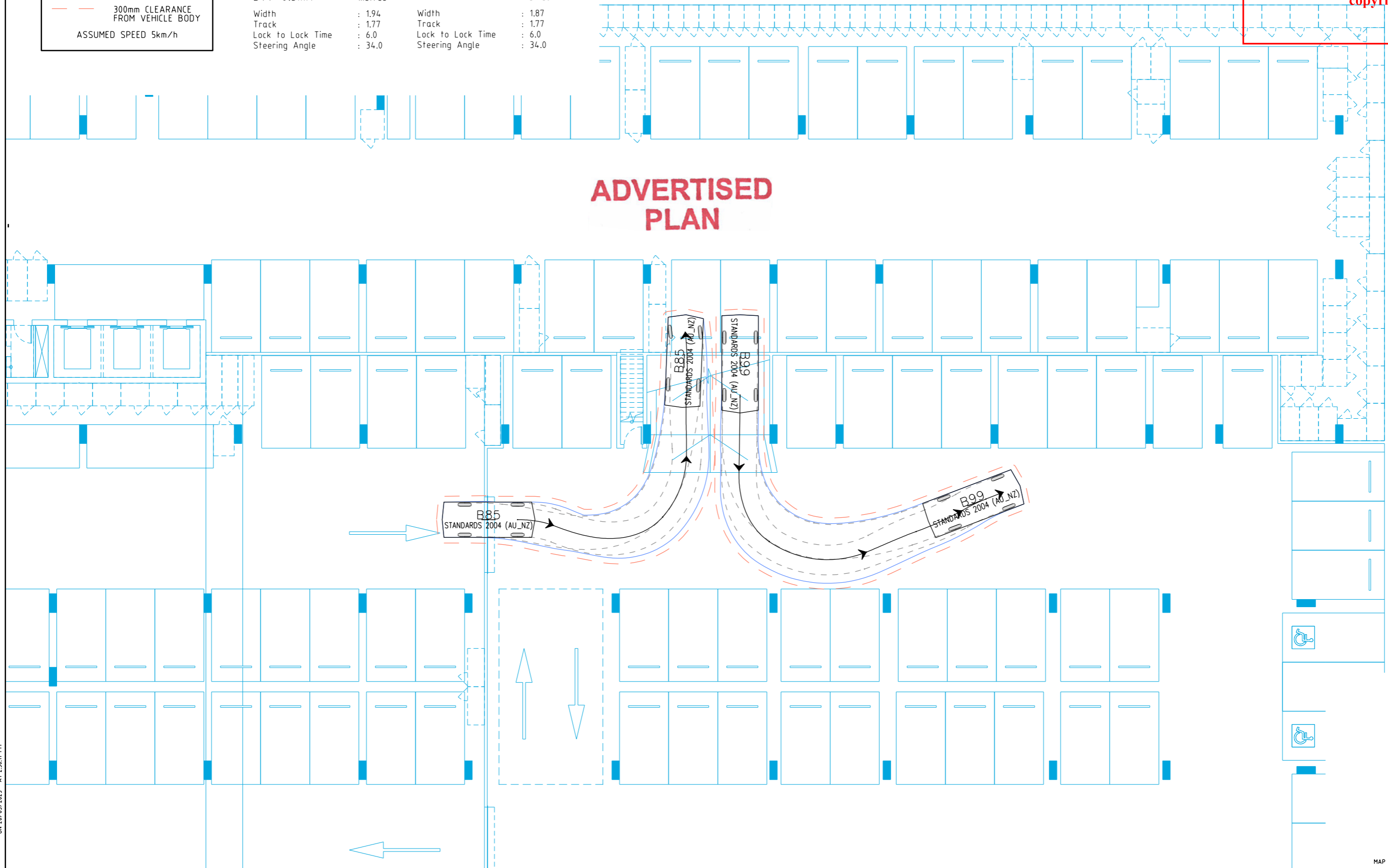
- VEHICLE CENTRE LINE
- - VEHICLE TYRE PATH
- VEHICLE BODY PATH
- - 300mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 5km/h



| B99 6.3mR | | metres | | B85 | | metres | |
|-------------------|--------|-------------------|--------|-------------------|--------|-------------------|--------|
| Width | : 1.94 | Width | : 1.87 | Width | : 1.87 | Width | : 1.87 |
| Track | : 1.77 | Track | : 1.77 | Track | : 1.77 | Track | : 1.77 |
| Lock to Lock Time | : 6.0 | Lock to Lock Time | : 6.0 | Lock to Lock Time | : 6.0 | Lock to Lock Time | : 6.0 |
| Steering Angle | : 34.0 | Steering Angle | : 34.0 | Steering Angle | : 34.0 | Steering Angle | : 34.0 |

ADVERTISED PLAN



DN 20/03/2023 AT 2:50:11 PM
PLOTTED BY : paulinguyen

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NORTH MELBOURNE
BASEMENT
SWEPT PATH ASSESSMENT
DRAWING NO. 300304476-AT01-13

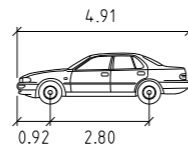
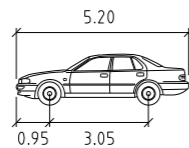
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SWEPT PATH KEY

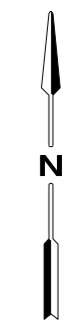
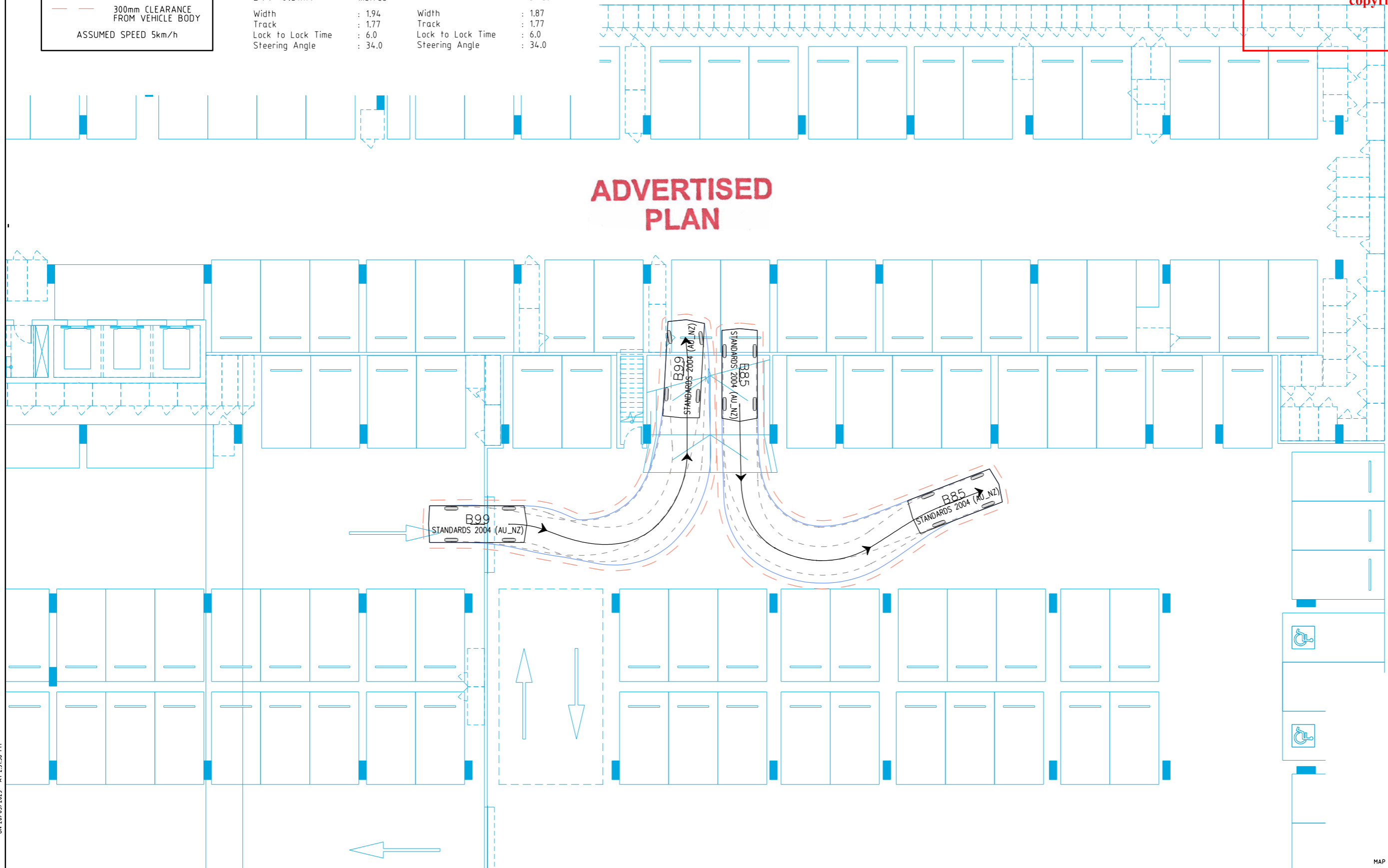
- VEHICLE CENTRE LINE
- - VEHICLE TYRE PATH
- VEHICLE BODY PATH
- - 300mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 5km/h



| B99 6.3mR metres | | B85 metres | |
|-------------------|--------|-------------------|--------|
| Width | : 1.94 | Width | : 1.87 |
| Track | : 1.77 | Track | : 1.77 |
| Lock to Lock Time | : 6.0 | Lock to Lock Time | : 6.0 |
| Steering Angle | : 34.0 | Steering Angle | : 34.0 |

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ON 20/03/2023 AT 2:51:58 PM
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APPROVED BY
J. SELLARS

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J. SELLARS

DATE ISSUED
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