

Report Prepared for  
FridCorp Pty Ltd

ratio:

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**Proposed Mixed-Use Development**  
270 Clayton Road, Clayton

10 November 2020

traffic:report

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Date	Issue	Prepared By	Checked By
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16/07/20	FINAL	S NAIK	R FAIRLIE
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# 1 Introduction:

Ratio Consultants was commissioned by Fridcorp Pty Ltd to assess the traffic and parking implications of the proposed a multi-storey mixed-use development on the subject site located at 270 Clayton Road, in Clayton.

This report has been prepared to address the traffic and parking needs of the proposal and is based on surveys and observations in the vicinity of the subject site and on previous studies of similar developments elsewhere in Melbourne.

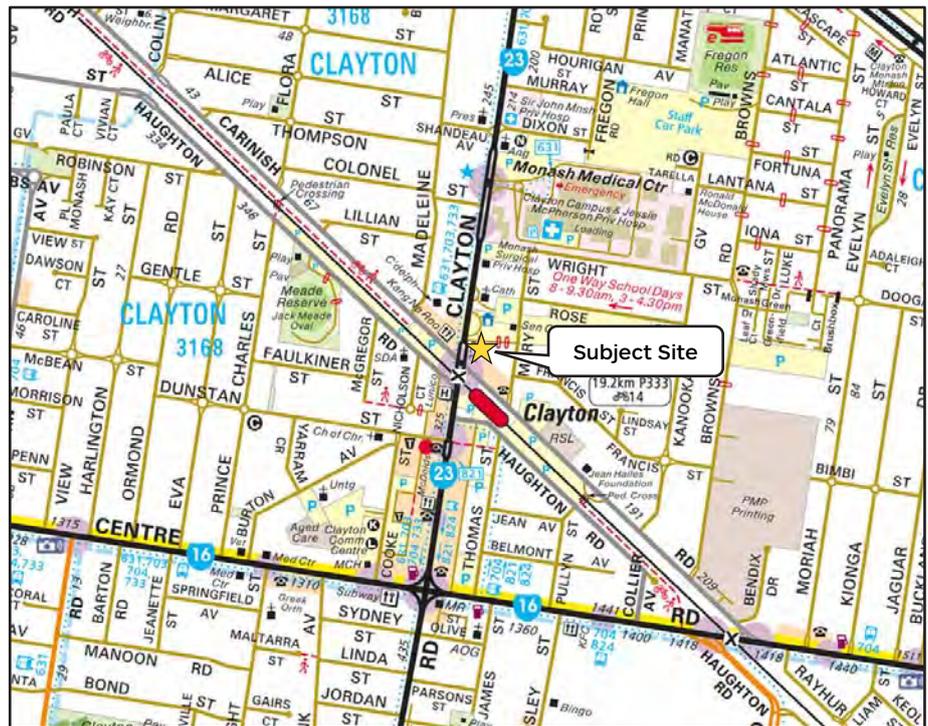
## 2 Existing Conditions:

### 2.1 Site Location and Surroundings

The subject site is located along the eastern side of Clayton Road, approximately 20 metres north of its intersection with Carinish Road, in Clayton. The subject site is irregular in shape with a frontage of approximately 25.4 metres to Clayton Road, a depth of approximately 50.3 metres and an overall site area of approximately 1,380 sqm. The site is currently occupied by a two-storey building that operates as a specialist medical centre.

The site's location relative to the surrounding road network is shown in Figure 2.1 below:

**Figure 2.1: Site Location and Surroundings**



The site is located in a Commercial 1 Zone (C1Z) and is subject to a Special Building Overlay (SBO). Land use within the immediate vicinity of the subject site is a mix of commercial and public use in addition to residential uses located to the east of the site. The site is in very close proximity to the Clayton Railway Station which is located approximately 75 metres to the south of the subject site.

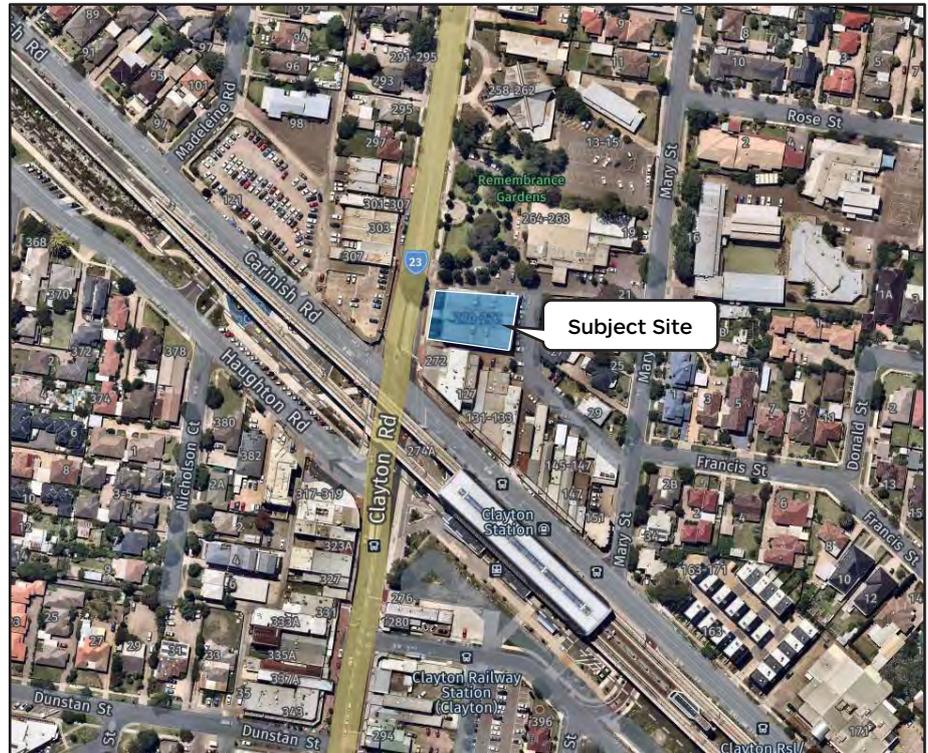
Some other key non-residential land uses in the vicinity include:

- Clayton Hall and Remembrance Gardens, located directly adjacent to the north of the subject site;
- Clayton Senior Citizens Centre, located approximately 90 metres to the north-east of the subject site;
- Several commercial and retail tenancies, located approximately 350 metres to the south of the subject site;
- St Peter's Parish Church, located approximately 100 metres to the north of the subject site;
- St Peter's Primary School fronting Mary Street, located approximately 400 metres to the east of the subject site;

- Monash Medical Centre, located approximately 550 metres to the north of the subject site; and
- The Clayton Activity Centre focused along both sides of Clayton Road between the railway line and Centre Road.

The aerial view of the site and surrounds is presented in Figure 2.2.

**Figure 2.2: Aerial View of the Site and Surrounds**



## 2.2 Road Network

**Clayton Road** is a Primary State Arterial Road under the care and management of Department of Transport (DoT), which essentially runs in a north-south alignment between Ferntree Gully Road and Kingston Road. Further north, the road continues as Stephenson's Road, while to the south the road continues as Boundary Road. Clayton Road has an approximate carriageway width of 16 metres accommodating two traffic lanes in each direction. Localised widening is provided along Clayton Road to accommodate separate turning lanes into Carinish Road. Clayton Road has a posted speed limit of 60 km/hr. Footpaths are constructed along both sides of the Clayton Road.

Views of Clayton Road facing north and south in the vicinity of the subject site are shown in Figure 2.3 and Figure 2.4 respectively.

**Figure 2.3: View of Clayton Road Facing North**



**Figure 2.4: View of Clayton Road Facing South**



**Carinish Road** is a Council managed Collector Road, that essentially runs in a northwest – southeast alignment. The road has a carriageway width of approximately 12.5 metres accommodating one traffic lane in each direction along with kerbside parallel parking provided on one side of the road. Carinish Road has a posted speed limit of 50 km/hr. Footpaths are provided along both sides of Carinish Road.

Views of Carinish Road facing northwest and southeast in the vicinity of the subject site are shown in Figure 2.5 and Figure 2.6 respectively.

Figure 2.5: View of Carinish Road Facing Northwest



Figure 2.6: View of Carinish Road Facing Southeast



A **Right of Way (RoW)** is located abutting the northern boundary of the site. The RoW runs in an east-west alignment between Clayton Road and Mary Street and has a trafficable width of approximately 3.0 metres.

Views of the RoW facing east and west in the vicinity of the subject site are shown in Figure 2.7 and Figure 2.8 respectively.

**Figure 2.7: View of the RoW Facing East**



**Figure 2.8: View of the RoW Facing West**



**Right of Ways (RoWs)** also abut the eastern and southern boundaries of the site and have trafficable widths of approximately 3.0 metres.

Views of the RoWs abutting the eastern boundary and southern boundary of the subject site are shown in Figure 2.9 and Figure 2.10 respectively.

**Figure 2.9: View of the RoW abutting Eastern Boundary of the Site (Looking South)**



**Figure 2.10: View of the RoW abutting Southern Boundary of the Site (Looking East)**



## 2.3 Parking Conditions

In order to assess the current parking conditions in the vicinity of the site, Ratio Consultants commissioned car parking occupancy surveys on Thursday 27 February 2020 from 7:00am to 6:00pm.

### Parking Inventory

The parking survey inventory indicated a supply of 281 on and off-street public car parking spaces in close proximity to the site. The parking inventory is summarised in Table 2.1 below:

**Table 2.1: Parking Inventory Summary**

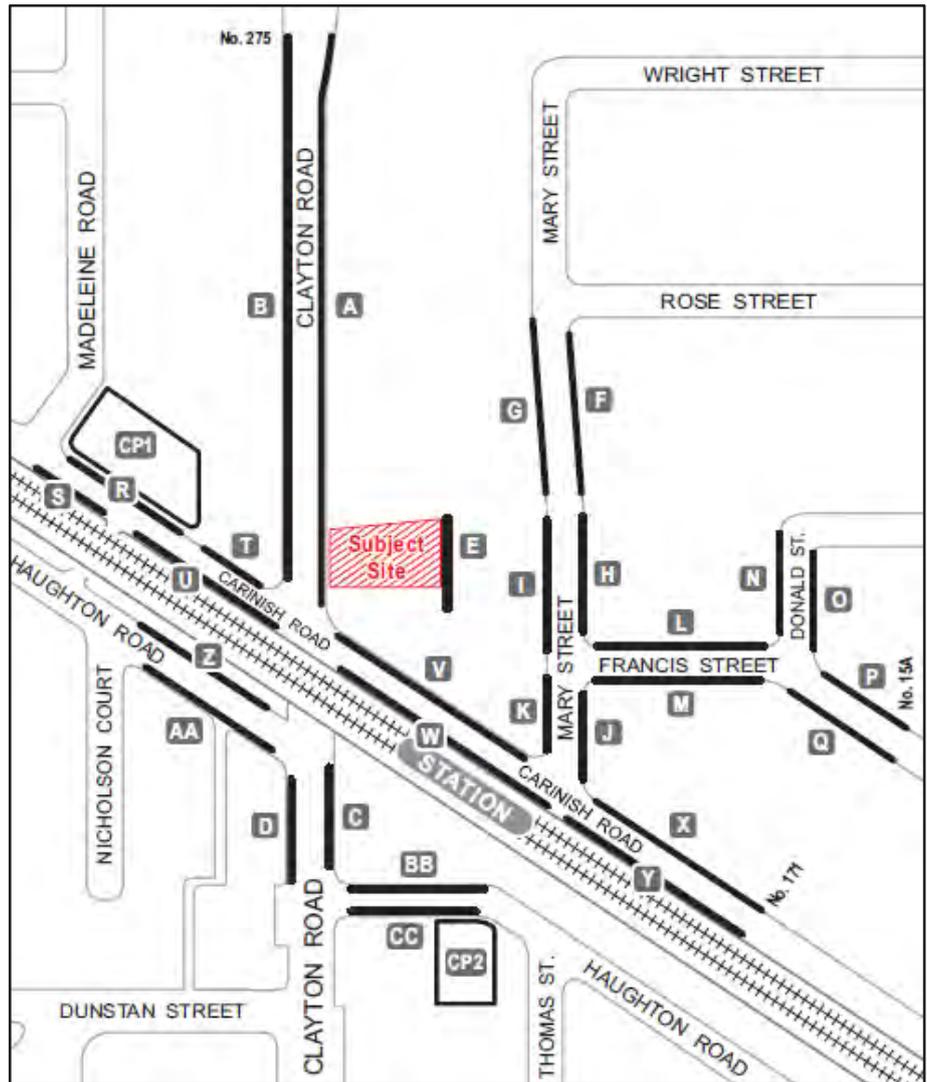
Parking Restriction		Supply
Short-Term Parking	P-5mins	10 spaces
	1/4P	6 spaces
	1/2P	29 spaces
	1P	21 spaces
	2P	71 spaces
Long Term Parking	4P	6 spaces
	Unrestricted	113 spaces
Other Parking	No Parking (8:00am to 8:00pm)	10 spaces
	Reserved	7 spaces
	Permit Zone	4 spaces
Service Zone	Taxi Zone	4 spaces
<b>TOTAL</b>		<b>281 spaces</b>

It is noted that of the 266 publicly available car parking spaces, the majority of the spaces (137 spaces) were subject to short-term parking restrictions (P-5mins, 1/4P, 1/2P 1P & 2P) during weekday business hours and during the day on Saturdays. This is typical of commercial zones and activity centres, thereby encouraging a high turnover of parking and is generally not suitable for long-term car parking. A proportion of the surrounding parking supply is unrestricted. There was observed to be a supply of 113 unrestricted parking spaces.

The commuter car parks located near Clayton Railway Station were not included in the car parking occupancy survey as these car parks are specifically designated for the use of commuters.

The area surveyed is shown below in Figure 2.11, with the detailed results presented in Appendix A.

**Figure 2.11: Parking Occupancy Survey Area**



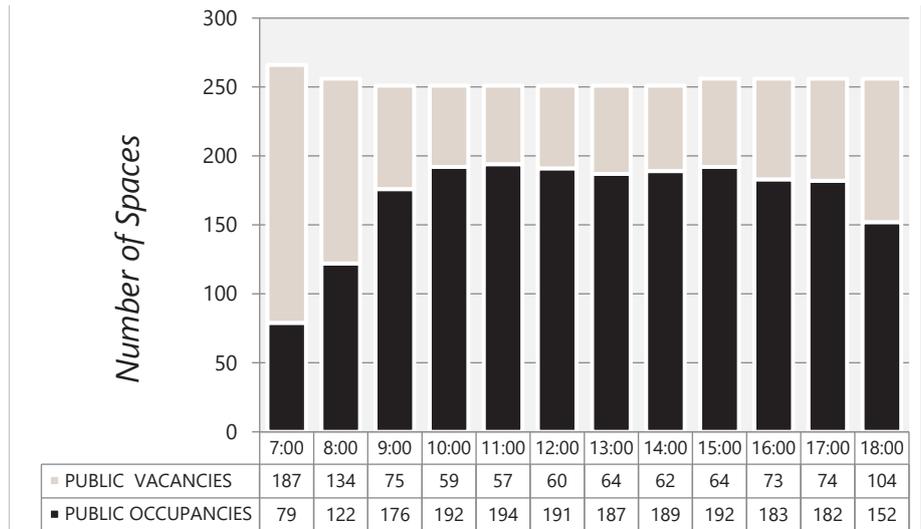
In summary, the survey results showed the following:

**Thursday 27 February 2020**

- There was a total supply of between 251 to 266 publicly available car parking spaces within the survey area (depending on the time of day).
- Overall, the demand for parking was low to reasonably strong with parking occupancy levels varying between 30% and 77%.
- The peak demand for parking occurred at 11:00am, when a total of 194 parking spaces were recorded occupied out of the available supply of 251 spaces, representing a parking occupancy of 77%. There were a minimum of 57 spaces available for parking at this time.
- The unrestricted car parking was observed to have occupancy levels that varied from 73% to 96% in business hours (8:00am to 5:00pm). Of the supply of 113 unrestricted parking spaces, there were a minimum of 5 spaces available for parking during this period.
- The parking demand remained consistent throughout business hours in the survey period.

The temporal parking demands for the survey period on Thursday are shown in Graph 2.1:

**Graph 2.1: Thursday 27 February 2020 - Temporal Profile of Parking Demand**

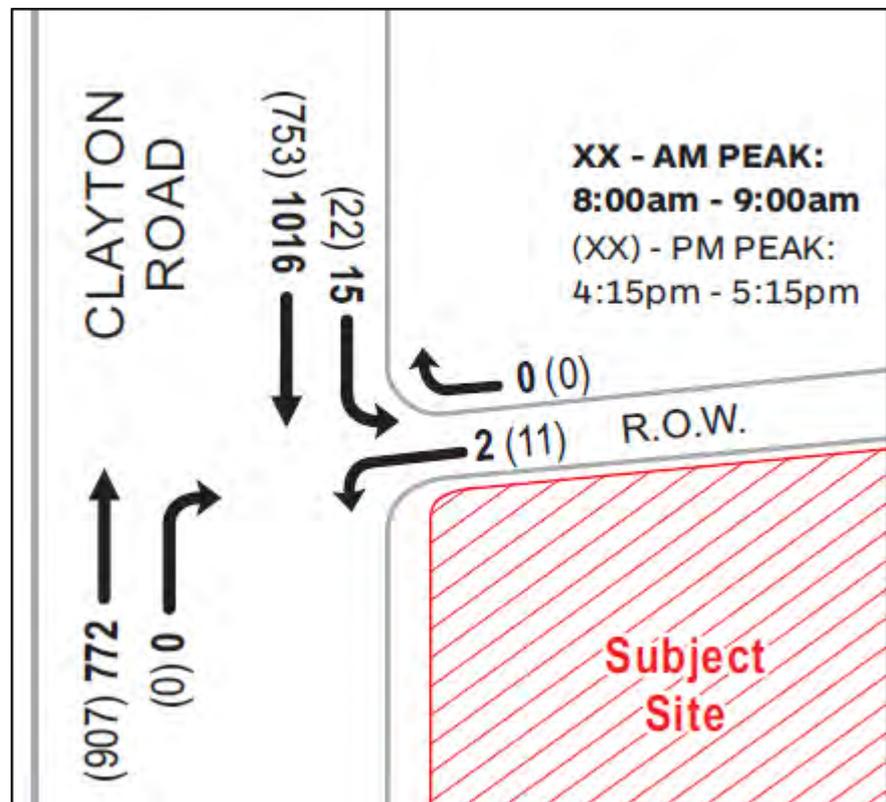


## 2.4 Traffic Conditions

In order to determine the traffic conditions in the vicinity of the site, Ratio Consultants commissioned traffic movement surveys on Thursday 27 February 2020 between 7:30am to 9:30am and 3:30pm to 5:30pm at the intersection of Clayton Road and the Right of Way (RoW) abutting the northern boundary of the site.

The AM peak hour of traffic was recorded between 8:00am and 9:00am, while the PM peak hour was recorded between 4:15pm and 5:15pm. The traffic volumes for the peak hours of traffic and presented in Figure 2.12 below, with the detailed results presented in Appendix A:

**Figure 2.12: Peak Hour Turning Movement Counts**

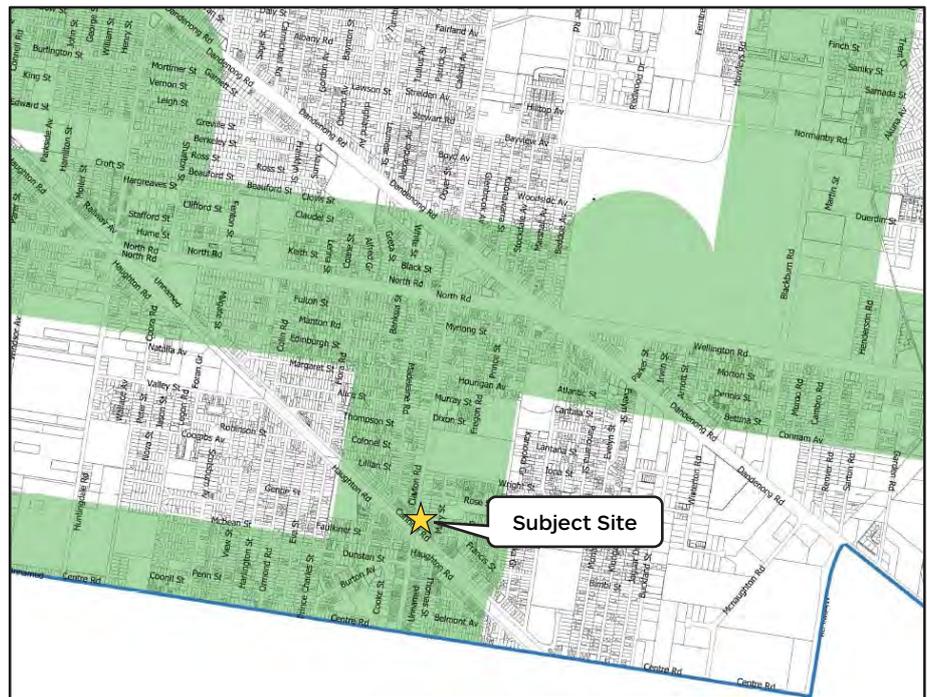


The northern ROW recorded 15 left turn ingress movements and two left turn exit movements in the AM peak hour and 22 left turn ingress movements and 11 left turn exit movements in the PM peak hour. The PM peak hour total of 33 movements just exceeded the preferred capacity of a single lane ROW without passing opportunities of 30 vehicles per hour.

## 2.5 Sustainable Transport

The subject site is located within the heart of the Principal Public Transport Network (PPTN) Area as shown on the PPTN Maps of the State Government of Victoria (July 2018). The location of the subject site relative to the PPTN area is shown in Figure 2.13 below:

**Figure 2.13: Subject Site with respect to the PPTN Area**

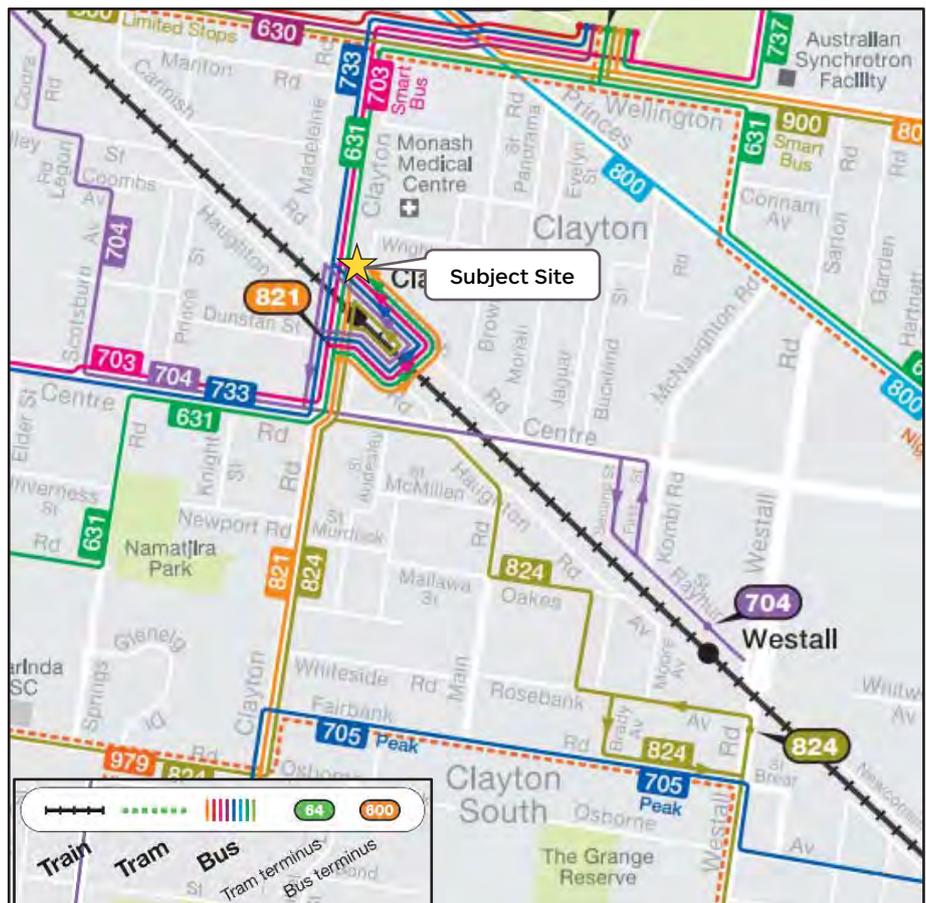


The subject site has excellent access to the public transport services primarily via Clayton Railway Station, located approximately 110 metres from the subject site. The public transport services available in close proximity of the subject site are summarised in Table 2.2 and illustrated in Figure 2.14:

**Table 2.2: Summary of Public Transport Services**

Mode	Route Number	Route	Nearest Stop	Distance (Walking Distance)
Train	Cranbourne and Pakenham Lines		Clayton Railway Station	110m (~2 mins)
Bus	631	Southland - Waverley Gardens via Clayton & Monash University		
	703	Middle Brighton - Blackburn via Bentleigh & Clayton & Monash University		
	704	East Clayton - Oakleigh via Clayton & Huntingdale		
	733	Oakleigh - Box Hill via Clayton & Monash University & Mt Waverley		
	821	Southland - Clayton via Heatherton		
	824	Moorabbin - Keysborough via Clayton & Westall		

**Figure 2.14: Public Transport Services in Close Proximity of the Site**



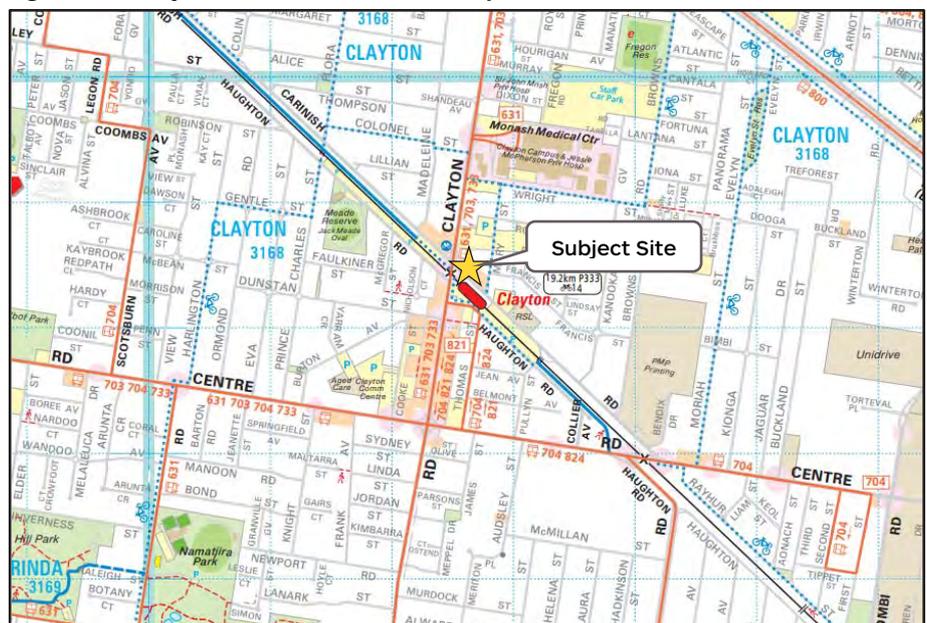
## Bicycle and Pedestrian Connectivity

The site also has very good bicycle accessibility, primarily via the Djerring Trail which runs approximately 100 metres to the south of the subject site. Other bicycle facilities providing a very good connection to the subject site via the broader bicycle network include:

- Off-road shared paths along the Djerring Trail, Westall Road, North Road and Wellington Road;
- On-road bicycle lanes along Huntingdale Road, Bourke Road, Viney Street and Oakes Avenue;
- Informal bicycle routes running along Mary Street, Colonel Street, Flora Road, Harlington Street, Moriah Street, Wright Street, Browns Road and Princes Highway (Dandenong Road).

The bicycle paths within the vicinity of the site are presented in the TravelSmart Map shown in Figure 2.15 below:

**Figure 2.15: Bicycle Routes - TravelSmart Map**

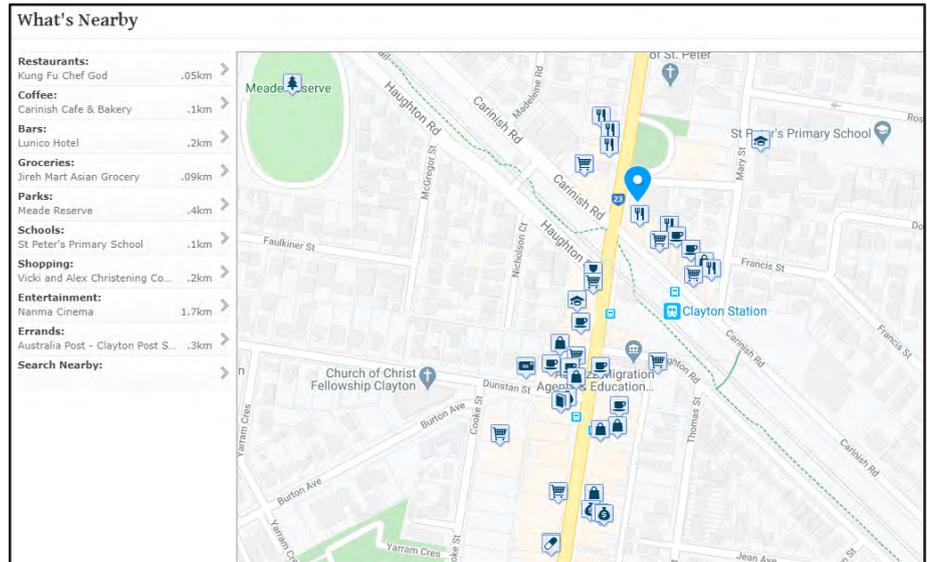


## Pedestrian Facilities

Pedestrian movements are well facilitated with footpaths provided on both sides of the road on Clayton Road, Carinish Road Street and in the surrounding streets of the subject site. These facilities provide a link between the subject site and surrounding public transport services, retail facilities, amenities and shopping precincts for pedestrians. The site has excellent access to key services and is within a short walking distance to the Clayton Activity Centre.

The site achieves a 'Walk Score' of 90 points (out of a possible 100) and is described as a 'Walkers Paradise' on WalkScore.com, noting that daily errands do not require a car. A site's walk score is calculated based on the walking distance to local amenities, such as supermarkets, schools, parks, public transport, etc. Walkscore.com utilises data sources such as Google and road network data to calculate a 'Walk Score'. The convenient everyday services are illustrated on a map in Figure 2.16.

**Figure 2.16: Walkable Services from the Subject Site**



### **Taxi Services and Car Share**

Taxis (including privately operated Uber, Ola and Didi) provide another alternative to the private vehicle.

Taxis can be booked online or by phone. Taxis can also be found at taxi ranks or flagged down on the street if required.

Ubers, Ola and Didi can be booked through their respective mobile applications.

In addition to the commercial operators, Car Next Door offers private vehicle carshare, with some vehicles currently located in close proximity of the subject site.

Car share schemes offer a viable alternative for employees to attend meetings and site visits during the workday without requiring access to their own vehicles.

### 3.1 Development Overview

It is proposed to demolish the existing buildings on-site to construct a 11-storey mixed-use development on the land located at 270 Clayton Road, in Clayton. More specifically, the development will comprise the following land uses:

- Two retail tenancies located on ground floor fronting Clayton Road with a combined floor area of 288 sqm.
- Office use with a combined floor area of 3,672 sqm across Levels 1-4.
- 104 serviced apartments across Levels 5-9 plus a ground level reception and lobby area.

Vehicular access to the on-site car park is proposed via a double width ramp located along the Right of Way (RoW) abutting the northern boundary of the site. A total of 120 car parking spaces (including one DDA space and one car share space) are proposed within four levels of basement parking.

A total of 73 bicycle parking spaces are proposed on-site to cater the needs of the employees, visitors and customers of the proposed development. The development also proposes to incorporate six share bikes, including two e-bikes, plus end of trip facilities (showers, changerooms and lockers) on ground floor adjacent to the bicycle parking area.

Primary pedestrian access is provided via a new pathway created on the subject site adjacent to the RoW abutting the northern boundary of the subject site. The development also proposes to extend this pedestrian pathway along the Clayton Road frontage of the site with associated landscaping to improve the streetscape in the precinct.

An on-site loading dock is proposed within the ground floor and this aims to facilitate convenient deliveries via the southern RoW, with service and delivery vehicles propping for a short period of time during off-peak periods within the southern RoW. Refuse and recycling storage is proposed on the ground floor in designated rooms.

## 4.1 Clause 52.06-5 – Car Parking Requirements

Parking requirements for new use developments are set out under Clause 52.06 of the Monash Planning Scheme. The purpose of Clause 52.06, amongst other things, is:

- To ensure that car parking is provided in accordance with the Municipal Planning Strategy and the Planning Policy Framework.
- 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 promote the efficient use of car parking spaces through the consolidation of car parking facilities.
- To ensure that car parking does not affect the amenity of the locality.
- 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.

The number of car parking spaces required for the specified uses is listed under Table 1 of Clause 52.06-5. The car parking requirement specified for a use listed in Table 1 does not apply if:

- A car parking requirement for the use is specified under another provision of the Planning Scheme: or
- A schedule to the Parking Overlay specifies the number of car parking spaces required for the use.

As per Amendment VC148, Column B rates of Table 1 from Clause 52.06 of the Monash Planning Scheme apply if:

- Any part of the land is identified as being within the Principal Public Transport Network Area as shown in the Principal Public Transport Network Area Maps (State Government of Victoria, 2018); or
- A Schedule to the Parking Overlay or another provision of the planning scheme specifies that Column B applies.

As discussed in Section 2.3, the subject site falls within the Principle Public Transport Network Area, and therefore Column B rates of Table 1 in Clause 52.06 are applicable for the number of car spaces to be provided, which are outlined in Table 4.1 below:

**Table 4.1: Statutory Car Parking Requirement**

Land Use	Size / Number	Column B Rate	Statutory Requirement
Retail (Shop)	288 sqm	3.5 spaces to each 100 sqm of leasable floor area	10 spaces
Office	3,672 sqm	3.0 spaces to each 100 sqm of net floor area	110 spaces
Serviced Apartments	104 Apartments	No Rate	N/A <sup>1</sup>
<b>TOTAL</b>			<b>120 spaces</b>

<sup>1</sup>Clause 52.06-5 states that where a land use is not specified in Table 1, car parking spaces must be provided to the satisfaction of the responsible authority.

Accordingly, the proposed development has a statutory requirement to provide **120** car parking spaces on-site, in accordance with the Monash Planning Scheme, acknowledging that additional car parking for the serviced apartment component is to be provided to the satisfaction of the responsible authority.

## 4.2 Car Parking Provision and Allocation

A total of 120 car parking spaces are proposed on-site allocated as follows:

- Total of **four** car spaces allocated to staff of the two retail tenancies fronting Clayton Road (two spaces each).
- **68** spaces allocated to the office use, at a provision rate of 1.85 spaces per 100sqm.
- **47** spaces allocated to the serviced apartments, at a provision rate of 0.45 spaces per serviced apartment.
- **One** car share space.

Accordingly, the proposed development seeks a reduction of **48** spaces (six spaces associated with retail use and 42 spaces associated with office use) against the parking requirements of the Monash Planning Scheme.

In regard to reducing the car parking requirement, Clause 52.06-7 states that:

*“An application to reduce (including reduce to zero) the number of car parking spaces required under Clause 52.06-5 or in a schedule to the Parking Overlay must be accompanied by a Car Parking Demand Assessment.*

*The Car Parking Demand Assessment must assess the car parking demand likely to be generated by the proposed new use.”*

## 4.3 Car Parking Demand Assessment

In accordance with Clause 52.06-7 of the Monash Planning Scheme, the Car Parking Demand Assessment **must** address the following matters, to the satisfaction of the responsible authority:

- 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.

These factors are discussed below in more detail below:

## **Likelihood of Multi-Purpose Trips within the Locality**

As discussed in Practice Note 22 – Using the Car Parking Provisions, in some situations a trip will serve more than one function, and this will tend to reduce the need for car parking.

## **Variation in Car Parking Demand**

Demands for car parking associated with the office tenancies depend largely on the nature of the businesses operating on the site, including hours of operation. Typical operation of the retail and office tenancies will predominantly occur during weekday business hours, with the retail tenancies also expected to incorporate weekend trade (mainly Saturdays).

### RETAIL PARKING DEMAND

The retail component of the development is likely draw most of its trade from walk-up customers associated with visitors to the activity centre, public transport commuters, and nearby residents and staff of the surrounding businesses (including the office and serviced apartments components of the proposed development). Therefore, the customer demand for car parking associated with the retail component of the development is expected to be minimal.

### OFFICE CAR PARKING DEMAND

Studies of car parking demands associated with office developments of varying sizes located in areas providing good access to public transport, have typically shown parking generation rates of between 1.0 and 3.0 spaces per 100sqm.

The proposed development has excellent access to a range of public transport services, in particular the nearby Clayton Railway Station and adjoining bus services (located approximately 110 metres from the site) and is accessible to bicycle infrastructure and proposes bicycle parking in excess of the statutory requirements. The offices will also have access to ride share services like Uber and taxi services.

Accordingly, future office employees who are not provided with an on-site car parking space will have the opportunity to use alternative modes of transport to access the site, rather than utilise a private vehicle.

In addition to the above, the surrounding areas are well regulated and restricted to a mix of shorter-term parking. It is also noted that the unrestricted supply of the surrounding car parking is subject to high occupancy levels. This will make it difficult for an employee to park their vehicle proximate to the site if not allocated an on-site car parking space.

In this regard, it is expected that the office car parking demands will generally be limited to the supply of parking provided by the development.

It is understood that Council recently (May 2020) approved a six-storey mixed use development on land at 2-4 Kingsway in Glen Waverley. This development included an office floor area of 1,515.7sqm with 28 car parking spaces, at an office parking rate of 1.84 spaces per 100sqm.

Endorsement of this parking rate was made on the basis of the site location being close to a range of public transport services, in particular the Glen Waverley Railway Station, and a range of facilities and services at the Glen Waverley Activity Centre, as well as information related to approved car parking rates for office uses in middle urban locations with car parking rates in the range from 1.2 to 2.04 spaces per 100sqm, namely:

- 1 McNab Avenue, Footscray (20,500sqm): 1.2 spaces/100sqm
- 913 Whitehorse Road, Box Hill (19,400sqm): 1.55 spaces/100sqm
- 254-262 Burwood Road, Hawthorn (9,000sqm): 2.04 spaces/100sqm

The proposed office location at 270 Clayton Road, Clayton shares a number of similar attributes to these examples, including the site at 2-4 Kingsway in Glen Waverley, which justifies the provision of a lower car parking rate for the proposed office use than the Planning Scheme rates.

The application plans show a total of 68 car parking spaces for the 3,672 sqm of net floor area of office, which results in a car parking provision rate of 1.85 spaces per 100sqm, which is considered suitable for the office component on the basis of the above discussion.

#### SERVICED APARTMENTS PARKING DEMAND

Guests that stay for business trips are unlikely to hire a car when staying at the hotel and therefore it is likely to generate lower car parking demands during weekdays and business hours.

Guests that book multi-night stays are likely to do so over the weekend, when the availability of car parking in the area generally increases. This is evidenced by the results of the parking surveys which were undertaken during anticipated peak times of the nearby uses.

#### **Short and Long Stay Parking Demands**

The land uses of the proposed development will generate demands for short and long stay car parking. Visitors of the office component and customers of the retail component will generate short stay parking demands while employees/staff of the office, retail and serviced apartments in addition to the guests of the serviced apartments will generate long stay parking demands.

It is expected that majority of the overall parking demands generated by the development will be long-stay demand associated with the employees/staff and guests of the serviced apartments, with the on-site car parking allocation seeking to accommodate these demands.

The relatively small proportion of short stay parking (visitor and customer parking) will be facilitated off-site within available on-street spaces in the vicinity of the site.

#### **Availability of Public Transport in the Locality**

The site has excellent access to a range of public transport services with train and several bus services operating in close proximity to the subject site. The site has ideal access to Clayton Railway Station, located within 110 metres of the site. The site is also located within close proximity to bus stops running along six (6) different routes (Bus Routes 631, 703, 704, 733, 821 and 824). These services are outlined in more detail in Section 2.4 of this report.

Given the excellent access to public transport options, users are able to travel to and from the site without relying on the use of a private motor vehicle.

#### **Convenience of Pedestrian and Cyclist Access to the Site**

Pedestrian movements are well facilitated with footpaths provided on both sides of the road on Clayton Road, Carinish Road Street and in the surrounding streets of the subject site. These facilities provide a link between the subject site and surrounding public transport services, retail facilities, amenities and shopping precincts for pedestrians.

The site has excellent access to key services and is within a short walking distance to the Clayton Activity Centre.

The site also has very good accessibility with formal and informal bicycle routes, primarily via the Djerring Trail which runs approximately 100 metres to the south of the subject site. Other bicycle facilities providing a very good connection to the subject site via the broader bicycle network include:

- Off-road shared paths along the Djerring Trail, Westall Road, North Road and Wellington Road;
- On-road bicycle lanes along Huntingdale Road, Bourke Road, Viney Street and Oakes Avenue;
- Informal bicycle routes running along Mary Street, Colonel Street, Flora Road, Harlington Street, Moriah Street, Wright Street, Browns Road and Princes Highway (Dandenong Road).

These facilities provide a viable means of alternative sustainable transport that is expected to reduce future reliance on private motor vehicles.

### **Provision of Bicycle Parking and End of Trip Facilities for Cyclists**

The proposal includes a generous provision of 73 bicycle spaces which is in excess of the statutory requirement for bicycle parking, including six share bikes. The facilities are designed to support bicycle use by employees/staff, guests, visitors and customers by providing end of trip facilities which complement the good access to the available bicycle connections.

### **Empirical Data or Case Studies**

#### OFFICE USES

##### 511 Church Street, Richmond

Surveys undertaken by Cardno in May 2016 of an office development at 511 Church Street, in Richmond recorded a peak parking demand of 1.76 spaces per 100 square metres of floor area. Parking conditions were unconstrained, with no more than 122 of the 174 car parking spaces provided occupied at any one time.

Cardno also undertook concurrent surveys of the on-street car parking in the area of the 511 Church Street (Richmond) site, with these showing that available long-term parking was saturated (98 percent occupied) and short-term parking was also highly utilised (91 percent occupied) at the time of the recorded on-site peak parking demand.

It is understood that access to the on-site car parking at 511 Church Street, Richmond is secured for staff use only and is available at no cost.

As such, the abovementioned on-site peak parking demand rate was unlikely to be artificially low due to incidences of building occupants choosing to park on-street and likely reflects that:

- The site is easily accessible by alternate transport, with:
  - Tram route 70 operates along Swan Street, just north of the site;
  - East Richmond train station located 450 metres to the west; and
  - The Main Yarra bicycle trail extending along the Yarra River to the south.
- These alternate transport modes are more attractive for many staff than driving and searching for all day parking.

The subject site has very similar characteristics to this site having regard to accessibility, on-street parking supply and availability, and road network conditions. As discussed in Section 2.3, the on-street parking in the surrounding streets is typically subject to short-term parking restrictions that encourage a high turnover of parking and is generally not suitable for long-term car parking. Additionally, the unrestricted parking supply in the surrounding area is subject to high levels of parking occupancy. The proposed office component of the development is likely to occasionally attract some visitors (meetings etc.) to the subject site. As such, it is anticipated that visitors to the office will be able to suitably park within the surrounding on-street short-term parking.

Ratio has recently sourced information in relation to car parking demand for an existing office development at 4-6 Croydon Road in Croydon, which is located in close proximity to the Croydon Railway Station. Information shows that the office use on the site currently generates a peak car parking demand of 8 spaces from a supply of 12 spaces for 530sqm office floor area at a rate of 1.51 spaces per 100sqm.

#### SERVICED APARTMENTS

The serviced apartments land use does not have a statutory parking rate and as such parking is required to be provided to the satisfaction of the responsible authority.

#### RMS Review

Residential hotel car parking demands are considered appropriate for the parking demand generated by the serviced apartment component of the proposed development. These car parking demands will fluctuate and vary between properties, depending on the location of the site, the type and nature of hotel proposed, and general market the hotel will specifically target.

Future guests and their need for car parking will be determined by the ease and availability of car parking on or near to the site, which could be influenced during the accommodation booking process. More often than not, the convenience and availability of car parking (if required) is likely to influence a guest's decision to whether they find accommodation at the property, travel on alternate dates or search elsewhere.

To understand potential parking demands that may be generated by the proposed hotel development, guidance has been sought from the RMS, RTA Guide to Traffic Generating Developments.

With respect to short-term/casual accommodation, the RMS Guide states that driving trips and parking demands typically depend on the level of amenity and facilities provided by the property, and therefore its hotel star rating.

The hotel rates suggested by the RMS Guide based on a modal average from survey results, exclusive of parking demand generated by hotel functions such as conference activities, is 1 car space per 4 rooms for 3 and 4-star hotels, or a rate of 0.25 spaces per room. As such, the RMS nominates a rate in the order of **0.20 – 0.25 spaces per room** for accommodation in metropolitan and regional area.

#### Case Study – Punthill Apartment Hotels

Reference is made to surveys undertaken by another consultancy in May 2019 at the Punthill Apartment Hotels located at 1384 Dandenong Road in Oakleigh.

Punthill staff undertook surveys of the on-site car parking over a one-week period from Thursday 2 May to Wednesday 8 May 2019 and

established an average overnight parking demand for 0.54 parking spaces per occupied room, inclusive of staff demands. Occupancy ranged from 38% to 82% over the course of the week. If occupancy was at 82%, this would equate to approximately 0.43 parking spaces per hotel room.

For comparison, surveys of similar serviced apartments in East Melbourne and Carlton identified parking demands of 0.27 and 0.35 spaces per apartment.

It is noted that subject site at 270 Clayton Road has better access to public transport services, in particular the Clayton Railway Station, as well as access to a range of shops, cafes, restaurants and other services at the nearby Clayton Activity Centre and shopping precincts.

#### Case Study Summary

It is proposed to allocate 47 parking spaces for the 104 serviced apartments which will be managed by staff of the serviced apartments and operate under a valet system.

Based on the above data, it is expected that there may be a demand up to 0.35 parking spaces per serviced apartment, for a total of 36 spaces. The provision of 47 spaces to the 104 rooms proposed equates to a parking provision of 0.45 spaces per room which exceeds the parking provision rate to the above case study data and therefore considered satisfactory.

#### RETAIL

Most of the patronage associated with the proposed ground floor retail tenancy/café is expected to be generated by guests of the serviced apartments, staff of the office use and others already visiting the Clayton Activity Centre and Railway Station precinct.

As a result, most of the car parking demands are expected to be generated by staff. Given the size of ground floor retail tenancies it is expected that demands for only one staff space will be generated. The development proposes to provide a total of four (4) staff spaces to the retail uses (2 spaces for each tenancy), which will cater the parking needs of the retail staff.

#### **Summary**

In light of the preceding, there is good opportunity to encourage a shift from private vehicle use to alternate transport through the suppression of car parking. As such, the site is a prime candidate to reduce on-site parking provisions in favour of implementing sustainable transport initiatives.

The site is readily accessible by public transport and the development scheme actively promotes alternate transport use through provision of a generous number of bicycle parking spaces and end of trip facilities.

Based on the preceding case study, it is considered that there are sufficient controls to suppress car parking demands through the limitation of on-site car parking.

## 4.4 Responsible Authority Considerations

Before granting a permit to reduce the number of spaces the responsible authority must consider the following, as appropriate:

- 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:
  - Efficiencies gained from the consolidation of shared car parking spaces.
  - Public car parks intended to serve the land.
  - 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.

The factors above are directly relevant to this assessment are discussed in more detail below:

### Relevant Local Planning Policies

There is significant support within the Monash Planning Scheme and various Council strategies for developments which encourage the use of sustainable transport alternatives from the private motor vehicle, including those listed and discussed below.

#### CLAYTON ACTIVITY CENTRE – PRECINCT PLAN

The Car Parking section of the Clayton Activity Centre – Precinct Plan (January 2020) outlines the following objective to be achieved:

*To provide car parking easy to access with minimal disruption on the public realm whilst decreasing demand for parking in the longer term.*

In order to achieve this, the plan outlines the following which are all relevant to the proposed development:

*Locate car parking facilities in strategic locations around the Activity Centre that can be accessed with minimal disruption to Clayton Road.*

*If existing at-grade car parks are redeveloped, ensure adequate parking is provided to replace existing parking and meet the demand generated by new land uses.*

*Provide for greater use of off-street car parks to reduce parking demand along Clayton Road.*

*Provide for safe and convenient pedestrian access to existing and future off-street car parks.*

*Encourage car-share services and parking within the Activity Centre.*

Further, the proposed development is also consistent and in line with the action outlined in the plan:

*Implement pedestrian, cycle and public transport improvements outlined in the Precinct Plan to encourage people to use other modes of transport to access the Centre and reduce demand for parking.*

## MONASH INTEGRATED TRANSPORT STRATEGY

The main focus of the Monash Integrated Transport Strategy (Monash ITS) is to develop a highly accessible and sustainable transport network that supports the safety, health and prosperity of all members of the community.

The recommended policy goals and actions address a diverse range of factors, such as public safety, public transport service quality, road network efficiency, provision of effective and attractive walking and cycling routes, parking management, and transport demand management.

The MONASH ITS conducted a review of relevant state, local, and national policy and this gave guidance towards the following key relevant directions in relation to transport and land use for the Monash ITS:

- **Transport choice** is central to providing equitable access to employment and services and this requires that there are a number of viable and attractive options, such as walking, cycling, public transport or private vehicles. It is noted that transport choice is also intrinsically linked to urban form. Providing higher density development close to activity centres with a range of employment, retail, educational and community services means that people will have more transport choices.
- **Promoting sustainable transport** (walking, cycling and public transport) is considered best practice and can help recognise the following benefits:
  - Safety: Increased sustainable and active transport improves safety and perceptions of safety.
  - Healthy, active communities: There is a strong link between active transport and health.
  - Socially connected, liveable communities: Places where people walk, cycle and use public transport more often are likely to perform better on a range of social indicators.
  - Transport efficiency: Increased use of sustainable transport has environmental and economic benefits through reduced greenhouse emissions and reduced space required for vehicle movement and storage.
- **Planning for new development** must consider providing for and promoting sustainable and active transport modes in accordance with the road user hierarchy. This includes a requirement for major developments to integrate with the transport network, including public transport and cycling.

### **Availability of Car Parking in the Locality**

The results of the parking surveys and observations outlined in Section 2.3 confirm that there is adequate on-street car parking in the vicinity of the site to meet the short-term (visitor/customer) parking needs generated by the proposed development.

There were observed to be a minimum of 57 spaces available during the weekday peak period of parking at 11:00am. During all other times there were at least 59 vacant car spaces available for parking. The time restrictions (1/4P, 1/2P, 1P & 2P during weekday business hours and during the day on Saturdays) for the on-street parking spaces in the surrounding area, encourage high turn-over and therefore are ideal for short-term users such as office visitors and retail customers of the proposed development.

It is noted that a proportion of the surrounding parking supply is currently unrestricted. The parking surveys undertaken indicate that the unrestricted parking is generally subject to high occupancy levels which will discourage future users of the proposed development from driving to/from the site and parking within these areas.

On this basis, the on-street parking can readily cater for the expected short-term parking demand associated with office visitor and retail customers car parking demand.

### **Accessibility to Alternate Transport Modes**

As discussed previously, the subject site has excellent accessibility by alternate transport modes (such as walking, cycling, public transport, car share, Uber and taxi services) which will allow the users of the proposed development (staff/employees and visitors/customers) to conveniently access the site without relying on a private vehicle.

## **4.5 Adequacy of the Proposed Car Parking Provision**

It is proposed to provide 120 car parking spaces on-site to meet the parking demands of the users of the proposed development. This level of parking provision is considered adequate for the following reasons:

- The site is ideally located to take advantage of access to sustainable transport alternatives such as the metropolitan train, buses, bicycle and pedestrian network. This will enable users of the proposed development to travel to and from the site.
- The provision of 120 car parking spaces (four for retail use, 68 spaces for office use, 47 spaces for serviced apartments and one car share space) is expected to meet the long-term parking demand (including staff/employees and guests of the serviced apartments) of the proposed development.
- The proposed level of on-site car parking for each of the component uses reflects the empirical demand and/or Council approval for sites with similar uses and locations in Activity Centres with excellent public transport and bicycle facilities.
- The generous provision of 73 bicycle parking spaces will encourage the use of alternative transport modes and reduce the reliance on private vehicle use.
- The provision of an on-site car share vehicle plus a share bicycle scheme for use by staff and guests will help to reduce the demand for car parking generated by uses on the site.
- The parking supply in the vicinity of the site is generally subject to short-term parking restrictions, with the unrestricted parking supply is generally subject to high occupancy levels and therefore not suitable for long term parking. This will discourage users such as employees/staff of the proposed development without an on-site car parking space to drive to/from the site.
- The parking surveys further indicate that there is ample capacity within the surrounding on-street parking (including during peak weekday afternoon), which is generally subject to short-term parking restrictions. These on-street car parking spaces can readily accommodate the expected short-term demand of office visitors and retail customers of the proposed development.

- It is expected that the retail tenancies will operate, to some extent, as ancillary to the surrounding retail and commercial businesses (including proposed on-site) in the area and will draw a portion of its patronage from nearby residents, commuters and customers of other businesses in the precinct.
- The proposed mixed-use development is in line with the Local and State Policies.

On the basis of the reasons discussed above it is considered that the proposed level of on-site car parking to be suitable for the nature and scale of the proposed development.

## 5.1 Clause 52.06-9 – Design Standard Assessment

The proposed access arrangements and car parking layout have been designed in accordance with the objectives and design requirements of Clause 52.06-9 of the Monash Planning Scheme, AS/NZS 2890.6:2009 and with the relevant sections of AS/NZS 2890.1:2004.

An assessment against the relevant design standards of Clause 52.06-9 of the Planning Scheme is provided below.

### Design Standard 1 – Accessways

Vehicular access is proposed via a double width crossover located along the Right of Way abutting the northern boundary of the site, accessed via Clayton Road and Mary Street.

Design Standard 1 of Clause 52.06-9 relates to the design of accessways. The requirements of Design Standard 1 are assessed against the proposal in Table 5.1.

**Table 5.1: Design Standard 1 Assessment - Accessways**

Requirement	Comments
Must be at least 3m wide.	<u>Complies:</u> All accessways have been provided with a minimum trafficable width of 5.2 metres.
Have an internal radius of at least 4m at changes of direction or intersection or be at least 4.2m wide.	<u>Complies:</u> Change of directions in the accessway have been provided with an internal radius of at least 4.5 metres or have been widened appropriately.
Allow vehicles parked in the last space of a dead-end accessway in public car parks to exit in a forward direction with one manoeuvre.	<u>N/A:</u> The car park is not a public car park.
Provide at least 2.1m headroom beneath overhead obstructions, calculated for a vehicle with a wheel base of 2.8m.	<u>Complies:</u> A minimum headroom clearance of 2.2 metres has been provided along the ramps in accordance with the Australian Standard AS2890.1:2004.
If the accessway serves four or more car spaces or connects to a road in a Road Zone, the accessway must be designed so that cars can exit the site in a forward direction.	<u>Complies:</u> All vehicles are able to enter/exit the site in a forward direction.
Provide a passing area at the entrance at least 6.1m wide and 7m long if the accessway serves ten or more car parking spaces and is either more than 50m long or connects to a road in a Road Zone.	<u>Complies:</u> The accessway at the entrance of the site is 6.1 metres wide and in excess of 7.0 metres in length which enables simultaneous two-way vehicular movements.
Have a corner splay or area at least 50% clear of visual obstructions extending at least 2m along the frontage road from the edge of an exit lane and 2.5m along the exit lane from the frontage, to provide a clear view of pedestrians on the footpath of the frontage road. The area clear of visual obstructions may include an adjacent entry or exit lane where more than one lane is provided, or adjacent landscaped areas, provided the landscaping in those areas is less than 900mm in height.	<u>Complies:</u> A pedestrian sight triangle is provided adjacent to the exit lane of the accessway at the entrance to the site, measuring 2.0 metres along the site frontage and extending 2.5 metres into the site as per the requirement of Design Standard 1. Any fixtures or landscaping in these areas will be below 900mm in height to ensure clear visibility. Since the accessway is double width at the entrance, pedestrian sight triangle is not required to be provided adjacent to the entrance lane of the accessway.

If an accessway to four or more car parking spaces is from land in a Road Zone, the access to the car spaces must be at least 6m from the road carriageway.

N/A: Car spaces are not accessed directly to/from a road in a Road Zone.

## Design Standard 2 - Car Parking Spaces

A total of 120 at-grade car parking spaces are proposed on-site within four levels of basement car parking for the proposed development.

Design Standard 2 of Clause 52.06-9 relates to the design of car spaces. The requirements of Design Standard 2 are assessed against the proposal in Table 5.2.

**Table 5.2: Design Standard 2 Assessment – Car Parking Spaces**

Requirement	Comments
Car parking spaces and accessways must have the minimum dimensions as outlined in Table 2 of Design Standard 2.	<u>Complies</u> : All of the car parking spaces have been provided dimensional accordance with Table 2 of Design Standard 2 to Clause 52.06 of the Planning Scheme.
A wall, fence, column, tree, tree guard or any other structure that abuts a car space must not encroach into the area marked 'clearance required' on Diagram 1 of Design Standard 2, other than:  - A column, tree or tree guard, which may project into a space if it is within the area marked 'tree or column permitted' on Diagram 1.  - A structure, which may project into the space if it is at least 2.1m above the space.	<u>Complies</u> : All car parking spaces are clear of any encroachment into the area marked on Diagram 1 of the Design Standard 2.
Car spaces in garages or carports must be at least 6m long and 3.5m wide for a single space and 5.5m wide for a double space measured inside the garage or carport.	<u>N/A</u> – No garages or carports are proposed within the development.
Where parking spaces are provided in tandem (one space behind the other) an additional 500mm in length must be provided between each space.	<u>N/A</u> – No car spaces are proposed in a tandem arrangement within the development.
Where two or more car parking spaces are provided for a dwelling, at least one space must be under cover.	<u>N/A</u> : No dwellings are proposed on site. Notwithstanding this, all the car parking spaces are provided under cover.
Disabled car parking spaces must be designed in accordance with Australian Standard AS2890.6-2009 (disabled) and the Building Code of Australia. Disabled car parking spaces may encroach into an accessway width specified in Table 2 of Design Standard 2 by 500mm.	<u>Complies</u> – The single DDA space and the adjacent shared zone have been designed with dimensions in excess of the dimensions outlined in AS2890.6:2009. The DDA space and shared zone each have a width of 3.0 metres and a length of 5.4 metres. The length of the DDA space and shared zone encroaches the access aisle by 500mm which is in accordance with the design standards of the Planning Scheme.

### Design Standard 3 – Gradients

Access to the four levels of basement car parking, is proposed to be provided via a ramp that comprises the following transitions:

- Ground Floor to Basement 1:
  - An upward gradient of 1:8 for a length of 1.25 metres at the entrance of the site from RL of 61.24 metres;
  - A vertical curve having radius 11.5 metres for a length of 5.096 metres. The vertical curve achieves an apex of RL 61.63 metres;
  - A mid-block gradient of 1:4 for 13.7 metres (measured at the innermost trafficable section of the ramp); and
  - A final gradient of 1:8 for 2.5 metres to reach RL 57.55 metres.
- Gradients within Basement 1:
  - 1:16 for 5.10 metres to reach RL 57.23 metres; and
  - 1:16.6 for 27.95 metres to reach RL 55.55.
- Basement 1 to Basement 2:
  - 1:8 for 7.2 metres to reach RL 54.65 metres in Basement 2.
- Gradients within Basement 2:
  - 1:16 for 5.10 metres to reach RL 54.33 metres; and
  - 1:16.6 for 27.95 metres to reach RL 52.65.
- Basement 2 to Basement 3:
  - 1:8 for 7.2 metres to reach RL 51.75 metres in Basement 3.
- Gradients within Basement 3:
  - 1:16 for 5.10 metres to reach RL 51.43 metres; and
  - 1:16.6 for 27.95 metres to reach RL 49.75.
- Basement 3 to Basement 4:
  - 1:8 for 7.2 metres to reach RL 48.85 metres in Basement 4.
- Gradients within Basement 4:
  - 1:16 for 5.10 metres to reach RL 48.53 metres; and
  - 1:16.6 for 27.95 metres to reach RL 46.85.

Design Standard 3 of Clause 52.06-9 relates to the design of gradients. The requirements of Design Standard 3 are assessed against the proposal in Table 5.3 below:

**Table 5.3: Design Standard 3 Assessment - Gradients**

Requirement	Comments
Accessway grades must not be steeper than 1:10 (10%) within 5m of the frontage to ensure safety for pedestrians and vehicles. The design must have regard to the wheelbase of the vehicle being designed for; pedestrian and vehicular traffic volumes; the nature of the car park; and the slope and configuration of the vehicle crossover at the site frontage. This does not apply to accessways serving three dwellings or less.	<u>Complies:</u> The first 3.0 metres into the site are flat which is followed by an upwards gradient of 1:8 and then a vertical curve. Therefore, the average gradient for the first five metres into the site is approximately an upward gradient 1:22 which is in accordance with this standard.
Ramps (except within 5 metres of the frontage) must have the maximum grades as outlined in Table 3 of Design Standard 3 and be designed for vehicles travelling in a forward direction.	<u>Complies:</u> The proposed grades are in accordance with Table 3 of Design Standard 3, with grades no steeper than 1:4.
Where the difference in grade between two sections of ramp or floor is greater than 1:8 (12.5%) for a summit grade change, or greater than 1:6.7 (15%) for a sag grade change, the ramp must	<u>Complies:</u> Appropriate transition sections have been provided to prevent scraping or bottoming.

include a transition section of at least 2 metres to prevent vehicles scraping or bottoming.

Plans must include an assessment of grade changes of greater than 1:5.6 (18%) or less than 3 metres apart for clearances, to the satisfaction of the responsible authority.

## 5.2 Swept Path Assessment

### Site Access

An assessment of the accessibility to/from the site using the 'Autodesk Vehicle Tracking' software has been conducted. It was found that two opposing a B85 design vehicle (85<sup>th</sup> percentile car) and a B99 design vehicle (99.8<sup>th</sup> percentile car), could pass at the site access in a suitable manner. Further, all vehicles will be able to enter / exit the site in a forwards direction.

### Car Parking Spaces

An assessment of the accessibility to/from the parking bays was also undertaken using the B85 design vehicle (85<sup>th</sup> percentile car) and it was found that each of the critical parking space could be accessed (ingress and egress) in a satisfactory manner.

Some corrective manoeuvres may be required, which is in accordance with AS/NZS2890.1:2004 (Table 1.1), which specifies that the three-point turn movements to enter and exit 90-degree parking spaces are permitted for regular users.

### Vertical Clearance Assessment

An assessment of the vertical clearance along the entrance ramp has been conducted using the 'Autodesk Vehicle Tracking' software. The B99 (99.8<sup>th</sup> percentile car) was used in the assessment and it was found that the B99 (having a height of 2.2 metres and ground clearance of 120mm) vehicle could gain access (ingress and egress) in a suitable manner without scraping.

### Summary

The assessment indicates that the access arrangements and car parking layout have been designed appropriately and in accordance with the requirements of the Monash Planning Scheme and/or AS/NZS 2890.1:2004.

The swept path assessment has been provided within Appendix B.

## 6.1 Traffic Generation

### Retail Traffic Generation

The retail tenancies are expected to generate in the order of one trip per allocated staff space during the AM and PM peak hours, which equates to four trips per hour. During the AM peak period, it is expected that every staff trip generated will be an arrival. Similarly, every staff trip generated during the PM peak will be a departing trip.

### Office Traffic Generation

Based on surveys at other office developments in Melbourne, it is expected that the development will generate 0.5 vehicular trips per car space during the morning peak hour and 0.5 vehicular trips per car space during the afternoon peak hour. Application of the above rates to the 68 spaces allocated for office use equates to a peak hour traffic generation of 34 vehicular trips. Employee trips will be mainly arriving in the morning peak and departing in the afternoon peak with approximately 90% of employees assumed to arrive in the morning and depart in the evening peak.

The office traffic generation for the AM and PM peak hours is shown below in Table 6.1:

**Table 6.1: Office Traffic Generation**

	AM Peak Hour	PM Peak Hour
Arriving trips:	31 vph	3 vph
Departing trips:	3 vph	31 vph
<b>Total trips:</b>	<b>34 vph</b>	<b>34 vph</b>

### Serviced Apartments Generation

The NSW RTA guide to Traffic Generating Developments provides traffic generation rates for a number of different uses and recommends the adoption of a traffic generation rate of 3 daily vehicle trips per unit and a rate of 0.4 movements per unit during the PM peak hour, for motel uses which is considered appropriate for the serviced apartment component of the proposed development.

Accordingly, application of the peak hour traffic generation rate of 0.4 vehicle movements per room to the 47 parking spaces allocated to the serviced apartments equates to a traffic generation of 19 vehicle movements during both commuter peak hours. During the AM peak, it is estimated that 80% of traffic will be outbound with 20% inbound movements, while during the PM peak, 80% of traffic will be inbound with 20% outbound movements.

It is noted that this assessment is considered to be conservative given that the occupation of accommodation uses such as serviced apartments vary seasonally and it is rare for all rooms within such uses to be fully occupied.

The serviced apartment traffic generation for the peak hours is shown below in Table 6.2:

**Table 6.2: Serviced Apartments Traffic Generation**

	AM Peak Hour	PM Peak Hour
Arriving trips:	4 vph	15 vph
Departing trips:	15 vph	4 vph
<b>Total trips:</b>	<b>19 vph</b>	<b>19 vph</b>

### Summary

A summary of the overall peak hour traffic generation for the proposed development is presented in Table 6.3:

**Table 6.3: Overall Traffic Generation**

	AM Peak Hour	PM Peak Hour
Arriving trips:	39 vph	18 vph
Departing trips:	18 vph	39 vph
<b>Total trips:</b>	<b>57 vph</b>	<b>57 vph</b>

## 6.2 Traffic Distribution and Impact

The additional traffic generated by the proposed mixed-use development will flow directly onto the ROW abutting the northern boundary of the site and then onto the surrounding road network via Clayton Road, Mary Street and Carinish Road.

It is recommended that Council give strong consideration to the conversion of the existing two-way vehicle flow along the northern ROW to a one-way eastbound direction between Clayton Road and the western side of the proposed site access point to reduce any potential conflict along the northern ROW, particularly at Clayton Road.

Subject to the section of the northern ROW abutting the site being converted to a one-way eastbound restriction, the surrounding road network including the three ROWs abutting the northern, eastern and southern boundaries of the site, as well as Clayton Road, Mary Street and Carinish Road have the ability to accommodate the expected increase in traffic volume (in the order of 57 vehicle movements in AM and PM peak hours) associated with the proposed development and therefore is not expected to create adverse traffic safety or operational impacts.

If the western section of the northern ROW cannot be converted to one-way operation, then it is recommended that a passing bay be created at the western end of the northern ROW to cater for simultaneous traffic movements to/from Clayton Road. This is considered to be an inferior option to the conversion to one-way eastbound restriction as it will require additional road space to be created from land located within the prime north facing portion of the site at Clayton Road, which can be better devoted to outdoor dining space.

## 7.1 Clause 52.34-5 – Bicycle Parking Requirements

Clause 52.34-3 of the Monash Planning Scheme outlines the requirements for bicycle parking for various uses. The bicycle parking requirements for the proposed mixed-use development are outlined in Table 7.1 below:

**Table 7.1: Bicycle Parking Requirement**

Use	User	Statutory Parking Rate	Statutory Requirement
Retail (Leasable Floor Area 288 sqm)	Employee	1 space to every 300 sqm of leasable area	1 space
	Customer	1 space to every 500 sqm of leasable area	1 space
Office (Net Floor Area 3,672 sqm)	Employee	1 space to every 300 sqm of net floor area	12 spaces
	Visitor	1 space to every 1000 sqm of net floor area	4 spaces
104 Serviced Apartments (Residential Building other than specified)	Staff	1 staff space per 10 lodging rooms	10 spaces
	Guest	1 guest space per 10 lodging rooms	10 spaces
<b>TOTAL</b>			<b>38 spaces</b>

Based on the above assessment, the proposed use of the site has a statutory requirement to provide 38 bicycle parking spaces (including 23 employee / staff spaces and 15 visitor / customer / guest spaces).

## 7.2 Bicycle Parking Provision

The development proposes to provide a total of 73 bicycle parking spaces across the site, in the following arrangement:

- 48 horizontal bicycle parking spaces provided within 24 double level bicycle parking rails within the bicycle parking room located on ground floor of the development. Six of these spaces are proposed to be allocated to the shared bike scheme, which will include two e-bikes.
- Eight horizontal bicycle parking spaces within four double sided 'hoop' rails (such as the Arc De Triomphe bicycle parking rails) located along the site's frontage of Clayton Road.
- Two horizontal bicycle parking spaces within two wall mounted rails (such as the Towel Hitching bicycle parking rails) located along the RoW abutting the eastern boundary of the site.
- Nine vertical bicycle parking spaces within wall mounted bicycle parking rails (such as the Ned Kelly bicycle parking rails) located at the south-eastern corner within Basement 1.
- Six horizontal bicycle parking spaces within three (3) double sided 'hoop' rails (such as the Arc De Triomphe bicycle parking rails) located at the south-eastern corner within Basement 1.

Accordingly, the proposal exceeds the requirements of the Monash Planning Scheme which is considered to be an appropriate bicycle parking provision.

### 7.3 Bicycle Parking Layout

Bicycle parking spaces have been designed in accordance with the dimensional requirements of AS2890.3:2015. More specifically, the following standards have been met:

- The proposed bicycle parking provides 87% bicycle parking spaces within ground level (horizontal rails), which exceeds the requirement outlined in AS2890.3:2015 that 20% of bicycle parking must be provided via ground level rails.
- The two-level bicycle parking rails are spaced at 500mm intervals and are accessed via an aisle of at least 2.0 metres in width. The bicycle parking room has a headroom clearance of 3.25 metres.
- Floor mounted horizontal bicycle rails are spaced at 1.0 metre intervals, with an envelope of 1.8 metres and accessed via an aisle with a width of at least 1.5 metres.
- Wall mounted vertical bicycle rails are spaced at 500mm intervals, with an envelope of 1.2 metres and accessed via an aisle with a width of 1.5 metres.

To encourage greater use of bicycles by guests residing at the serviced apartments and office employees it is proposed that six (6) of the 73 bicycle spaces will be used as part of a 'bike share scheme' implemented by the management of the serviced apartments. Staff and guests will be able to book the share bikes, which will include two e-bikes, for daily leisure and business trips.

Accordingly, it is considered that the bicycle parking has been designed appropriately and in accordance with the relevant sections of AS2890.3:2015.

The bicycle parking specifications are provided within Appendix C.

### 7.4 Requirements of End of Trip Facilities

In addition to bicycle parking, Clause 52.34-3 requires that showers and change rooms are provided for employee bicycle parking. The rates are applied in Table 7.2 below:

**Table 7.2: End of Trip Facility Requirements**

Component	Requirement	Number Required	Requirement
Showers	If 5 or more employee bicycle spaces are required, 1 shower for the first 5 employee bicycle spaces, plus 1 to each 10 employee bicycle spaces thereafter.	23 employee spaces	3 showers
Change Rooms	1 change room or direct access to a communal change room to each shower. The change room may be a combined shower and change room.	3 showers	3 change rooms

Based on the foregoing, the proposal has a requirement for three showers and three change rooms (or direct access to a communal change room).

## **7.5 Provision of End of Trip Facilities**

The development proposes to provide a total of eight combined showers and changing rooms (four each for males and females) adjacent to the bicycle parking room within the ground floor of the development. In addition, a separate DDA shower and changing room has also been provided in the same location. Further, the development provides a total of 58 lockers.

Overall, the nine combined showers/changerooms exceeds the requirement of the Planning Scheme and is considered to be adequate in catering for the intended users and thus the proposed provision is considered satisfactory.

## 8.1 Loading and Unloading Arrangements

Clause 65.01 of Monash Planning Scheme outlines the provision of loading facilities and states the following:

*“Before deciding on an application or approval of a plan, the responsible authority must consider, as appropriate:*

- *The adequacy of loading and unloading facilities and any associated amenity, traffic flow and road safety impacts.”*

A loading area has been provided on the ground floor of the proposed mixed-use development. Loading and unloading activities will be undertaken within the Right of Way (RoW) abutting the southern boundary of the subject site.

A swept path assessment has been undertaken using the Autodesk Vehicle Tracking software. The assessment demonstrates a 6.4 metre long Small Rigid Vehicle (SRV as defined in AS2890.2-2002) entering the RoW abutting the southern boundary of the site in a forwards direction via the RoWs abutting the northern and eastern boundary of the site, access the loading bay to load/unload items and then exit the RoW in a forward direction onto Clayton Road in a suitable manner.

Accordingly, it is considered that loading and unloading associated with the proposal can suitably be undertaken within the RoW abutting the southern boundary of the site.

The swept path assessment for the loading bay has been provided within Appendix D.

## 8.2 Waste Collection Arrangements

Waste is proposed to be stored within the bin storage room provided within the ground floor level of the mixed-use development.

It is understood that waste will be collected from the RoW abutting the southern boundary of the site, by a private contractor via a 6.4 metre long Mini Rear Loader Truck. A swept path assessment demonstrates the ability for this vehicle to enter the RoW abutting the southern boundary of the site in a forward direction via the RoWs abutting the northern and eastern boundary of the site, collect waste and depart the site onto Clayton Road in a forward direction.

This is considered to be an acceptable arrangement from a traffic engineering perspective.

The swept path assessment for the waste collection truck has been provided within Appendix D.

It is proposed to construct a multi-storey mixed-use development on the subject site located at 270 Clayton Road, in Clayton. The development will comprise of two ground floor retail tenancies, four levels of office use and 104 serviced apartments. A total of 120 car parking spaces (including one DDA space and one car share space) are proposed within the four levels of basement parking. Vehicle access is proposed to be provided to/from the Right of Way abutting the northern boundary of the site. A total of 73 bicycle parking spaces are proposed on-site. Based on the assessment undertaken above, the following conclusions have been reached:

### **Car Parking Provision**

- The provision of 120 car parking spaces for the proposed development is considered to be satisfactory for the following reasons:
  - The site is ideally located to take advantage of access to sustainable transport alternatives such as the metropolitan train, buses, bicycle and pedestrian network. This will enable users of the proposed development to travel to and from the site.
  - The provision of 120 car parking spaces (four for retail use, 68 spaces for office use, 47 spaces for serviced apartments and one car share space) is expected to meet the long-term parking demand (including staff/employees and guests of the serviced apartments) of the proposed development.
  - The proposed level of on-site car parking for each of the component uses reflects the empirical demand and/or Council approval for sites with similar uses and locations in Activity Centres with excellent public transport and bicycle facilities.
  - The generous provision of 73 bicycle parking spaces will encourage the use of alternative transport modes and reduce the reliance on private vehicle use.
  - The provision of an on-site car share vehicle plus a share bicycle scheme for use by staff and guests will help to reduce the demand for car parking generated by uses on the site.
  - The parking supply in the vicinity of the site is generally subject to short-term parking restrictions, with the unrestricted parking supply is generally subject to high occupancy levels and therefore not suitable for long term parking. This will discourage users such as employees/staff of the proposed development without an on-site car parking space to drive to/from the site.
  - The parking surveys further indicate that there is ample capacity within the surrounding on-street parking (including during peak weekday afternoon), which is generally subject to short-term parking restrictions. These on-street car parking spaces can readily accommodate the expected short-term demand of office visitors and retail customers of the proposed development.
  - It is expected that the retail tenancies will operate, to some extent, as ancillary to the surrounding retail and commercial businesses (including proposed on-site) in the area and will draw a portion of its patronage from nearby residents, commuters and customers of other businesses in the precinct.
  - The proposed mixed-use development is in line with the Local and State Policies.

### **Vehicular Access and Car Parking Layout**

- Vehicular access to/from the site is proposed the RoW abutting the northern boundary of the site. The accessway located at the north-east corner of the site has been designed in accordance with the requirements of the Monash Planning Scheme.

- The proposed 120 car parking spaces (including one DDA space and one car share space) have been designed in accordance with the requirements of the Monash Planning Scheme and/or relevant sections of AS 2890.1:2004.
- Swept path assessments demonstrates that all critical car parking spaces can be accessed in a satisfactory manner.

### **Traffic Generation and Impact**

- The proposed development is estimated to generate up to 57 vehicular movements in the AM and PM peak hours of traffic which will flow directly onto the RoW abutting the northern boundary of the site and then onto the surrounding road network via Clayton Road/Mary Street.
- It is recommended that Council give strong consideration to the conversion of the existing two-way vehicle flow along the northern ROW to a one-way eastbound direction between Clayton Road and the western side of the proposed site access point to reduce any potential conflict along the northern ROW, particularly at Clayton Road.
- Subject to the section of the northern ROW abutting the site being converted to a one-way eastbound restriction, the surrounding road network including the three ROWs abutting the northern, eastern and southern boundaries of the site, as well as Clayton Road, Mary Street and Carinish Road have the ability to accommodate the expected increase in traffic volume associated with the proposed development and therefore is not expected to create adverse traffic safety or operational impacts.
- If the western section of the northern ROW cannot be converted to one-way operation, then it is recommended that a passing bay be created at the western end of the northern ROW to cater for simultaneous traffic movements to/from Clayton Road.

### **Bicycle Parking Provision & Layout and End of Trip Facilities**

- The development provides a total of 73 bicycle parking spaces on-site to cater for the needs of all the users of the proposed development. This provision of bicycle parking spaces exceeds the statutory requirements of Clause 52.34 of the Monash Planning Scheme and is considered to be appropriate.
- The bicycle parking layout has been designed in accordance with the Australian Standard AS2890.3:2015 and is considered satisfactory.
- Provision of nine combined showers and change rooms adjacent to the bicycle parking room on ground floor of the development is considered satisfactory. The development also provides a total of 58 lockers for the users.

### **Loading and Waste Collection Arrangements**

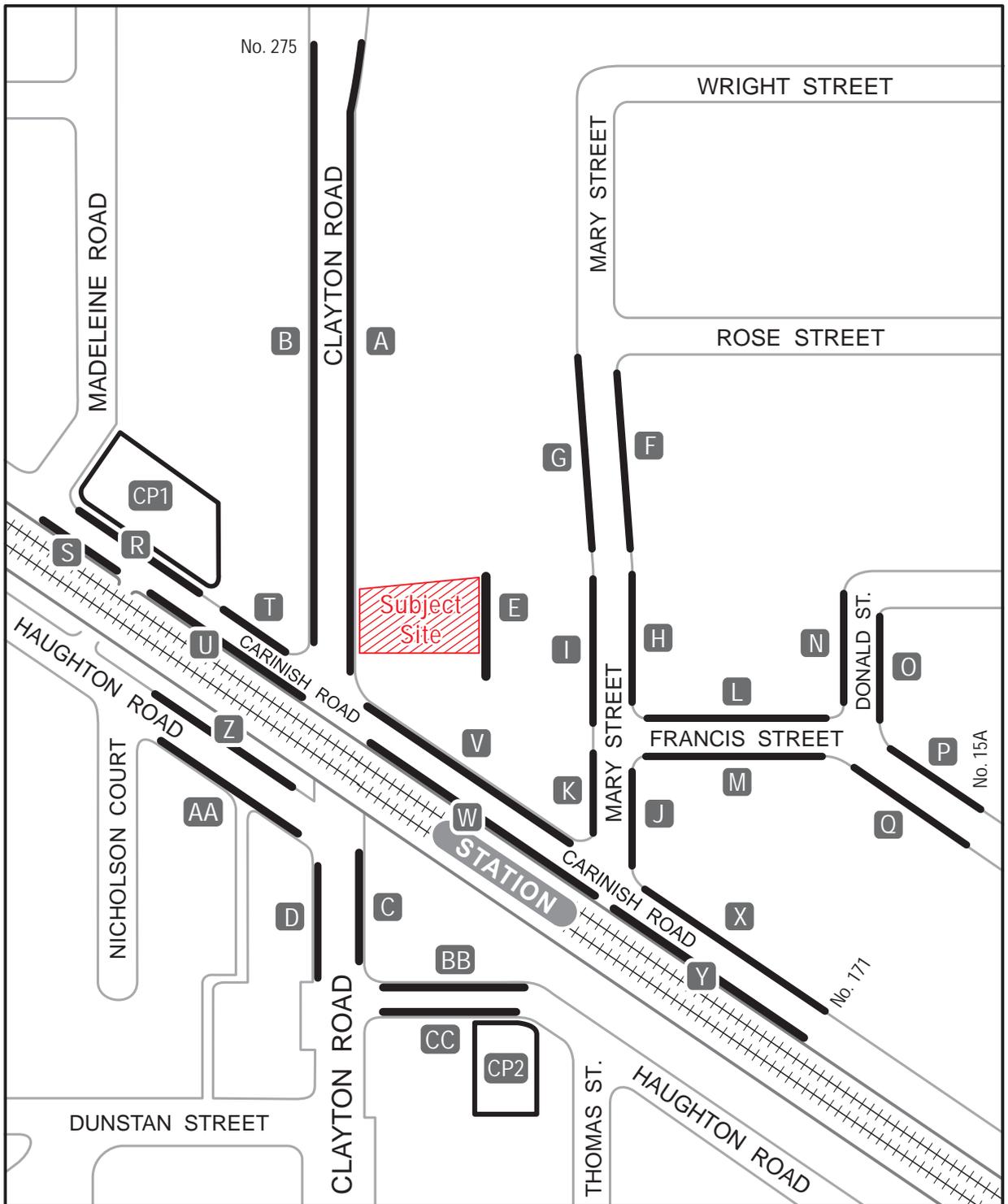
- A loading area has been provided on ground floor of the proposed development. The loading and unloading activities associated with the proposed development will be undertaken within the RoW abutting the southern boundary of the site. The swept path assessment demonstrates a 6.4-metre-long Small Rigid Vehicle entering the RoW abutting the southern boundary of the site in a forwards direction via the RoWs abutting the northern and eastern boundary of the site, access the loading bay to load/unload items and then exit the RoW in a forwards direction onto Clayton Road in a suitable manner.

- Waste is proposed to be collected from the RoW abutting the southern boundary of the site by a private waste contractor.
- The swept path assessment undertaken demonstrates the ability for a 6.4-metre-long Mini Rear Loader Waste Collection Truck to enter the the RoW abutting the southern boundary of the site via the RoWs abutting the northern and eastern boundary of the site, collect waste and depart onto Clayton Road in a suitable manner.

Overall, based on the assessment undertaken above, the proposed mixed-use development is considered to be acceptable from the traffic engineering perspective and is not expected to create adverse traffic or parking impacts in the precinct.

# Appendix A Survey Results



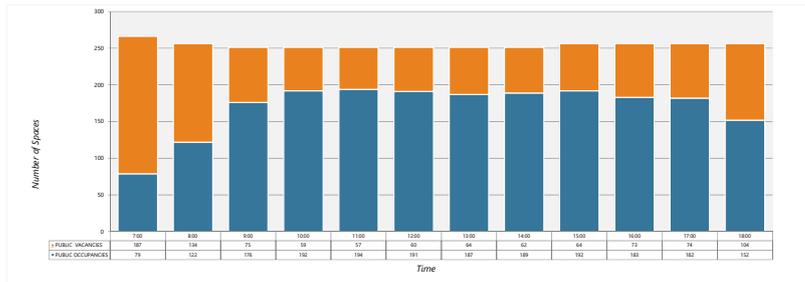


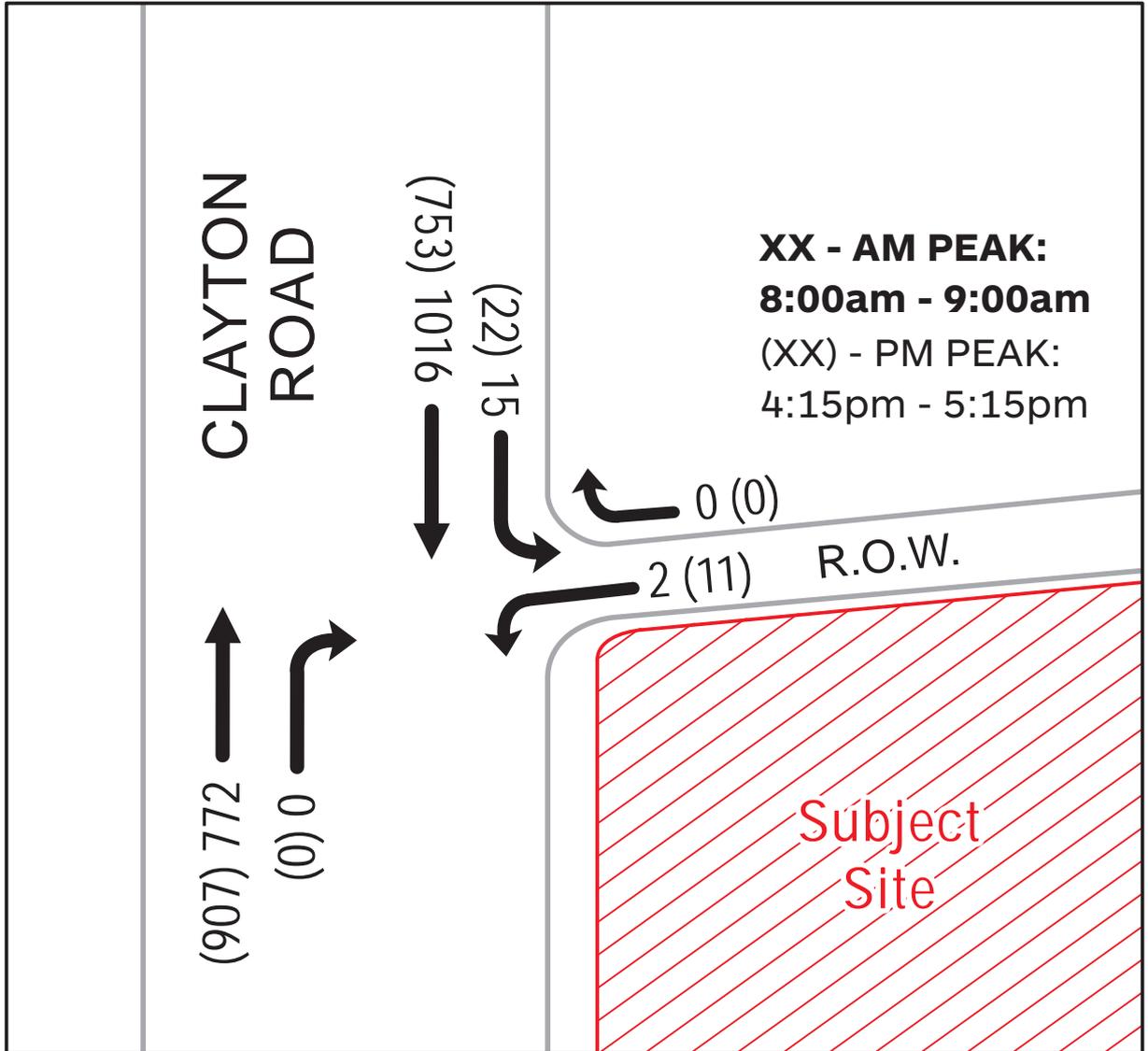
270 Clayton Road Clayton - Parking Survey v1.1

Parking Occupancy Survey	
Date	Thursday, 27 February 2020
Location	270 Clayton Road, Clayton
Weather	

Public Parking (L/R)	Map Ref	Street	Section	Side	Restriction	Clear Way	Capacity	Parking Occupancy																				
								7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00									
1	A				No Stopping		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
1	B				1/4P 8am-6pm Mon-Fri, 8am-1pm Sat		2	0	0	0	2	2	1	1	1	0	0	0	2	1								
1					1P 8am-6pm Mon-Fri, 8am-1pm Sat		4	1	1	0	3	3	3	1	2	2	1	1	1	2								
1	C				No Stopping		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
1					Bus Zone		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
1	D				No Stopping		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
1	E				Reserved		7	0	2	6	6	6	6	6	6	6	6	6	6	6	4	2						
1	F				No Stopping 8am-8pm		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
1					No Parking 8am-8pm		8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
1	G				P 5Min 8am-9am, 3pm-4pm, 1P 9am-3pm Authorised Vehicles Allowed		3	0	0	0	0	0	0	1	1	0	0	0	2	2								
1					Permit Zone		4	0	0	0	0	0	0	0	2	2	2	2	2	2								
1	H				No Parking 8am-8pm		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
1	I				1P 8am-6pm Mon-Fri, 8am-1pm Sat		8	3	3	4	3	3	2	2	2	2	3	4	2									
1					P 5Min 8am-9am, 5pm-6pm School Days, 9am-5pm Authorised Vehicles Allowed		2	0	0	0	0	0	0	0	1	2	1	1	1	0								
1	J				No Stopping		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
1	K				1P 8am-6pm Mon-Fri, 8am-1pm Sat		3	0	0	1	1	1	1	2	2	3	3	3	2									
1	L				1/2P 8am-6pm Mon-Fri		8	0	0	0	1	1	0	0	1	3	3	4	2									
1	M				1/2P 8am-6pm Mon-Fri		8	1	1	1	1	2	1	1	1	2	2	3	3									
1	N				1/2P 8am-6pm Mon-Fri		4	0	0	0	0	0	0	0	0	0	0	0	1									
1	O				1/2P 8am-6pm Mon-Fri		3	0	0	0	0	1	1	0	0	0	0	0	0	0	2							
1	P				1/2P 8am-6pm Mon-Fri		4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
1	Q				1/2P 8am-6pm Mon-Fri		2	0	0	0	0	0	0	0	1	1	0	0	1									
1	R				Unrestricted		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2						
1	S				No Stopping		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
1	T				Unrestricted		6	6	6	6	6	6	6	6	6	6	6	4	4	3								
1	U				No Stopping		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
1	V				1P 8am-7pm Mon-Fri, 8am-1pm Sat		3	1	3	3	3	2	3	3	1	3	3	3	3									
1					1/4P		4	1	1	3	3	2	2	2	1	2	4	3	3									
1	W				No Stopping		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
1	X				P 2Min, Rail Replacement Buses Excepted		2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
1					4P 8am-6pm Mon-Fri		6	0	2	6	6	6	6	6	5	5	5	5	3									
1	Y				Unrestricted		4	4	4	4	4	3	3	3	4	4	4	3	3									
1					Taxi Zone		4	1	1	1	1	0	0	0	0	0	0	0	0	1								
1	Z				2P 8am-6pm Mon-Fri		21	0	0	18	20	21	21	21	21	18	18	16	18									
1	AA				2P 8am-6pm Mon-Fri		4	1	1	3	3	3	3	3	3	2	3	4										
1	BB				1P 8am-6pm Mon-Fri, 8am-1pm Sat		3	3	3	3	3	3	3	3	3	3	3	2	2									
1	CC				P 5Min		3	2	2	1	2	1	0	2	2	1	0	0	0									
1	CP1				Unrestricted		101	53	70	88	96	94	94	94	95	95	93	91	67									
1	CP2				2P 8am-6pm Mon-Sat		42	1	17	33	32	37	37	35	36	35	32	30	26									
1					2P Disabled		4	0	0	0	1	1	2	0	0	0	0	0	0									
<b>PUBLIC CAPACITY</b>								<b>266</b>	<b>256</b>	<b>251</b>	<b>251</b>	<b>251</b>	<b>251</b>	<b>251</b>	<b>251</b>	<b>256</b>	<b>256</b>	<b>256</b>	<b>256</b>									
<b>PUBLIC OCCUPANCIES</b>								<b>79</b>	<b>122</b>	<b>176</b>	<b>192</b>	<b>194</b>	<b>187</b>	<b>189</b>	<b>192</b>	<b>183</b>	<b>182</b>	<b>152</b>										
<b>PUBLIC VACANCIES</b>								<b>187</b>	<b>134</b>	<b>75</b>	<b>59</b>	<b>57</b>	<b>60</b>	<b>64</b>	<b>62</b>	<b>64</b>	<b>73</b>	<b>74</b>	<b>104</b>									
<b>PUBLIC % OCCUPANCIES</b>								<b>30%</b>	<b>48%</b>	<b>70%</b>	<b>76%</b>	<b>77%</b>	<b>76%</b>	<b>75%</b>	<b>75%</b>	<b>71%</b>	<b>71%</b>	<b>59%</b>										

not available for public parking





# TRANS TRAFFIC SURVEY

## TURNING MOVEMENT SURVEY

trafficsurvey.com.au



### Intersection of Row and Clayton Rd, Clayton

GPS -37.923396, 145.120165

Date:	Thu 27/02/20
Weather:	Fine
Suburban:	Clayton
Customer:	Ratio

North:	Clayton Rd
East:	Row
South:	Clayton Rd
West:	N/A

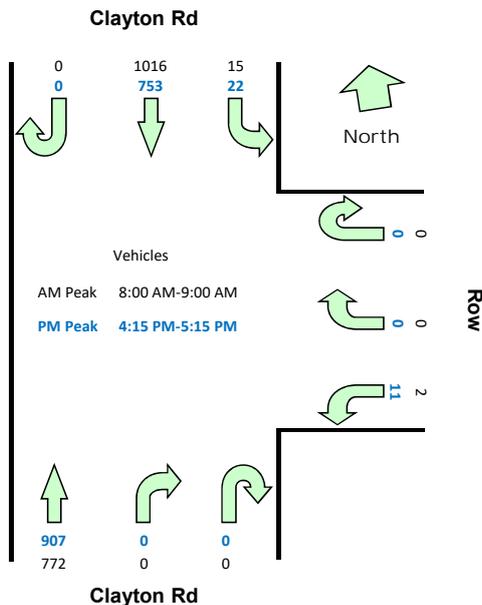
Survey Start		
AM:	7:30	PM: 15:30
Peak hours		
Vehicles	AM:	8:00 AM-9:00 AM
	PM:	4:15 PM-5:15 PM
Ped	AM:	N/A
	PM:	N/A

#### All Vehicles

Time		North Approach Clayton Rd			East Approach Row			South Approach Clayton Rd			Hourly Total	
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	Hour	Peak
7:30	7:45	0	228	4	0	0	2	0	0	208	1736	
7:45	8:00	0	199	3	0	0	0	0	0	172	1737	
8:00	8:15	0	246	3	0	0	0	0	0	198	1805	Peak
8:15	8:30	0	268	3	0	0	0	0	0	202	1798	
8:30	8:45	0	244	5	0	0	1	0	0	193	1768	
8:45	9:00	0	258	4	0	0	1	0	0	179		
9:00	9:15	0	236	0	0	0	4	0	0	200		
9:15	9:30	0	251	2	0	0	0	0	0	190		
15:30	15:45	0	155	3	0	0	2	0	0	209	1595	
15:45	16:00	0	165	7	0	0	2	0	0	235	1676	
16:00	16:15	0	167	8	0	0	1	0	0	243	1670	
16:15	16:30	0	185	4	0	0	2	0	0	207	1693	Peak
16:30	16:45	0	196	10	0	0	4	0	0	240	1680	
16:45	17:00	0	182	6	0	0	4	0	0	211		
17:00	17:15	0	190	2	0	0	1	0	0	249		
17:15	17:30	0	169	3	0	0	1	0	0	212		

Peak Time		North Approach Clayton Rd			East Approach Row			South Approach Clayton Rd			Peak total
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	
8:00	9:00	0	1016	15	0	0	2	0	0	772	1805
16:15	17:15	0	753	22	0	0	11	0	0	907	1693

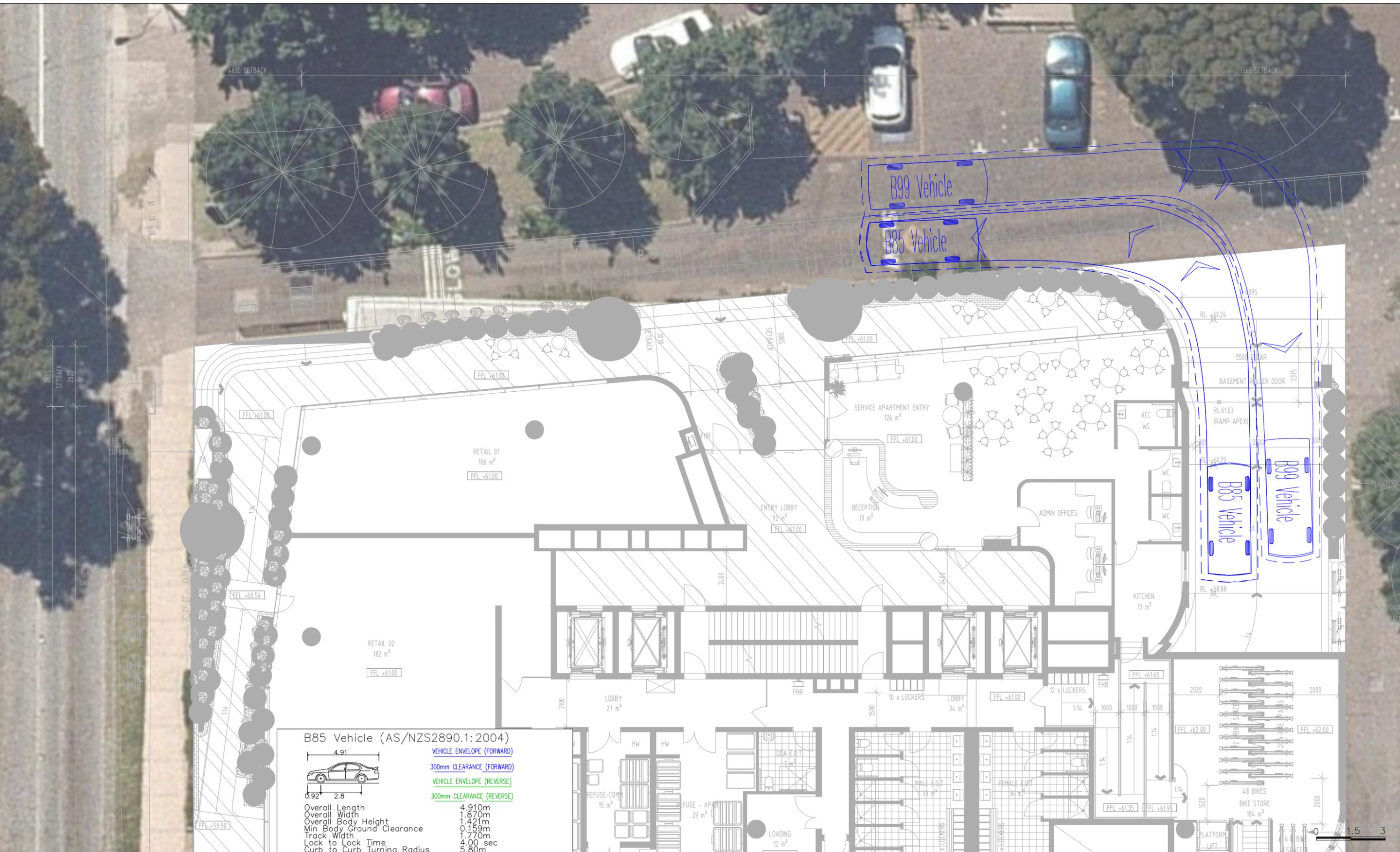
Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.



# Appendix B Swept Path Assessment



10/11/2020 10:25:17 AM Y:\16501-17000\16916T - 270 CLAYTON ROAD, CLAYTON\DESIGN\SKETCH\SK09 (2020.11.10)\16916T-SK09.DWG



**B85 Vehicle (AS/NZS2890.1:2004)**

	<b>VEHICLE ENVELOPE (FORWARD)</b>
300mm CLEARANCE (FORWARD)	
	<b>VEHICLE ENVELOPE (REVERSE)</b>
300mm CLEARANCE (REVERSE)	
Overall Length	4.910m
Overall Width	1.870m
Overall Body Height	1.421m
Min Body Ground Clearance	0.159m
Track Width	1.770m
Lock to Lock Time	4.00 sec
Curb to Curb Turning Radius	5.80m

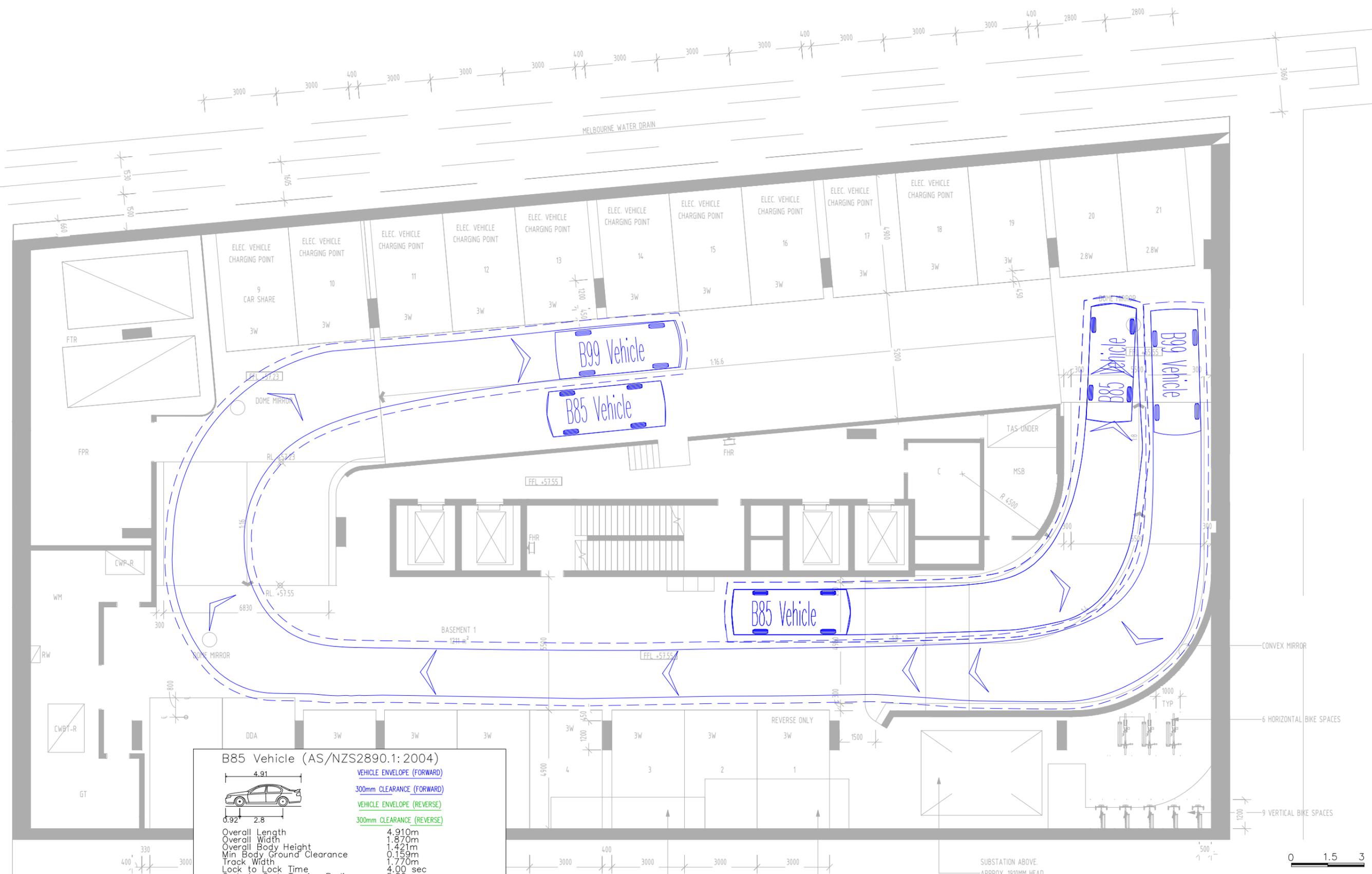
**B99 Vehicle (AS/NZS2890.1:2004)**

	<b>VEHICLE ENVELOPE (FORWARD)</b>
300mm CLEARANCE (FORWARD)	
	<b>VEHICLE ENVELOPE (REVERSE)</b>
300mm CLEARANCE (REVERSE)	
Overall Length	5.200m
Overall Width	1.940m
Overall Body Height	2.200m
Min Body Ground Clearance	0.312m
Track Width	1.840m
Lock to Lock Time	4.00 sec
Curb to Curb Turning Radius	6.30m

**Proposed Mixed-Use Development**  
 270 Clayton Road, Clayton  
 Swept Path Assessment – Ground Floor

**NOTE:**  
 1) Base Plan Supplied by BG Architecture on 2020.11.10  
 2) Maximum Design Speed 10km/h

10/11/2020 10:25:19 AM V:\16501-17000\16916T - 270 CLAYTON ROAD, CLAYTON\DESIGN\SKETCH\SK09 (2020.11.10)\16916T-SK09.DWG



B85 Vehicle (AS/NZS2890.1:2004)	
	VEHICLE ENVELOPE (FORWARD)
	300mm CLEARANCE (FORWARD)
	VEHICLE ENVELOPE (REVERSE)
	300mm CLEARANCE (REVERSE)
Overall Length	4.910m
Overall Width	1.870m
Overall Body Height	1.421m
Min Body Ground Clearance	0.159m
Track Width	1.770m
Lock to Lock Time	4.00 sec
Curb to Curb Turning Radius	5.80m

B99 Vehicle (AS/NZS2890.1:2004)	
	VEHICLE ENVELOPE (FORWARD)
	300mm CLEARANCE (FORWARD)
	VEHICLE ENVELOPE (REVERSE)
	300mm CLEARANCE (REVERSE)
Overall Length	5.200m
Overall Width	1.940m
Overall Body Height	2.200m
Min Body Ground Clearance	0.312m
Track Width	1.840m
Lock to Lock Time	4.00 sec
Curb to Curb Turning Radius	6.30m

### Proposed Mixed-Use Development 270 Clayton Road, Clayton Swept Path Assessment – Basement 1

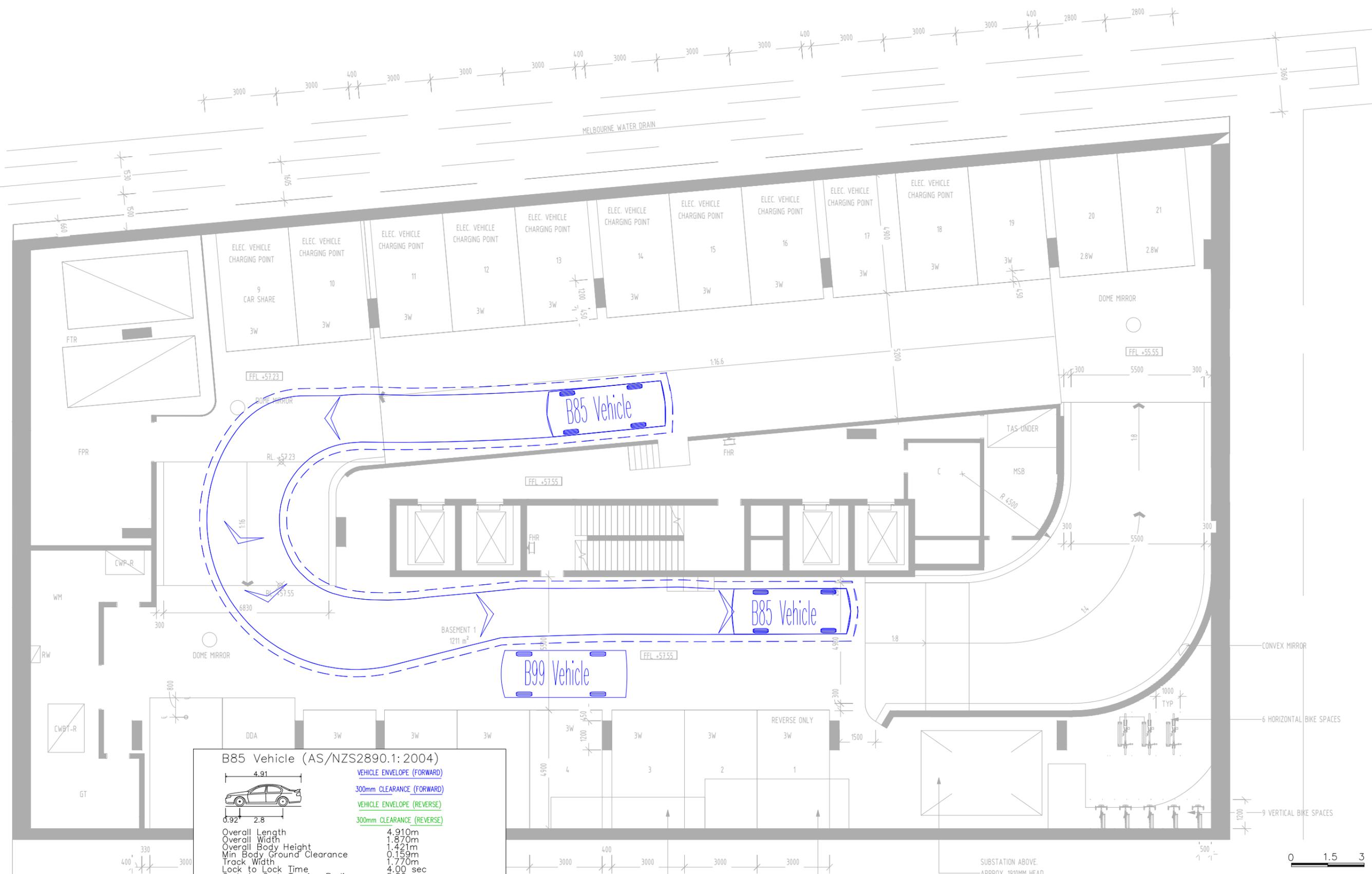
NOTE:  
1) Base Plan Supplied by BG Architecture on 2020.11.10  
2) Maximum Design Speed 10km/h



RATIO CONSULTANTS PTY LTD  
ABN 005 422 104  
8 GWYNNE STREET  
CREMORNE, VICTORIA 3121  
TELEPHONE (03)9429 3111  
FACSIMILE (03)9429 3011

RATIO REFERENCE 16916T-SK09/SN	SHEET No. 2 of 17	SCALE 1:150@A3	DATE 10/11/2020
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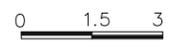
B85 Vehicle (AS/NZS2890.1:2004)	
	VEHICLE ENVELOPE (FORWARD)
4.91	300mm CLEARANCE (FORWARD)
	VEHICLE ENVELOPE (REVERSE)
0.92 2.8	300mm CLEARANCE (REVERSE)
Overall Length	4.910m
Overall Width	1.870m
Overall Body Height	1.421m
Min Body Ground Clearance	0.159m
Track Width	1.770m
Lock to Lock Time	4.00 sec
Curb to Curb Turning Radius	5.80m

B99 Vehicle (AS/NZS2890.1:2004)	
	VEHICLE ENVELOPE (FORWARD)
5.2	300mm CLEARANCE (FORWARD)
	VEHICLE ENVELOPE (REVERSE)
0.95 3.05	300mm CLEARANCE (REVERSE)
Overall Length	5.200m
Overall Width	1.940m
Overall Body Height	2.200m
Min Body Ground Clearance	0.312m
Track Width	1.840m
Lock to Lock Time	4.00 sec
Curb to Curb Turning Radius	6.30m

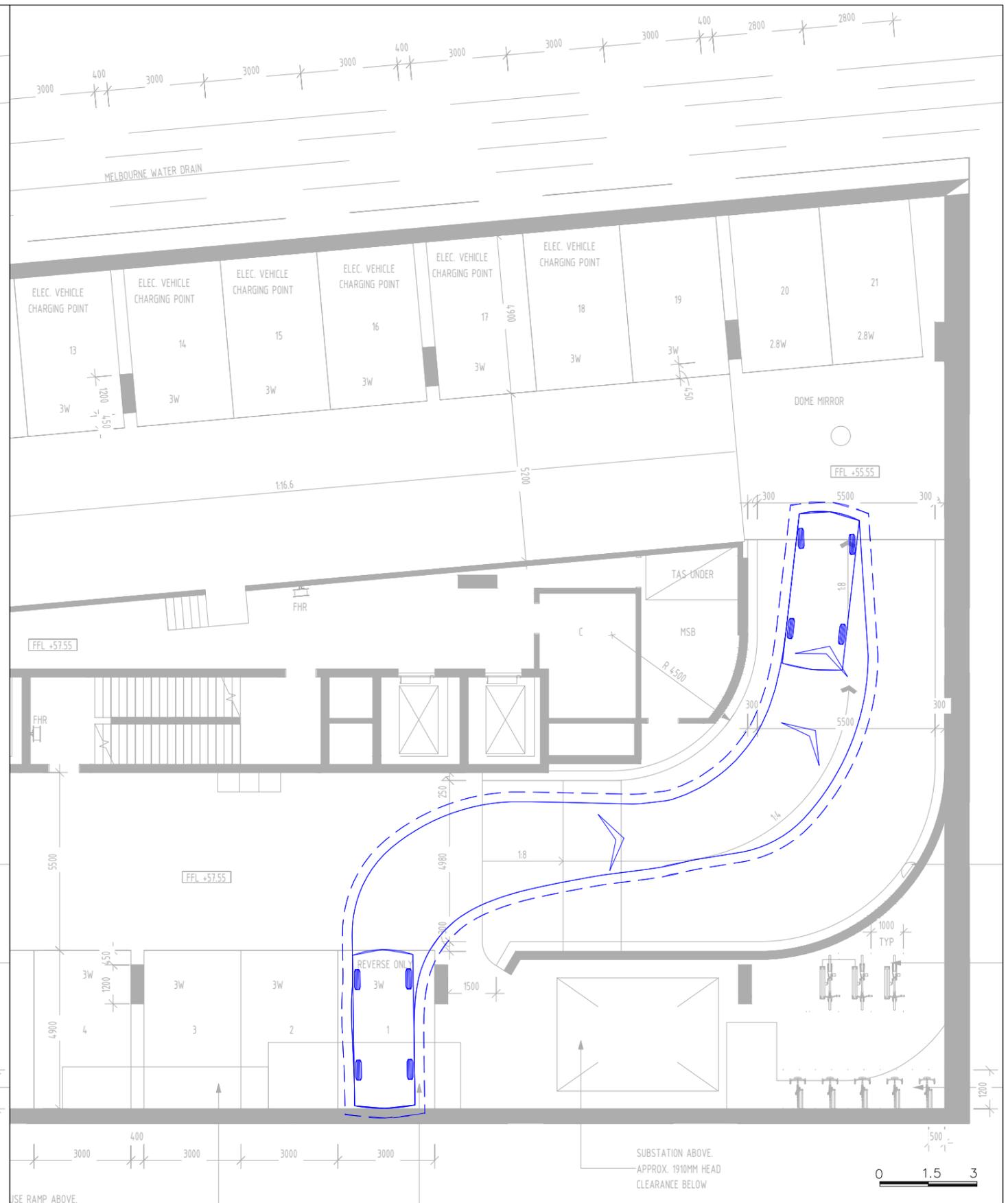
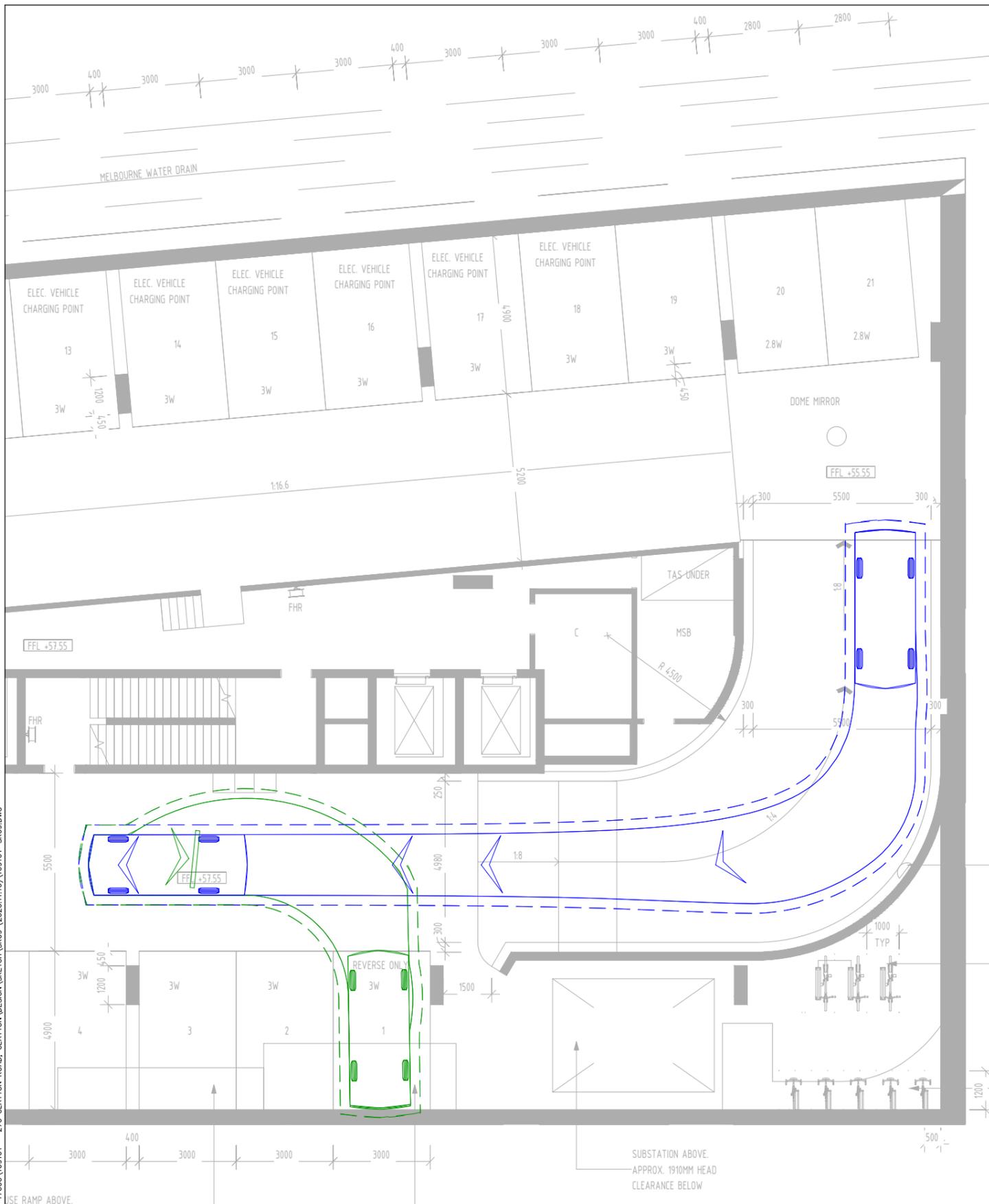
Proposed Mixed-Use Development  
 270 Clayton Road, Clayton  
 Swept Path Assessment – Basement 1

NOTE:  
 1) Base Plan Supplied by BG Architecture on 2020.11.10  
 2) Maximum Design Speed 10km/h

RATIO REFERENCE 16916T-SK09/SN	SHEET No. 3 of 17	SCALE 1:150@A3	DATE 10/11/2020
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10/11/2020 10:25:20 AM Y:\16501-17000\16916T - 270 CLAYTON ROAD, CLAYTON\DESIGN\SKETCH\SK09 (2020.11.10)\16916T-SK09.DWG



**ratio:**  
 RATIO CONSULTANTS PTY LTD  
 ABN 005 422 104  
 8 GWYNNE STREET  
 CREMORNE, VICTORIA 3121  
 TELEPHONE (03)9429 3111  
 FACSIMILE (03)9429 3011

**B85 Vehicle (AS/NZS2890.1:2004)**

VEHICLE ENVELOPE (FORWARD)  
 300mm CLEARANCE (FORWARD)  
 VEHICLE ENVELOPE (REVERSE)  
 300mm CLEARANCE (REVERSE)

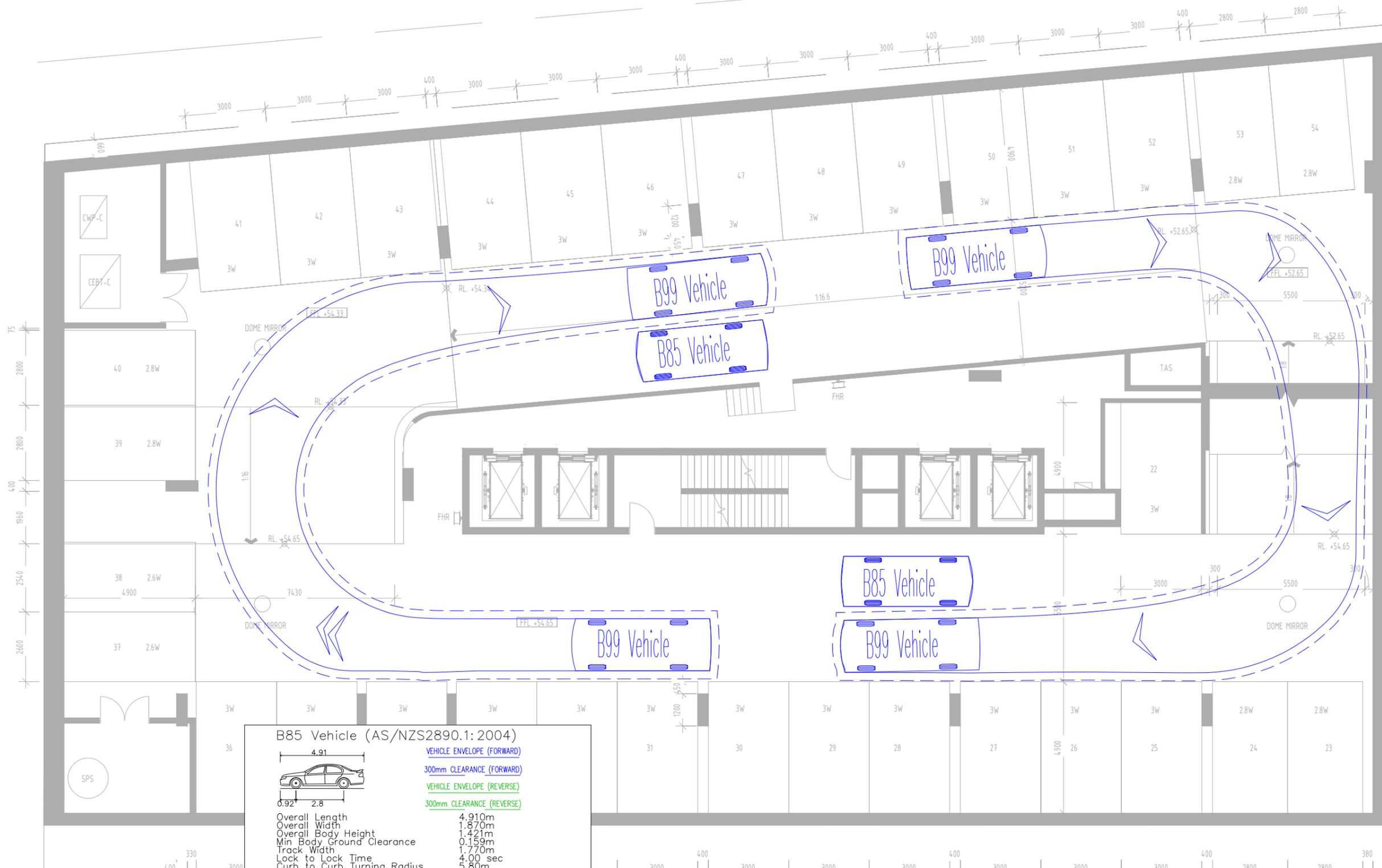
Overall Length 4.91m  
 Overall Width 1.87m  
 Overall Body Height 1.421m  
 Min Body Ground Clearance 0.159m  
 Track Width 1.770m  
 Lock to Lock Time 4.00 sec  
 Curb to Curb Turning Radius 5.80m

Proposed Mixed-Use Development  
 270 Clayton Road, Clayton  
 Swept Path Assessment – Basement 1

NOTE:  
 1) Base Plan Supplied by BG Architecture on 2020.11.10  
 2) Maximum Design Speed 10km/h

RATIO REFERENCE 16916T-SK09/SN	SHEET No. 4 of 17	SCALE 1:150@A3	DATE 10/11/2020
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B85 Vehicle (AS/NZS2890.1: 2004)	
	VEHICLE ENVELOPE (FORWARD)
	VEHICLE ENVELOPE (REVERSE)
Overall Length	4.91m
Overall Width	1.870m
Overall Body Height	1.421m
Min. Body Ground Clearance	0.159m
Track Width	1.770m
Lock to Lock Time	4.00 sec
Curb to Curb Turning Radius	5.80m

B99 Vehicle (AS/NZS2890.1: 2004)	
	VEHICLE ENVELOPE (FORWARD)
	VEHICLE ENVELOPE (REVERSE)
Overall Length	5.200m
Overall Width	1.940m
Overall Body Height	2.200m
Min. Body Ground Clearance	0.312m
Track Width	1.840m
Lock to Lock Time	4.00 sec
Curb to Curb Turning Radius	6.30m

Proposed Mixed-Use Development  
 270 Clayton Road, Clayton  
 Swept Path Assessment – Basement 2

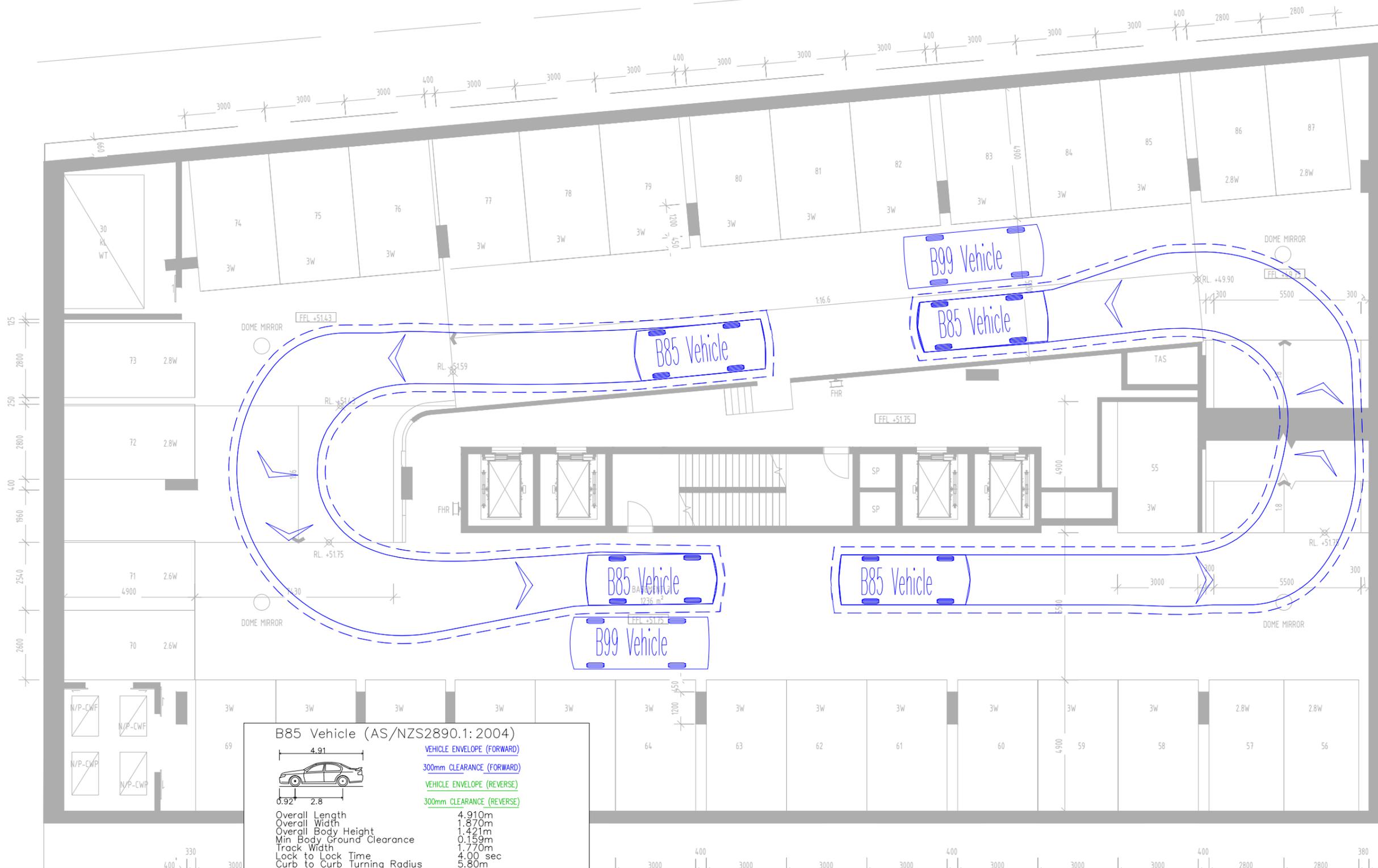
NOTE:  
 1) Base Plan Supplied by BG Architecture on 2020.11.10  
 2) Maximum Design Speed 10km/h

RATIO REFERENCE 16916T-SK09/SN	SHEET No. 5 of 17	SCALE 1:150@A3	DATE 10/11/2020
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**ratio:**

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 ABN 005 422 104  
 8 GWYNNE STREET  
 CREMORNE, VICTORIA 3121  
 TELEPHONE (03)9429 3111  
 FACSIMILE (03)9429 3011

**B85 Vehicle (AS/NZS2890.1:2004)**

	<b>VEHICLE ENVELOPE (FORWARD)</b>
	<b>300mm CLEARANCE (FORWARD)</b>
	<b>VEHICLE ENVELOPE (REVERSE)</b>
	<b>300mm CLEARANCE (REVERSE)</b>
Overall Length	4.910m
Overall Width	1.870m
Overall Body Height	1.421m
Min Body Ground Clearance	0.159m
Track Width	1.770m
Lock to Lock Time	4.00 sec
Curb to Curb Turning Radius	5.80m

**B99 Vehicle (AS/NZS2890.1:2004)**

	<b>VEHICLE ENVELOPE (FORWARD)</b>
	<b>300mm CLEARANCE (FORWARD)</b>
	<b>VEHICLE ENVELOPE (REVERSE)</b>
	<b>300mm CLEARANCE (REVERSE)</b>
Overall Length	5.200m
Overall Width	1.940m
Overall Body Height	2.200m
Min Body Ground Clearance	0.312m
Track Width	1.840m
Lock to Lock Time	4.00 sec
Curb to Curb Turning Radius	6.30m

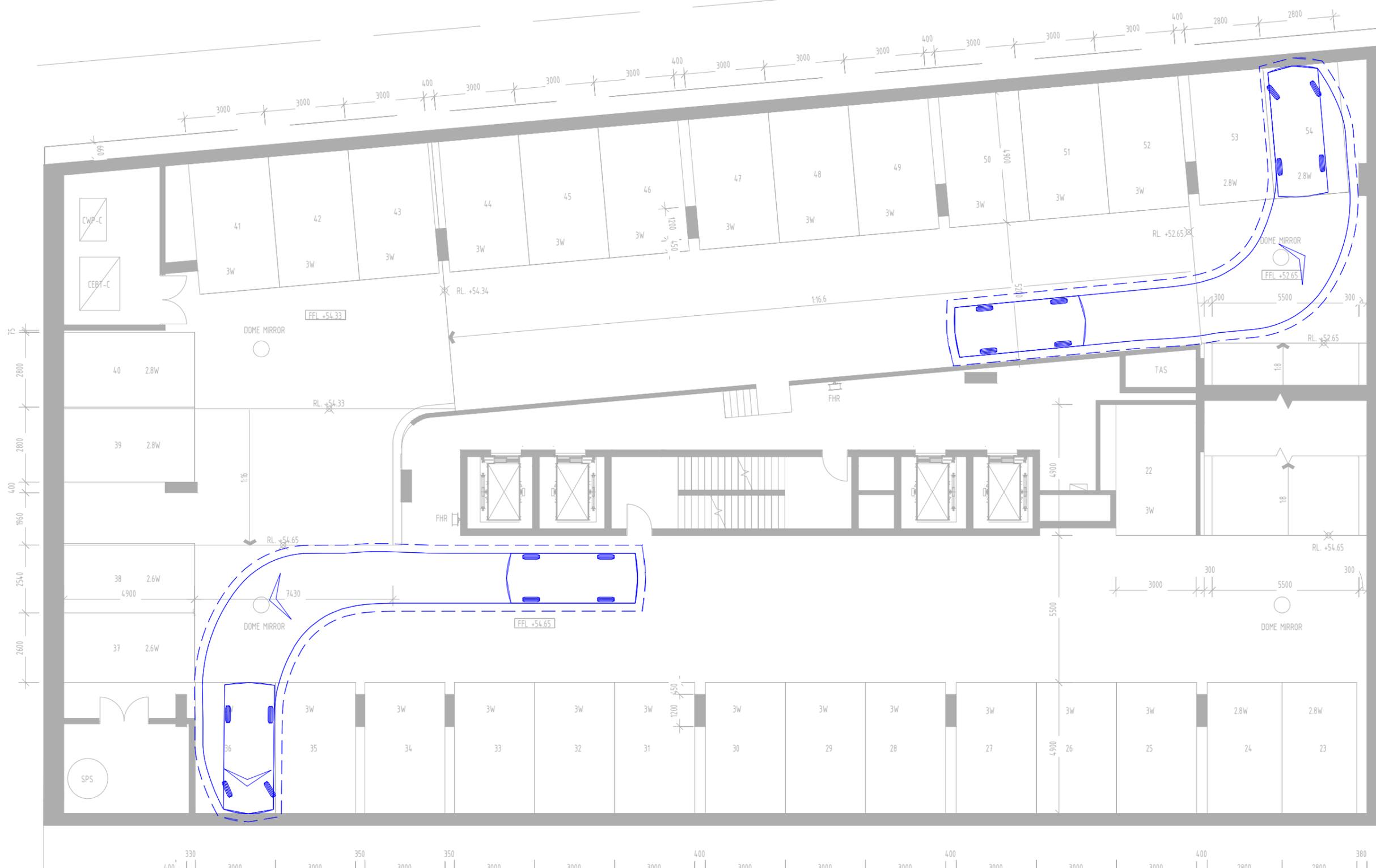
Proposed Mixed-Use Development  
 270 Clayton Road, Clayton  
 Swept Path Assessment – Basement 3

NOTE:  
 1) Base Plan Supplied by BG Architecture on 2020.11.10  
 2) Maximum Design Speed 10km/h

RATIO REFERENCE 16916T-SK09/SN	SHEET No. 6 of 17	SCALE 1:150@A3	DATE 10/11/2020
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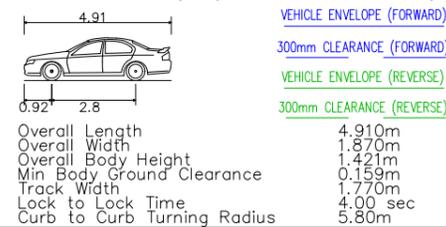
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# ratio:

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 TELEPHONE (03)9429 3111  
 FACSIMILE (03)9429 3011

**B85 Vehicle (AS/NZS2890.1:2004)**



Proposed Mixed-Use Development  
 270 Clayton Road, Clayton  
 Swept Path Assessment – Basement 2

NOTE:  
 1) Base Plan Supplied by BG Architecture on 2020.11.10  
 2) Maximum Design Speed 10km/h

RATIO REFERENCE  
 16916T-SK09/SN

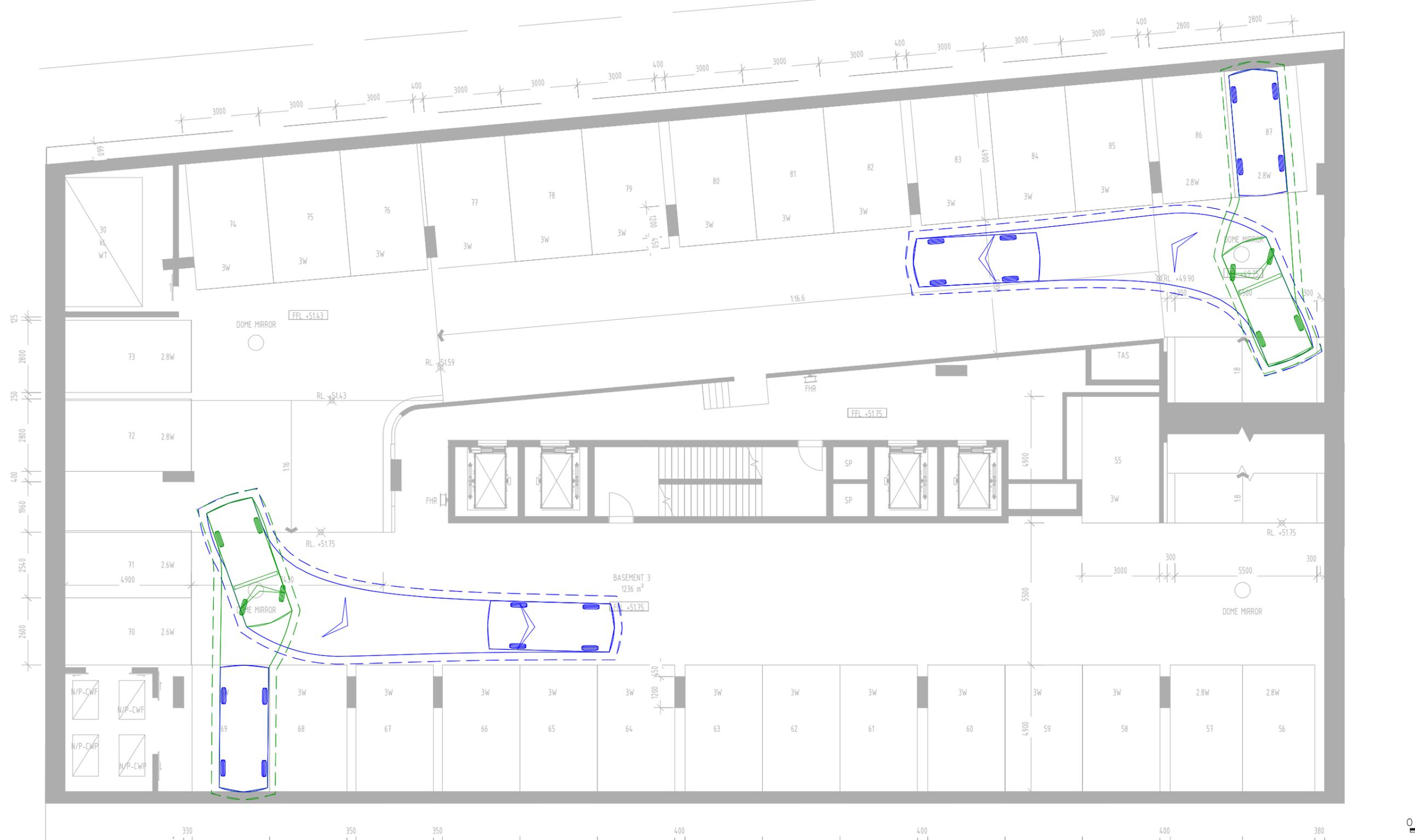
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 7 of 17

SCALE  
 1:150@A3

DATE  
 10/11/2020



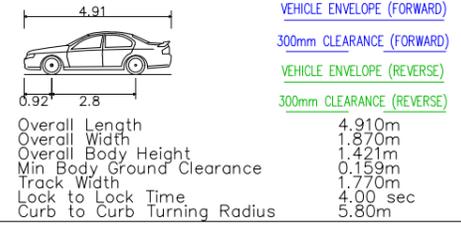
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# ratio:

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 FACSIMILE (03)9429 3011

**B85 Vehicle (AS/NZS2890.1:2004)**



Proposed Mixed-Use Development  
 270 Clayton Road, Clayton  
 Swept Path Assessment – Basement 3

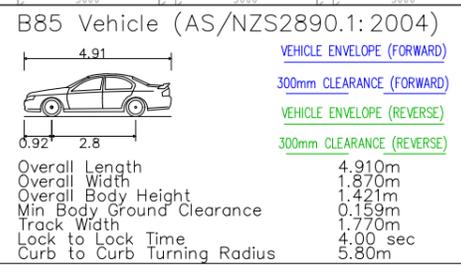
NOTE:  
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 2) Maximum Design Speed 10km/h

RATIO REFERENCE 16916T-SK09/SN	SHEET No. 8 of 17	SCALE 1:150@A3	DATE 10/11/2020
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**ratio:**  
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 ABN 005 422 104  
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 CREMORNE, VICTORIA 3121  
 TELEPHONE (03)9429 3111  
 FACSIMILE (03)9429 3011



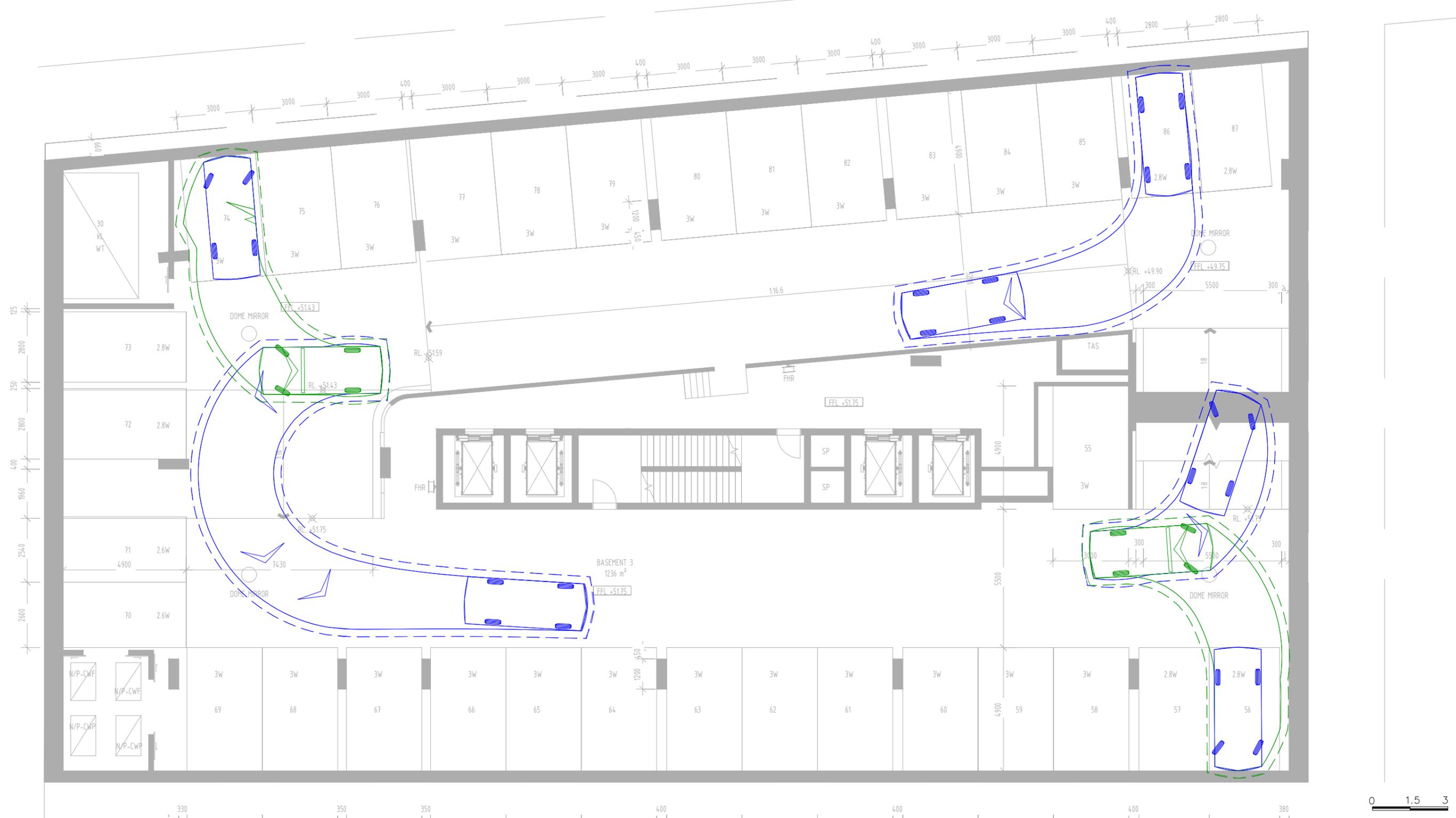
Proposed Mixed-Use Development  
 270 Clayton Road, Clayton  
 Swept Path Assessment – Basement 2

NOTE:  
 1) Base Plan Supplied by BG Architecture on 2020.11.10  
 2) Maximum Design Speed 10km/h

RATIO REFERENCE 16916T-SK09/SN	SHEET No. 9 of 17	SCALE 1:150@A3	DATE 10/11/2020
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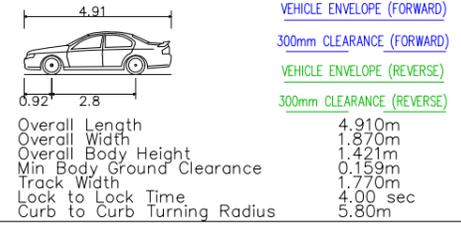
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**ratio:**

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 8 GWYNNE STREET  
 CREMORNE, VICTORIA 3121  
 TELEPHONE (03)9429 3111  
 FACSIMILE (03)9429 3011

B85 Vehicle (AS/NZS2890.1:2004)



Proposed Mixed-Use Development  
 270 Clayton Road, Clayton  
 Swept Path Assessment – Basement 3

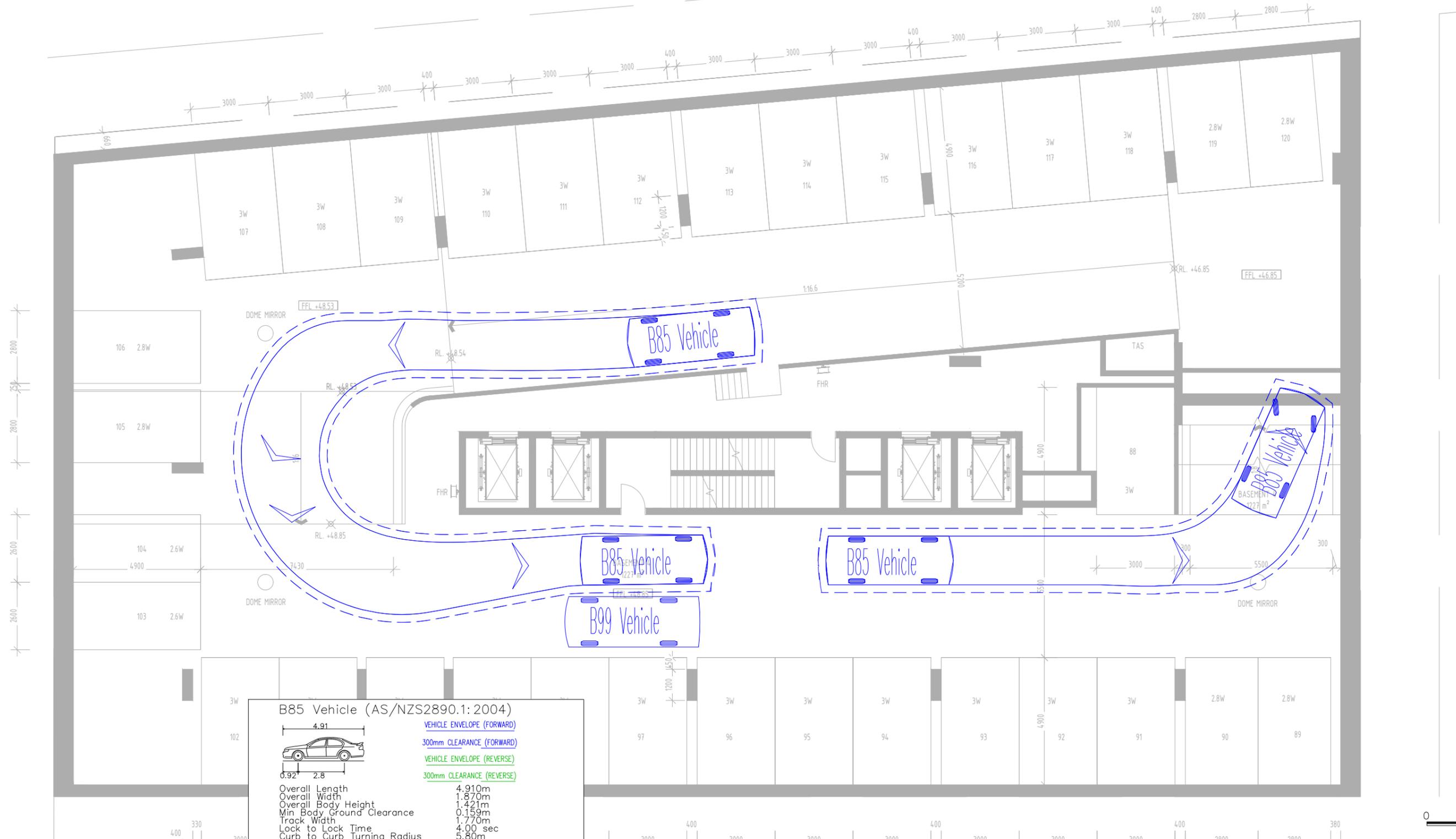
NOTE:  
 1) Base Plan Supplied by BG Architecture on 2020.11.10  
 2) Maximum Design Speed 10km/h

RATIO REFERENCE 16916T-SK09/SN	SHEET No. 10 of 17	SCALE 1:150@A3	DATE 10/11/2020
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B85 Vehicle (AS/NZS2890.1: 2004)	
	VEHICLE ENVELOPE (FORWARD)
	VEHICLE ENVELOPE (REVERSE)
Overall Length	4.910m
Overall Width	1.870m
Overall Body Height	1.421m
Min. Body Ground Clearance	0.159m
Track Width	1.770m
Lock to Lock Time	4.00 sec
Curb to Curb Turning Radius	5.80m
300mm CLEARANCE (FORWARD)	
300mm CLEARANCE (REVERSE)	

B99 Vehicle (AS/NZS2890.1: 2004)	
	VEHICLE ENVELOPE (FORWARD)
	VEHICLE ENVELOPE (REVERSE)
Overall Length	5.200m
Overall Width	1.940m
Overall Body Height	2.200m
Min. Body Ground Clearance	0.312m
Track Width	1.840m
Lock to Lock Time	4.00 sec
Curb to Curb Turning Radius	6.30m
300mm CLEARANCE (FORWARD)	
300mm CLEARANCE (REVERSE)	

Proposed Mixed-Use Development  
 270 Clayton Road, Clayton  
 Swept Path Assessment – Basement 4

NOTE:  
 1) Base Plan Supplied by BG Architecture on 2020.11.10  
 2) Maximum Design Speed 10km/h

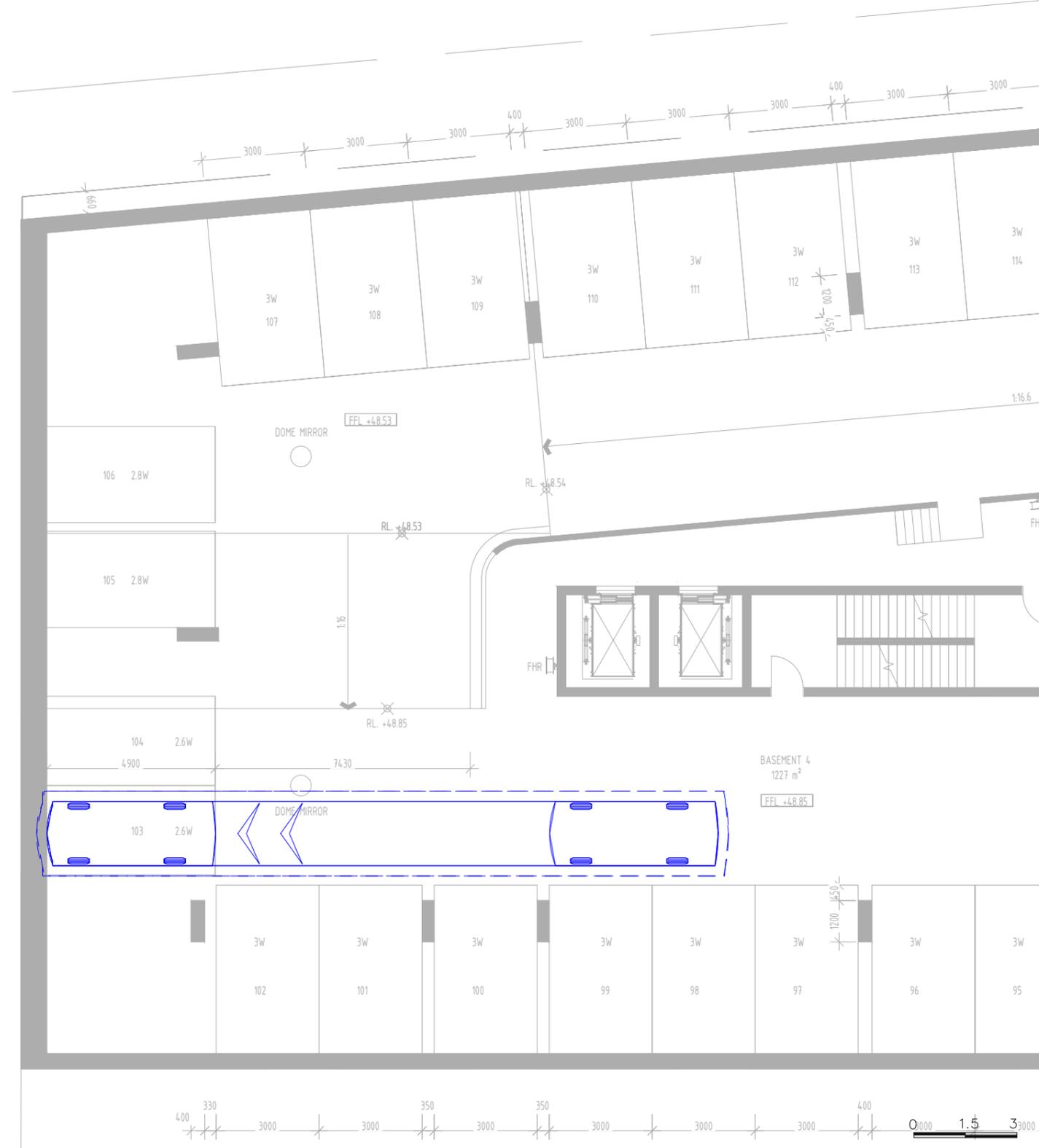
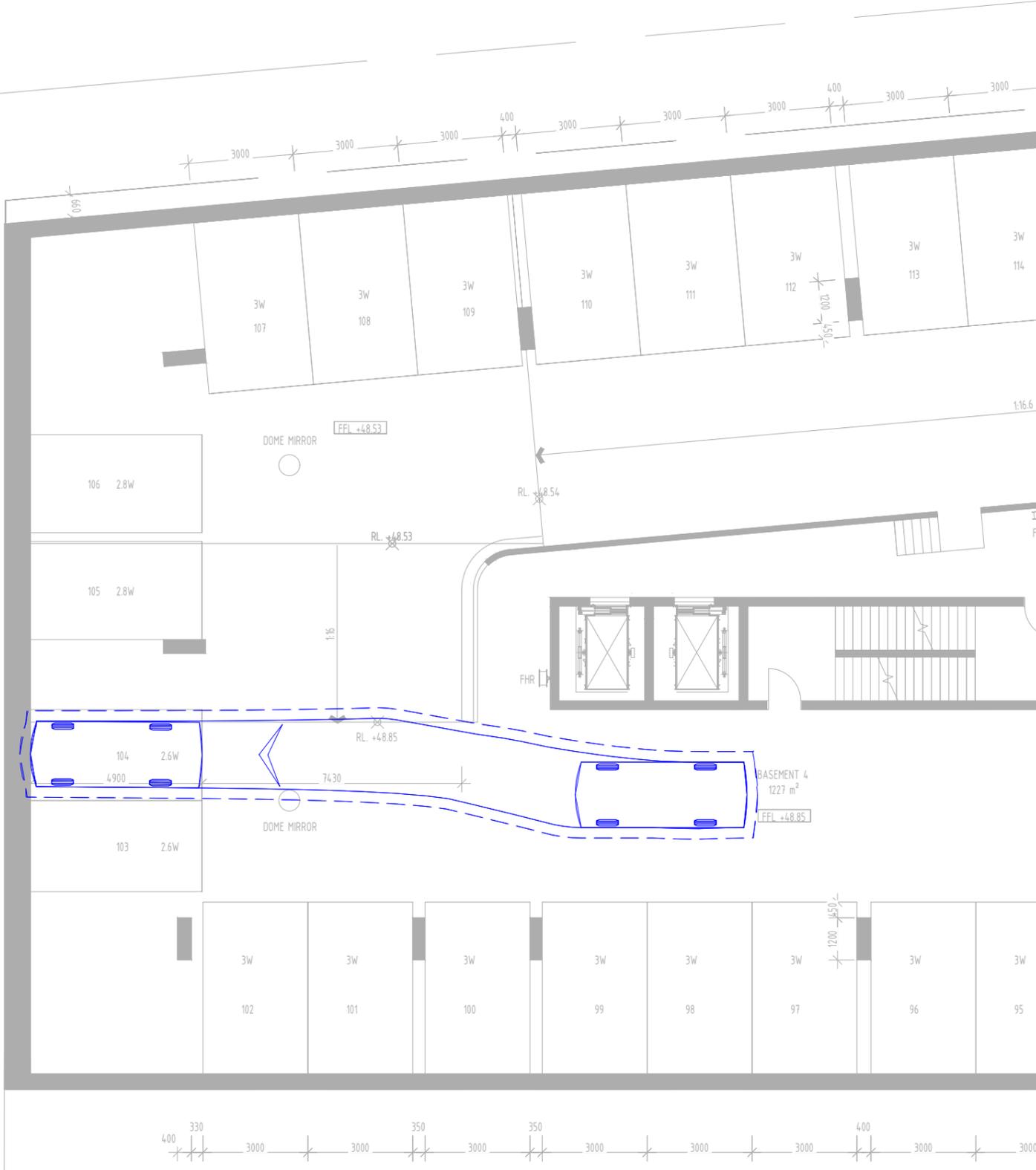
RATIO REFERENCE 16916T-SK09/SN	SHEET No. 12 of 17	SCALE 1:150@A3	DATE 10/11/2020
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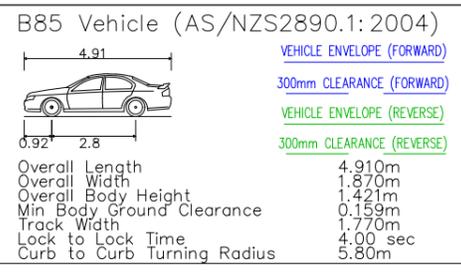
RATIO CONSULTANTS PTY LTD  
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 8 GWYNNE STREET  
 CREMORNE, VICTORIA 3121  
 TELEPHONE (03)9429 3111  
 FACSIMILE (03)9429 3011



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**ratio:**  
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 8 GWYNNE STREET  
 CREMORNE, VICTORIA 3121  
 TELEPHONE (03)9429 3111  
 FACSIMILE (03)9429 3011



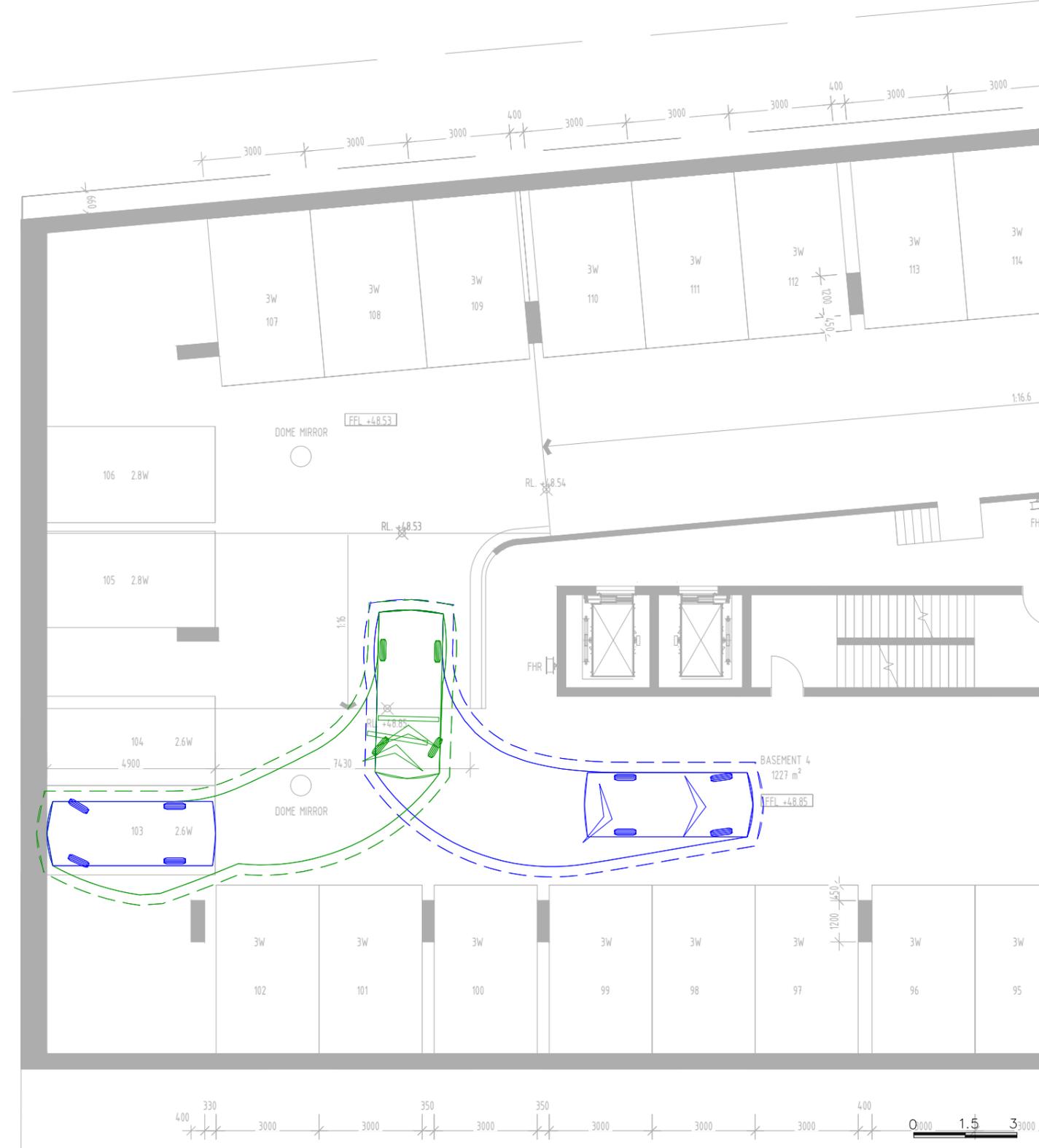
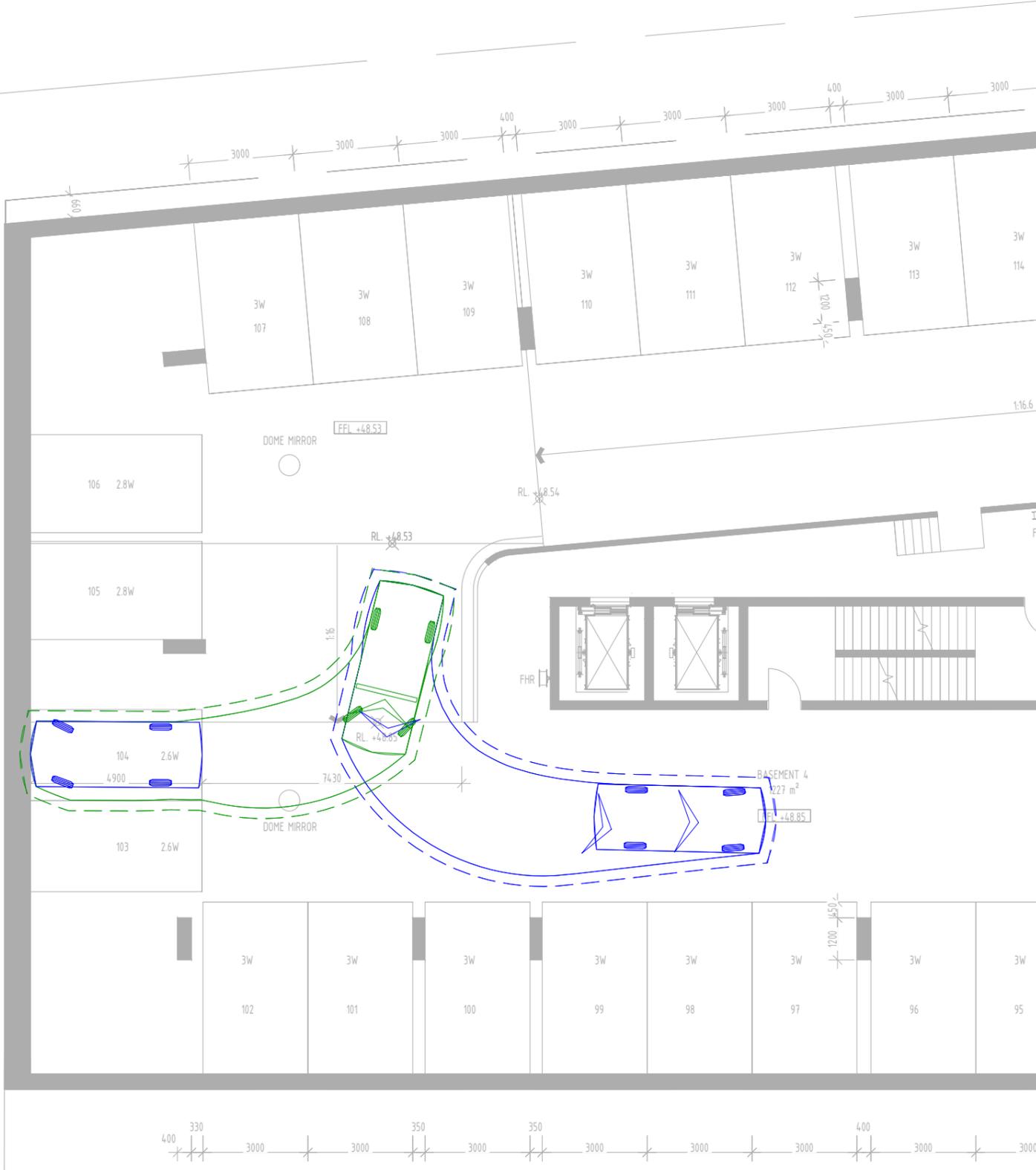
Proposed Mixed-Use Development  
 270 Clayton Road, Clayton  
 Swept Path Assessment – Basement 4

NOTE:  
 1) Base Plan Supplied by BG Architecture on 2020.11.10  
 2) Maximum Design Speed 10km/h

RATIO REFERENCE 16916T-SK09/SN	SHEET No. 13 of 17	SCALE 1:150@A3	DATE 10/11/2020
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**ratio:**  
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 ABN 005 422 104  
 8 GWYNNE STREET  
 CREMORNE, VICTORIA 3121  
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 FACSIMILE (03)9429 3011

**B85 Vehicle (AS/NZS2890.1:2004)**

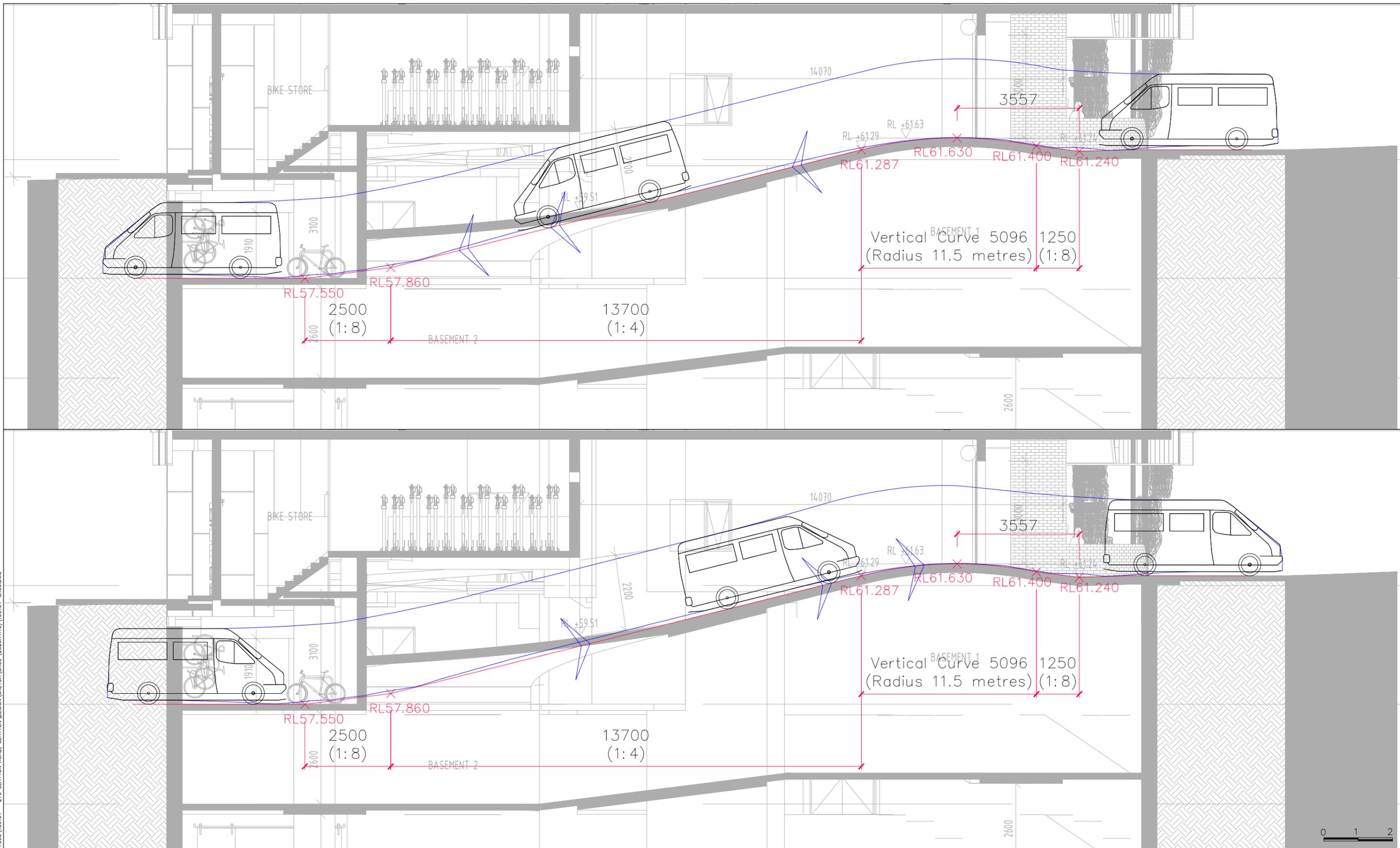
	<p>VEHICLE ENVELOPE (FORWARD)          300mm CLEARANCE (FORWARD)          VEHICLE ENVELOPE (REVERSE)          300mm CLEARANCE (REVERSE)</p>
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Proposed Mixed-Use Development  
 270 Clayton Road, Clayton  
 Swept Path Assessment – Basement 4

NOTE:  
 1) Base Plan Supplied by BG Architecture on 2020.11.10  
 2) Maximum Design Speed 10km/h

RATIO REFERENCE 16916T-SK09/SN	SHEET No. 14 of 17	SCALE 1:150@A3	DATE 10/11/2020
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**ratio:**  
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 ABN 005 422 104  
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 CREMORNE, VICTORIA 3121  
 TELEPHONE (03)9429 3111  
 FACSIMILE (03)9429 3011

B99 Vertical Model (AS/NZS2890.1:2004)

Overall Length	5.200m
Overall Width	1.940m
Overall Body Height	2.200m
Min Body Ground Clearance	0.120m
Track Width	1.840m
Lock to Lock Time	4.00 sec
Curb to Curb Turning Radius	8.000m

Proposed Mixed-Use Development  
 270 Clayton Road, Clayton  
 Swept Path Assessment

NOTE:  
 1) Base Plan Supplied by BG Architecture on 2020.11.10  
 2) Maximum Design Speed 10km/h

RATIO REFERENCE 16916T-SK09/XX	SHEET No. 15 of 17	SCALE 1:100@A3	DATE 10/11/2020
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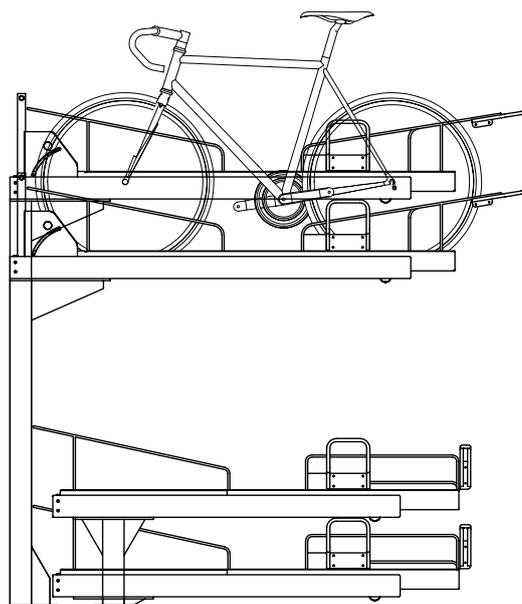
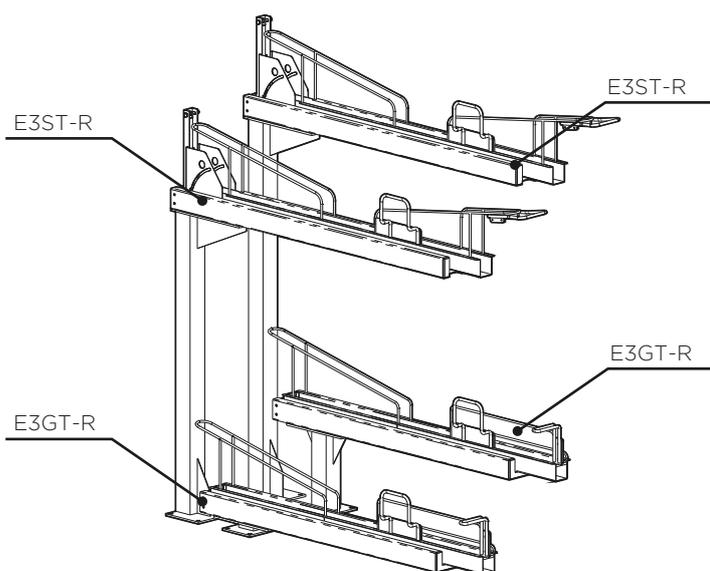


# Appendix C Bicycle Parking Specifications

# Bike Rack Installation Instructions

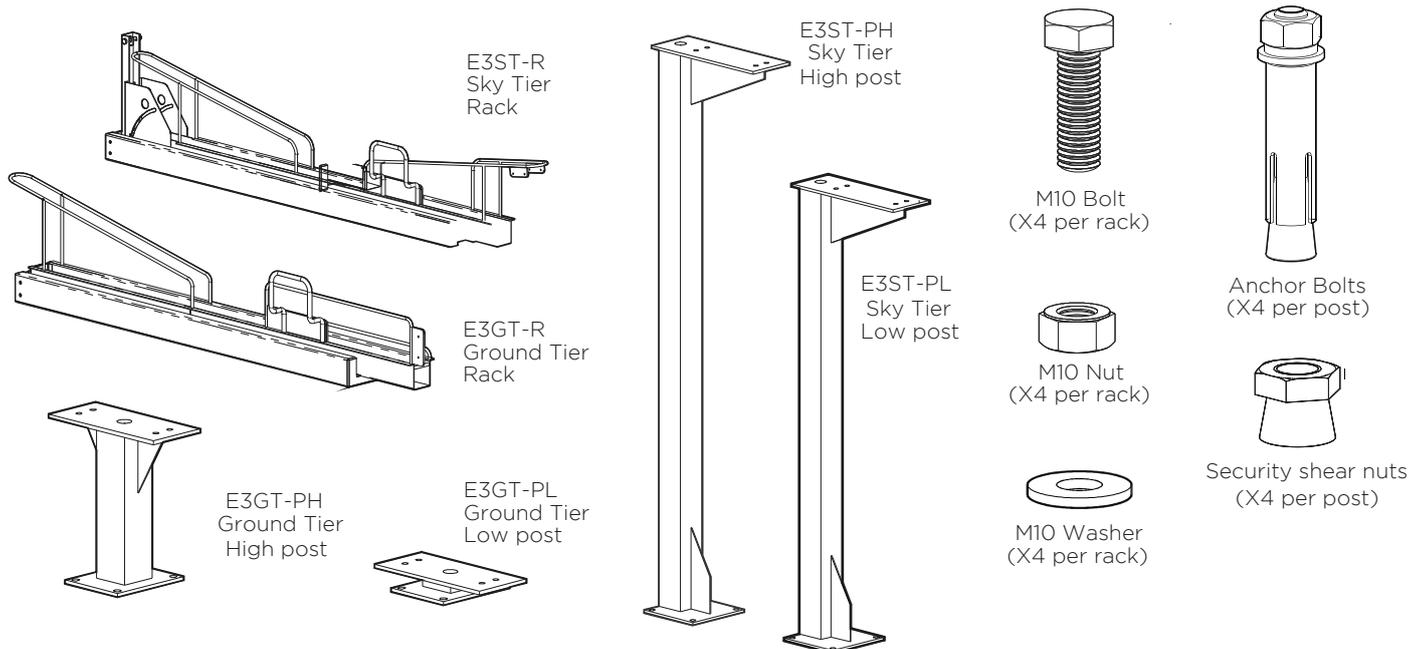
## Cora Bike Rack - E3DT-GT Rack Series

This instruction sheet is to be used for the E3DT-GT Series Rack.



Cora - E3DT-GT Bike Rack Series

Components for E3GT Rack used in assembly



### 1. Site selection

When selecting a site for your new bicycle rack, the most important advice is - **do not try to hide it, as it will not be used!** Suitable locations include;

- Adjacent to entrance doors and in line of sight of a window
- Near high pedestrian traffic
- A flat location at the same surface level which cyclists use for access
- Covered areas

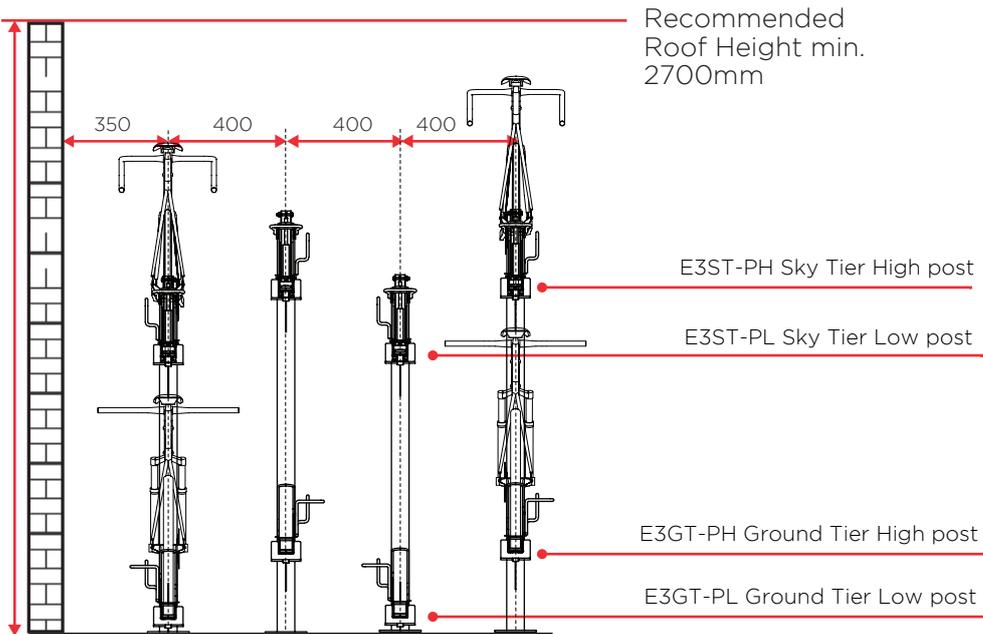
Other things to remember;

- Where a rack is being installed at an existing location, the rack should be placed where bicycles are currently parked
- When using a garage location, it is recommended to use a parking bay that is adjacent to an end wall nearest to an entrance door.

# Bike Rack Installation Instructions

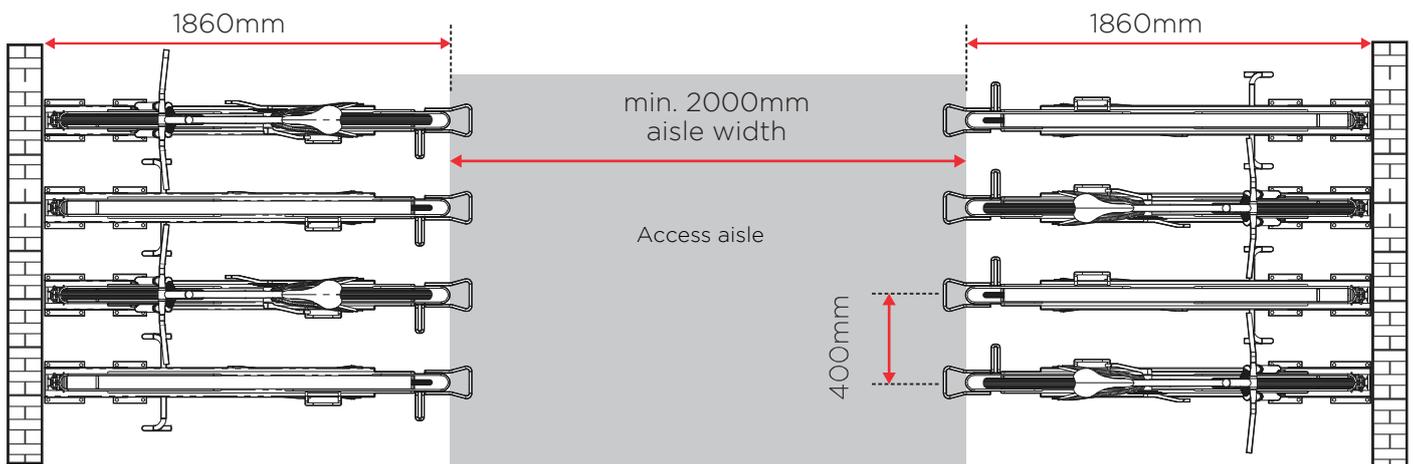
## Cora Bike Rack - E3DT-GT Rack Series

### 2. Access and clearance



For Multiple mounted racks

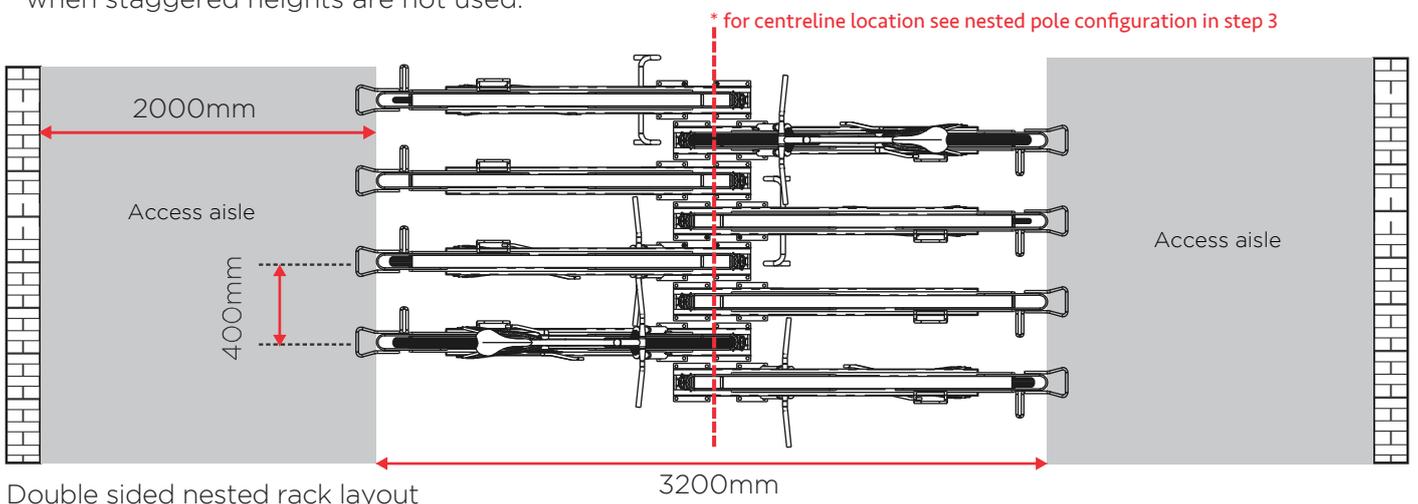
- If multiple racks are mounted in a row. Racks must be alternated in height. Alternate use of E3GT-PL and E3GT-PH and E3ST-PL and E3ST-PH.



Single sided, double row layout

To comply with AS2890.3 (2015) minimum 400mm spacing between post centres and to edge of walls or other obstructions.

Spacing of 500mm between posts will increase ease of use. Minimum spacing of 700mm recommended when staggered heights are not used.

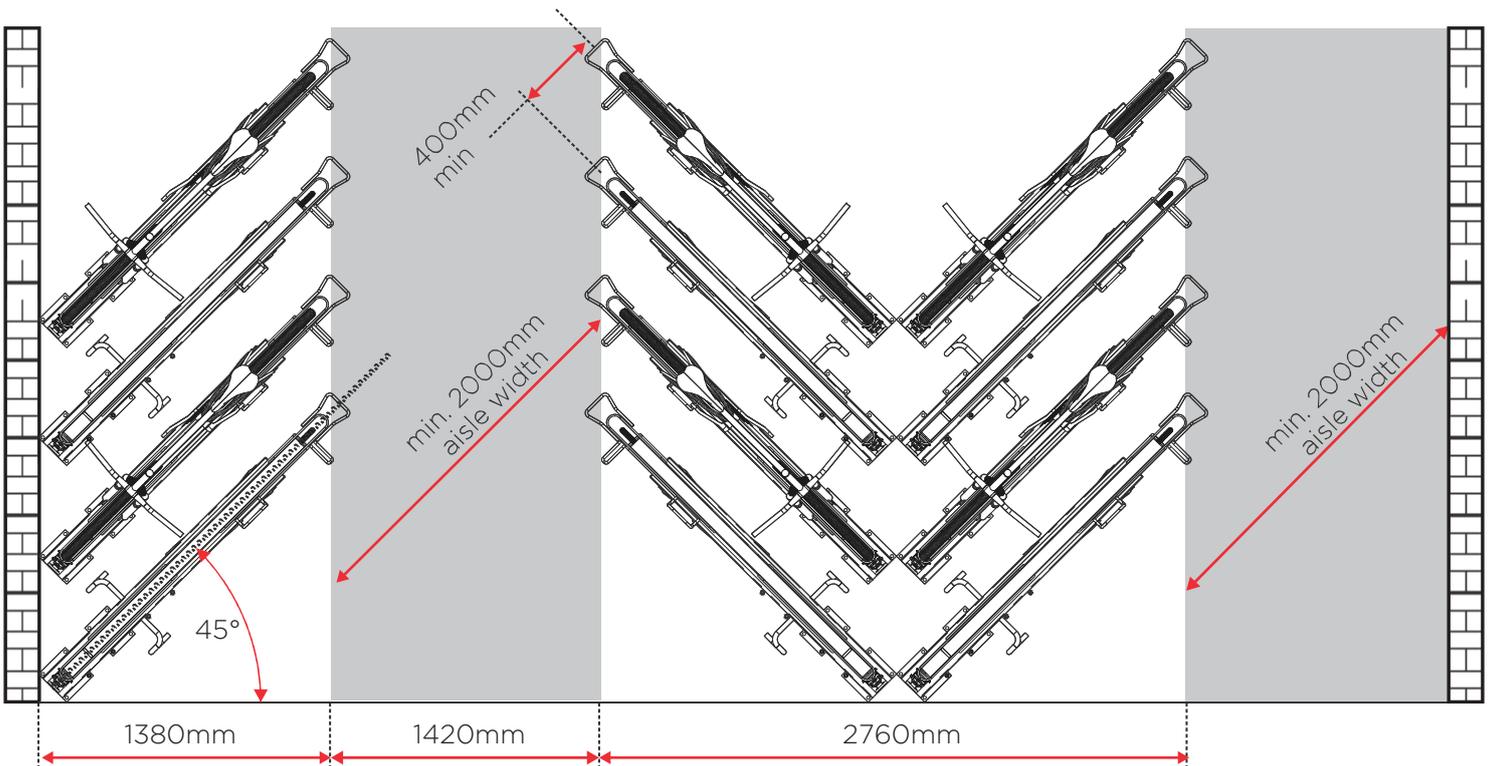


Double sided nested rack layout

# Bike Rack Installation Instructions

## Cora Bike Rack - E3DT-GT Rack Series

### 2. Access and clearance



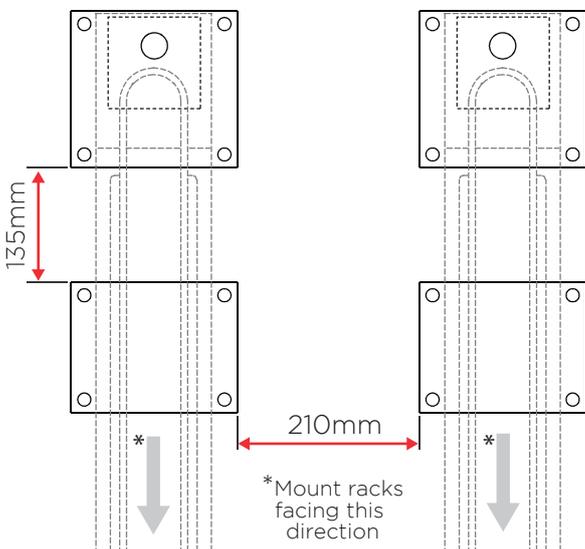
Single sided, double row at 45deg angle layout

#### Access dimensions around racks

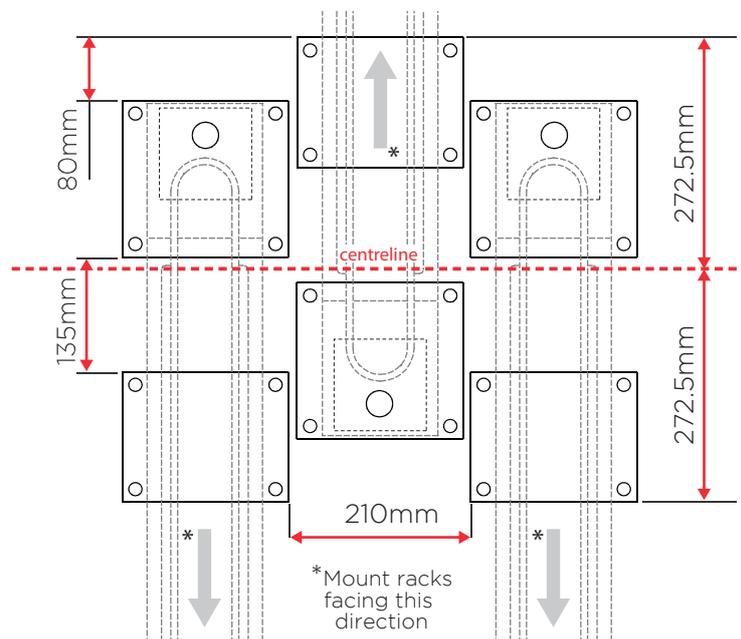
- Before mounting rack, find a suitable place that will allow for minimum spacing dimensions
- Ensure min distance of 2000mm is provided for correct aisle space and access for bikes
- Ensure minimum spacing from walls, other racks or obstructions to allow for minimum access
- In multiple rack instal, racks may be mounted in an staggered cluster, nested cluster, or angle cluster and as a single or double level. See product specification sheets for alternate mounting options. Can be found at [cora.com.au](http://cora.com.au)

### 3. Locate, and configure in suitable location

Mounting pole configuration for spacing posts, for single rows of racks, looking from top



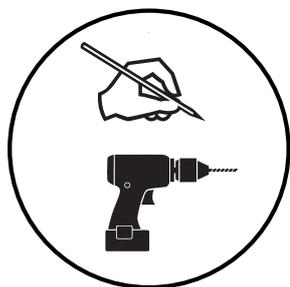
Mounting pole configuration for spacing posts, for nested rows of racks, looking from top



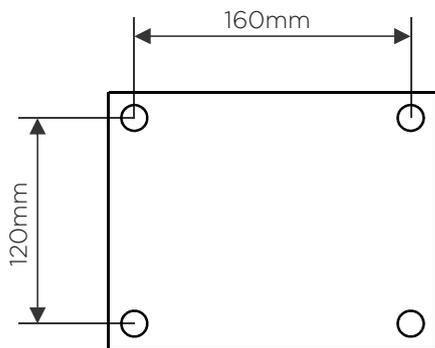
# Bike Rack Installation Instructions

## Cora Bike Rack - E3DT-GT Rack Series

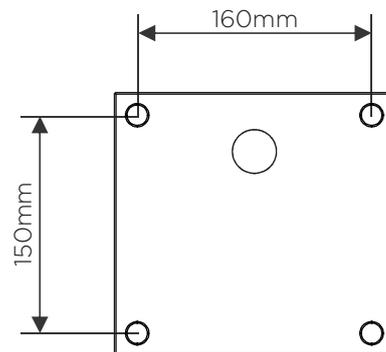
### 4. Drill in location



Dimensions for E3GT drill holes



Dimensions for E3ST drill holes



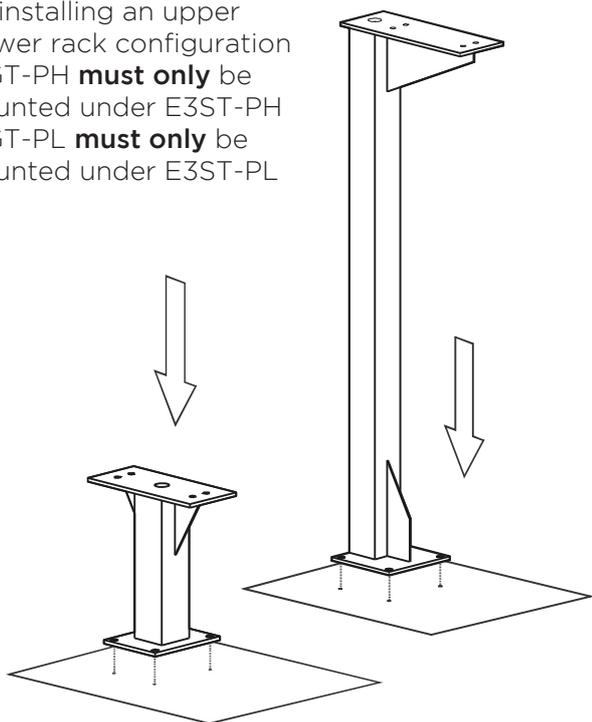
- Use dimensions above for anchor bolt drill hole locations
- Drill or core hole 13mm diameter and 80mm min. depth

### 5. Fix posts to floor

- Locate posts in position
- Insert four (x4) anchor bolts into holes in each post ensuring washer is firmly against post base plate
- Tighten anchor bolts with standard supplied nut
- Gently remove standard nut from anchor and replace with four (X4) shear nuts (optional use)
- Tighten shear nuts until head snaps off

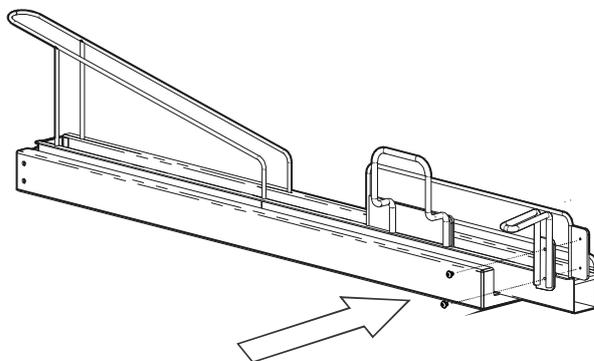
When installing an upper and lower rack configuration

- E3GT-PH **must only** be mounted under E3ST-PH
- E3GT-PL **must only** be mounted under E3ST-PL



### 6. Fix pull handle to racks

This step is only necessary if the handle is **NOT** already attached.

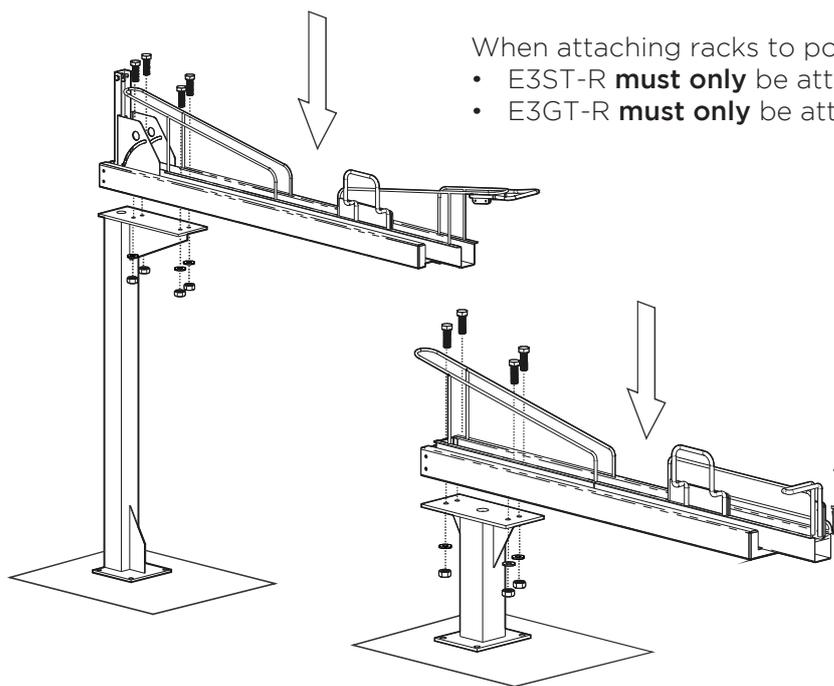


- Fix one pull handle to the rear bracket of each rack
- Use supplied security screws with one (1) screw and one (1) washer per hole. A total of four (4) screws should be used to fix handle

# Bike Rack Installation Instructions

## Cora Bike Rack - E3DT-GT Rack Series

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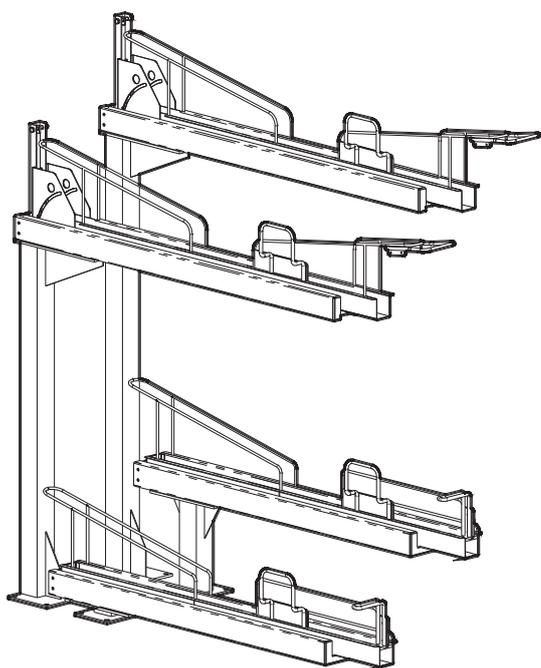
When attaching racks to posts

- E3ST-R **must only** be attached sky tier posts (E3ST-PH or E3ST-PL)
- E3GT-R **must only** be attached ground tier posts (E3GT-PH or E3GT-PL)

- Fix one rack to the top of each mounted pole
- Use supplied M10 bolt, nut and washer, with one (x1) screw and one (x1) washer per hole. A total of four (x4) bolts should be used to fix each rack to each post

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### 8. Installation complete



Installation of the Cora E3DT- GT Series Rack is now complete



**CORA**  
BIKERACK

PH 1800 249 878

sales@cora.com.au

www.cora.com.au

# Arc de Triomphe™



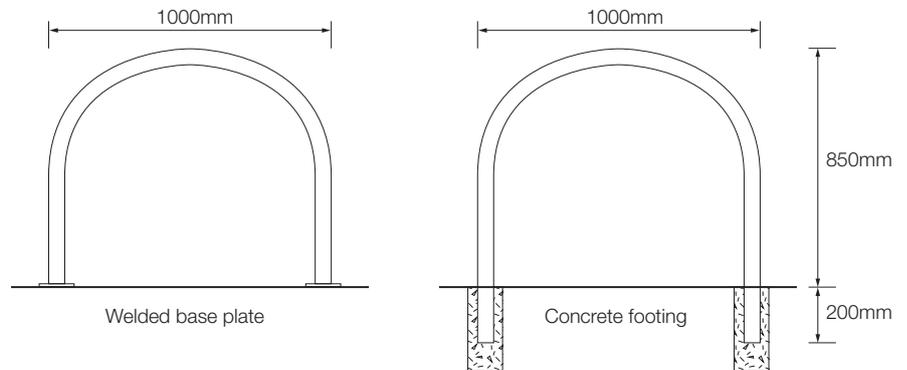
Galvanised finish / Stainless Steel finish

## Features



- Each rail supports two adult bikes in an upright position
- Can be either bolted to a concrete slab or concreted in situ
- Available in stainless steel or galvanised steel
- Provides the ability to lock both wheels and frame
- Suitable for foyers and entry areas

## Dimensions



## Specifications

### Material options

- Galvanised (Duragal)
- 316 Marine grade stainless steel

### Fixing options

- Welded flange - Bolt on
- In situ

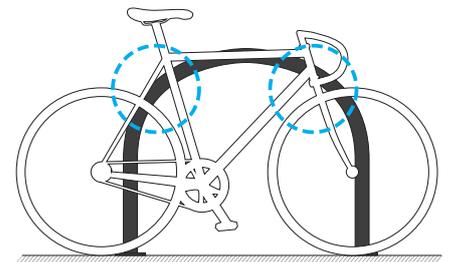
### Recommended fasteners

- Galvanised Dynabolts (M10 x 65mm)
- Stainless Dynabolts (M10 x 65mm)
- Shear Nut security fasteners

### Dimensions

1000mm [w] x 850mm [h]

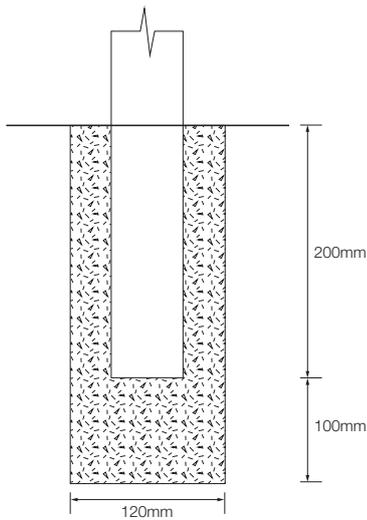
## Locking Points



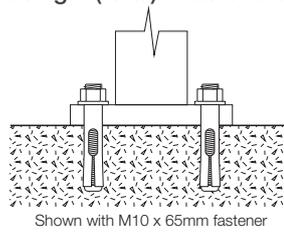
V4.1 - 1/05/2017 | Specification may be subject to change without notice. ©Bicycle Network

## Fixing options

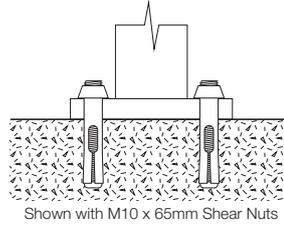
In situ (Concrete footing)



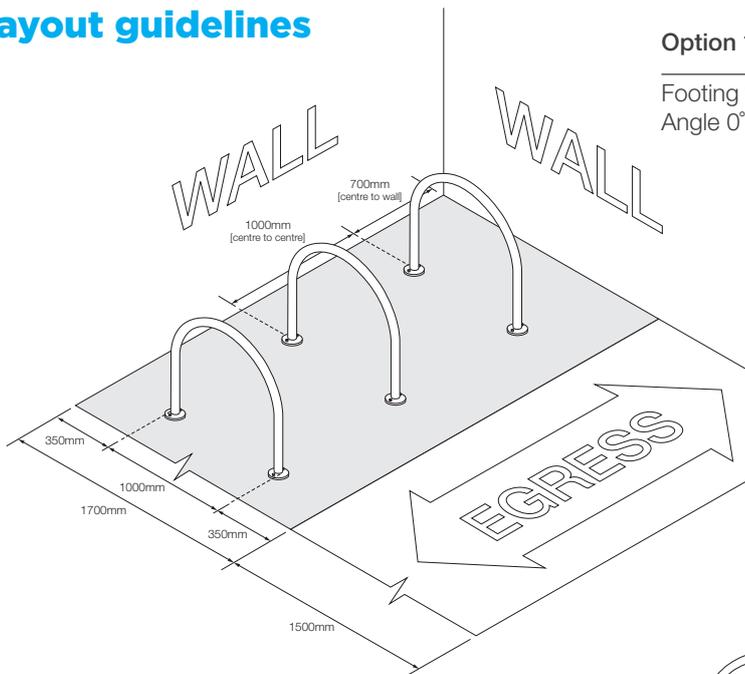
Welded flange (Bolt on)  
using 4 (total) x fasteners



Welded flange (Security heads)  
using 4 (total) x fasteners



## Layout guidelines

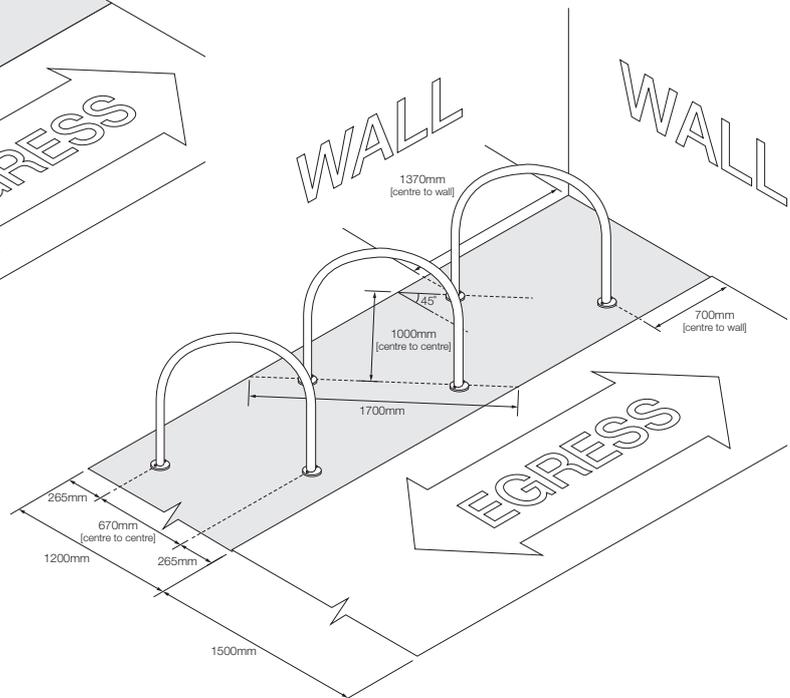


Option 1:

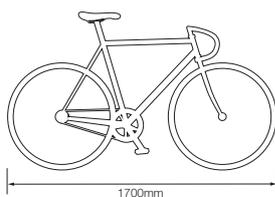
Footing Width 1700mm  
Angle 0°

Option 2:

Footing Width 1200mm  
Angle 45°



Typical Bicycle Length



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# Ned Kelly™



Zinc finish



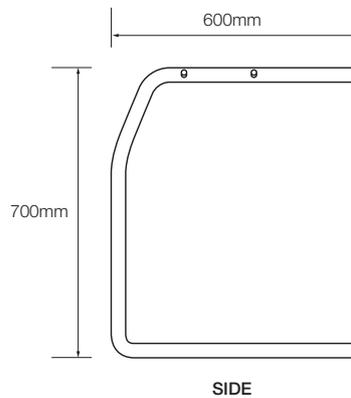
Black powder coat finish

## Features



- Each rail provides storage for a single bike
- Suits bikes with full length mud guards
- Available in Zinc finish or Black powder coat over mild steel
- Provides the ability to lock the main frame and one wheel
- Support prongs with protective coating prevent damage to rim
- Can be used with custom framing - no wall needed

## Dimensions



## Specifications

### Material options

- Zinc finish
- Black powder coat over mild steel
- Stainless steel - *Pre-order only*

### Fixing options

- Bolt on to wall
- Fixed to support framing

### Recommended fasteners - wall

- Dynabolts (M8 x 40mm)
- Shear Nut security fasteners

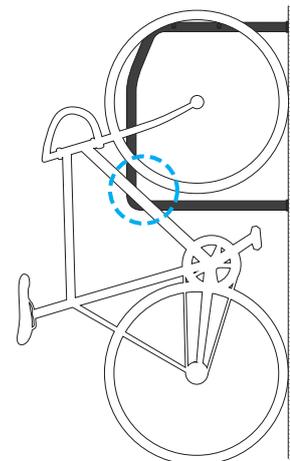
### Recommended fasteners - framing

- Bolt and nut (M10 x 60mm)
- Tek screws

### Dimensions

125mm [w] x 700mm [h] x 600mm [d]

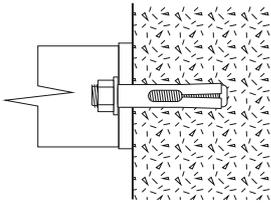
## Locking Points



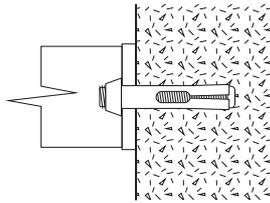
V4.1 - 1/05/2017 | Specification may be subject to change without notice. ©Bicycle Network

# Fixing options

## Fix to a wall using 4x fasteners or Shear Nuts

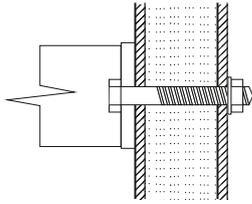


Shown with M8 x 40mm fastener

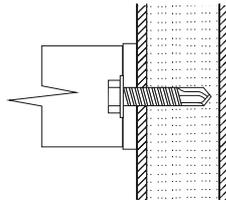


Shown with M8 x 40mm Shear Nuts

## Fix to a frame using 4x bolts or Tek Screws



Shown with M10 x 60mm Bolt, Washer & Nut

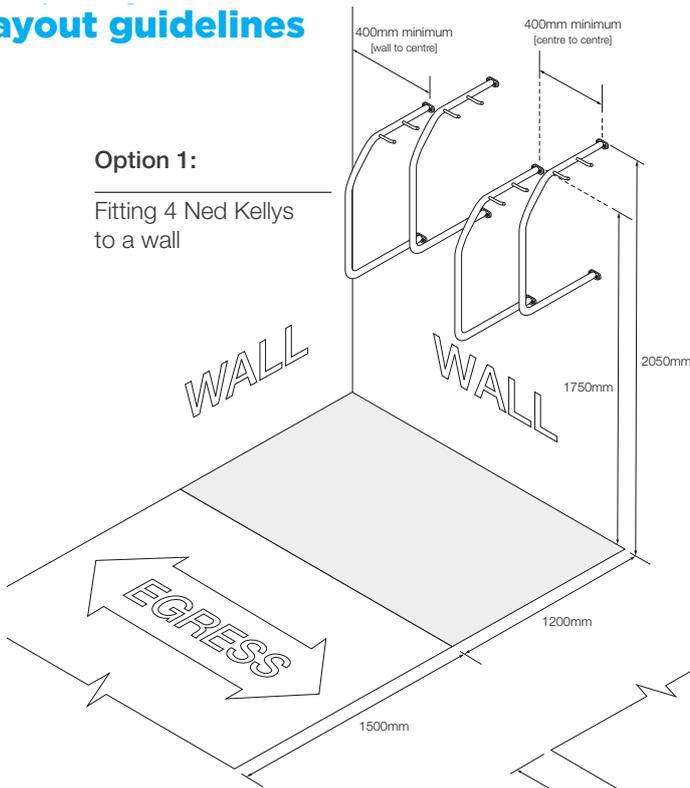


Shown with Tek Screw

# Layout guidelines

### Option 1:

Fitting 4 Ned Kellys to a wall

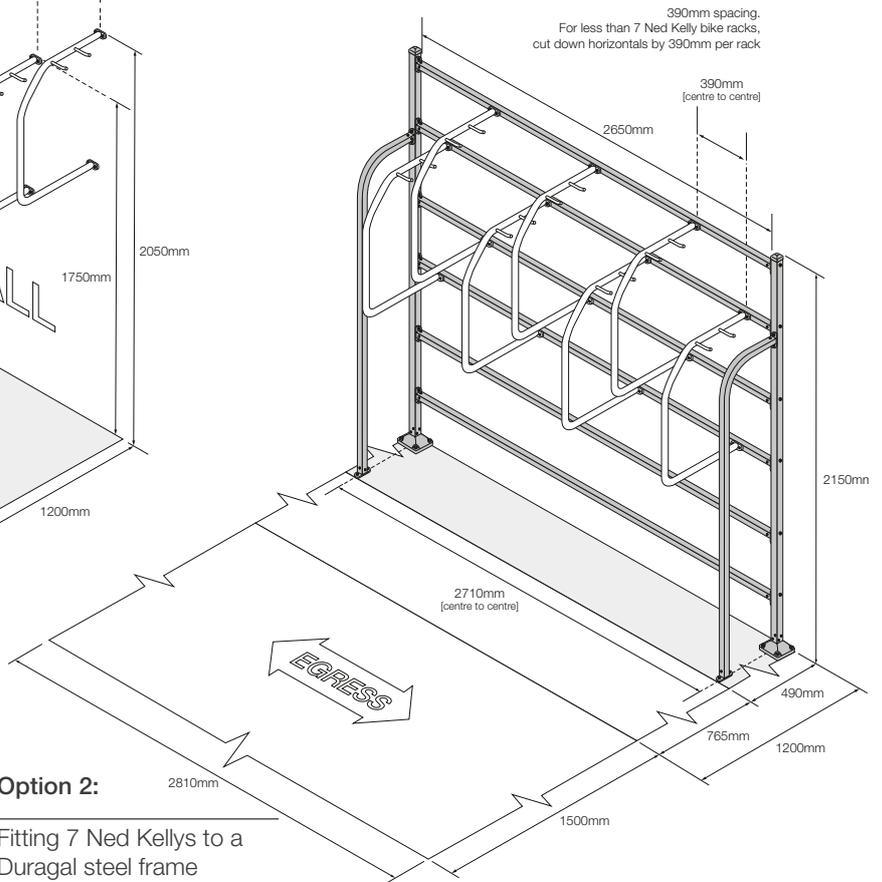


Typical Bicycle Length



### Option 2:

Fitting 7 Ned Kellys to a Duragal steel frame

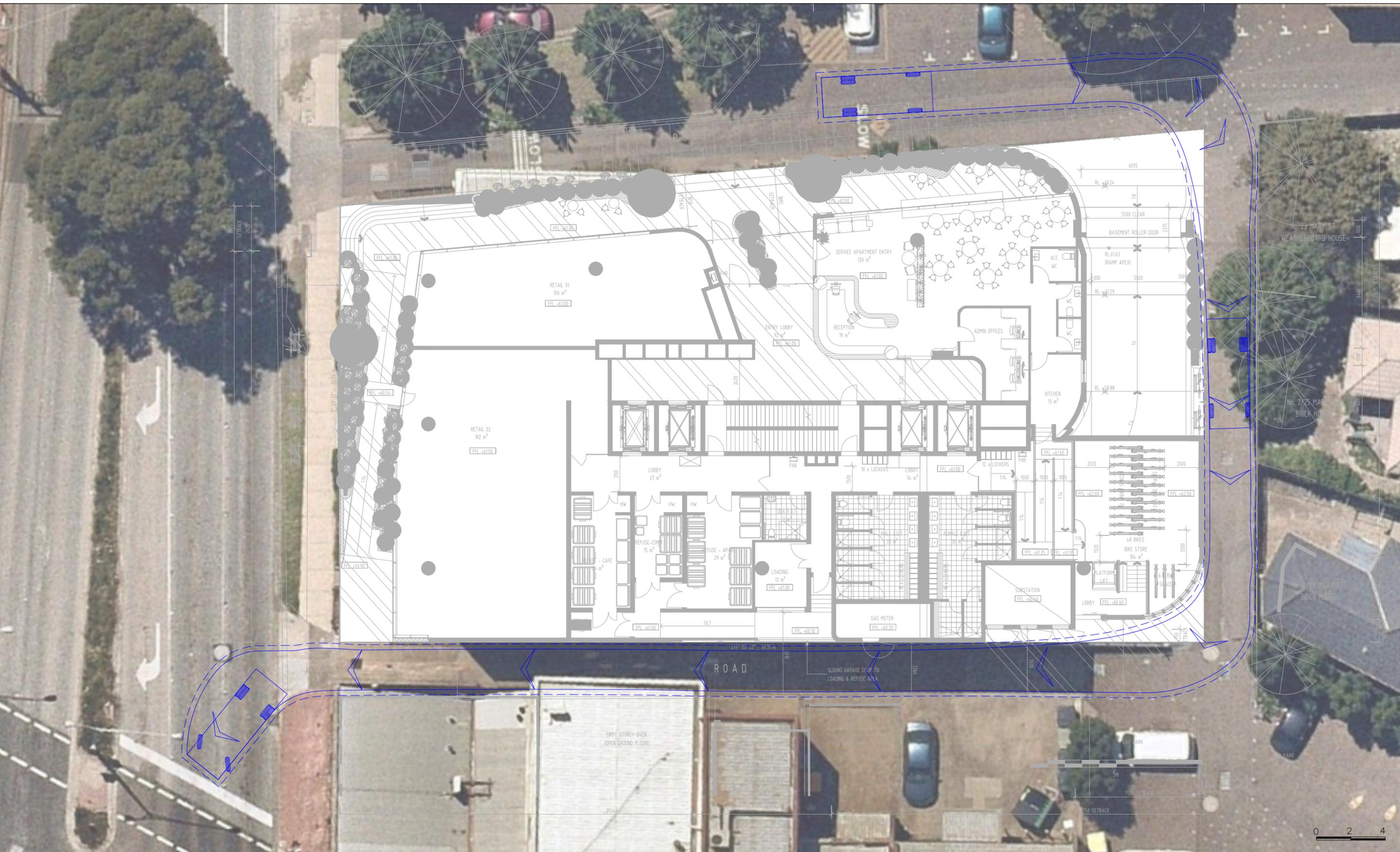


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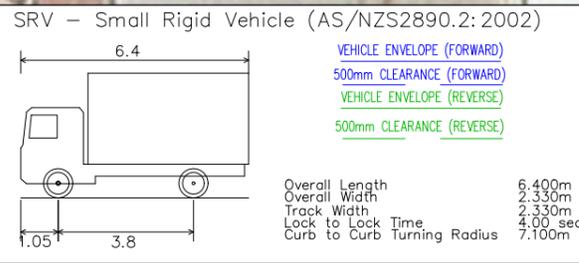


# Appendix D Service Vehicle Swept Paths

10/11/2020 10:25:48 AM V:\16501-17000\16916T - 270 CLAYTON ROAD, CLAYTON\DESIGN\SKETCH\SK09 (2020.11.10)\16916T-SK09.DWG



**ratio:**  
 RATIO CONSULTANTS PTY LTD  
 ABN 005 422 104  
 8 GWYNNE STREET  
 CREMORNE, VICTORIA 3121  
 TELEPHONE (03)9429 3111  
 FACSIMILE (03)9429 3011



Proposed Mixed-Use Development  
 270 Clayton Road, Clayton  
 Swept Path Assessment – Ground Floor (Loading)

NOTE:  
 1) Base Plan Supplied by BG Architecture on 2020.11.10  
 2) Maximum Design Speed 10km/h

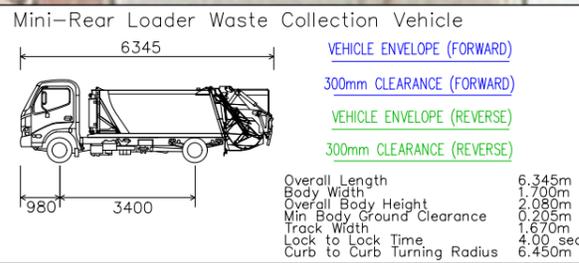
RATIO REFERENCE 16916T-SK09/SN	SHEET No. 16 of 17	SCALE 1:200@A3	DATE 10/11/2020
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10/11/2020 10:25:52 AM V:\16501-17000\16916T - 270 CLAYTON ROAD, CLAYTON\DESIGN\SKETCH\SK09 (2020.11.10)\16916T-SK09.DWG



**ratio:**  
 RATIO CONSULTANTS PTY LTD  
 ABN 005 422 104  
 8 GWYNNE STREET  
 CREMORNE, VICTORIA 3121  
 TELEPHONE (03)9429 3111  
 FACSIMILE (03)9429 3011



Proposed Mixed-Use Development  
 270 Clayton Road, Clayton  
 Swept Path Assessment – Ground Floor (Waste)

NOTE:  
 1) Base Plan Supplied by BG Architecture on 2020.11.10  
 2) Maximum Design Speed 10km/h

RATIO REFERENCE 16916T-SK09/SN	SHEET No. 17 of 17	SCALE 1:200@A3	DATE 10/11/2020
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