

Proposed Mixed Use Development at 2 Bowen Crescent, Melbourne

**Prepared For
WUZHONG ALBERT PTY LTD**

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G18745R-01B**

Traffic Engineering Assessment

2 Bowen Crescent, Melbourne: Proposed Mixed Use Development

Traffic Engineering Assessment

Proposed Mixed Use Development

at

2 Bowen Crescent, Melbourne

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1 Introduction

Traffix Group has been engaged by Wuzhong Albert Pty Ltd to prepare a traffic engineering report for a proposed mixed use development at 2 Bowen Crescent, Melbourne.

In preparing this report, the subject site and environs have been inspected, relevant parking data has been collected and reviewed, plans of the proposed development have been perused and the traffic engineering implications of the proposed development have been assessed.

2 Existing Conditions

2.1 Subject Site

The subject site is located on the northwestern side of Bowen Crescent approximately 50m to the southwest of St Kilda Road in Melbourne, as shown in the locality plan in Figure 1.

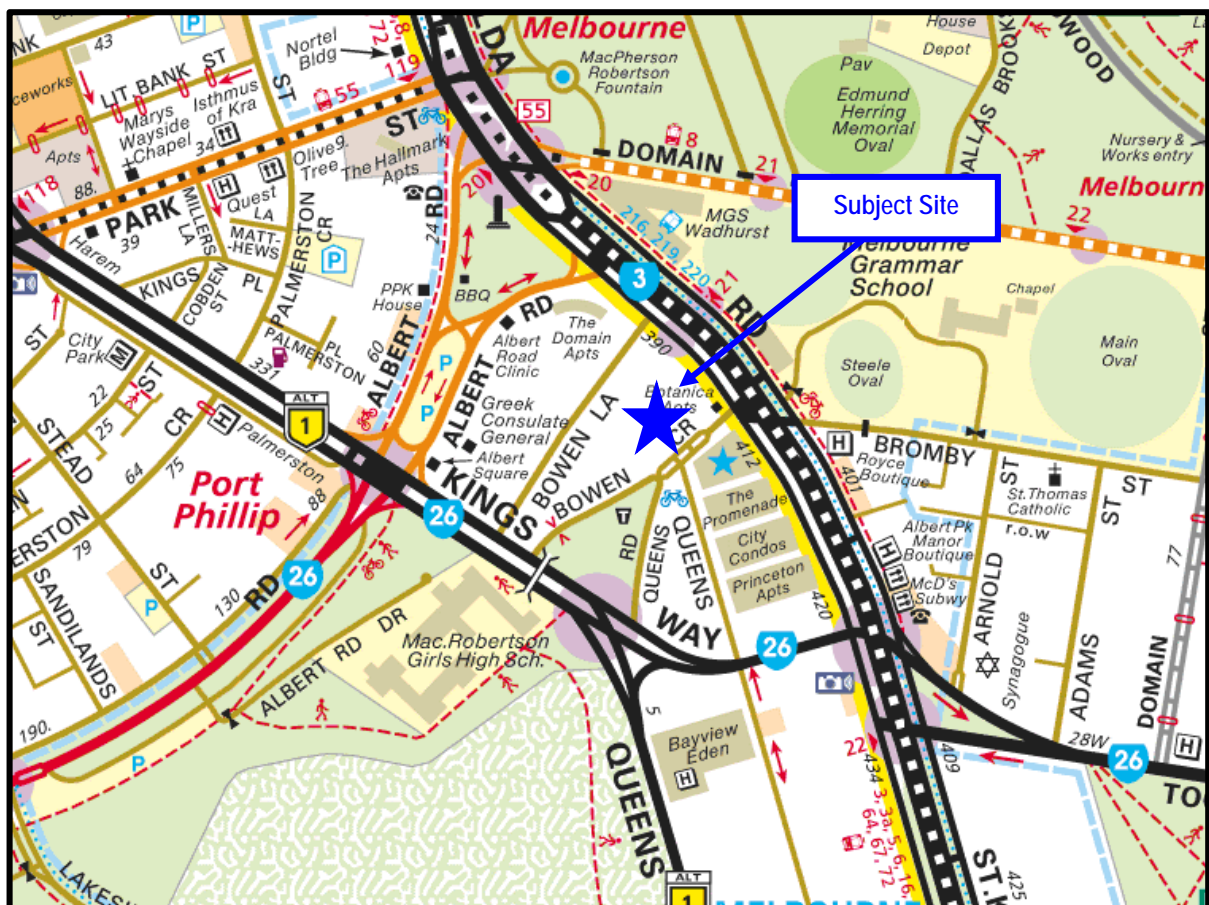


Figure 1: Locality Plan

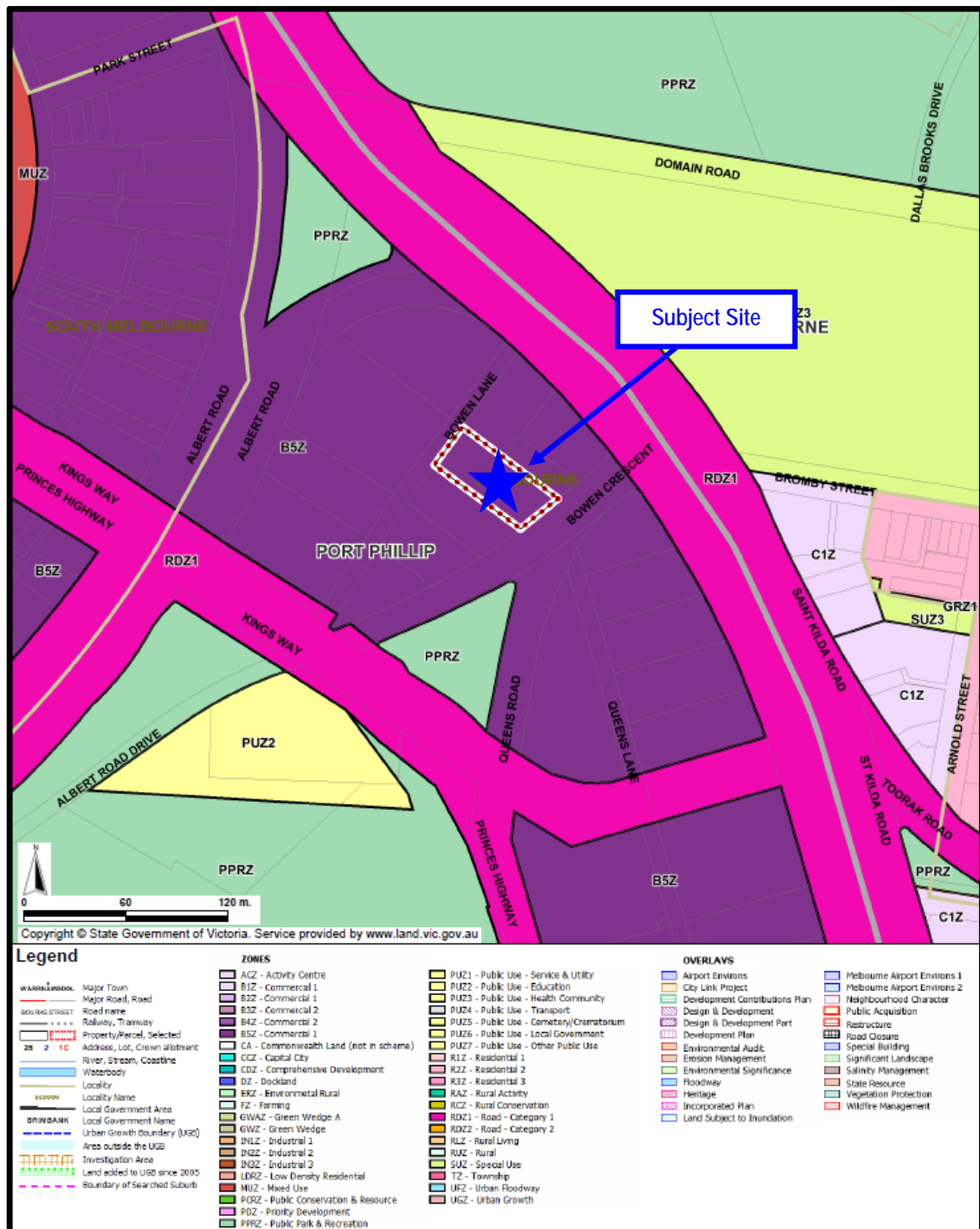
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The subject site has frontages to Bowen Crescent and Bowen Lane, and currently accommodates a multi-storey public car park known as 'Ace Parking', with a food and drink/cafe premises located at ground level. Vehicle access to the site is currently taken via a crossover to Bowen Crescent and a crossover to Bowen Lane.

The subject site is situated within a Commercial 1 Zone (B5Z) under the Port Phillip Planning Scheme, as shown in the zoning map in Figure 2.



Source: <http://services.land.vic.gov.au>

Figure 2: Zoning Map

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Existing land uses surrounding the subject site comprise a mixture of commercial and mixed uses. Significant land uses surrounding the subject site include:

- Albert Road Clinic – a medical clinic located on the eastern side of Albert Road with vehicle access taken via Bowen Lane directly opposite the site;
- Albert Park Lake – located on the western side of Queens Road approximately 600m to the southwest of the site; and
- Shrine of Remembrance – located on the eastern side of St Kilda Road approximately 420m to the north of the site.
- Royal Botanic Gardens – located on the eastern side of St Kilda Road approximately 510m to the northeast of the site.

Melbourne CBD is located approximately 2.0km to the north of the subject site.

2.2 Road Network

Bowen Crescent is a local road which extends between St Kilda Road to the northeast and Kings Way to the southwest. In the vicinity of the subject site, Bowen Crescent has an undivided carriageway which accommodates a single lane of through traffic and formal kerbside parallel parking in each direction of travel.

On-street parking along Bowen Crescent is predominantly subject to short-term ticketed parking restrictions. Two traffic islands are located along Bowen Crescent adjacent to the subject site.

Bowen Crescent is shown in Photographs 1 and 2.



**Photograph 1: Bowen Crescent - View
Northeast Adjacent to Subject Site**



**Photograph 2: Bowen Crescent - View
Southwest Adjacent to Subject Site**

Bowen lane is a local road which extends between St Kilda Road to the northeast and Kings Way to the southwest. In the vicinity of the subject site, Bowen Lane has a 6.1m wide carriageway with kerbside parallel parking provided on the eastern side only.

On-street parking along Bowen Lane is predominantly subject to Loading Zone parking restrictions.

The intersections of Bowen Lane with St Kilda Road and Kings Way provide for left in/left out movements only.

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Bowen Lane is shown in Photographs 3 and 4.



Photograph 3: Bowen Lane - View Northeast Adjacent to Subject Site



Photograph 4: Bowen Crescent - View Southwest Adjacent to Subject Site

3 Proposal

It is proposed to develop the subject site as a multi-storey mixed use development. A breakdown of the proposed development is set out in Table 1.

Table 1: Development Breakdown

<i>Use</i>	<i>No./Size</i>	<i>Car Parking Allocation</i>
<i>Dwellings - Residents</i>		
One-bedroom dwellings	101	199 spaces (including 21 visitor spaces)
Two-bedroom dwellings	105	
Three-bedroom dwellings	8	
<i>Sub-Total</i>	<i>214</i>	<i>199 spaces</i>
<i>Commercial - Retail</i>		
Shop (2 tenancies)	698m ²	7 spaces (including a disabled space)
<i>Sub-Total</i>	<i>698m²</i>	<i>7 spaces</i>
<i>Total</i>		<i>206 spaces</i>

A total of 206 car spaces are proposed on the site, with 68 spaces (including 8 tandem pairs) provided within two basement levels and 138 spaces (including 6 tandem pairs) provide within six (6) podium levels.

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Vehicle access to the podium car parking is to be taken via a new crossover to Bowen Lane, located adjacent to the site's southern boundary. Vehicle access to the basement car parking will also be taken via a new crossover to Bowen Lane, located towards the site's northern boundary.

The existing crossover to Bowen Crescent is to be demolished and the kerb and channel is to be re-instated. This will result in the creation of one new car space along the site's Bowen Crescent frontage.

A total of 82 bicycle spaces are to be provided on site, with 21 spaces provided at ground level, 33 spaces provided within basement level 2 and 28 spaces provided within the podium levels.

A total of four motorcycle spaces are also provided on the site within the basement levels as part of the proposed development.

Plans of the proposed development are attached at Appendix A.

4 Car Parking Considerations

4.1 Statutory Car Parking Requirements

The statutory car parking requirements of the proposed development are outlined within Clause 52.06 of the Port Phillip Planning Scheme. Table 2 outlines the statutory car parking requirements of the proposed development.

Table 2: Statutory Car Parking Requirements (Clause 52.06)

<i>Use</i>	<i>No./Size</i>	<i>Parking Rate</i>	<i>Requirement</i>
<i>Dwellings - Residents</i>			
One and two-bedroom dwellings	206	1 space to each dwelling	206 spaces
Three-bedroom+ dwellings	8	2 spaces to each dwelling	16 spaces
<i>Sub-Total</i>			<i>222 spaces</i>
<i>Dwellings - Visitors</i>			
Dwellings	214	1 space to every 5 dwellings	42 spaces ⁽¹⁾
<i>Sub-Total</i>			<i>42 spaces</i>
<i>Commercial Component - Retail</i>			
Shop (2 tenancies)	698m ²	4 spaces to each 100m ² of leasable floor area	27 spaces ⁽¹⁾
<i>Sub-Total</i>			<i>27 spaces</i>
<i>Total</i>			<i>291 spaces</i>

⁽¹⁾ Rounded down in accordance with the requirements of Clause 52.06-5 of the Planning Scheme.

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Table 2 indicates that the proposed development has a statutory car parking requirement to provide a total of 291 car spaces, comprising 222 resident spaces, 42 visitor spaces and 27 retail spaces.

A total of 206 car spaces are to be provided on site, comprising 178 resident spaces, 21 visitor spaces and seven (7) retail spaces. Accordingly, the proposed car parking provision falls short of the statutory car parking requirements.

Clause 52.06-3 of the Planning Scheme allows a permit to be granted to vary the statutory car parking requirements. Clause 52.06-6 of the Planning Scheme states:

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.

Clause 52.06-6 also states that the Car Parking Demand Assessment must address a number of matters, to the satisfaction of the responsible authority. These matters include:

- *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 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.*
- *An empirical assessment or case study.*

Clause 52.06-6 of the Planning Scheme also states:

Before granting a permit to reduce the number of spaces below the likely parking demand assessed by the Car Parking Demand Assessment, the responsible authority must consider a number of factors, including 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:*
 - *On street parking in non residential zones.*
- *On-street parking in residential zones in the locality of the land that is intended to be for residential use.*
- *Access to or provision of alternative transport modes to and from the land.*

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4.2 Car Parking Demand Assessment

4.2.1 Sustainable Modes of Transport

Public Transport

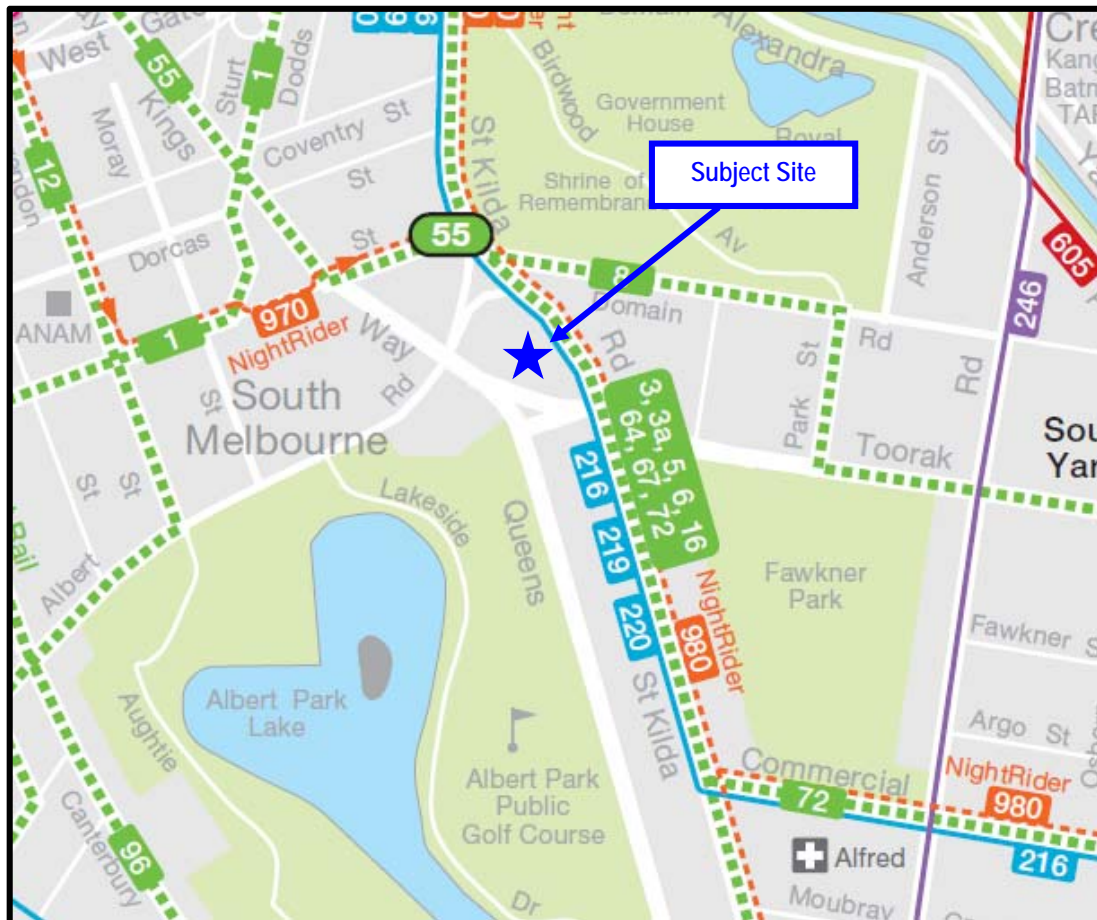
The subject site has excellent accessibility to public transport, with the following services operating nearby:

- **Bus Route 216** operates along St Kilda Road approximately 200m to the east of the subject site. It provides a service between Caroline Springs and Brighton Beach.
- **Bus Route 219** operates along St Kilda Road approximately 200m to the east of the subject site. It provides a service between Sunshine South and Gardenvale.
- **Bus Route 220** operates along St Kilda Road approximately 200m to the east of the subject site. It provides a service between Sunshine, the City and Gardenvale.
- **Night Rider Route 980** operates along St Kilda Road approximately 200m to the east of the subject site. It provides a service between the City and Dandenong.
- **Tram Route 3/3a** operates along St Kilda Road approximately 120m to the east of the subject site. It provides a service between Melbourne University and East Malvern.
- **Tram Route 5** operates along St Kilda Road approximately 120m to the east of the subject site. It provides a service between Melbourne University and Malvern.
- **Tram Route 6** operates along St Kilda Road approximately 120m to the east of the subject site. It provides a service between Melbourne University and Glen Iris.
- **Tram Route 8** operates along Domain Road approximately 240m to the north of the subject site. It provides a service between Moreland and Toorak.
- **Tram Route 16** operates along St Kilda Road approximately 120m to the east of the subject site. It provides a service between Melbourne University and Kew.
- **Tram Route 55** operates along Park Street approximately 290m to the northwest of the subject site. It provides a service between West Coburg and Domain Interchange.
- **Tram Route 64** operates along St Kilda Road approximately 120m to the east of the subject site. It provides a service between Melbourne University and East Brighton.
- **Tram Route 67** operates along St Kilda Road approximately 120m to the east of the subject site. It provides a service between Melbourne University and Carnegie.
- **Tram Route 72** operates along St Kilda Road approximately 120m to the east of the subject site. It provides a service between Melbourne University and Camberwell.

These routes and services provide access to other public transport services, as shown in the Port Phillip public transport map in Figure 3. Given the high level of public transport access in this locality, the proposed development is expected to generate parking at a lower rate than a similar site within an inner suburban location with less accessibility to public transport.

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Source: <http://metlinkmelbourne.com.au>

Figure 3: Port Phillip Public Transport Map

Bicycle Network and Walkability

The City of Port Phillip is well serviced by the Principal Bicycle Network (PBN), with on-road and off-road bicycle paths directly linking the City of Port Phillip with surrounding municipalities.

The subject site has excellent access to bicycle infrastructure with on-road bicycle lanes and informal bicycle routes on many roads in the immediate vicinity of the subject site, including St Kilda Road, Albert Road, Domain Road and Park Street. In addition, a bike share station is located near the intersection of Bowen Crescent and Queens Road directly opposite the subject site. Figure 4 illustrates the available bicycle infrastructure in the vicinity of the subject site.

The subject site is also highly walkable. The site achieved a 'walk score' of 93 out of 100 and is classified as 'Walker's Paradise' by the walk score website¹. This indicates that daily errands can be accomplished by foot rather than a vehicle.

¹ <https://www.walkscore.com/>

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Source: <http://www.portphillip.vic.gov.au/>

Figure 4: Port Phillip TravelSMART Map

Car Share Scheme

The subject site is located within close proximity to a number of car share pods operated by commercial operators. Car share schemes are supported by the City of Port Phillip through the allocation of public car spaces for use by commercial operators.

The objective of car share schemes is to give members access to cars on demand for rent by the hour or by the day. The rental cost covers all expenses, including petrol, insurance, cleaning, registration and maintenance. Members are required to pay a small joining fee and a fully refundable deposit. Members book a car online or by phone and pay for the use of the car on an hourly or daily basis each time they use a share car. Access to the share car is via a smart card which unlocks doors and logs user time and kilometres. These schemes are particularly cost effective for people who drive less than 10,000km per year. It gives them access to a car when required, whilst eliminating the cost of owning, maintaining and parking a car.

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A number of car share pods are located within convenient walking distance from the subject site. These are as follows:

- Flexicar:
 - One pod located on the south side of St Kilda Road near Park Street, approximately 230m to the northwest of the subject site.
 - One pod located on the south side of Toorak Road opposite Adams Street, approximately 460m to the southeast of the subject site.
- GreenShare Car:
 - One pod located on the eastern side of Queens Road near Bowen Crescent, directly opposite the subject site.
 - One pod located on the western side of St Kilda Road near Arthur Street, approximately 560m to the southeast of the subject site.
- GoGet:
 - One pod located within the car park of 50 Albert Road, approximately 330m to the west of the subject site.
 - One pod located within the car park of 436 St Kilda Road, approximately 425m to the southeast of the subject site.
 - One pod located on the western side of St Kilda Road near Toorak Road West, approximately 330m to the southeast of the subject site.

4.2.2 Bicycle Parking Provision

As discussed in Section 5 of this report, the proposed development provides bicycle parking in excess of its statutory bicycle parking requirements.

This will ensure that occupants of the proposed development have an alternative mode of transport available for them to access daily destinations or nearby services.

4.2.3 Anticipated Parking Demands

Residents

The proposed development is to provide a total of 178 car spaces for the proposed 214 apartments. As a result of the number of tandem spaces provided on the site, these spaces will be allocated as follows:

- One-bedroom dwellings: 54 spaces. i.e. 0.53 spaces per dwelling
- Two-bedroom dwellings: 108 spaces, i.e. 1.03 spaces per dwelling
- Three-bedroom dwellings: 16 spaces, i.e. 2 spaces per dwelling

The application therefore satisfies and exceeds the statutory car parking requirement for the three and two-bedroom dwellings, respectively, and is not seeking a waiver or reduction for resident parking for these dwelling types.

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A review of car ownership statistics of 'flats units and apartments' within the suburb of Melbourne and the Port Phillip LGA highlights the average car ownership statistics shown in Table 3. This data was recorded by the Australian Bureau of Statistics (ABS) in the 2011 census.

Table 3: ABS Car Ownership Statistics (2011)

Type of Dwelling	Number of Cars	Melbourne Suburb	Port Phillip LGA
One-bedroom Flat/Unit/Apartment	Average no. of cars per dwelling	0.3	0.8
	0 cars	71%	33%
	1 car	27%	58%
	2 or more cars	2%	9%

It is acknowledged that the above data for the Melbourne suburb includes the Melbourne CBD. Accordingly, the ABS rates are considered to be lower than what would be expected for residents occupying dwellings in this particular area.

To understand car ownership rates proximate to the site, we have sourced the 2011 Australian Bureau of Statistics (ABS) Census data for 'flats, units or apartments' within the surrounding Statistical Areas (SA1)² illustrated in Figure 5. This data highlights the car ownership statistics shown in Table 4.

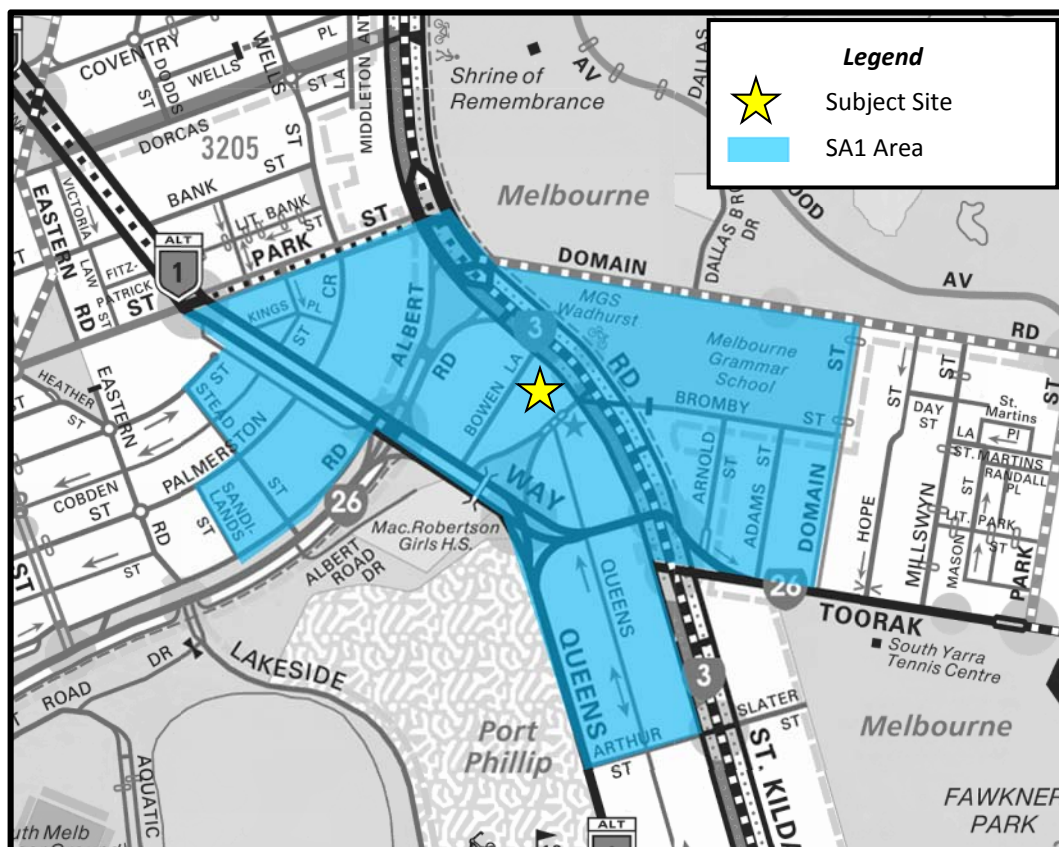


Figure 5: SA1 Statistical Area

² Area codes used: 2112806, 2112830, 2112831, 2112508, 2113216.

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Table 4: ABS Car Ownership Statistics (2011) – SA1 Area

Type of Dwelling	Number of Cars	SA1 Area
One-bedroom Flat/Unit/Apartment	Average no. of cars per dwelling	0.8
	0 cars	32%
	1 car	59%
	2 or more cars	7%

The above data indicates that there is a considerable demand for dwellings where limited or no parking is required by residents of one-bedroom apartments.

The subject site has excellent accessibility to public transport and is highly walkable. Furthermore, future residents will not have access to residential parking permits. In consideration of the short-term parking restrictions which apply to parking within the surrounding area, there will be limited opportunity for future residents without an on-site car space to park on street. Accordingly, we are of the opinion that the car parking supply in this instance will control the parking demand.

The proposed level of car parking provision is therefore considered appropriate for residents of the proposed development.

Residential Visitors

To estimate the projected residential visitor car parking demand, car parking surveys undertaken by Cardno at apartment developments located at 127 and 147 Beach Street in Beacon Cove have been sourced. The surveys were conducted over a 36 hour period from 6:00am on Friday 19 November to midnight on Saturday 20 November, 2010. The surveys recorded a peak parking demand for 0.1 spaces per apartment of an evening and weekend, with a peak business hours demand of 0.06 spaces per apartment recorded.

Application of these rates to the proposed development produces the following visitor car parking demands:

- Business hours: 13 spaces
- Evenings/weekend: 21 spaces

A total of 21 visitor spaces are to be provided on site for the proposed development, which satisfies the likely visitor parking demands.

Retail

Retail tenancies such as those proposed typically operate as service retail, providing convenient access to food and drink, retail and other essential services for neighbouring properties. Accordingly, the proposed retail tenancies are likely to attract a lot of foot traffic from people who are already within the nearby area, rather than generate additional customer parking demands.

Nonetheless for the purposes of a conservative assessment, the statutory requirement for 27 spaces is accepted as being representative of the likely parking demand associated with the proposed retail tenancies. This demand is likely to comprise a long-term (staff) demand for seven spaces and a short-term (customer) demand for up to 20 spaces.

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A total of seven car spaces are to be provided on site for retail staff which satisfies the likely staff parking demand. No car parking is to be provided on site for retail customers. Accordingly, the anticipated customer parking demands will need to be accommodated off site.

Customer parking demands tend to peak during business hours and on weekends. The proposed retail tenancies are not expected to operate during evenings.

Total

Based on the foregoing assessment, the proposed development is anticipated to be reliant on up to 20 off-site spaces associated with retail customers.

4.3 Allowing Fewer Car Spaces

4.3.1 Car Parking Availability

Traffix Group undertook car parking occupancy surveys within approximately 200m walking distance from the site. The survey area is shown in Figure 6.

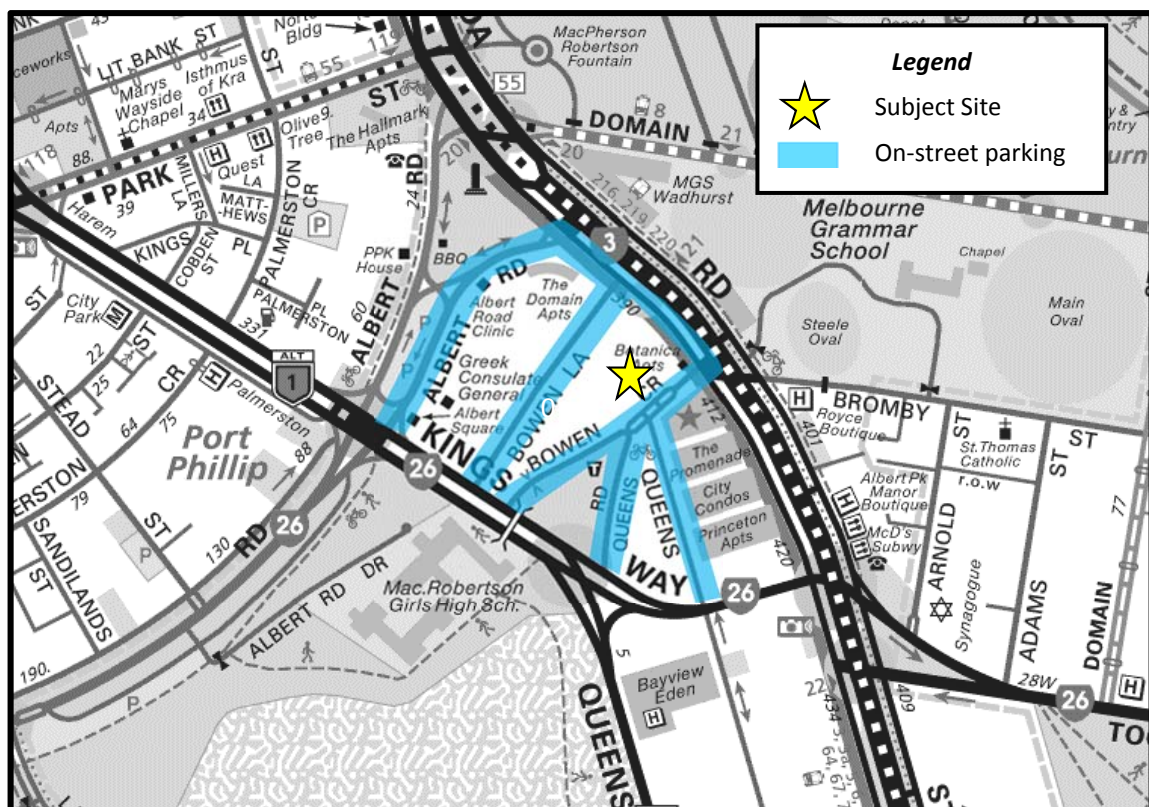


Figure 6: Parking Survey Area

The parking surveys were undertaken at the following times:

- Wednesday 28 August, 2015 at 2:00pm;
- Friday 11 September, 2015 at 12:00noon and 7:00pm; and
- Saturday 12 September, 2015 at 1:30pm and 7:00pm.

Details of the surveys, including parking restrictions and occupancies, are attached at Appendix B.

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The surveys indicate that on-street parking within the area is predominantly subject to short-term and short-term ticketed parking restrictions. It is therefore evident that Council is discouraging long-term parking within this area.

In summary, the parking surveys found the following:

Wednesday 28 August, 2015 at 2:00pm:

- There were a total of 165 suitable³ car spaces available within the survey area.
- At 2:00pm, a total of 139 spaces were occupied (84% occupancy), leaving a total of 26 vacant spaces within the area.

Friday 11 September, 2015 at 12:00noon:

- There were a total of 163 suitable car spaces available within the survey area.
- At 12:00noon, a total of 134 spaces were occupied (82% occupancy), leaving a total of 29 vacant spaces within the area.

Friday 11 September, 2015 at 7:00pm:

- There were a total of 180 suitable car spaces available within the survey area.
- At 7:00pm, a total of 164 spaces were occupied (91% occupancy), leaving a total of 16 vacant spaces within the area.

Saturday 12 September, 2015 at 1:30pm:

- There were a total of 167 suitable car spaces available within the survey area.
- At 1:30pm, a total of 140 spaces were occupied (84% occupancy), leaving a total of 27 vacant spaces within the area.

Saturday 12 September, 2015 at 7:00pm:

- There were a total of 180 suitable car spaces available within the survey area.
- At 7:00pm, a total of 161 spaces were occupied (89% occupancy), leaving a total of 19 vacant spaces within the area.

The surveys indicate that on-street parking within the area is well utilised. Casual observations of the available parking within the area indicates that as a result of the short-term parking restrictions which predominantly apply to parking, there is a high turnover of spaces.

It is noted that there is an off-street car park located at 1 Queens Road (approximately 90m to the south of the subject site) which is suitable for use by the public. This car park is open 24/7 and is subject to fees, with a maximum flat rate of \$25 applicable. We are advised by the operator that this car park comprises a total of 475 parking spaces suitable for use by the public.

³ Suitable spaces are spaces that can be utilised by retail customers during the specified survey period. These exclude Permit Zone and Mail Zone parking restrictions. The number of suitable spaces varies throughout the day due to the varying parking restrictions.

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Based on the foregoing assessment, we are of the opinion that there is sufficient scope for the likely parking demands associated with retail customers to be accommodated off site within the nearby parking resources.

4.3.2 Relevant Local Planning Policy

The City of Port Phillip has adopted a parking policy for new developments. This policy allows a reduced parking demand rate of 0.8 car parking spaces per one-bedroom dwelling and one space per three or more bedroom dwellings for residential uses.

The policy outlines a number of conditions which should be satisfied in order to apply a reduced rate of 0.8 spaces per dwelling. These conditions are as follows:

- *Within or no more than 200 metres walk to edge of an Activity Centre (defined by business zoning).*
- *No more than 200 metres to fixed rail public transport.*
- *Strict control of on-street parking in surrounding streets.*
- *Not eligible to participate in Council's parking permit scheme.*
- *Provision of motor scooter / motorbike parking on site.*
- *Small dwellings only.*
- *In the order of 400 metres to a full line (over 1,500 sqm) supermarket.*

Additional requirements for a reduced rate of below 0.8 spaces for dwellings are:

- *Participation in car share scheme or other similar initiatives.*
- *Be located within a mixed use development or in an employment precinct.*
- *Other contributions to sustainable transport infrastructure or services.*
- *Other initiatives to reduce usage and/or ownership of motor vehicles.*

An assessment of the development against these conditions is provided in Table 5.

Table 5: Assessment of Council's Policy Requirements

Council's Requirements	Compliance	Comments
<i>Reduced rate of 0.8 spaces per dwelling</i>		
Within or no more than 200 metres walk to edge of an Activity Centre (defined by business zoning)	Complies	The site is situated within a Commercial 1 Zone (B5Z) under the Port Phillip Planning Scheme.
No more than 200 metres to fixed rail public transport	Complies	The subject site is located within no more than 200m walking distance to seven tram routes which operate along St Kilda Road.
Strict control of on-street parking in surrounding streets	Complies	On-street parking within the area is predominantly subject to short-term and short-term ticketed parking restrictions.
Not eligible to participate in Council's parking permit scheme	Complies	Residents of the proposed development will not be eligible for residential parking permits, as per Council's Resident Parking Permit Policy.

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Council's Requirements	Compliance	Comments
Provision of motor scooter/motorbike parking on site	Complies	A total of four motorcycle spaces are to be provided on site as part of the development. This provides an alternative mode of transport for residents who are not provided with on-site car parking.
Small dwellings only	Complies	Dwellings without parking will only be one-bedroom dwellings.
In the order of 400 metres to a full line (over 1,500 sqm) supermarket	Does not comply	<p>The nearest full line supermarket is a Foodworks supermarket located near the intersection of Wells Street and Dorcas Street, approximately 710m walking distance to the northwest of the subject site.</p> <p>This supermarket can be easily accessed via one of the many nearby public transport services or via a short cycling trip.</p>
Reduced rate below 0.8 spaces per dwelling		
Participation in car share scheme or other similar initiatives	Does not comply	<p>The development proposes to utilise the car share vehicles in the nearby area rather than provide one on site. This includes seven car share pods located no more than 600m walking distance from the site.</p> <p>Residents without an on-site car space can have easy access to car share vehicles as desired, without the need for an on-site car share space.</p>
Be located within a mixed use development or in an employment precinct	Complies	The subject site is situated within a Commercial 1 Zone (B5Z) under the Port Phillip Planning Scheme, with surrounding land uses including a mixture of residential, retail/commercial and mixed uses.
Other contributions to sustainable transport infrastructure or services	Complies	The subject site provides bicycle parking for residents in excess of the statutory bicycle parking requirements. This provides residents with an alternative sustainable mode of transport to access everyday services and destinations.
Other initiatives to reduce usage and/or ownership of motor vehicles	-	No other initiatives are provided.

We are satisfied that this development generally complies with Council's Sustainable Parking Rates Policy and that the development's location supports providing some dwellings without private car parking.

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4.3.3 Conclusion – Allowing Fewer Car Spaces

Based on the foregoing assessment, we are of the opinion that:

1. The proposed level of car parking provision is appropriate for residents of the proposed development, based on the following grounds:
 - The ABS data indicates that there is a considerable demand for dwellings where limited or no parking is required by residents, particularly for one-bedroom apartments;
 - The proposed development provides bicycle parking at a rate which exceeds the statutory bicycle parking requirements of residents. This will ensure that future residents who are not provided with an on-site car parking space have an alternative mode of transport available to them to access everyday services and destinations;
 - The proposed development provides motorcycle parking. This will also ensure that future residents who are not provided with an on-site car parking space have an alternative mode of transport available to them to access everyday services and destinations;
 - The subject site has excellent accessibility to convenient and efficient public transport services;
 - The subject site is highly walkable and would enable residents to easily access everyday destinations and services by foot; and
 - On-street parking within the vicinity of the site is predominantly subject to short-term and short-term ticketed parking restrictions. Further, future residents of this development will not be eligible for residential parking permits.
2. The proposed car parking provision satisfies the likely parking demands associated with residential visitors and retail staff.
3. There is sufficient scope for the anticipated retail customer parking demands to be accommodated off site within the nearby parking resources.

A reduction in the statutory car parking requirements is therefore justified.

4.4 Car Parking Layout and Access Arrangements

The proposed car parking layout and access arrangements have been checked against the relevant requirements of the Port Phillip Planning Scheme and AS/NZS 2890.1:2004 (where relevant).

An assessment of the car parking layout and access arrangements reveals the following:

Car Spaces

- All car spaces (with the exception of the disabled car space) are measured to be at least 2.6m wide, 4.9m long and accessed from an aisle that is at least 6.4m wide. These dimensions satisfy the requirements of the Planning Scheme.
- Car spaces adjacent to a wall are measured to be at least 2.9m wide (where a wall/structure is located on one side) and at least 3.2m wide (where a wall/structure is located on both sides), in accordance with the requirements of the Planning Scheme.
- Tandem spaces are to be provided with an additional 500mm in length between spaces, in accordance with the requirements of the Planning Scheme.

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2 Bowen Crescent, Melbourne: Proposed Mixed Use Development

- The proposed disabled car space is measured to be 2.4m wide and 5.4m long, and has a shared area that is also 2.4m wide and 5.4m long. This space also has a headroom clearance of at least 2.5m. These dimensions accord with the requirements of the Australian Standard for people with disabilities.
- All column locations comply with *Diagram 1 Clearance to car parking spaces* under the Planning Scheme.
- A minimum headroom clearance of 2.2m is to be achieved above all car spaces (with the exception of car spaces 12 and 13 within basement level 2) and within parking levels. This satisfies the requirements of AS/NZS 2890.1:2004 and exceeds the requirements of the Planning Scheme.
Car spaces 12 and 13 within basement level 2 are located underneath a ramp and will provide a minimum headroom clearance of 2.1m to the underside of the ramp above (at the end of the spaces). This satisfies the requirements of the Planning Scheme and is considered to be appropriate.

Manoeuvrability

In order to check the accessibility of the most critical car spaces under the proposed layout, swept path diagrams for a B85 design vehicle have been prepared. These swept paths are attached at Appendix C and show that all car spaces can be accessed in an appropriate and acceptable manner.

We note that some car spaces may require a vehicle to undertake a single correction manoeuvre in order for the vehicle to enter and/or exit the car spaces. AS/NZS 2890.1:2004 specifically allows for three-point entry and exit into 90 degree spaces for residential, domestic and employee parking.

Access

- The proposed access ramps are measured to be at least 6.1m wide between walls, in accordance with the requirements of AS/NZS 2890.1:2004 for a two-way ramp.
- The proposed grades and grade changes of the access ramps satisfy the requirements of the Planning Scheme. Of specific note, the proposed access ramps provide a maximum grade of 1:10 for the first 5.0m into the site, in accordance with the requirements of the Planning Scheme.
- The proposed internal ramps are to have a maximum grade of 1:5, with 1:8 transitions provided at the top and bottom of the ramps. This satisfies the requirements of the Planning Scheme.
- A minimum headroom clearance of 2.2m is to be achieved along all ramps, specifically at the point where the ramps pass under the level above. This satisfies the requirements of AS/NZS 2890.1:2004 and exceeds the requirements of the Planning Scheme.
- The Planning Scheme requires an accessway to have a corner splay or area at least 50% clear of visual obstructions extending at least 2.0m along the frontage road and 2.5m from the edge of the exit lane from the frontage for pedestrian safety.

A sight triangle measuring at least 2.0m along the boundary and 1.5m into the site is to be provided on the departure side of the northern access ramp. Whilst this doesn't strictly meet the requirements of the Planning Scheme, it will provide for a splay that is at least 50% clear of visual obstructions.

The required sight triangle cannot be achieved on the departure side of the southern access ramp as a result of the location of the ramp. The development plans indicate the provision of a convex

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mirror on the northern side of this ramp. We are of the opinion that this mirror is appropriate and will enable exiting drivers to observe any pedestrians along the footpath and more importantly, will enable pedestrians to observe exiting vehicles.

Based on the foregoing assessment, we are of the opinion that the proposed car parking layout and access arrangements are appropriate for the proposed development and will provide for convenient and accessible parking.

5 Bicycle Considerations

The statutory bicycle parking requirements of the proposed development are outlined under Clause 52.34 of the Port Phillip Planning Scheme. Table 6 outlines the statutory bicycle parking requirements of the proposed development.

Table 6: Statutory Bicycle Parking Requirements (Clause 52.34)

<i>Use</i>	<i>No./Size</i>	<i>Parking Rate</i>	<i>Requirement</i>
<i>Dwellings</i>			
Residents	214	1 space to each 5 dwellings	43 spaces
Visitors		1 space to each 10 dwellings	21 spaces
<i>Sub-Total</i>			<i>64 spaces</i>
<i>Retail Component - Shop</i>			
Staff	698m ²	1 space to each 600m ² of leasable floor area if the net floor area exceeds 1,000m ²	0 spaces
Customers		1 space to each 500m ² of leasable floor area if the net floor area exceeds 1,000m ²	0 spaces
<i>Sub-Total</i>			<i>0 spaces</i>
<i>Total</i>			<i>64 spaces</i>

Table 6 indicates that the proposed development has a statutory requirement to provide a total of 64 bicycle spaces, comprising 43 resident spaces and 21 visitor spaces. No bicycle parking is required for the retail component as a result of the limited size of the proposed retail tenancies.

A total of 82 bicycle spaces are to be provided on site for the proposed development, with 21 spaces provided at ground level and 61 spaces provided within the podium and basement parking levels.

The 21 spaces at ground level are appropriate for use by residential visitors and retail customers (if required) while the spaces within the podium and basement parking levels are suitable for use by residents and retail staff (if required).

Traffic Engineering Assessment

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All bicycle spaces (with the exception of four spaces adjacent to the Bowen Crescent lobby at ground level) are to be provided via wall mounted vertical rails. The four bicycle spaces located adjacent to the Bowen Crescent lobby are to be provided via standard bicycle hoops. All bicycle spaces have been provided in accordance with the requirements of the Bicycle Victoria Bicycle Parking Handbook.

The proposed bicycle parking provision therefore exceeds the statutory bicycle parking requirements of the proposed development.

6 Traffic Considerations

6.1 Traffic Generation and Distribution

Dwellings

Given the site's location and the size of the proposed apartments, a traffic generation rate of 3 vehicles per day (vpd) per dwelling that is provided with a car space is considered to be appropriate in this instance. Peak hour traffic generation will be in the order of 10% of the daily traffic generation, i.e. 0.3 vehicles per hour (vph) per dwelling that is provided with a car space.

For the proposed development (i.e. 166 dwellings with a car spaces), this equates to 498 vehicle trip ends (vte) per day, with 50 vte occurring in each of the commuter peak hours.

This volume of traffic will comprise entering and exiting traffic roughly split as follows:

	<i>In</i>	<i>Out</i>
• AM Peak Hour:	20% or 10 vph	80% or 40 vph
• PM Peak Hour:	60% or 30 vph	80% or 20 vph

Visitors

The proposed visitor car spaces are not anticipated to generate a significant level of traffic during the commuter peak hour periods.

Retail Staff

Each of the proposed retail staff spaces are anticipated to generate one 'in' vehicle movement during the AM peak hour period and one 'out' vehicle movement during the PM peak hour period, with intermittent movements possible throughout the day.

Total

Based on the foregoing assessment, the development as a whole is anticipated to generate a total of 57 vehicle movements during commuter peak hour periods. This volume of traffic will comprise entering and exiting traffic as follows:

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	<i>In</i>	<i>Out</i>
• AM Peak Hour:	17 vph	40 vph
• PM Peak Hour:	30 vph	27 vph

For the purposes of this assessment, it is assumed that this level of traffic will be equally split to/from St Kilda Road and Kings Way, via Bowen Lane.

6.2 Traffic Impact

The proposed development is anticipated to generate in the order of 57 vehicle movements to/from Bowen Lane during the commuter peak hour periods, as follows:

- AM peak period:
 - 'In': one vehicle, on average, every 3.5 minutes
 - 'Out': one vehicle, on average, every 1.5 minutes
- PM peak period:
 - 'In': one vehicle, on average, every 2.0 minutes
 - 'Out': one vehicle, on average, every 2.2 minutes

This level of traffic is small and will not have detrimental impacts on the capacity and operation of Bowen Lane. Further in consideration of the left in/left out arrangement of the intersections of Bowen Lane with St Kilda Road and Kings Way, we are of the opinion that this level of traffic will be easily distributed to the surrounding road network with minimal impacts.

7 Conclusions

Having undertaken a detailed traffic engineering assessment of the proposed mixed use development at 2 Bowen Crescent, Melbourne, we are of the opinion that:

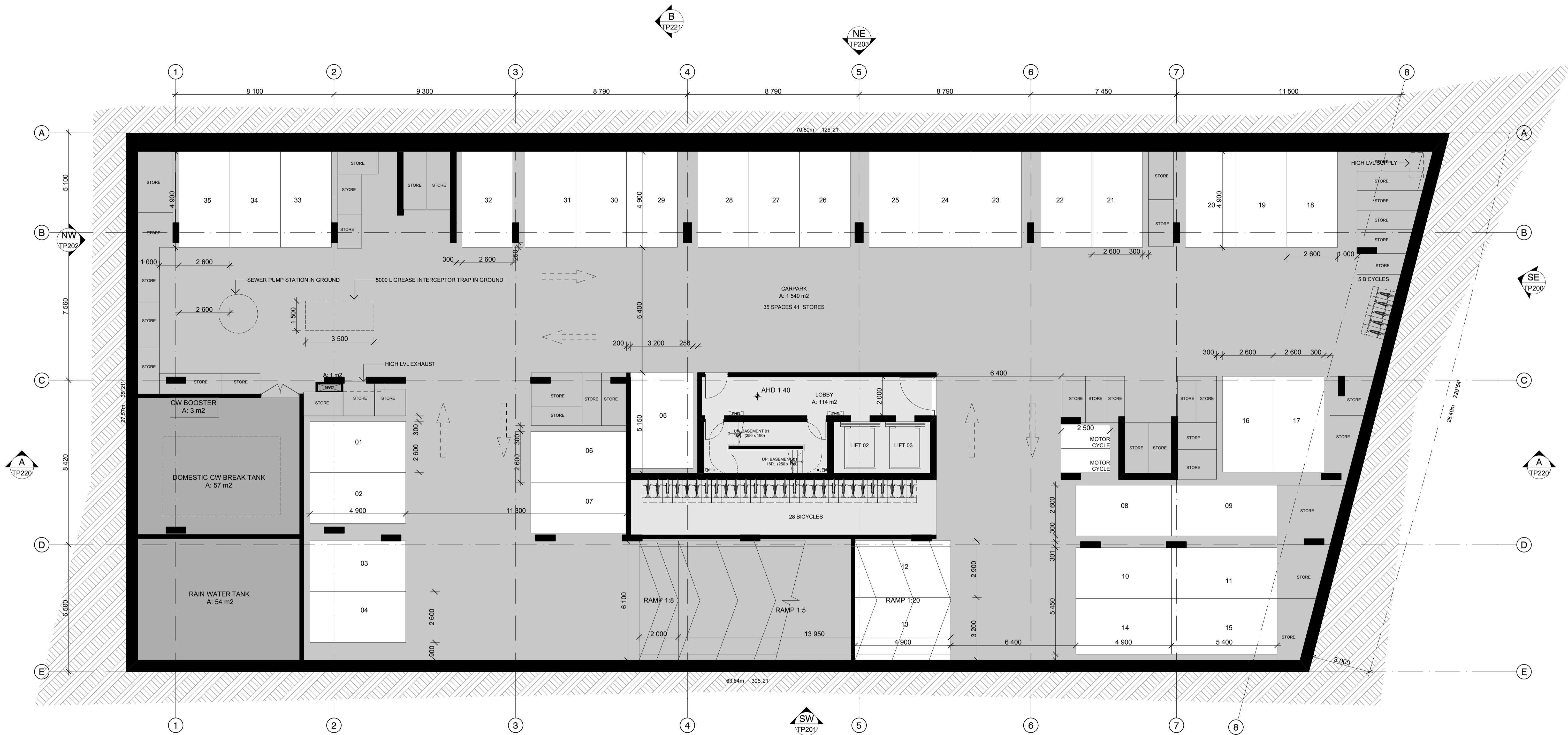
- a) The proposed level of car parking provision is appropriate for residents of the proposed development, based on the following grounds:
 - The ABS data indicates that there is a considerable demand for dwellings where limited or no parking is required by residents, particularly for one-bedroom apartments;
 - The proposed development provides bicycle parking at a rate which exceeds the statutory bicycle parking requirements of residents. This will ensure that future residents who are not provided with an on-site car parking space have an alternative mode of transport available to them to access everyday services and destinations;
 - The proposed development provides motorcycle parking. This will also ensure that future residents who are not provided with an on-site car parking space have an alternative mode of transport available to them to access everyday services and destinations;
 - The subject site has excellent accessibility to convenient and efficient public transport services;

Traffic Engineering Assessment

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- The subject site is highly walkable and would enable residents to easily access everyday destinations and services by foot; and
 - On-street parking within the vicinity of the site is predominantly subject to short-term and short-term ticketed parking restrictions. Future residents of this development will not be eligible for residential parking permits.
- b) The proposed car parking provision satisfies the likely parking demands associated with residential visitors and retail staff.
- c) There is sufficient scope for the anticipated retail customer parking demands to be accommodated off site within the nearby parking resources.
- d) The proposed car parking layout and access arrangements are appropriate for the proposed development and will provide for convenient and accessible parking.
- e) The proposed bicycle parking provision exceeds the statutory bicycle parking requirements of the proposed development.
- f) The volume of traffic that is likely to be generated by the proposed development is small and will not have any detrimental impacts on the capacity and operation of Bowen Lane and the surrounding road network and intersections.
- g) There are no traffic engineering reasons why a planning permit should not be issued for the proposed development.

Appendix A: Proposed Development Plans



DATE	REVISION	BY	CHK	NO.
25/11/2015	TP ISSUE	AM	EL	-

DATE	REVISION	BY	CHK	NO.

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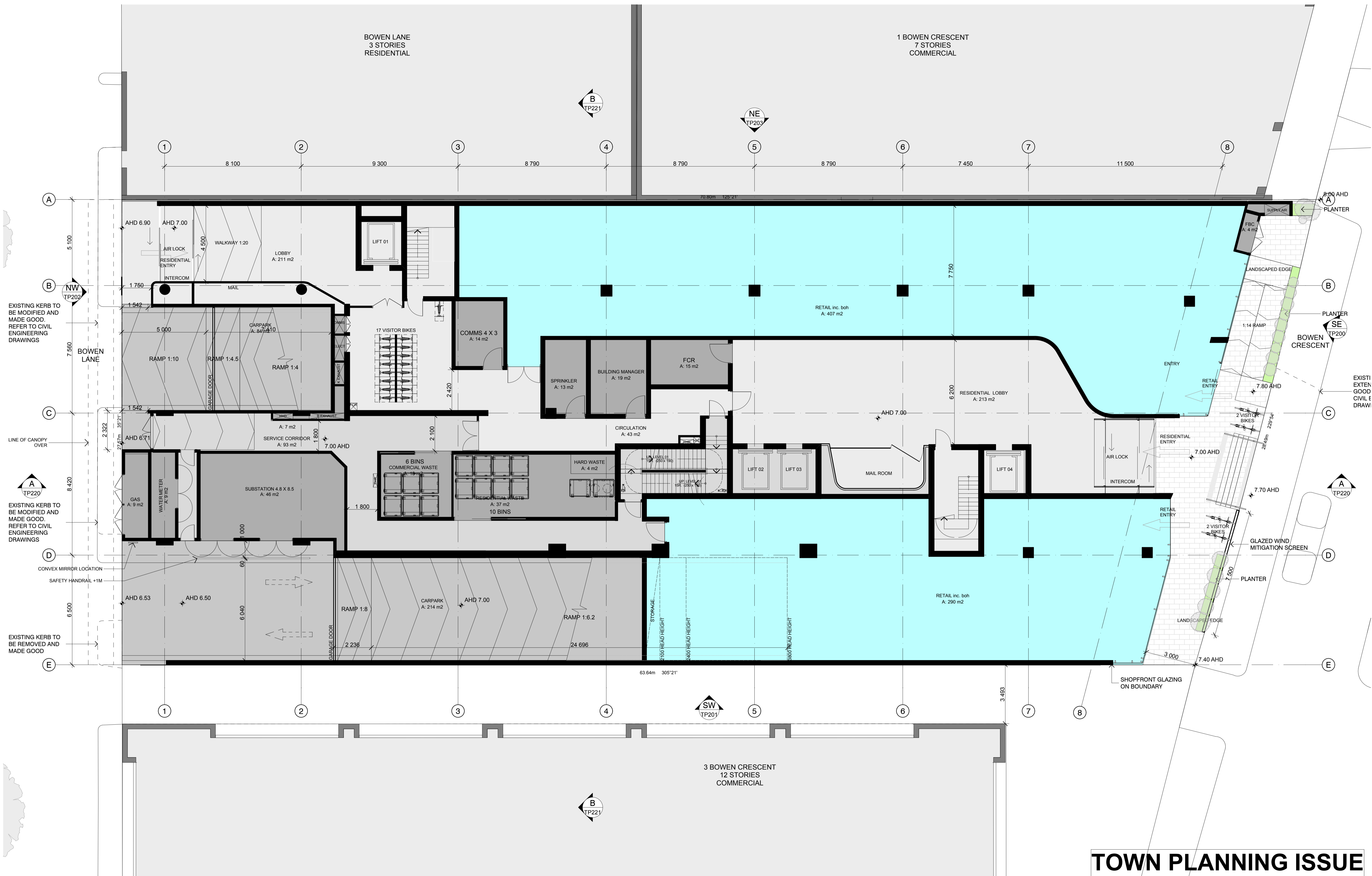
Plus Architecture Pty. Ltd.
ACN 091690336

TOWN PLANNING ISSUE

PROJECT 2 Bowen Crescent	DRAWING TITLE BASEMENT 2	SCALE 1:100	DATE 25/11/2015	PLOT DATE 25/11/2015	
DRAWN AM	CHECKED EL	JOB NO. 11806	DRAWING NO. TP098	REVISION -	
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DATE 25/11/2015	PLOT DATE 25/11/2015	
DRAWN AM	CHECKED EL	
JOB NO. 11806	DRAWING NO. TP099	REVISION -



TOWN PLANNING ISSUE

DATE	REVISION	BY	CHK	NO.
25/11/2015	TP ISSUE	AM	EL	-

DATE	REVISION	BY	CHK	NO.

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PROJECT 2 Bowen Crescent	DRAWING TITLE GROUND	SCALE 1:100	DATE 25/11/2015	PLOT DATE 25/11/2015	CHECKED EL	DRAWING NO. TP100	REVISION -
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TOWN PLANNING ISSUE

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25/11/2015	TP ISSUE	AM	EL	-

DATE	REVISION	BY	CHK	NO.

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PROJECT 2 Bowen Crescent	DRAWING TITLE LEVEL 01	SCALE 1:100	PLOT DATE 25/11/2015	CHECKED EL	REVISION
DRAWN AM		JOB NO. 11806	DRAWING NO. TP101	-	

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TOWN PLANNING ISSUE

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25/11/2015	TP ISSUE	AM	EL	-					

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	<input type="checkbox"/>
	<input type="checkbox"/>



PROJECT 2 Bowen Crescent	DRAWING TITLE LEVEL 06	SCALE 1:100		
DATE 25/11/2015	PLOT DATE 25/11/2015	DRAWN AM	CHECKED EL	
JOB NO. 11806	DRAWING NO. TP106	REVISION		

Appendix B: Parking Survey Results

2 Bowen Crescent, Melbourne

Parking Occupancy Survey

GRP18745

Survey Date: See below



LOCATION	RESTRICTION	Capacity	NO. OF CARS PARKED				
			Wednesday 26/8/15 2:00pm	Friday 11/9/15 12:00noon	Friday 11/9/15 7:00pm	Saturday 12/9/15 1:30pm	Saturday 12/9/15 8:00pm
Bowen Lane (West Side)							
St Kilda Road to Kings Way	No Stopping	0	0	0	0	0	0
Bowen Lane (East Side)							
Kings Way to SB No. 2 Bowen Crescent	No Stopping	0	0	0	0	0	0
	1/4P 8am-6pm Mon-Fri	3	3	1	3	3	2
	No Stopping	0	0	0	0	0	0
	Loading Zone 15min 8am-6pm Mon-Sat	6	2	2	5	1	4
SB No. 2 Bowen Crescent to St Kilda Road	Loading Zone 15min 8am-6pm Mon-Sat	3	2	3	3	0	2
	No Stopping	0	0	0	0	0	0
	Loading Zone 15min 8am-6pm Mon-Sat	4	3	3	2	3	2
	No Stopping	0	0	0	0	0	0
Bowen Lane	Capacity	-	3	3	16	3	16
	No. Cars Parked	-	3	1	13	3	10
	No. Vacant Spaces	-	0	2	3	0	6
	Percentage Occupancy	-	100%	33%	81%	100%	63%
Bowen Crescent (North Side)							
St Kilda Road to EB No. 2 Bowen Crescent	No Stopping	0	0	0	0	0	0
	2P Disabled	1	0	0	0	1	0
	Loading Zone 15min 8am-6pm Mon-Fri	1	1	0	1	1	1
	No Stopping	0	0	0	0	0	0
EB No. 2 Bowen Crescent to WB No. 2 Bowen Crescent	1P Ticket 8am-6pm Mon-Fri	2	2	2	2	2	2
WB No. 2 Bowen Crescent to Kings Way	1P Ticket 8am-6pm Mon-Fri	7	5	6	6	6	7
	No Stopping	0	0	0	0	0	0
	1P Ticket 8am-6pm Mon-Fri	3	3	3	3	3	3
	No Stopping	0	0	0	0	0	0

2 Bowen Crescent, Melbourne

Parking Occupancy Survey

GRP18745

Survey Date: See below



LOCATION	RESTRICTION	Capacity	NO. OF CARS PARKED				
			Wednesday 26/8/15 2:00pm	Friday 11/9/15 12:00noon	Friday 11/9/15 7:00pm	Saturday 12/9/15 1:30pm	Saturday 12/9/15 8:00pm
Bowen Crescent (South Side)							
Kings Way to Queens Road	No Stopping	0	0	0	0	0	0
	2P Ticket 8am-6pm Mon-Fri	11	11	10	10	9	11
	No Stopping	0	0	0	0	0	0
Queens Road to Queens Lane	No Stopping	0	0	0	0	0	0
Queens Lane to St Kilda Road	No Stopping	0	0	0	0	0	0
	No Stopping Police Vehicles Excepted	5*	0*	0*	0*	0*	0*
	No Stopping	0	0	0	0	0	0
Bowen Crescent	Capacity	-	24	24	25	25	25
	No. Cars Parked	-	21	21	22	22	24
	No. Vacant Spaces	-	3	3	3	3	1
	Percentage Occupancy	-	88%	88%	88%	88%	96%
Queens Road (West Side)							
Bowen Crescent to Kings Way	No Stopping	0	0	0	0	0	0
	2P Disabled	1	0	0	0	0	0
	1P Ticket 8am-6pm Mon-Fri	13	11	13	13	8	11
	No Stopping	0	1	0	0	0	0
Queens Road (East Side)							
Kings Way to Bowen Crescent	No Stopping	0	0	0	0	0	0
	1P Ticket 8am-6pm Mon-Fri	12	10	11	11	10	11
	Permit Zone Authorised Car Share Vehicle Only (Green Car Share)	1*	0*	1*	0*	0*	0*
	No Stopping	0	0	0	0	0	0
Queens Road	Capacity	-	26	24	25	25	25
	No. Cars Parked	-	22	24	24	18	22
	No. Vacant Spaces	-	4	0	1	7	3
	Percentage Occupancy	-	85%	100%	96%	72%	88%

2 Bowen Crescent, Melbourne

Parking Occupancy Survey

GRP18745

Survey Date: See below



LOCATION	RESTRICTION	Capacity	NO. OF CARS PARKED				
			Wednesday 26/8/15 2:00pm	Friday 11/9/15 12:00noon	Friday 11/9/15 7:00pm	Saturday 12/9/15 1:30pm	Saturday 12/9/15 8:00pm
Queens Lane (West Side)							
Bowen Crescent to Kings Way	No Stopping	0	0	0	0	0	0
Queens Lane (East Side)							
Kings Way to Bowen Crescent	No Stopping	0	0	0	0	0	0
	Loading Zone	3*	1*	2*	2*	2*	2*
	Taxi Zone	1*	0*	0*	0*	0*	0*
	Loading Zone	5*	4*	4*	3*	4*	3*
	No Stopping	0	1	0	0	0	0
Queens Lane	Capacity	-	0	0	0	0	0
	No. Cars Parked	-	1	0	0	0	0
	No. Vacant Spaces	-	0	0	0	0	0
	Percentage Occupancy	-	-	-	-	-	-
Albert Road Eastern Section (West Side)							
St Kilda Road to Kings Way	No Stopping	0	0	0	0	0	0
	Loading Zone 15min 8am-6pm Mon-Fri	2	1	2	2	1	2
	No Stopping	0	0	0	0	0	0
	2P Ticket 8am-6pm Mon-Fri	17	16	17	15	16	17
	No Stopping	0	0	0	0	0	0
	2P Ticket 8am-6pm Mon-Fri	30	22	18	28	27	29
	No Stopping	0	0	0	0	0	0

2 Bowen Crescent, Melbourne

Parking Occupancy Survey

GRP18745

Survey Date: See below

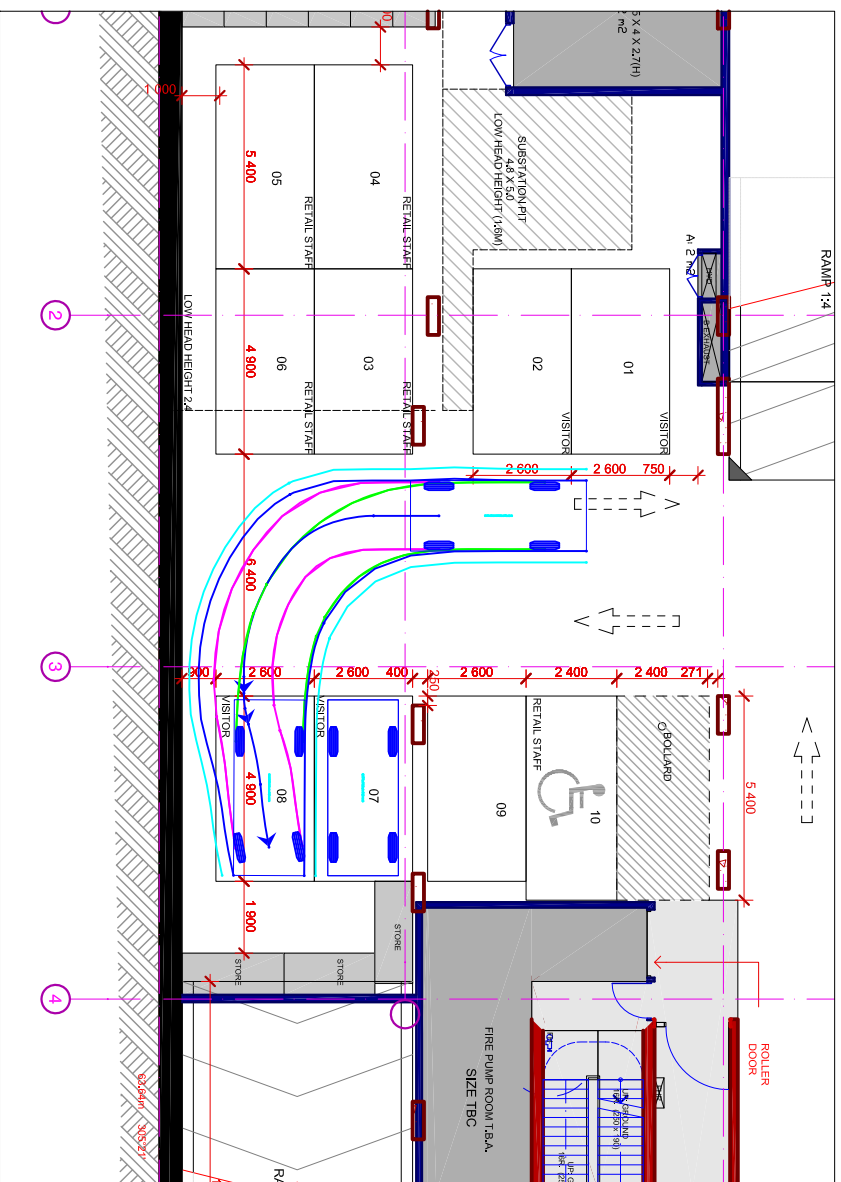


LOCATION	RESTRICTION	Capacity	NO. OF CARS PARKED				
			Wednesday 26/8/15 2:00pm	Friday 11/9/15 12:00noon	Friday 11/9/15 7:00pm	Saturday 12/9/15 1:30pm	Saturday 12/9/15 8:00pm
Albert Road Eastern Section (East Side)							
Kings Way to St Kilda Road	No Stopping	0	0	0	0	0	0
	2P Ticket 8am-6pm Mon-Fri	29	24	20	27	26	27
	2P Disabled	4	3	3	1	0	1
	No Stopping	0	0	0	0	0	0
	2P Ticket 8am-6pm Mon-Fri	11	9	11	11	8	10
	No Stopping	0	0	0	0	0	0
	2P Ticket 8am-6pm Mon-Fri	10	9	9	10	8	8
	No Stopping	0	0	0	0	0	0
Albert Road (Eastern Section)	Capacity	-	101	101	103	103	103
	No. Cars Parked	-	83	78	94	86	94
	No. Vacant Spaces	-	18	23	9	17	9
	Percentage Occupancy	-	82%	77%	91%	83%	91%
St Kilda Road (South Side)							
Allbert Road to Bowen Lane	No Stopping	0	0	0	0	0	0
	1P Ticket 8am-6pm Mon-Fri	1	0	1	1	1	1
	No Stopping	0	0	0	0	0	0
	1P Ticket 8am-6pm Mon-Fri	2	2	1	2	2	2
	Mail Zone	1*	0*	1*	1*	1*	1*
	No Stopping	0	0	0	0	0	0
Bowen Lane to Bowen Crescent	No Stopping	0	0	0	0	0	0
	P15min 8am-6pm Mon-Fri	2	1	2	2	2	2
	No Stopping	0	0	0	0	0	0
	1P Ticket 8am-6pm Mon-Fri	6	6	6	6	6	6
	No Stopping	0	0	0	0	0	0
	No Stopping	0	0	0	0	0	0
St Kilda Road	Capacity	-	11	11	11	11	11
	No. Cars Parked	-	9	10	11	11	11
	No. Vacant Spaces	-	2	1	0	0	0
	Percentage Occupancy	-	82%	91%	100%	100%	100%
TOTAL PARKING	Capacity	-	165	163	180	167	180
	No. Cars Parked	-	139	134	164	140	161
	No. Vacant Spaces	-	26	29	16	27	19
	Percentage Occupancy	-	84%	82%	91%	84%	89%

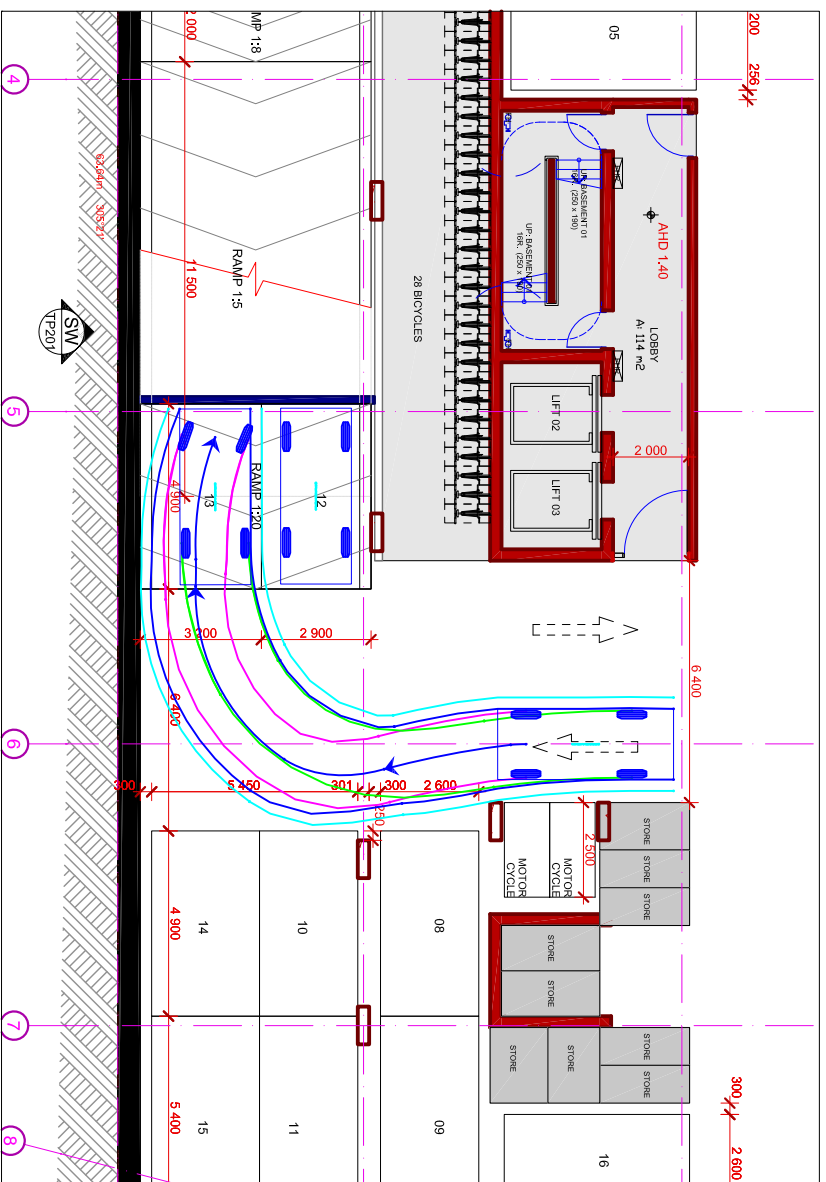
SB: South boundary
WB: West boundary
NB: North boundary
EB: East boundary
* = Unsuitable Car Spaces

Appendix C: Swept Path Diagrams

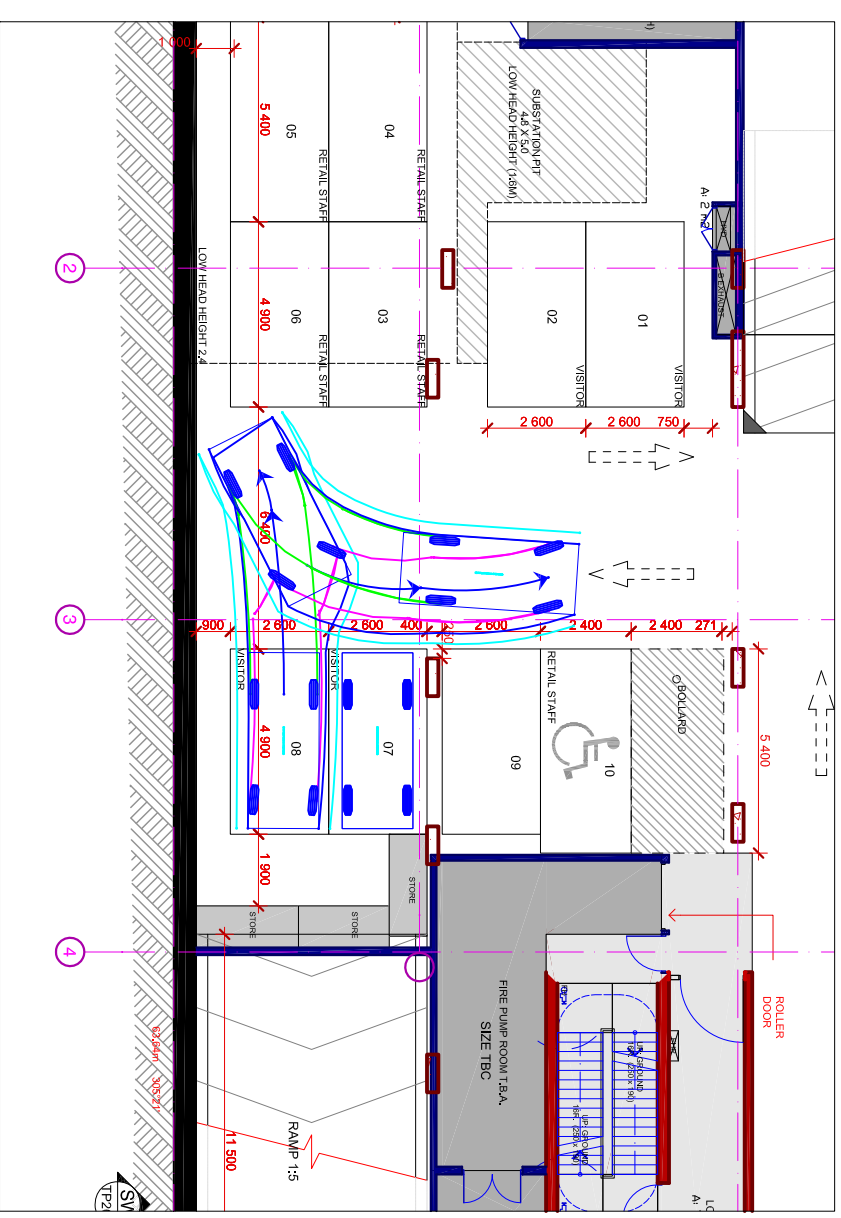
CAR SPACE - INGRESS



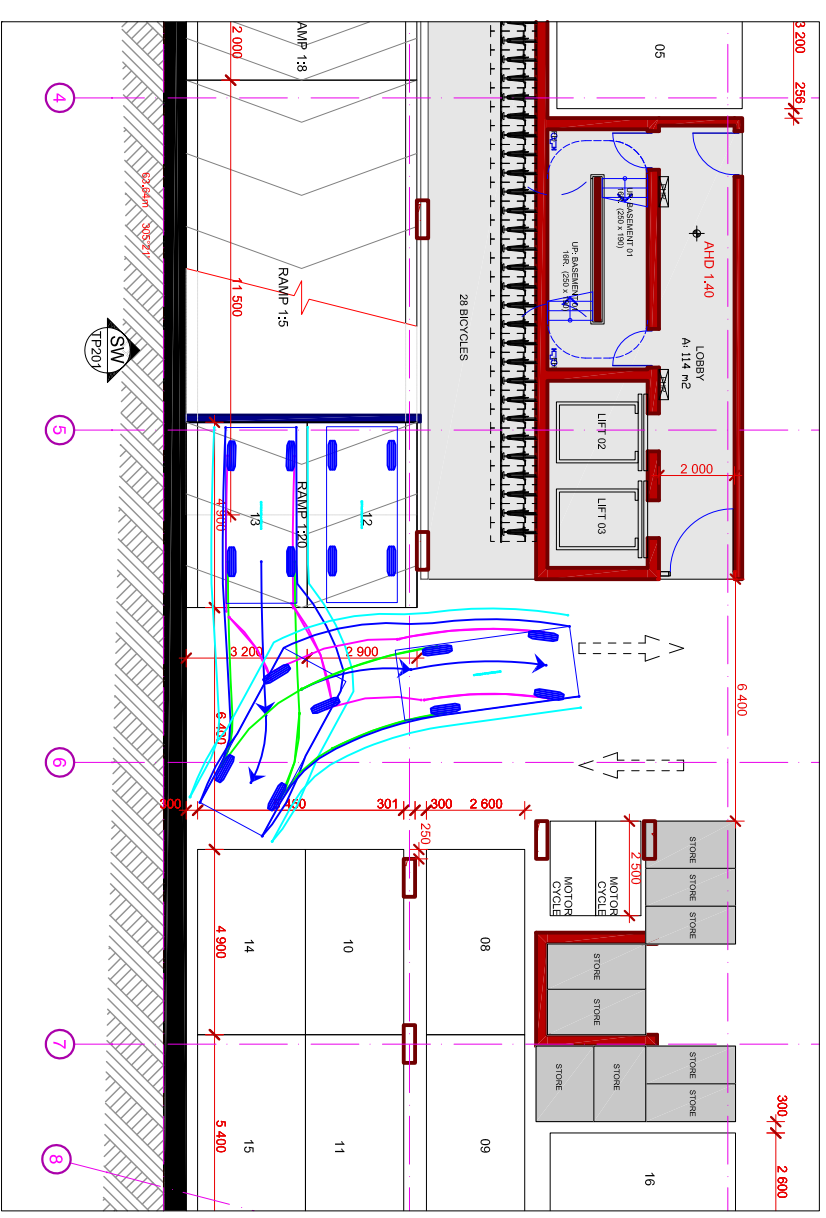
CAR SPACE - INGRESS



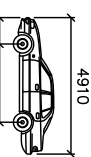
CAR SPACE - EGRESS



CAR SPACE - EGRESS



VEHICLE USED IN SIMULATION



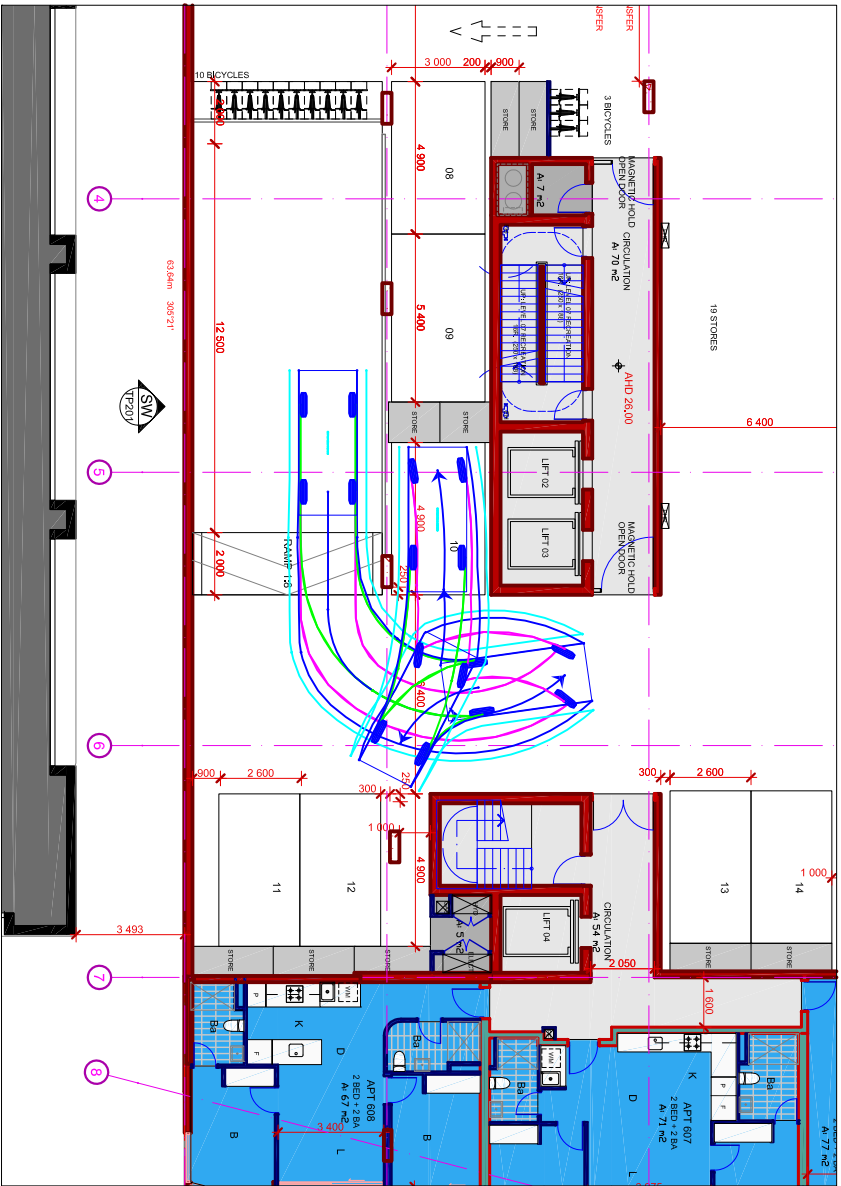
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Track	1770
Lock to Lock Time	6.00
Steering Angle	37.50

LEGEND

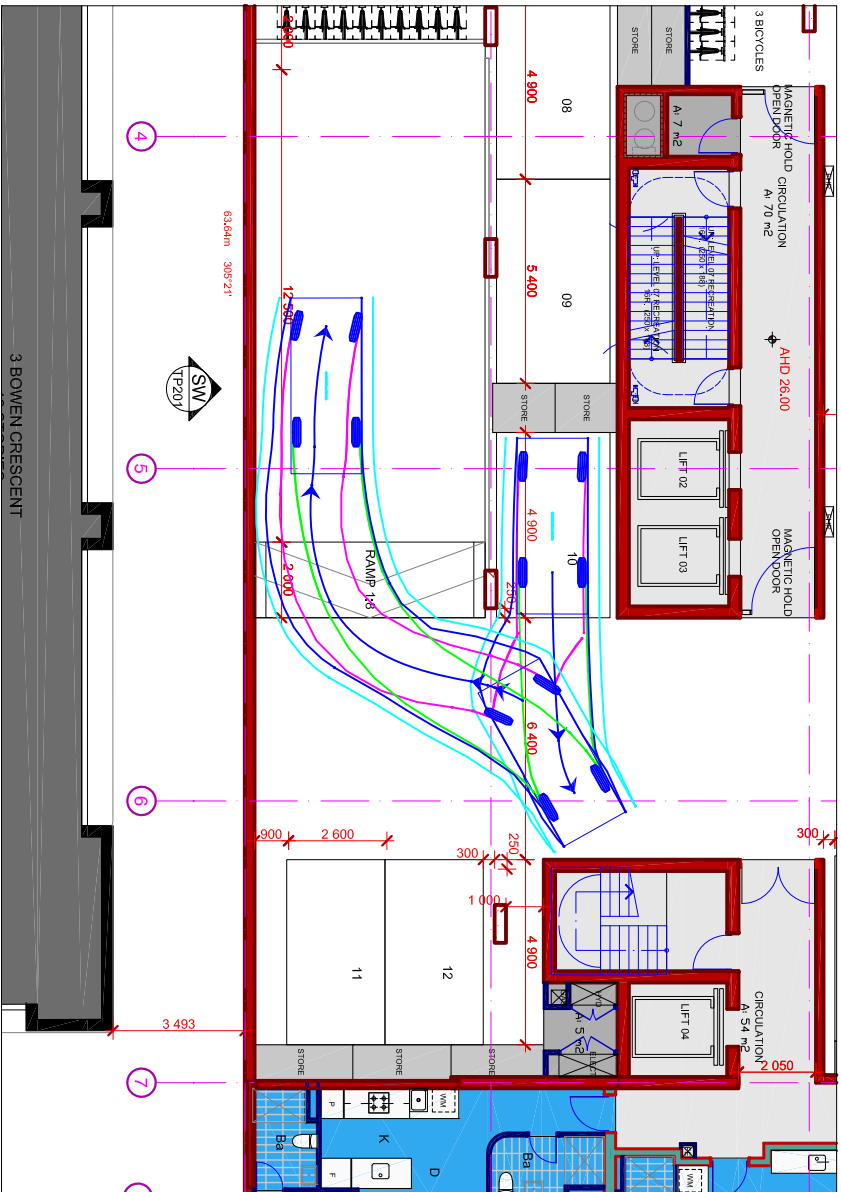
FRONT WHEELS	REAR WHEELS	VEHICLE BODY	BODY CLEARANCE
100	100	100	100

[illegible]

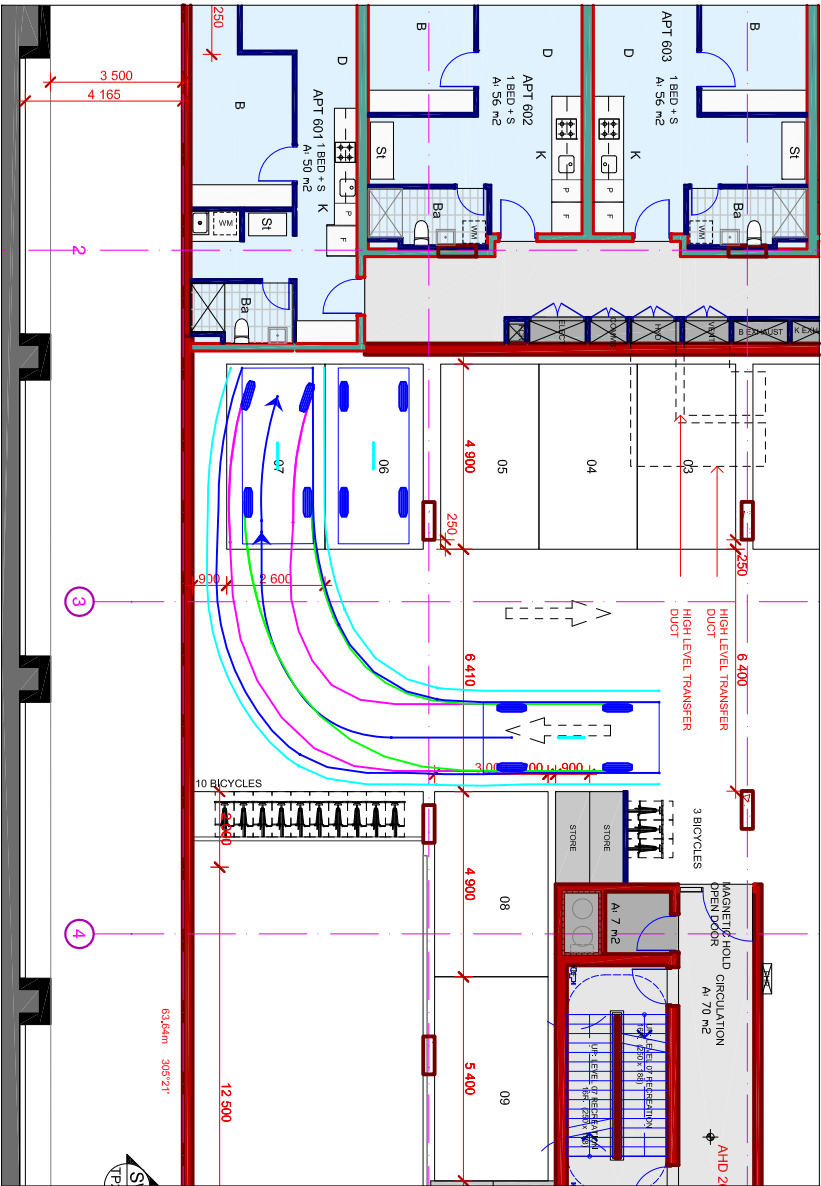
CAR SPACE – INGRESS



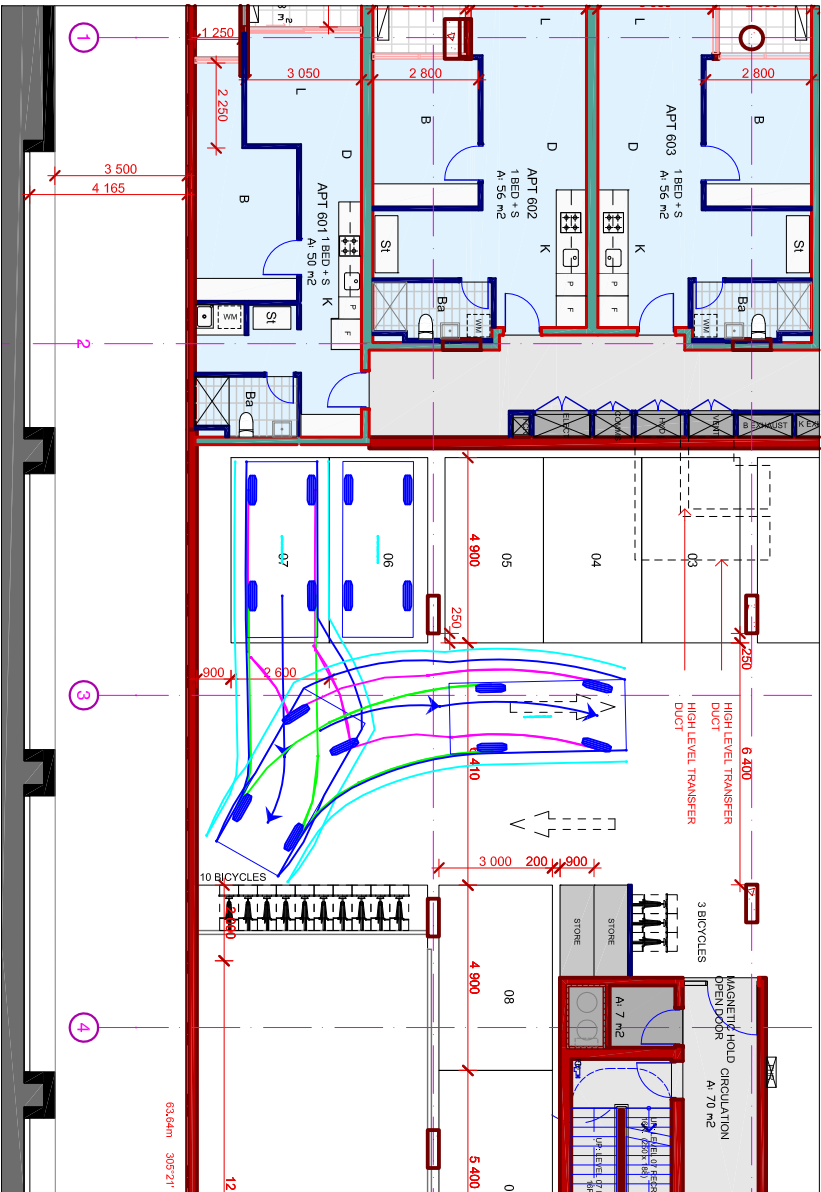
CAR SPACE – EGRESS



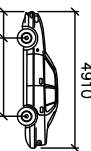
CAR SPACE – INGRESS



CAR SPACE – EGRESS



VEHICLE USED IN SIMULATION



85TH-CAR-AS2890-04 (mm)
Width : 1870
Track : 1770
Lock to Lock Time : 6.00
Steering Angle : 37.50

LEGEND

- FRONT WHEELS
- REAR WHEELS
- VEHICLE BODY
- BODY CLEARANCE

REVISION NOTES

REVISION	REVISION DATE	GENERAL NOTES

REVISION DATE

REVISION DATE	GENERAL NOTES

DESIGNED:

I. TOGANY 17 NOV 15

CHECKED:

D. ROBERTSON 17 NOV 15

FILE NAME:

18745-01.DWG

ISSUE:

A



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2 BOWEN CRESCENT, MELBOURNE

B85 DESIGN CAR SWEEP PATHS

PROPOSED MIXED USE DEVELOPMENT

SCALE

0 2 4

SHEET No. 02

DWG No. 18745-01