

Client
Greek Orthodox Archdiocese of
Australia

Date
17 March 2026

Planning

Transport

Urban Design

Waste Management

Landscape Architecture

Civil Engineering

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Transport Impact Assessment

Mixed-use Development

7 Hartington Street, Northcote

ratio:

Project
7 Hartington Street, Northcote

Prepared for
Greek Orthodox Archdiocese of Australia

Our reference
19797T

Directory path	https://ratioconsultants1.sharepoint.com/sites/19797T/Shared Documents/General/Work/Reports/19797T-REP01-F03.docx
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Version	Date	Issue	Prepared by	Checked by
F01	14/08/2025	Final	A. Lee	A. Harmer
F02	22/08/2025	Updated Final	A. Lee	A. Harmer
F03	17/03/2026	Updated Final – RFI Response	R. Tan	A. Harmer

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Acknowledgement of Country

We acknowledge the Traditional Owners of the land we work, live and travel on, and appreciate the rich cultures of the Aboriginal and Torres Strait Islander Peoples and their enduring connection to country.

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1. Introduction

1.1. Overview

Ratio Consultants has been engaged by Greek Orthodox Archdiocese of Australia to assess the transport implications of a proposed mixed-use development on the site at 7 Hartington Street in Northcote.

The proposal seeks to retain and repurpose the existing church building, along with introducing a range of new buildings and uses on the site, summarised in Table 1-1, with a detailed development summary in Section 3:

Table 1-1: Summary of Proposed Development

Building	Proposed Uses	Car Parking Provision and Access Arrangements
Building A (existing retained building)	13 x Residential Apartments - Hotel - Existing Church - Church Office - Bookshop - Makers Space (Art Space) - Function Room - Café	120 car parking spaces provided across two (2) basement levels accessed via an internal accessway to Hartington Street
Building B	22 x Residential Townhouses	44 car parking spaces (22 double garages) within a single basement level accessed via Hawthorn Road
Building C	47 x Residential Apartments	81 car parking spaces within a single basement level accessed via an internal accessway to Hartington Street
Building D	- A Childcare Centre (110 places) - Theatre	70 car parking spaces within a single basement level accessed via St Georges Road

Following receipt and review of the planning permit application (Ref. No. PA2503893), Council issued a Section 52 Request for Further Information (RFI) letter dated 3 December 2025. The relevant item raised by Council has been addressed in detail in Section 9 of this updated report.

Accordingly, Ratio Consultants has updated the Transport Impact Assessment report to respond to transport engineering matters raised in the City of Darebin Council's letter.

1.2. Purpose and Structure of this Report

This report sets out an assessment of the anticipated parking, traffic and transport implications of the proposed Permit Application, including consideration of the:

- Existing traffic conditions surrounding the site.
- Parking demand likely to be generated by the proposed development.
- Suitability of the proposed parking in terms of supply and layout.
- Proposed access arrangements for the site.
- Traffic generation characteristics of the proposed development.
- Transport impact of the development proposal on the surrounding road network.
- Sustainable transport facilities and connectivity for the development.

1.3. References

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

- Plans for the proposed development prepared by KUD, attached as Appendix A (Rev0).
- Darebin Planning Scheme.
- Australian/New Zealand Standard, Parking Facilities Part 1: Off-Street Car Parking (AS2890.1:2004).
- Australian Standard, Parking Facilities Part 2: Off-Street Commercial Vehicle Facilities (AS2890.1:2002).
- Australian/New Zealand Standard, Parking Facilities Part 6: Off-Street Parking for People with Disabilities (AS/NZS 2890.6:2009).
- An inspection of the subject site and its surrounds.
- Other documents as nominated.

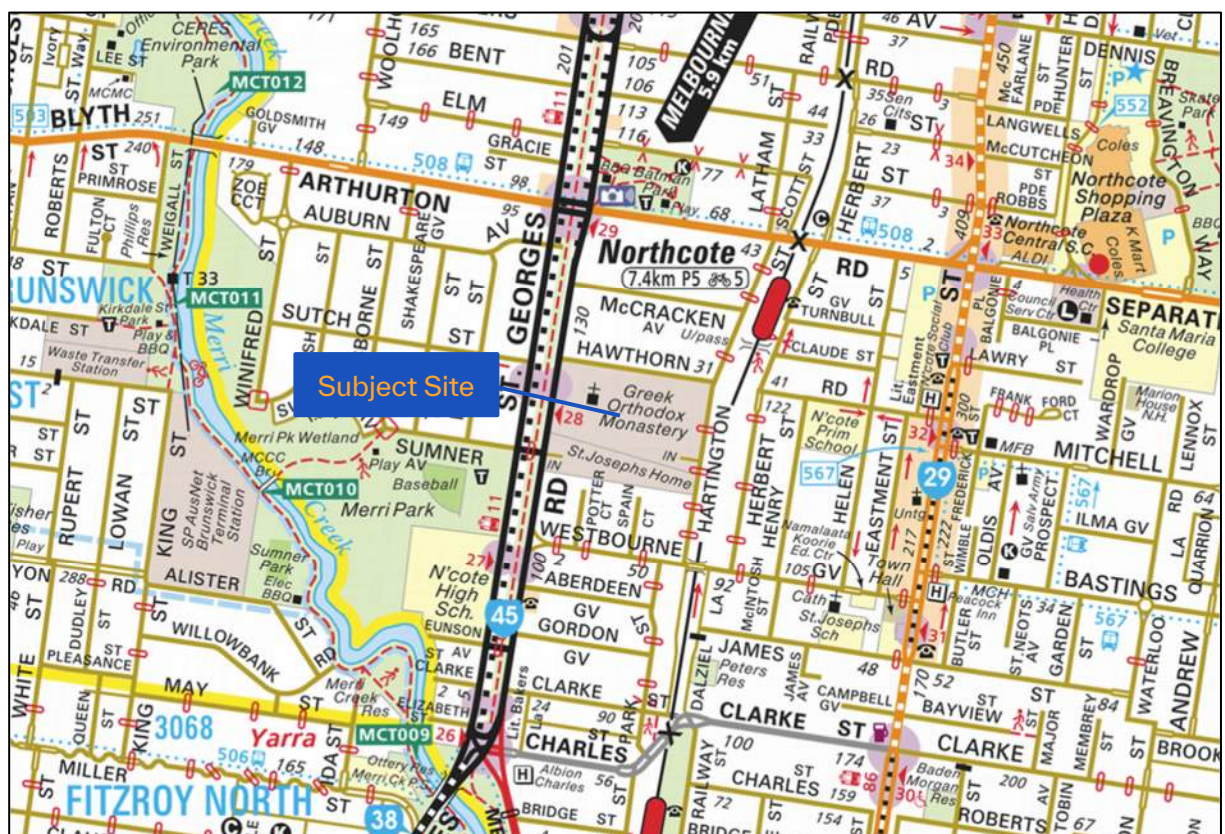
2. Existing Conditions

2.1. Site Location

The subject site is located at 7 Hartington Street in Northcote. The site is currently occupied by the existing Greek Orthodox Archdiocese of Australia church.

The site's location relative to the surrounding road network is shown in Figure 2-1.

Figure 2-1: Site Locality



Source: online.melway.com.au/melway/

The site is located within a General Residential Zone - Schedule 2 (GRZ2) and subject to the following overlays:

- Design and Development Overlay - Schedule 1 (DDO1); and
- Heritage Overlay (HO175).

The surrounding land use within the immediate vicinity of the site is predominately residential in nature, with the land to the southwest of the site zoned Public Conservation and Resource (PCRZ) and Public Use Zone - Education (PUZ2).

An aerial photograph of the subject site is shown in Figure 2-2.

Figure 2-2: Aerial View of Site and Surrounds



Source: app.landchecker.com.au/

2.2. Road Network

St Georges Road

St Georges Road is a Transport Road Zone 2 (TRZ2), which is under the care and management of the Department of Transport and Planning (DTP). St Georges Road runs in a general north-south alignment between Murray Road to the north and Brunswick Street to the south.

In the vicinity of the site, St Georges Road is configured as a dual carriageway separated by a central median approximately 16 metres wide, which accommodates a two-way bicycle path. The road comprises two traffic lanes in each direction, with a dedicated tram corridor located along the western side of the centre median. Footpaths are provided on both sides of the carriageway, and kerbside parallel parking is permitted intermittently, subject to 'Clearway' restrictions during designated time periods.

The posted speed limit along the northbound carriageway is 60 km/h, with a reduced 40 km/h school speed zone applying between 8:00 am and 9:00 am, and between 2:30 pm and 4:00 pm. A 70 km/h speed limit applies to southbound traffic.

Along the site frontage, St Georges Road includes two breaks in the central median, accommodating a T-intersection with Sumner Avenue (which also functions as a U-turn facility) and a dedicated signalised pedestrian crossing.

A street view of St Georges Road near the site is provided in Figure 2-3.

Figure 2-3: View of St Georges Road Looking South



Source: Google Street View

Hartington Street

Hartington Street is a Council managed road, with a north-south alignment between Arthurton Road and Westbourne Grove.

In the vicinity of the subject site, Hartington Street has an approximate sealed carriageway width of 7.0 metres accommodating a single traffic lane in each direction and kerbside parking on both sides, with a constructed pedestrian path provided along the western side of the road. Hartington Street has a posted speed limit of 40km/hr.

A street view of Hartington Street near the site is provided in Figure 2-4.

Figure 2-4: View of Hartington Street Looking North



Source: Google Street View

Hawthorn Road

Hawthorn Road is a Council managed road running in an east-west direction between St Georges Road and Hartington Street.

In the vicinity of the subject site, Hawthorn Road has a sealed carriageway approximately 10 metres wide, accommodating a single traffic lane in each direction and kerbside parking on both sides. A constructed footpath is provided along the northern side of the carriageway only. The posted speed limit on Hawthorn Road is 40 km/h.

A street view of Hawthorn Road near the site is provided in Figure 2-5.

Figure 2-5: View of Hawthorn Road Looking West



Source: Google Street View

2.3. Existing Traffic Conditions

Tube count surveys were conducted on Hartington Street and Hawthorn Road within the subject site frontage for a 7-day period between 24 March – 31 March 2023. The tube count survey data indicated the following two-way traffic volumes on Hartington Street and Hawthorn Road:

– Hartington Street:

- AM Peak (8:00-9:00am) – 185 vehicles per hour
- PM Peak (3:00-4:00pm) – 115 vehicles per hour
- 7-day AADT – 1,089 vehicles per day

– Hawthorn Road:

- AM Peak (8:00-9:00am) – 49 vehicles per hour
- PM Peak (3:00-4:00pm) – 36 vehicles per hour
- 7-day AADT – 358 vehicles per day

These volumes are typical of a local road of this nature.

Further peak period turning movement counts at selected intersections were also completed and are referenced within the traffic assessment section of this report (Section 8).

2.4. Sustainable Transport

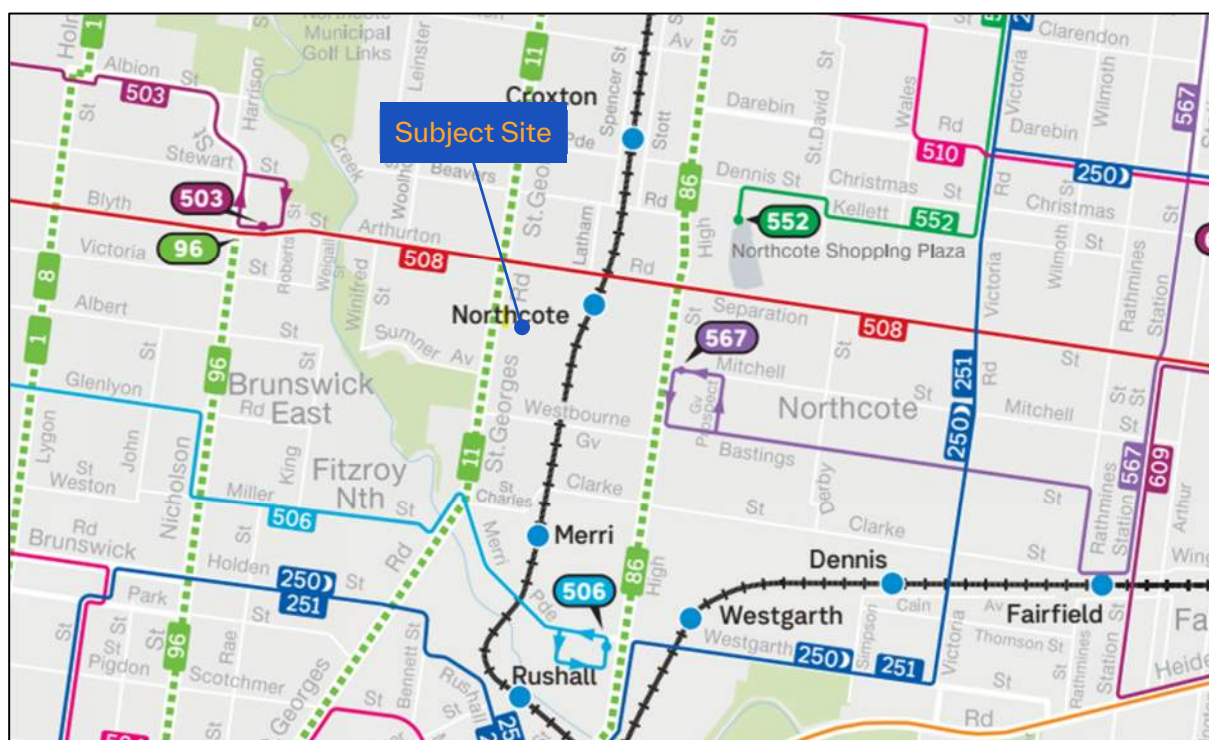
Public Transport

The subject site has excellent access to the public transport network, with bus, tram and train services operating within convenient walking distance of the site. The public transport services which are conveniently located near the site are summarised in Table 2-1 and shown in Figure 2-6.

Table 2-1: Public Transport Services

Service	Route #	Route	Nearest Stop	Approximate Walking Distance
Bus	508	Alphington – Moonee Ponds via Northcote and Brunswick	St Georges Road / Arthurton Road	550 metres
Tram	11	West Preston – Victoria Harbour Docklands	Sumner Avenue / St Georges Road	In front of site
	86	Bundoora RMIT – Waterfront City Docklands	Mitchell Street / High Street	600 metres
Train	Mernda Line		Northcote Station	300 metres

Figure 2-6: Public Transport Services Proximate to the Subject Site



Source: Public Transport Victoria

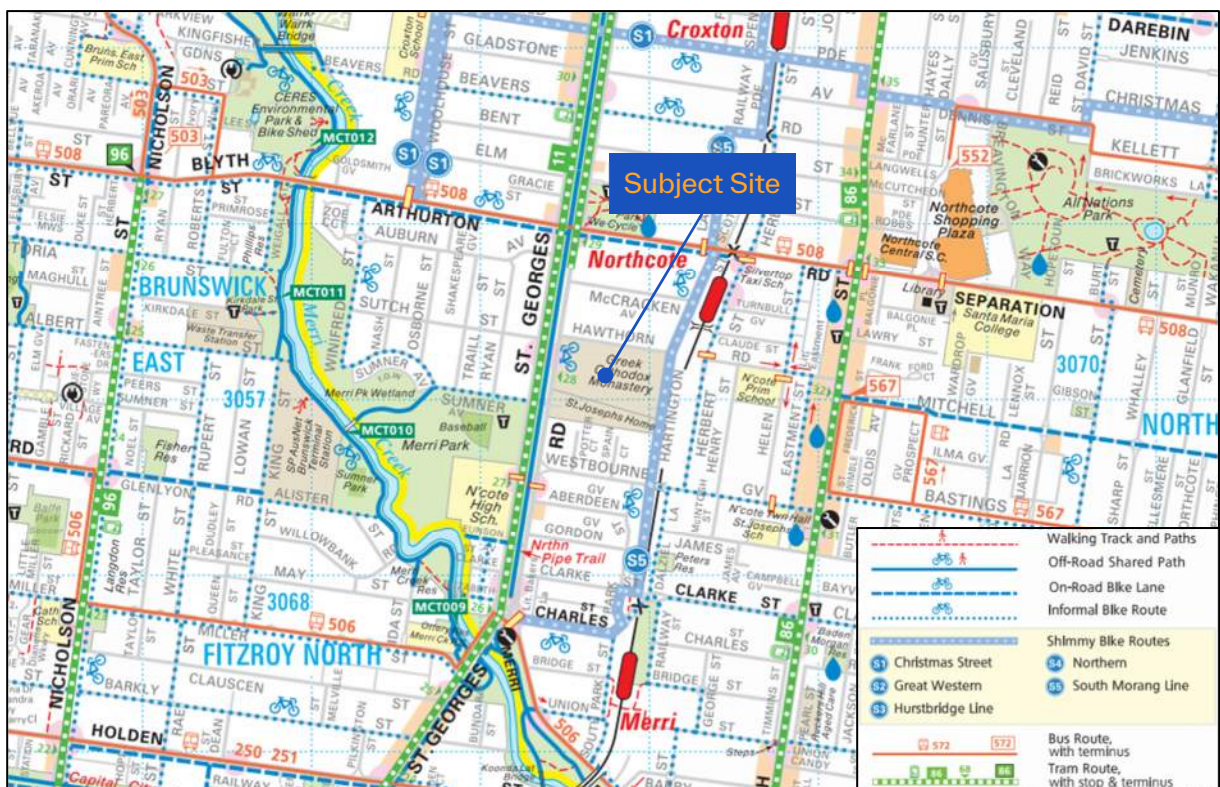
Active Transport

St Georges Road includes a constructed pedestrian footpath on both sides of the carriageway, while Hawthorn Road and Hartington Street each provide a footpath along one side only (noting that Hartington Street backs onto the railway line and therefore has no active fronting to the eastern side). A signalised pedestrian crossing is located on St Georges Road along the site frontage.

The site has good access to Melbourne's bicycle network, connecting to a range of on-road and off-road bicycle paths throughout the suburb of Northcote and the City of Darebin. Notable bicycle paths within the vicinity of the site include:

- Off-road shared path along St Georges Road;
- Shimmy bike route along Hartington Road; and
- On-road bike lanes along Arthurton Road.

Figure 2-7: Bicycle Network Proximate to the Subject Site



Source: City of Darebin TravelSmart Map

2.5. Crash Analysis

A review has been conducted of the Department of Transport and Planning 'Victoria Road Crash Data' for the latest five-way reporting period (03/07/2020 – 03/07/2025) for any reported casualty crashes along St Georges Road, Hawthorn Road and Hartington Street in the vicinity of the subject site.

This database records all accidents causing injury that have occurred in Victoria since 1987 (as recorded by Victorian Police) and categorises these accidents as follows:

- Fatal injury: at least one person was killed in the accident or died within 30 days as a result of the accident.

- Serious injury: at least one person as sent to Hospital as a result of the accident.
- Other injury: at least one person required medical treatment as a result of the accident.

A total of three crashes were recorded on within the study area, summarised as follows:

- An ‘other injury crash’ at the St Georges Road / Sumner Avenue intersection, involving a collision between a cyclist and vehicle.
- A ‘serious injury crash’ at the St Georges Road / Sumner Avenue intersection, involving a collision between a cyclist and vehicle.
- A ‘serious injury crash’ midblock on St Georges Road north of the site, involving a collision between a southbound vehicle and a parked vehicle.

Three crashes have been recorded within the study area during the most recent five-year reporting period, two of which occurred at the intersection of St Georges Road and Sumner Avenue. The low number of incidents over this period, including only two crashes at the intersection despite the presence of a well-used bicycle path, does not indicate any discernible trends or underlying road safety issues.

As such, the proposed development is not expected to exacerbate any existing safety or capacity constraints in the surrounding road network.

3. Proposal

3.1. Overview

The proposal seeks to retain and repurpose the existing church building (Building A), along with introducing a range of new buildings and uses on the site. More specifically, the development will incorporate the following land use yield and associated transport infrastructure, as summarised in Table 3-1.

Table 3-1: Proposed Development Summary

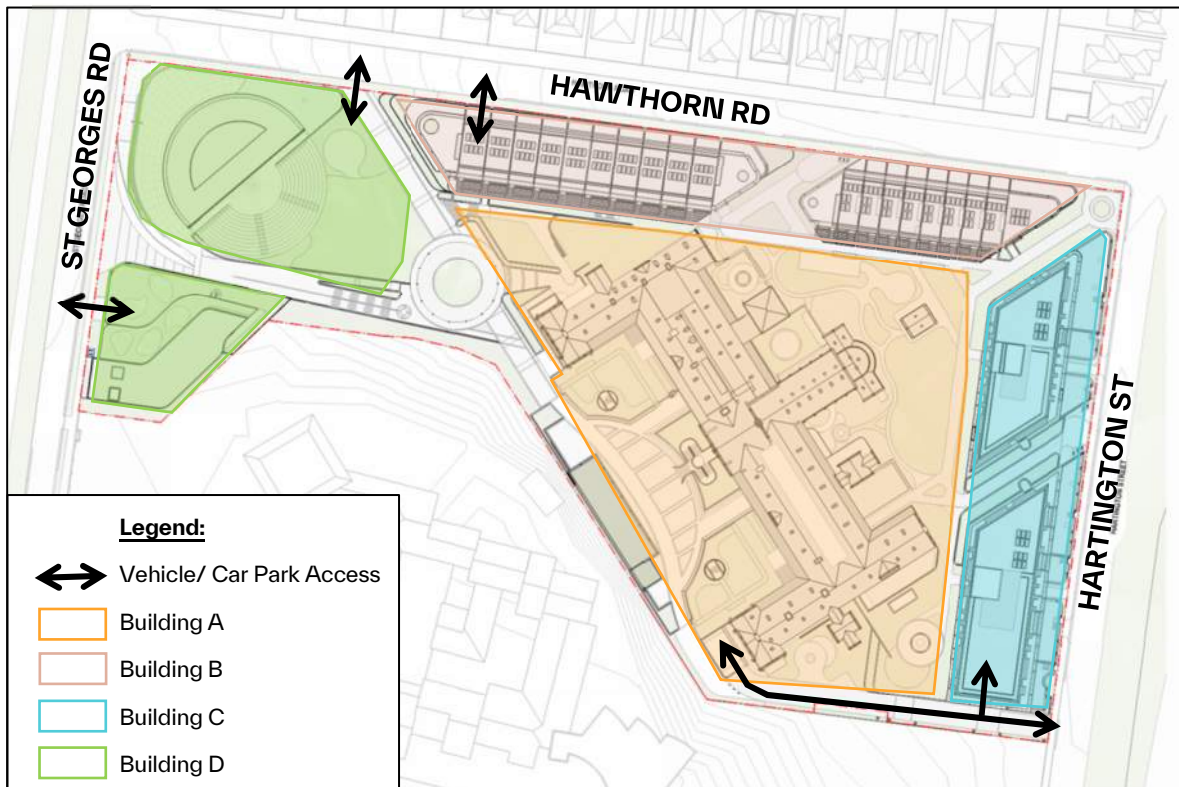
Building	Land Use	Size/ No. of dwellings	Car Parking	Bicycle Parking
A	Apartments	4 x one-bedroom 9 x three-bedroom	120 spaces across two basement levels	72 employee/ resident and 12 visitor spaces
	Hotel	23 rooms		
	Bookshop	168 sqm		
	Church [1] / Function Rooms	Up to 430 patrons [2]		
	Makers Space (Art Space)	488.8 sqm		
	Café	282 sqm		
B	Townhouses	22 x three-bedroom	44 spaces within 22 double garages	44 resident and 6 visitor spaces
C	Apartments - C1	3 x one-bedroom 3 x two-bedroom 16 x three-bedroom (Total - 22 dwellings)	81 spaces within a single basement level	70 resident and 10 visitor spaces
	Apartments - C2	3 x one-bedroom 4 x two-bedroom 18 x three-bedroom (Total - 25 dwellings)		
D	Childcare Centre	110 children	70 spaces within a single basement level	20 employee and 10 visitor spaces
	Theatre	Up to 430 patrons [2]		

[1] The 401 sqm of church office space is considered ancillary to the primary place of worship use and has therefore not been included in the above summary as a separate office land use.

[2] Due to the range of place of assembly uses proposed on-site, including the church and various function rooms in Building A and the proposed new theatre building, a combined site-wide 430 patron cap is proposed to be shared between these various uses. This cap will apply to regular day-to-day activities, but excludes major church services that attract larger crowds but only occur on selected days of the year (such as Easter or Christmas services).

Figure 3-1 illustrates the proposed site layout, including a markup of the previously mentioned building locations within the site and their respective vehicle access locations.

Figure 3-1: Overall Site Layout



Source: Overall Site Layout Plan, prepared by KUD (Rev A)

The site includes an internal pedestrian network that connects the various buildings, with each building also providing direct pedestrian access from the fronting streets (with the exception of Building A which has internal pedestrian access due to existing site levels).

All loading and waste collection activities are proposed to be accommodated within the basement car park levels.

A porte cochere is proposed adjacent to Building A, with a dedicated access point from Hawthorn Road to accommodate pick-up and drop-off movements, primarily associated with the proposed hotel, church, function rooms, and theatre. This access option will also operate as a service vehicle access route for occasional event set-ups in the piazza area in front of Building A.

4. Car Parking Assessment

4.1. Car Parking Requirements

Parking requirements for a range of uses are set out under Clause 52.06 of the City of Darebin Planning Scheme. Table 1 of Clause 52.06 sets out the car parking requirement that applies to a use listed in the Table.

In this instance, the subject site is located within the PPTN area and therefore subject to Column B rates outlined in Table 1 of Clause 52.06.

Accordingly, the statutory car parking requirements for the proposed development have been assessed against the following Column B rates.

Table 4-1: Clause 52.06 Planning Scheme Parking Rates

Land Use	Statutory Car Parking Rate (Column B)
Residential Apartments/ Townhouses	<i>1 space to each one or two bedroom dwelling 2 spaces to each three or more bedroom dwelling Zero visitor parking spaces</i>
Bookshop ('Shop')	<i>3.5 spaces to each 100sqm of net floor area</i>
Makers Space ('Arts & Craft Centre')	<i>3.5 to each 100sqm of net floor area</i>
Café ('Food and drink premise')	<i>3.5 to each 100sqm of leasable floor area</i>
Childcare Centre	<i>0.22 space to each child</i>
Church/ Function Room/ Theatre ('Place of Assembly')	<i>0.3 spaces to each patron permitted</i>
Residential Hotel	<i>To the satisfaction of the responsible authority</i>

Residential Hotel Car Parking Requirement

Given that the residential hotel land use does not have its own statutory car parking rate under Clause 52.06, guidance in respect to its anticipated car parking generating characteristics has been sought from surveys undertaken for comparable developments. In this respect, surveys indicate that residential hotels generate a car parking demand ranging from **0.2 to 0.6 spaces per room** with depending on the sites access to public transport, surrounding amenities, the available car parking provision and the level of complimentary facilities (i.e. function rooms, restaurants, etc.).

A motel use is considered broadly comparable to the proposed hotel use, with both the Guide to Transport Impact Assessments (GTIA 2024) and Table 1 of Clause 52.06 of the Planning Scheme specifying a minimum requirement of **one (1) space per room**.

Having regard to the characteristics of the proposed development, a car parking rate of **one (1) space per room** has been adopted for the purposes of this assessment, but is considered to be highly conservative given the case study data rates ranging between 0.2-0.6 spaces/room.

Summary

Based on the above statutory car parking requirements and empirical car parking rate for the residential hotel use, the minimum car parking requirement has been summarised in Table 4-2 below.

Table 4-2: Summary of Car Parking Requirements

Building	Land Use	Size/ No. of dwellings	Car Parking Minimum Requirement
A	Apartments	4 x one-bedroom	22 spaces
		9 x three-bedroom	
	Bookshop	168 sqm	5 spaces
	Makers Space	488.8 sqm	17 spaces
	Café	282 sqm	9 spaces
	Hotel	23 rooms	23 spaces
	Church / Function Room	<i>Combined Patron Cap of 430, assessed separately below</i>	
		Building A Subtotal	<u>76 spaces</u> (excluding requirement for church / function room)
B	Townhouses	22 x three-bedroom	<u>44 spaces</u>
C	Apartments – C1	3 x one-bedroom	38 spaces
		3 x two-bedroom	
		16 x three-bedroom	
	Apartments – C2	3 x one-bedroom	43 spaces
		4 x two-bedroom	
		18 x three-bedroom	
		Building C Subtotal	<u>81 spaces</u>
D	Childcare Centre	110 children	<u>24 spaces</u>
	Theatre	<i>Combined Patron Cap of 430, assessed separately below</i>	

A / D	Church / Function Room / Theatre [1]	Combined 430 Patron Cap	<u>129 spaces</u>
<u>TOTAL</u>			<u>354 spaces</u>

[1] Patrons of the Church / Function Rooms / Theatre will have access to the car parking areas within both Building A and Building D, depending on the events they will be hosting and the anticipated number of patrons.

Based on the above assessment, the proposed development has a statutory requirement to provide a total of 354 on-site car parking spaces.

The development proposes a total of **315 spaces** across Buildings A to D, resulting in an overall shortfall of 39 spaces compared to the minimum statutory requirement. A breakdown of the proposed provision is provided below:

- Building A: 120 spaces
- Building B: 44 spaces
- Building C: 81 spaces
- Building D: 70 spaces

It is noted that the minimum resident car parking requirements have been satisfied within Buildings A, B and C, and the identified parking shortfall is associated with the public car parking spaces proposed in Buildings A and D supporting the non-residential uses.

On the basis of a statutory car parking requirement of 354 spaces, a planning permit is sought to reduce the requirement by 39 non-residential car parking spaces against the requirements of Clause 52.06 of the Darebin Planning Scheme.

Under the provision of Clause 52.06, the Responsible Authority is able to reduce the parking requirements (including reduced to zero), provided the applicant satisfies the responsible authority that the provision of car parking is justified on the basis of:

- The car parking demand likely to be generated by the use; and
- Whether it is appropriate to allow fewer spaces to be provided than the number likely to be generated by the use.

4.2. Car Parking Demand Assessment

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

- *The likelihood of multi-purpose trips 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.*

As noted, the assessment has been undertaken for the non-residential uses within Buildings A and D that generate a shortfall, noting that the residential car parking requirement has been satisfied. These uses include:

- **Building A:** Hotel, Bookshop, Church, Function Rooms, Makers Space, and Café
- **Building D:** Childcare Centre and Theatre

The relevant car parking demand assessment criteria are discussed as follows:

Likelihood of Multi-Purpose Trips

There is a range of complementary facilities proposed within the development will result in a reasonable number of multi-purpose trips. The impact of multi-purpose trips from a parking perspective is that the overall parking demand is reduced compared with assessing each land use individually, but the average length of stay increases.

Short Stay and Long Stay Parking Demands

Long stay parking demand will be generated by employees, who require parking for longer periods of time. Customer and visitor parking and childcare centre pick up / drop off parking are all classified as short stay parking. The majority of car parking activity for the proposed non-residential uses is short stay and on this basis car parking will turn over on a regular basis.

Availability of Alternative Transport Modes

As discussed in Section 2.4, the subject site has excellent access to the public transport network, with bus, tram and train services operating within convenient walking distance of the site. The public transport services which are conveniently located near the site are summarised in Table 2-1 and shown in Figure 2-6.

In addition, St Georges Road includes a constructed pedestrian footpath on both sides of the carriageway, while Hawthorn Road and Hartington Street each provide a footpath along one side only (noting that Hartington Street backs onto the railway line and therefore has no active frontage to the eastern side). A signalised pedestrian crossing is located on St Georges Road along the site frontage. The site has good access to Melbourne's bicycle network, connecting to a range of on-road and off-road bicycle paths throughout the suburb of Northcote and the City of Darebin.

Variation in Car Parking Demand Over Time

The various uses within the development will experience peak car parking demands at different times of the day and week.

The car parking demand characteristics for the proposed uses have been discussed within the following sections, with an overall car parking demand and temporal analysis provided as a conclusion. Google Analytics trends for comparable uses in the surrounding area, along with case study data from our office and first principles assessments where applicable, have been used to inform the variation in parking demands and activity generated by each individual land use that will share use of the public car parking supply.

HOTEL

Hotel parking demand generally peaks during key guest activity periods throughout the day. Demand is typically high from early to late morning, prior to typical guest check-out times, and then decreases as departing guests vacate spaces. A second peak usually occurs in the late afternoon and early evening, corresponding with guest check-in periods when vehicles arrive. Following check-in, overnight parking demand remains relatively high and steady. Weekend demand tends to be higher than weekday demand due to an increased proportion of recreational guests.

BOOKSHOP

Bookshop parking demand typically remains steady throughout standard business hours (9:00am – 5:00pm Monday to Friday), reflecting consistent customer and staff parking demand during the day. Outside the operating hours of the bookshop and on the weekend, there is expected to be no parking demand generated by the bookshop.

CHURCH / FUNCTION ROOM / THEATRE

Parking demand for church activities typically peaks on weekends, particularly Sunday late mornings to early afternoons, corresponding with service times.

Function rooms and theatres generally experience peak parking demand during weekday and weekend evenings, driven by scheduled events and performances. Outside of these peak periods, parking demand is typically negligible.

MAKERS SPACE (ART SPACE)

For the purpose of informing the temporal analysis, the expected parking demand profile for the proposed art space has been estimated based on Google Analytics data from similar art gallery and arts/crafts activity venues. On weekdays, demand is anticipated to be concentrated around the late morning to early afternoon period, reflecting visitor patterns for gallery exhibitions and workshop sessions. Weekend demand is expected to be higher overall, with peak periods occurring both around midday and in the evening, coinciding with programmed events or workshops.

CAFÉ

The demand for car parking associated with food and drink tenancies varies considerably depending on the types of businesses operating on-site. The proposed tenancy is assumed to likely be occupied by a café-style business. These cafés are expected to operate primarily during weekday business hours, with some also trading on weekends, when peak parking demand is anticipated.

It is noted that a typical food and beverage premise is likely to draw a significant proportion of its trade from walk-up customers associated nearby residents and staff of the surrounding businesses.

To inform expected usage patterns, reference was made to Google Analytics data for a nearby popular café, which is expected to operate similarly to the proposed tenancy. Based on this data, peak car parking demand is anticipated around midday on a weekday and late afternoon on a weekend.

CHILDCARE CENTRE

Car parking demand at childcare centres typically peaks during morning drop-off and afternoon pick-up periods, generally between 7:00–9:00am and 4:00–6:00pm on weekdays. Demand is short-stay in nature, with parents or guardians typically parking for brief periods (5–10 minutes). Outside of these peak times, parking demand is significantly reduced and limited to staff parking only.

Summary of Temporal Car Parking Analysis

Based on the preceding analysis and discussion, and given the various land uses proposed on-site, simply combining the peak parking demands of all land uses yields an overly conservative peak demand. This results in an excessive parking supply that is never fully utilised given that different land uses peak at different times of the day.

A temporal analysis of the parking demand profiles for each land use across the course of a typical weekday and weekend means that a more accurate combined peak car parking demand can be determined for the site's public car parking supply.

Parking demand profiles for the proposed land uses have been developed using case study data from comparable sites across Victoria, sourced from both Ratio and other engineering consultants, as well as Google Analytics data for similar uses in the surrounding area, and informed by first-principles analysis where other data is unavailable.

The individual parking demand profile for each land use and the overall combined demand profile for the development is provided in Figure 4-1 and Figure 4-2 for a typical weekday and weekend (for which Sunday was considered to be the peak day, capturing a church service).

Figure 4-1: Weekday Car Parking Demand Temporal Analysis

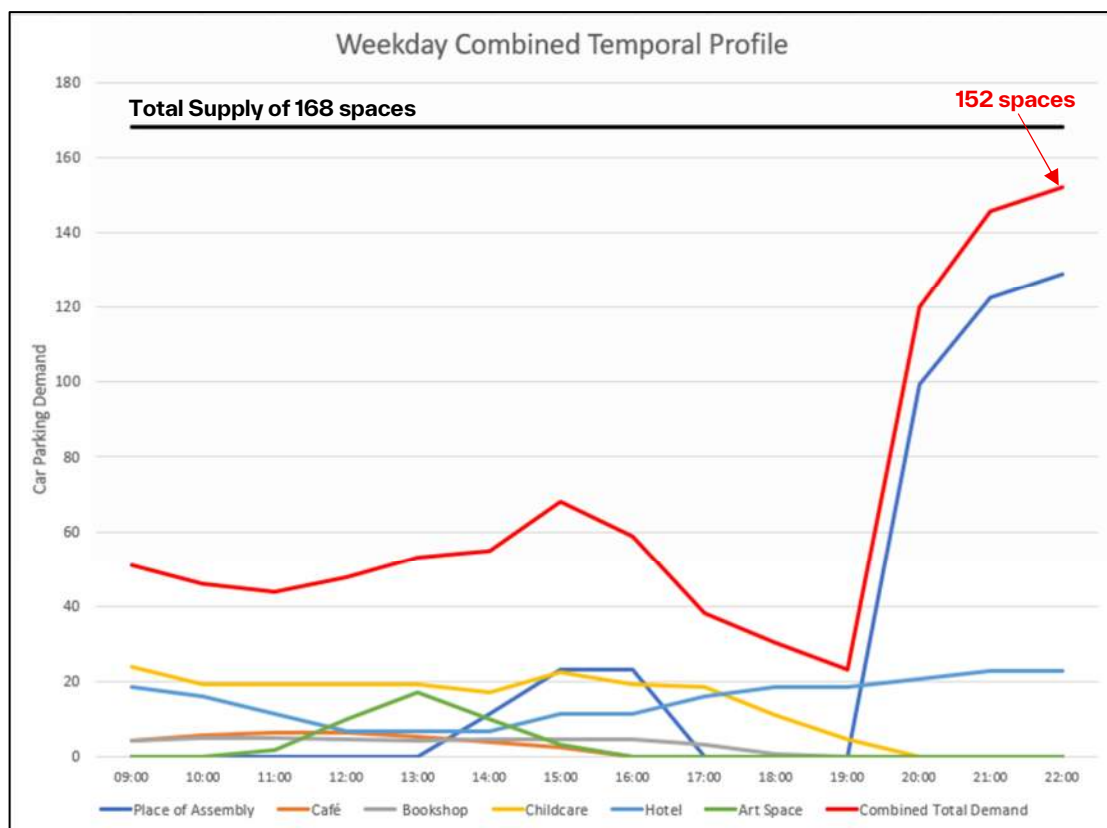
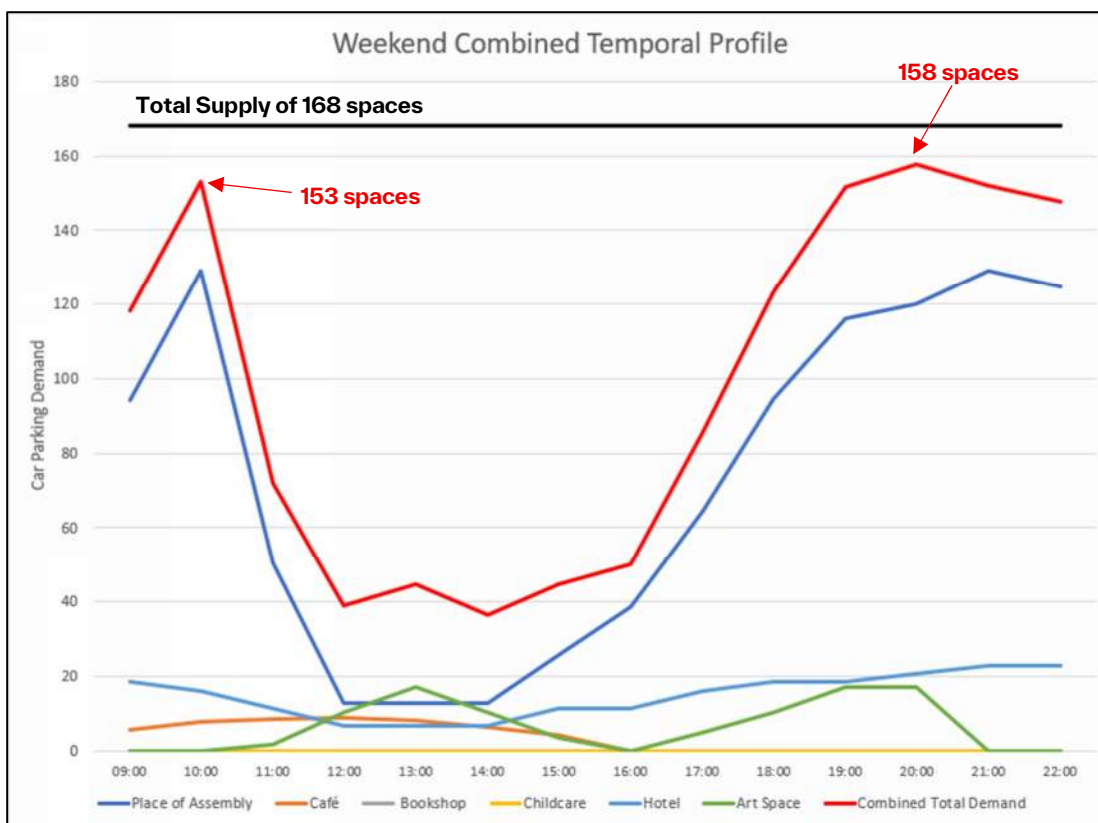


Figure 4-2: Weekend (Sunday) Car Parking Demand Temporal Analysis



* No parking demand generated by the bookshop and childcare centre during the weekend

Based on the temporal assessment, the varying demands for the combination of proposed uses is anticipated to generate a peak car parking demand of up to 152 spaces on a weekday at around 10:00pm, and 158 spaces on a weekend at around 8:00pm. On weekdays, demand is projected to be relatively steady throughout the day and increase from 7:00pm toward the evening peak, with no notable secondary peaks. On weekends (Sunday), a secondary peak occurs at approximately 10:00am, corresponding to peak church activity.

In both weekday and weekend scenarios, the peak combined parking demand is largely driven by the shared patron allowance for the place of assembly uses, including the Church, Function Centre, and Theatre. Demand for these uses has been calculated based on the combined patron capacity of 430 persons, assuming full attendance. This represents a highly conservative assumption, as in practice these uses will not consistently be operating at the combined maximum capacity and more commonly may only generate a reduced portion of their patron capacity.

Accordingly, the temporal analysis for both weekday and weekend scenarios are considered conservative, particularly given that all other uses are expected to generate relatively low and steady parking demand throughout the day. However, importantly this assessment comprehensively captures the peak operating scenario for the site, based on the proposed combined cap of 430 patrons.

Adequacy of Car Parking Provision

The provision of 168 publicly available spaces (i.e. excluding onsite residential parking) satisfies the anticipated peak demands on both weekdays and weekends, as identified in the temporal analysis. Even under the conservative scenario assuming full attendance of 430 patrons for place of assembly uses, parking demand can be fully accommodated within the

available supply. In reality, given that these place of assembly uses are not expected to be consistently operating at full capacity on a day-to-day basis, there is expected to be a notable surplus of parking above peak weekday and weekend demands. On this basis, the proposed parking provision is considered sufficient to cater for the anticipated peak demand generated by the development.

4.3. Place of Assembly & Event Parking Considerations

As previously detailed in this report, the place of assembly type uses, including the Church, Function Rooms and Theatre, are proposed to operate with a combined patron cap across the site of 430 patrons for typical day-to-day activity. Given that it is highly unlikely that all of these event / assembly spaces are going to be used all at the same time, it would be illogical for their car parking requirements to all be assessed individually and therefore the combined patron cap has been proposed. This arrangement and its operational details are already somewhat covered under the 'Operating Strategy' document but could be further detailed as part of a Car Parking Management Plan prepared as a condition of permit (if necessary).

In this regard, the publicly accessible car parking areas are located in Buildings A and D. Depending on where the relevant event/s are being held and the number of patrons involved, this will determine whether all patrons can be housed in the one car park area or whether there would need to be some utilisation of the other car park area, which may potentially be outside the building that patrons are attending.

It is understood that the proposed Church use may occasionally generate significantly higher car parking demands than the proposed cap of 430 patrons, during special events or major church services. These events are expected to be primarily limited to special Church services at Easter or Christmas, therefore occurring on an infrequent basis and not reflective of the typical day-to-day operation of the site.

Given the infrequent nature of such events, it is not considered reasonable or necessary to design the car parking supply to accommodate these peak-of-peak, non-typical scenarios. The proposed car parking provision is appropriate for the regular operational needs of the development and considered to be appropriate.

Furthermore, there is available on-street parking capacity along Hartington Street, Hawthorn Road, and St Georges Road that can reasonably accommodate any overflow parking generated during these occasional special service events. These events are likely to occur outside standard weekday peak periods (predominantly on weekends) thereby limiting any conflict with other land uses, including commuter car parking demand from the nearby train station.

It is also noted that the church is currently operating and already generates similar parking demands for these special major services. Based on current observations, there are no apparent issues with the availability or management of parking during such times. As such, it is anticipated that the surrounding parking network can continue to adequately accommodate these infrequent high-demand events.

5. Access and Car Parking Layout

5.1. Clause 52.06 Design Standard Assessment

The proposed vehicular access arrangements and car parking layout have been designed in accordance with the objectives and design requirements of Clause 52.06-9 of the City of Darebin Planning Scheme and with the relevant sections of AS/NZS 2890.1:2004 and AS/NZS 2890.6:2009. Key design elements of the design are summarised below:

- The proposed crossovers on Hartington Street, Hawthorn Road and St Georges Road provide a minimum two-way width of 5.5 metres and internal accessway widths are minimum 6.1 metres wall-to-wall, satisfying the minimum requirements of Design Standard 1. Crossovers should be annotated on plans and will be constructed in accordance with Council's standard drawings.
- A 2.0m x 2.5m pedestrian visibility splay has been incorporated on the departure side of each proposed crossover, which is at least 50% clear of visual obstruction.
- The access into Building A basement includes an entry boom gate at the top of the ramp down to Basement Level 1, with the exit boom gate at the bottom of the ramp. It is noted that the boom gates will need to operate with a number plate reading system, as no centre median has been allowed for in the design.
- Basement car parking spaces have been designed with minimum dimensions of 2.6 metres in width and 4.9 metres in length, accessed via aisles with a minimum width of 6.4 metres, in accordance with Design Standard 2.
- All proposed garage spaces are at least 6.0 metres long and 3.5 metres wide for a single garage and minimum 5.5 metre wide for a double garage, in accordance with Design Standard 2. Tandem garages are at least 3.5m wide and 11.2m long, which is considered to be a satisfactory length to accommodate a tandem parking arrangement with adequate clearances for pedestrian movement around parked vehicles.
- The Building B garages are accessed from a reduced 6.1 metre wide aisle, however swept path assessment confirms that the movements in/out can be completed with adequate clearances and the permitted corrective manoeuvre for a Class 1A car park.
- Accessible parking spaces and adjacent shared zones have been designed in accordance with AS/NZS 2890.6:2009, providing a minimum space width of 2.4 metres, a minimum shared zone width of 2.4 metres, and a length of 5.4 metres, accessed via a minimum 5.8 metre aisle. The accessible space within Building D (allocated to the Early Learning Centre) measures 2.4 metres x 5.4 metres, however the adjacent shared zone is 2.4 metres x 5.0 metres. The reduced shared zone length is considered acceptable as it remains unobstructed and functional, with the reduction resulting from the pedestrian path running along the front of the space.
- An additional length of 500mm has been provided between the front and rear car parking spaces provided in tandem arrangement.

- All columns and structures within basement parking areas comply with the clearance envelope requirements of Diagram 1 in Design Standard 2.
- In Building D car park, there is a blind / dead-end aisle area in the NE corner of the car park that is greater than 6 spaces long. These end spaces in this aisle are recommended to be allocated for staff use, or alternatively a hatched turnaround bay provided at the end of this aisle.
- A minimum height clearance of 2.2 metres is provided throughout all basement car parks, in accordance with Design Standard 1, noting that 2.5m clearance is required above the disabled spaces and shared zones themselves.
- Accessway grades and grade transitions are compliant with the maximum grade and transition lengths set out in Design Standard 3.
- The porte cochere treatment accessed off Hawthorn Road has been designed to cater for independent car access, as well as circulation by vehicles up to a 25 seater mini-bus in size. It is understood that the porte cochere and its access from Hawthorn Road are still subject to further design development. Minor refinements are required to ensure the layout accommodates the swept path of the largest design vehicle and incorporates a dedicated drop-off/pick-up lane clear of the inside vehicle circulation lane.

5.2. Swept Path Assessment

An assessment of the accessibility to/from the site and critical internal vehicle movements has been conducted using the 'Autodesk Vehicle Tracking' software (refer to Appendix B).

The assessment based on a B99 (99.8th percentile) and B85 (85th percentile) passenger vehicle confirms that two opposing vehicles can pass through the site access points and along the primary internal accessways that connect to the car parking areas. All vehicles are also able to enter and exit the basement parking areas in a forward direction.

An assessment of the accessibility to/from the critical car parking spaces was also undertaken using the B85 (85th percentile car) as per AS2890.1 and it was found that each parking space could be accessed (ingress and egress) in a satisfactory manner.

The largest vehicles anticipated to access the site are those associated with loading and waste collection. Waste collection is expected to be undertaken by a 6.4-metre Mini Rear Loader. A swept path assessment demonstrates that this vehicle can access the designated waste areas within the basement car parks, and exit the site in a forward direction following collection.

The porte cochere area should be designed to accommodate simultaneous two-way movements between a B99 and B85 vehicle, as well as circulation of a typical 25-seater mini-bus independent of any vehicles propped to drop-off/pick-up around the outside of the roundabout area. Preliminary swept paths for the porte cochere are provided in Appendix B, subject to further amendment as the design of this treatment is refined.

5.3. Adequacy of Access Arrangements & Car Park Layout

Based on the preceding assessment, the proposed access arrangements and car park layout have been designed appropriately, in accordance with the requirements outlined within Clause 52.06-9 of the Darebin Planning Scheme and/or relevant sections of the Australian Standard (AS2890 series).

6. Bicycle Parking

6.1. Bicycle Parking Requirements

Clause 52.34 of the City of Darebin Planning Scheme seeks to encourage cycling as a mode of travel through the provision of appropriate bicycle parking and associated facilities.

The statutory bicycle parking requirements are outlined in Clause 52.34 of the City of Darebin Planning Scheme, with specific rates provided in Table 1 of the clause.

Table 6-1 below outlines the assessment of statutory bicycle parking requirements applicable to the proposed uses within the development.

Table 6-1: Clause 52.34 Statutory Bicycle Requirement

Clause 73.03 Land Use Term ¹	Building/ Use	Size	Statutory Parking Rate		Statutory Requirement	
			Resident / Employee	Visitor	Resident/ Employee	Visitor
Dwelling	Building A Apartment Units	13 units			3	1
	Building B Townhouses	22 units	In developments of four or more storeys, 1 to each 5 dwellings	In developments of four or more storeys, 1 to each 10 dwellings	4	2
	Building C Apartment Units	47 units			9	5
Residential Building	Building A Residential Hotel	23 rooms	In developments of four or more storeys, 1 to each 10 lodging rooms	In developments of four or more storeys, 1 to each 10 lodging rooms	2	2
Place of assembly	Building A Church/ Function Room	1500sqm	1 space to each 1500sqm of net floor area	2 plus 1 to each 1500sqm of net floor area	1	3
	Building D Theatre	1366 sqm			1	3
Retail	Building A Café	282 sqm	1 space to each 300sqm leasable floor area	1 space to each 500sqm leasable floor area	1	1

¹ Land use is classified based on the land use terms under Clause 73.03 of the Planning Scheme

Total	21 spaces	17 spaces
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The office and bookshop areas do not exceed 1,000sqm and therefore do not trigger a requirement under Clause 52.34. Additionally, Table 1 of Clause 52.34 does not specify bicycle parking rates for Childcare Centre and Arts and Craft Centre uses.

Based on the above, the proposed development generates a statutory bicycle parking requirement of total of 38 spaces (21 resident/ staff and 17 visitor spaces).

The development seeks to provide a total of 244 bicycle parking spaces on-site, summarised as follows:

- **Building A:** 72 x employee/ resident horizontal spaces, and 12 x visitor horizontal spaces.
- **Building B:** 44 x resident vertical bicycle spaces, and 6 x visitor horizontal bicycle spaces.
- **Building C:** 41 x resident over-bonnet wall mounted bicycle spaces, 29 x resident vertical bicycle spaces and 10 x visitor horizontal bicycle spaces.
- **Building D:** 20 x employee vertical bicycle spaces, and 10 x visitor horizontal bicycle spaces.

As such, the bicycle parking provision for all buildings significantly exceed the statutory bicycle parking requirements in the City of Darebin Planning Scheme.

6.2. Bicycle Parking Design

Bicycle parking is proposed in the form of horizontal ground-mounted hoops, vertical racks, and over-bonnet wall-mounted racks. Of the total 244 bicycle spaces, 110 are provided as horizontal spaces, equating to 45% of the total supply. The provision therefore meets the requirement of AS 2890.3:2015, which specifies that at least 20% of bicycle parking spaces must be provided as horizontal spaces.

The proposed bicycle parking is generally appropriately designed and conveniently accessible for residents, staff, and visitors of the site. However, it is recommended that the horizontal bicycle spaces for employees and residents within the Building A basement levels provide a minimum 1.5 m access path adjacent to all spaces, in accordance with AS 2890.3:2015.

7. Loading and Waste

7.1. Statutory Requirement

Clause 65.01 of the City of Darebin Planning outlines the provision of loading arrangements 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 and any associated amenity, traffic flow or road safety impacts.”

7.2. Loading Arrangements

The site will generate loading and unloading activities associated with deliveries to the various parts of the development. Having regard for the proposed scale of the site, multiple deliveries could be expected throughout a typical week.

It is expected that the typical largest vehicle to carry out loading/unloading activities will be a standard delivery van or courier vehicle. The B99 is generally considered to be representative of these types of vehicles.

Residential move-in/move-out loading activity is expected to be done from the residential street frontages, as is standard practice on local streets.

A porte cochere is also proposed centrally within the site, adjacent to Building A, with a dedicated access point from Hawthorn Road to accommodate pick-up and drop-off movements. The porte cochere will be designed for access by a 25-seat mini-bus, which is approximately 7.7m long. Therefore, any loading activities with vehicles larger than a car but no larger than the mini-bus, will be able to informally use the porte cochere area and parking bays outside of peak operational periods.

7.3. Waste Collection

A Waste Management Plan (WMP) has been prepared by Ratio Consultants to inform the proposed development. As outlined in the WMP, waste collection is proposed to be undertaken via private collection services. For Buildings B, C and D, private waste vehicles will access the respective basement levels to service bins located adjacent to designated waste rooms. Waste generated by Building A is proposed to be managed via a shared waste collection area with Building B.

The nominated collection vehicle is a 6.4-metre mini rear loader. As detailed in Section 5.2 of this report, a swept path assessment confirms that the mini rear loader can appropriately access the basement levels and exit the site in a forward direction upon completion of collection (refer to Appendix B). It is noted that 2.5m height clearance is needed above the collection points for bin lifting operations.

8. Traffic Assessment

8.1. Proposed Traffic Generation

For the purpose of estimating site-generated traffic volumes from the proposed development, reference has been made to multiple case study data points from various established developments with the same land uses.

The proposal involves the redevelopment and expansion of the existing Greek Orthodox Archdiocese of Australia church site, noting the existing church use and operations are to be retained and therefore already accounted for in the existing baseline traffic volumes. The redevelopment will introduce a range of new buildings and uses compared to existing conditions. These new uses have been assessed during the weekday AM and PM peak periods. Existing regular church traffic activity will continue, however, as it typically occurs on weekends and does not coincide with weekday peak periods, it has been excluded from this assessment.

Table 8-1 provides a summary of the adopted weekday peak period traffic generation rates for each use on the site, along with the following inbound and outbound traffic splits:

Table 8-1: Proposal Traffic Generation Rates

Use	AM Peak Hour Rate	PM Peak Hour Rate
Residential Dwellings	0.3 vehicle trips per dwelling 20% IN / 80% OUT	0.3 vehicle trips per dwelling 60% IN / 40% OUT
Place of Assembly [1] (Function centre / Theatre)	N/A	0.09 vehicle trips per patron 60% IN / 40% OUT
Childcare Centre	0.83 vehicle trips per child 50% IN / 50% OUT	0.82 vehicle trips per child 50% IN / 50% OUT
Bookshop [2]	1 vehicle trip per staff 100% IN / 0% OUT	1 vehicle trip per staff 0% IN / 100% OUT
Makers Space [2]	1 vehicle trip per staff 100% IN / 0% OUT	1 vehicle trip per staff 0% IN / 100% OUT
Café	1 vehicle trip per staff 100% IN / 0% OUT	1 vehicle trip per staff 0% IN / 100% OUT

[1] An even split of the combined maximum 430 patrons has been assumed, with 215 allocated to the function centre and 215 to the theatre. Note that the church component of the combined 'place of assembly' patronage generates negligible traffic during weekday peak hours.

[2] Assumed two staff members each for the bookshop, makers space and café for assessment purposes.

Based on the above rates and splits, Table 8-2 provides a summary of the development traffic estimated to be generated by the proposed development during the weekday AM and PM peak hours.

Table 8-2: Site Generated Traffic Summary

	AM Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total
Site Generated Traffic	55	68	122	83	77	160

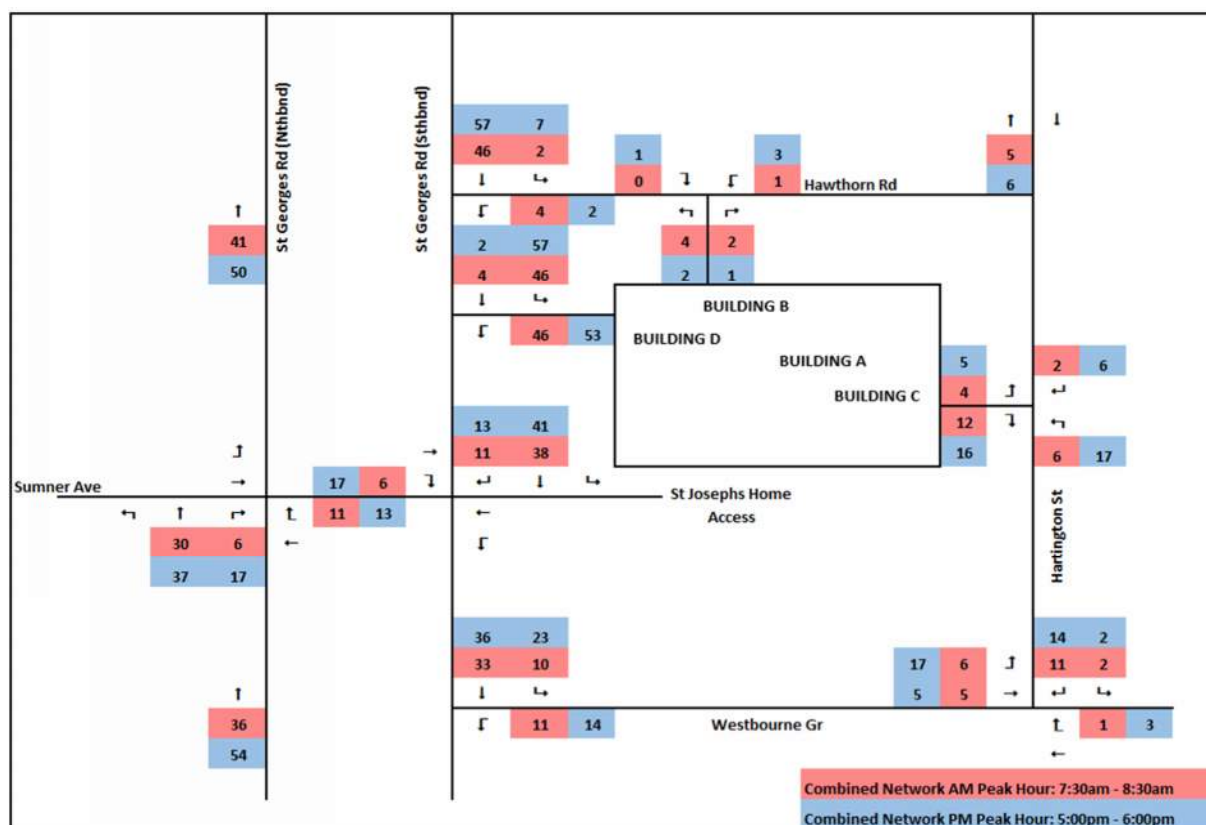
8.2. Proposed Traffic Distribution

Having regard to the configuration of the proposed building access points on the external network, surrounding road network and location of nearby uses and amenities, the following general directional distribution of site generated traffic has been adopted for the purposes of this analysis:

- 25% traffic to / from North via Hartington Street and St Georges Road;
- 65% traffic to / from South via St Georges Road;
- 10% traffic to / from East via Westbourne Grove.

The anticipated development traffic generation based on the above distribution assumptions is presented in Figure 8-1.

Figure 8-1: Anticipated AM / PM Peak Development Traffic Distribution



8.3. Intersection Modelling Analysis

General

Existing and post-development peak hour intersection analysis has been undertaken using SIDRA Intersection 9.1 for the following key intersections in the vicinity of the site:

- St Georges Road / Hawthorn Road
- St Georges Road / Sumner Avenue
- St Georges Road / Westbourne Grove
- Westbourne Grove / Hartington Street

Existing Turning Movements

Ratio Consultants commissioned turning movement count surveys at the aforementioned intersections on 28 March 2023 between 7:30–9:30 am and 4:30–6:30 pm.

The combined network peaks were identified to be 7:30–8:30 am and 5:00–6:00 pm.

The existing turning volumes at these intersections during the respective peak hour periods are presented in Figure 8-2 and Figure 8-3 below.

Figure 8-2: AM Peak Existing Turning Movements

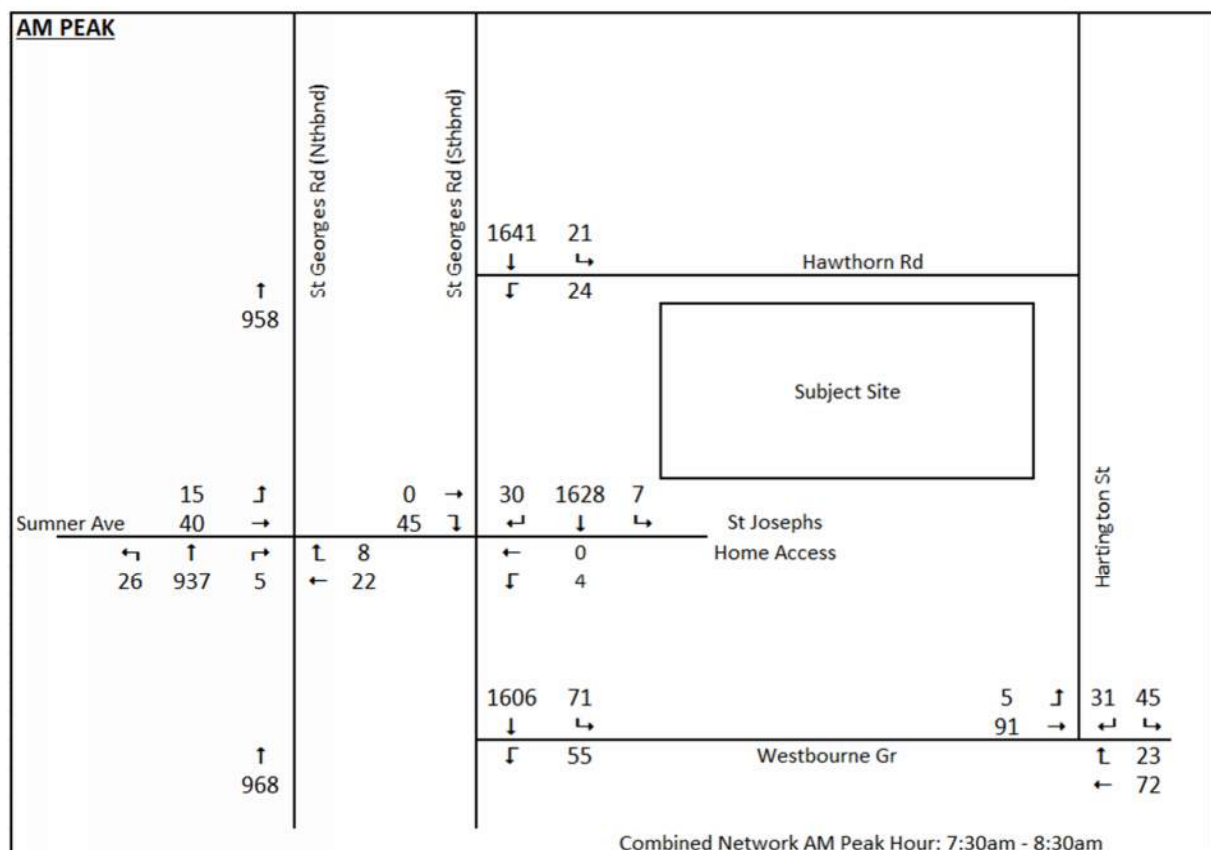
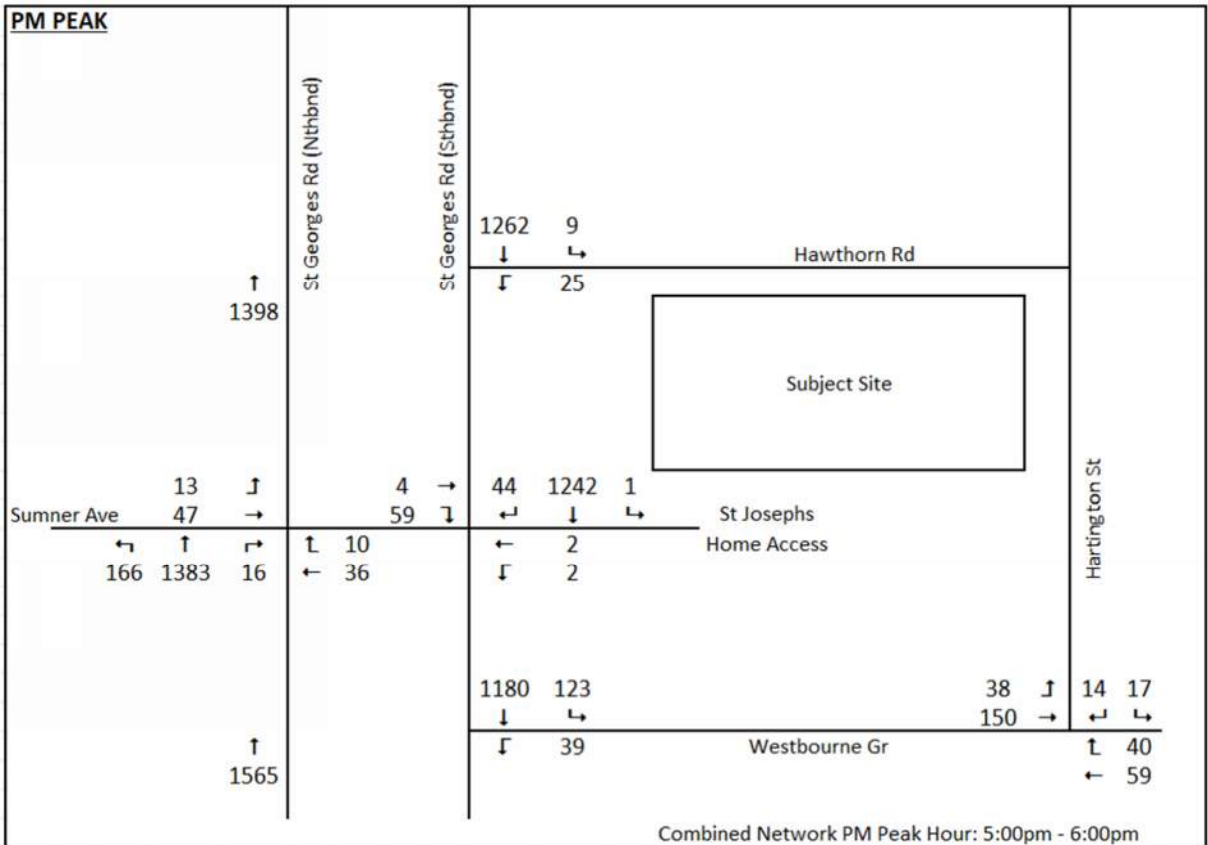


Figure 8-3: PM Peak Existing Turning Movements



Post-Development Turning Movements

By combining the existing and site-generated traffic volume information outlined in the previous sections, the post-development traffic turning movements at the key intersections were estimated and have been modelled, with the results summarised in the following sections.

SIDRA Modelling Parameters

A SIDRA modelling analysis was undertaken in order to understand the existing and post development conditions at the key existing intersections. The results of the analysis have been summarised in terms of Degree of Saturation, 95th percentile queue and average delay. The SIDRA parameters are defined as follows:

Table 8-3: Degree of Saturation Ratings

Degree of Saturation (DOS)	Rating
Up to 0.6	Excellent
0.61 – 0.70	Very Good
0.71 – 0.80	Good
0.81 – 0.90	Fair
0.91 – 1.00	Poor
Greater than 1.00	Very Poor

Degree of Saturation is a ratio of arrival (or demand) flow to capacity. Degrees of saturation above 1.0 represent oversaturated conditions and degrees of saturation below 1.0 represent undersaturated conditions.

Although operating conditions with a degree of saturation around 1.00 are undesirable, it is acknowledged that this level of congestion is typical of many metropolitan intersections during the AM and PM peak hours.

The 95th Percentile Queue Length is the value below which 95 percent of all observed cycle queue lengths fall, or 5 percent of all observed queue lengths exceed.

Average Delay is the average time, in seconds, that all vehicles making a particular movement can be expected to wait at an intersection.

It should be noted that these models have not been calibrated in detail and are primarily intended to be used to demonstrate the net differences in performance between existing and post development conditions. Notwithstanding, the existing results of all the study intersections are generally consistent with observed operating conditions on-site.

8.4. SIDRA Modelling Results

St Georges Road / Hawthorn Road

The results of the SIDRA analysis for St Georges Road / Hawthorn Road are attached at Appendix C and summarised in Table 8-4 and Table 8-5.

Table 8-4: St Georges Road / Hawthorn Road AM Peak Hour Results

Approach		Existing Conditions			Post-Development Scenario		
		DoS	Avg Delay (s)	95%ile Queue (m)	DoS	Avg Delay (s)	95%ile Queue (m)
St Georges Road (S)	Through	0.26	0.1	0	0.27	0.1	0
Hawthorn Road (E)	Left	0.07	17	1.8	0.09	18	2.1
	Left	0.46	5.7	0	0.47	5.7	0

St Georges Road (N)	Through	0.46	0.2	0	0.47	0.2	0
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Table 8-5: St Georges Road / Hawthorn Road PM Peak Hour Results

Approach		Existing Conditions			Post-Development Scenario		
		DoS	Avg Delay (s)	95%ile Queue (m)	DoS	Avg Delay (s)	95%ile Queue (m)
St Georges Road (S)	Through	0.38	0.1	0	0.39	0.1	0
Hawthorn Road (E)	Left	0.05	13	1.2	0.05	13	1.3
St Georges Road (N)	Left	0.35	5.6	0	0.36	5.6	0
	Through	0.35	0.1	0	0.36	0.1	0

As shown above, the SIDRA analysis confirms that the St Georges Road / Hawthorn Road intersection is expected to operate satisfactorily during both AM and PM peak periods following the proposed development of the subject site.

St Georges Road / Sumner Avenue / St Joseph's Home Access

The results of the SIDRA analysis for St Georges Road / Sumner Avenue / St Joseph's Home Access are attached at Appendix C and summarised in Table 8-6 and Table 8-7.

This intersection has been modelled as a network comprising the intersections of St Georges Road (northbound) / Sumner Avenue / St Georges Road Central Median and St Georges Road (southbound) / St Joseph's Home Access / St Georges Road Central Median.

Table 8-6: St Georges Road / Sumner Avenue / St Joseph's Access AM Peak Hour Results

Approach		Existing Conditions			Post-Development Scenario		
		DoS	Avg Delay (s)	95%ile Queue (m)	DoS	Avg Delay (s)	95%ile Queue (m)
St Georges Road (S)	Left	0.27	5.6	0	0.28	5.7	0
	Through	0.27	0.1	0	0.28	0.1	0
	Right	0.27	5.8	0	0.28	5.8	0
Centre Median (E)	Through	0.07	6.9	1.5	0.1	7.4	2.3
	Right	0.07	10	1.5	0.1	11	2.3
	Left	0.1	7.4	2.3	0.1	7.5	2.4

Sumner Ave (W)	Through	0.1	9.7	2.3	0.1	10	2.4
St Joseph's Access (E)	Left	0.02	13	0.4	0.02	14	0.4
	Through	0.02	26	0.4	0.02	28	0.4
St Georges Road (N)	Left	0.46	5.8	0	0.47	5.9	0
	Through	0.46	0.2	0	0.47	0.2	0
	Right	0.46	5.9	0	0.47	5.9	0
Centre Median (W)	Through	0.44	34	9.5	0.56	43	12.4
	Right	0.44	43	9.5	0.56	53	12.4

Table 8-7: St Georges Road / Sumner Avenue / St Joseph's Access PM Peak Hour Results

Approach		Existing Conditions			Post-Development Scenario		
		DoS	Avg Delay (s)	95%ile Queue (m)	DoS	Avg Delay (s)	95%ile Queue (m)
St Georges Road (S)	Left	0.43	5.7	0	0.44	5.7	0
	Through	0.43	0.2	0	0.44	0.2	0
	Right	0.43	5.9	0	0.44	5.9	0
Centre Median (E)	Through	0.26	22	5.7	0.38	27	8.6
	Right	0.26	24	5.7	0.38	30	8.6
Sumner Ave (W)	Left	0.24	9.4	5.6	0.27	10	6.2
	Through	0.24	22	5.6	0.27	24	6.2
St Joseph's Access (E)	Left	0.01	8.4	0.2	0.01	8.6	0.2
	Through	0.01	14	0.2	0.01	15	0.2
St Georges Road (N)	Left	0.35	5.6	0	0.37	5.6	0
	Through	0.35	0.1	0	0.37	0.1	0
	Right	0.35	5.8	0	0.37	5.8	0
	Through	0.28	14	6.3	0.39	17	9.3

Centre Median (W)	Right	0.28	18	6.3	0.39	22	9.3
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As shown above, the SIDRA analysis confirms that the St Georges Road / Sumner Avenue / St Joseph's Access intersection is expected to operate satisfactorily during both AM and PM peak periods following the proposed development of the subject site. The model indicates some reasonable delays for the right turn movement from the centre median to travel southbound, but with only minor changes in operation due to the development traffic and queue lengths kept very low due to the minimal demands.

St Georges Road / Westbourne Grove

The results of the SIDRA analysis for St Georges Road / Westbourne Grove are attached at Appendix C and summarised in Table 8-8 and Table 8-9.

Table 8-8: St Georges Road / Westbourne Grove AM Peak Hour Results

Approach		Existing Conditions			Post-Development Scenario		
		DoS	Avg Delay (s)	95%ile Queue (m)	DoS	Avg Delay (s)	95%ile Queue (m)
St Georges Road (S)	Through	0.27	0.1	0	0.28	0.1	0
Westbourne Grove (E)	Left	0.14	16	3.4	0.17	16	4.2
St Georges Road (N)	Left	0.46	5.7	0	0.47	5.7	0
	Through	0.46	0.2	0	0.47	0.2	0

Table 8-9: St Georges Road / Westbourne Grove PM Peak Hour Results

Approach		Existing Conditions			Post-Development Scenario		
		DoS	Avg Delay (s)	95%ile Queue (m)	DoS	Avg Delay (s)	95%ile Queue (m)
St Georges Road (S)	Through	0.42	0.2	0	0.44	0.2	0
Westbourne Grove (E)	Left	0.07	12	1.6	0.09	12	2.3
St Georges Road (N)	Left	0.36	5.6	0	0.37	5.7	0
	Through	0.36	0.1	0	0.37	0.1	0

As shown above, the SIDRA analysis confirms that the St Georges Road / Westbourne Grove intersection is expected to operate satisfactorily during both AM and PM peak periods following the proposed development of the subject site.

Westbourne Grove / Hartington Street

The results of the SIDRA analysis for Westbourne Grove / Hartington Street are attached at Appendix C and summarised in Table 8-10 and Table 8-11.

Table 8-10: Westbourne Grove / Hartington Street AM Peak Hour Results

Approach		Existing Conditions			Post-Development Scenario		
		DoS	Avg Delay (s)	95%ile Queue (m)	DoS	Avg Delay (s)	95%ile Queue (m)
Westbourne Grove (E)	Through	0.03	0.1	0.9	0.03	0.1	0.9
	Right	0.03	6.0	0.9	0.03	6.1	0.9
Hartington Street (N)	Left	0.04	8.2	1.0	0.04	8.2	1.1
	Right	0.04	9.7	1.2	0.06	9.8	1.6
Westbourne Grove (W)	Left	0.03	5.5	0	0.03	5.5	0
	Through	0.03	0	0	0.03	0	0

Table 8-11: Westbourne Grove / Hartington Street PM Peak Hour Results

Approach		Existing Conditions			Post-Development Scenario		
		DoS	Avg Delay (s)	95%ile Queue (m)	DoS	Avg Delay (s)	95%ile Queue (m)
Westbourne Grove (E)	Through	0.03	0	0	0.03	0	0
	Right	0.04	6.3	1.0	0.04	6.4	1.1
Hartington Street (N)	Left	0.02	8.3	0.4	0.02	8.2	0.4
	Right	0.02	11	0.6	0.05	11	1.2
Westbourne Grove (W)	Left	0.05	5.6	0	0.06	5.6	0
	Through	0.05	0	0	0.06	0	0

As shown above, the SIDRA analysis confirms that the Westbourne Grove / Hartington Street intersection is expected to operate satisfactorily during both AM and PM peak periods following the proposed development of the subject site.

8.5. Summary of Traffic Impact

The proposal is anticipated to generate in order of 122 and 160 vehicle movements per hour during the network AM and PM peak periods, respectively.

The impact of site generated traffic on the external road network is expected to be minimal, with additional movements spread between the surrounding key intersections, which are expected to continue to operate within acceptable conditions under the post-development conditions and with minimal changes from existing operations.

9. RFI Matters

The initial application for Planning Permit PA2503893 was submitted via the Development Facilitation Program in September 2025, accompanied by a Traffic Impact Assessment dated 22 August 2025 prepared by Ratio Consultants. Subsequently, DTP has since issued a Request for Further Information (RFI) letter, which captures comments received from Council and seeks clarification on a number of matters.

The transport and traffic-related items from the RFI comments that require response (both the summary comments and those more specific items captured in Appendix F) are reproduced in *italics* with the associated direct responses to these items thereafter.

7. Transport (Appendix F)

(a) Improvements to pedestrian connectivity and safety is not demonstrated, including:

- *Limited pedestrian links from the St Georges Road tram route and Northcote Railway Station, noting that the absence of footpaths on the south side of Hawthorn Road and the east side of Hartington Street and no indication the applicant would fund these upgrades.*

While it is acknowledged that there is currently no formal pedestrian infrastructure along the southern side of Hawthorn Road and the eastern side of Hartington Street, these reflect existing conditions within the surrounding street network and are not expected to result in significant connectivity issues for pedestrians visiting the site for the following reasons:

- A signalised pedestrian crossing is located approximately at the SW corner of the site's St Georges Road frontage, connected with the nearest tram stop to the site. This crossing provides a safe and convenient opportunity for pedestrians to cross St Georges Road and access tram Route 11. From here, there are direct pedestrian links into the heart of the site from St Georges Road and internal links to all buildings. This means there is no real desire or need for pedestrians to circulate via Hawthorn Road to travel to/from the site via the tram stop.
- Additionally, the southern verge along Hawthorn Road is heavily planted with established significant trees. To construct a footpath along this side of the road would require removal of all these trees. On balance and with consideration to the excellent pedestrian permeability that the site development will provide, removal of these trees is not considered to be warranted for the small benefit this footpath link would provide along Hawthorn Road. The townhouses along the Hawthorn Road frontage are also designed to be accessed internally, without pedestrian access provided to the Hawthorn Road interface, making a pedestrian path along Hawthorn Road even less necessary.
- Hartington Street includes multiple existing raised platform speed humps. These traffic calming measures assist in reducing vehicle speeds and improving pedestrian safety. There are also existing kerb ramp crossings over Hartington Street that connect with the station

access points, allowing pedestrians to move directly to the western side of Hartington Street to travel north-south. This existing infrastructure currently supports pedestrian activity associated with the train station and surrounding existing land uses. There is not considered to be sufficient need and nexus between the additional pedestrian activity generated by the development and the construction of a footpath along the full length of the eastern side of Hartington Street.

This would be on the opposite side of the road to the site, which would also require a significant amount of tree removal. Pedestrians will be far more likely to cross the road at the existing locations and walk along the existing footpath on the site's side of the road.

- *The potential for enhanced pedestrian safety at key intersections, including the consideration of raised thresholds or other pedestrian priority treatments at intersections along Hawthorn Road.*

Hawthorn Road is considered as a low-traffic local street that primarily serves local access rather than through traffic, with a posted low speed limit of 40km/h. Pedestrians are able to access the site via the two access points along Hawthorn Road and also at the corner of Hawthorn Road / Hartington Street.

There will be two vehicle crossovers to the site along Hawthorn Road, one of which will be servicing the Building B dwellings and the other accessing the porte cochere treatment which is expected to carry only occasional vehicle movements. A raised threshold crossing treatment is typically only implemented where there is an at-grade intersection format, with significant traffic and pedestrian volumes that justify the priority treatment. By default, pedestrians have the right of way over a vehicle crossover such as those proposed on Hawthorn Road and therefore a raised crossing does not make sense in this setting.

Furthermore, as noted in the previous responses there is no footpath provided along the Hawthorn Road frontage and none proposed to be constructed. Therefore, to provide raised threshold crossing treatments over the site access points holds no logic given the lack of continuity in the link.

The localised nature of the street, combined with low vehicle speeds and volumes, allow pedestrians to walk along or cross the roadway where required. Such conditions are typical of local residential streets where pedestrian and vehicle movements commonly share the road environment.

With respect to the crossings over Hawthorn Road at the St Georges Road intersection, there has been very little or no pedestrian activity observed during multiple site visits and not expected to be significantly increased along this route as a result of the development. Accordingly, a raised crossing is not considered to be warranted in this location.

- ***Residential Parking***

The development should, as far as practicable, minimise long-term on-street parking associated with residential uses by ensuring such parking is accommodated off-street. Accordingly, any approval should include a condition requiring the preparation of a Car Parking Management Plan.

As detailed in the TIA report, resident parking is provided to meet the statutory rates. The non-residential uses involve some sharing of parking supply and the operational arrangements are already partially addressed in the Operating Strategy document prepared for the

development. As nominated in the TIA report, this informed could potentially be further detailed in a Car Parking Management Plan as a condition of permit if deemed necessary.

- ***Access Arrangements***

The access into Building A basement includes an entry boom gate at the top of the ramp down to Basement Level 1, with the exit boom gate at the bottom of the ramp. It is noted that the boom gates will need to operate with a number plate reading system, as no centre median has been allowed for in the design. This appears problematic and it is recommended a centre median is implemented to allow for card identification.

This matter has already been identified in the TIA. If the developer's preference is for a number plate recognition system to save on the spatial impacts of a centre median added to the access ramp, then this technology is readily available and there should be no operational issue with opting for this type of system.

The proposal should seek to limit the number of access points given the road safety implications for our vulnerable road users. Specifically:

- *Avoid access from Hartington Street as it is a Streets for People corridor. The applicant should refer to Council's Streets for People Strategy.*

From a total street frontage length of 486m, the proposal only includes four vehicle crossovers, leaving approximately 460m of undistributed frontage (95%). In the context of the scale of this site and the number of proposed buildings, this is a low ratio of vehicle access points and entirely appropriate to service the site without unreasonably compromising vulnerable road user safety.

The single vehicle access to Hartington Street cannot reasonably be said to compromise pedestrian and cyclist safety. The proposal actually consolidates the number of Hartington Street vehicle access points from the existing two access points down to one.

The placement of buildings across a site of this scale also makes it impractical to remove the access point from Hartington Street. This would require longer internal vehicle driveways through the site which increases the conflict with the internal pedestrian and cyclist movement, where there is likely to be a higher concentration of activity compared with the Hartington Street frontage.

- *Utilise Hawthorn Road for residential access and minimise number of access points.*

Hawthorn Road is already being used for residential vehicle access to Building B. There is one other vehicle access to Hawthorn Road to the internal porte cochere treatment, which is expected to have relatively low levels of activity.

- *Use St Georges Road for all other access and waste vehicles. St Georges Road is a Department of Transport & Planning Road*

Building D is already being accessed via St Georges Road due to proximity. Otherwise, this comment from Council would be completely contradictory to the direction DTP would typically provide, which is to gain access via the lower order roads and not directly from an arterial road wherever possible.

10. Conclusion

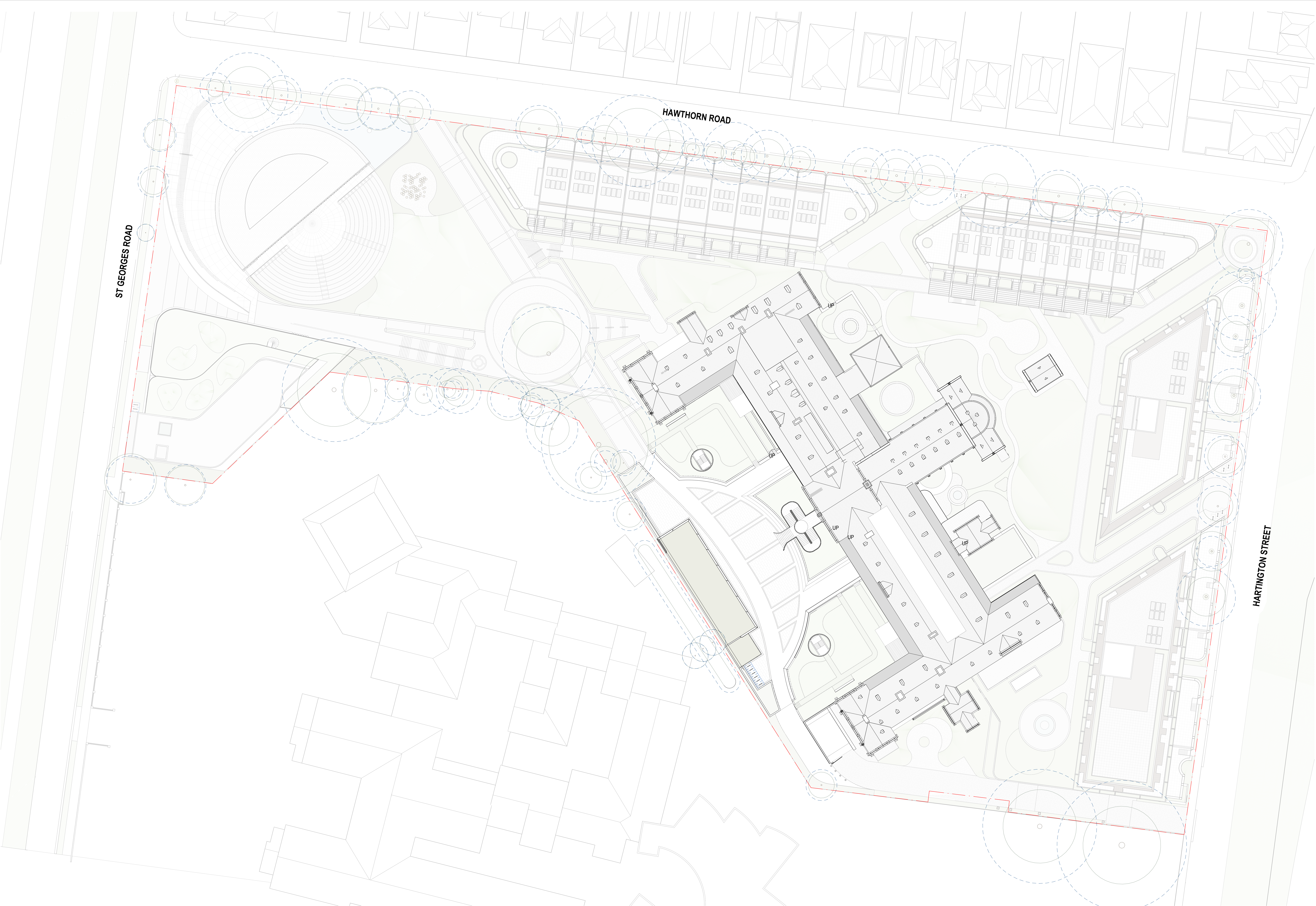
The proposed development at 7 Hartington Street, Northcote is considered appropriate from a traffic and transport perspective, based on the following:

- The development proposes a total of 315 spaces across Buildings A to D, resulting in an overall shortfall of 39 spaces compared to the minimum statutory requirement (with the shortfall associated with the non-resident car parking spaces in Buildings A and D).
- Based on a temporal car parking assessment that considers the variation in parking demands across the course of the day for all proposed non-residential land uses, the combined car parking demand peak for the centre is for 152 and 158 spaces on a weekday and weekend respectively.
- The provision of 168 publicly available onsite spaces (i.e. excluding residential parking) is sufficient to cater for the developments anticipated parking demands. Even under a conservative full-attendance scenario of 430 patrons between the Church, Function Centre and Theatre, demand can be fully accommodated with the on-site supply. In practice these place of assembly uses are unlikely to be consistently operating at full patron capacity and therefore a surplus in parking supply is expected at most times on both weekdays and weekends.
- The proposed access arrangements and car park layout have been designed appropriately, in accordance with the requirements outlined within Clause 52.06-9 of the Darebin Planning Scheme and/or relevant sections of the Australian Standard (AS2890 series).
- The swept path assessment demonstrates that the proposed accessways and on-site car parking are satisfactory.
- It is understood that the porte cochere and its access from Hawthorn Road are still subject to further design. Minor refinements are required to ensure the layout accommodates the swept path of the largest design vehicle and incorporates a dedicated drop-off/pick-up lane clear of the vehicle circulation lane.
- The bicycle parking provision for Buildings A, B, C and D (212 spaces) exceed the statutory bicycle parking requirements in the City of Darebin Planning Scheme.
- It is recommended that the horizontal bicycle spaces within the Building A basement levels provide a minimum 1.5 m access path adjacent to all spaces, in accordance with AS 2890.3:2015.
- Waste collection is to occur by a private collection service utilising 6.4 metre long Mini Rear Loader. A swept path assessment confirms that the mini rear loader can appropriately access the basement levels and exit the site in a forward direction upon completion of collection.
- The proposal is anticipated to generate in order of 122 vehicle movements per hour and 160 movements per hour during the network AM and PM peak periods, respectively. The impact of site generated traffic on the external road network is expected to be minimal, with

surrounding key intersections expected to operate within acceptable conditions under the post-development modelling scenarios.

Overall, the proposed development is not expected to create adverse traffic or parking impacts in the precinct.

Appendix A Site Layout Plans



GENERAL NOTES - SITE

- SITE**
01. DRAWINGS TO BE READ IN CONJUNCTION WITH CIVIL DOCUMENTATION AND OTHER RELATED DRAWINGS.
02. BEWARE OF UNDERGROUND SERVICES. THE CONTRACTOR WILL LOCATE ALL SERVICES ON-SITE PRIOR TO COMMENCEMENT OF WORK.
03. REFER TO CIVIL AND LANDSCAPE DRAWINGS FOR ROAD PAVING SETOUT AND LEVELS.
04. INDICATIVE UNDERGROUND SERVICES RELATING TO PROPOSED STORMWATER DRAINAGE AND ON-SITE STORAGE HAVE BEEN SHOWN DASHED.
05. CONTRACTOR TO CONFIRM ALL EXISTING SERVICE LOCATIONS.
06. PROPERTY BOUNDARY AND FOOTPATH LEVELS ARE TO BE REINSTATE TO THE ORIGINAL LEVELS AS DEFINED BY VICROADS AND/OR LOCAL AUTHORITY.
07. ALL DRAINS PENETRATING FOOTINGS OR ANY OTHER CONCRETE OR MASONRY WORK ARE TO BE SLOTTED TO ALLOW FOR SETTLEMENT OF STRUCTURE AND/OR GROUND MOVEMENT (TYPICAL HEAVE AND SIGH OUTLINED IN GEOTECHNICAL ENGINEERING'S SOIL REPORT).
08. LANDSCAPING AS PER LANDSCAPE ARCHITECTS DESIGN UNLESS OTHERWISE NOTED. SPOT LEVELS SHOWN ON SITE PLAN ARE INDICATIVE AND SHOULD BE READ IN CONJUNCTION WITH LANDSCAPE ARCHITECTS DOCUMENTATION AND DETAILS.
- TREE PROTECTION**
09. PRIOR TO COMMENCEMENT OF WORKS, SET UP A TREE PROTECTION ZONE (PTZ). TREE PROTECTION ZONES ARE TO BE IN ACCORDANCE WITH THE ARBORIST REPORT. TREE PROTECTION PLAN AND/OR AS 4319 TREE PROTECTION MEASURES MAY INCLUDE FENCING, MULCH OR GROUND PROTECTION AND MUST BE IN PLACE FOR THE DURATION OF THE WORKS.
10. TREE PROTECTION ZONES ARE INDICATIVELY SHOWN WITH DASHED CIRCLES AND ARE TO BE CALCULATED IN ACCORDANCE WITH AS 4319-2009 AND INCLUDE AREAS ABOVE AND BELOW GROUND.
11. AVOID ANY WORKS IN THE TREE PROTECTION ZONE AND ENSURE ANY DEMOLITION, EXCAVATION AND CONSTRUCTION WORKS UNDERTAKEN WITHIN THE TREE PROTECTION ZONE DO NOT CAUSE DAMAGE TO A TREE. THE FOLLOWING ACTIVITIES MUST BE RESTRICTED OR PREVENTED WITHIN THE TREE PROTECTION ZONE, UNLESS APPROVED BY AN ARBORIST AND/OR COUNCIL.

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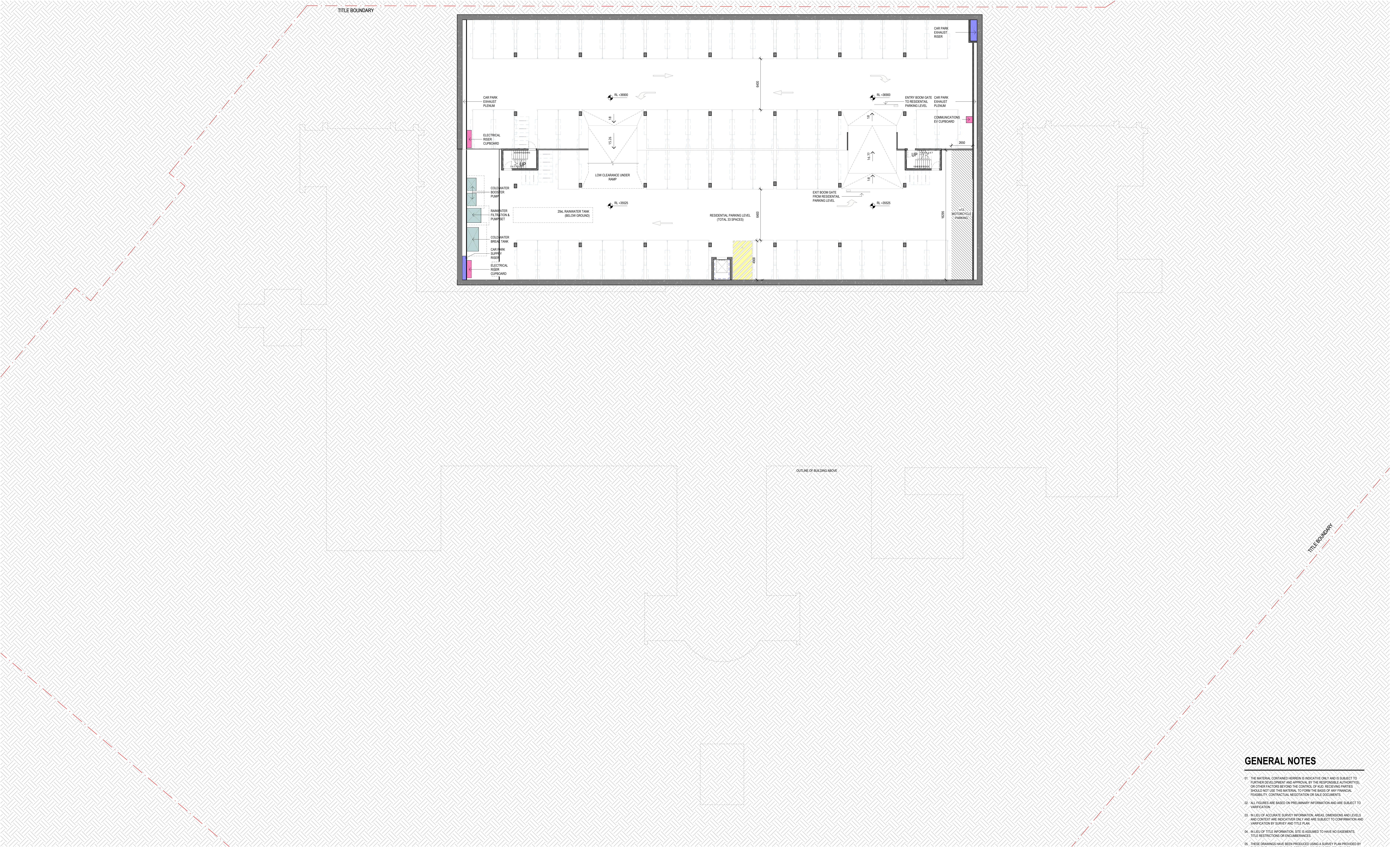
CLIENT NAME:
GREEK ORTHODOX
ARCHDIOCESE

CONTRACTOR NAME:

TITLE:
PROPOSED SITE PLAN

ADDRESS:
7 HARTINGTON STREET

PROJECT NO.:
22-004



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07. DOUBLE GLAZING OR BETTER TO ALL WINDOWS.
08. DEVELOPMENT WILL INCLUDE ELECTRICAL CAPACITY PROVISIONS FOR EV FUTUREPROOFING TO 100% OF THE RESIDENTIAL CARPARKING SPACES, 10% OF THE OFFICE/RETAIL CARPARKING SPACES AND 20% OF THE REMAINING BUILDING USES CARPARKING SPACES. MIN. 5% OF VEHICLE PARKING SPACES ARE DESIGNED FOR MOTORBIKE SPACES.
09. MINIMUM 50M² OF COMMUNAL FOOD PRODUCTION AREA WITHIN THE DEVELOPMENT.

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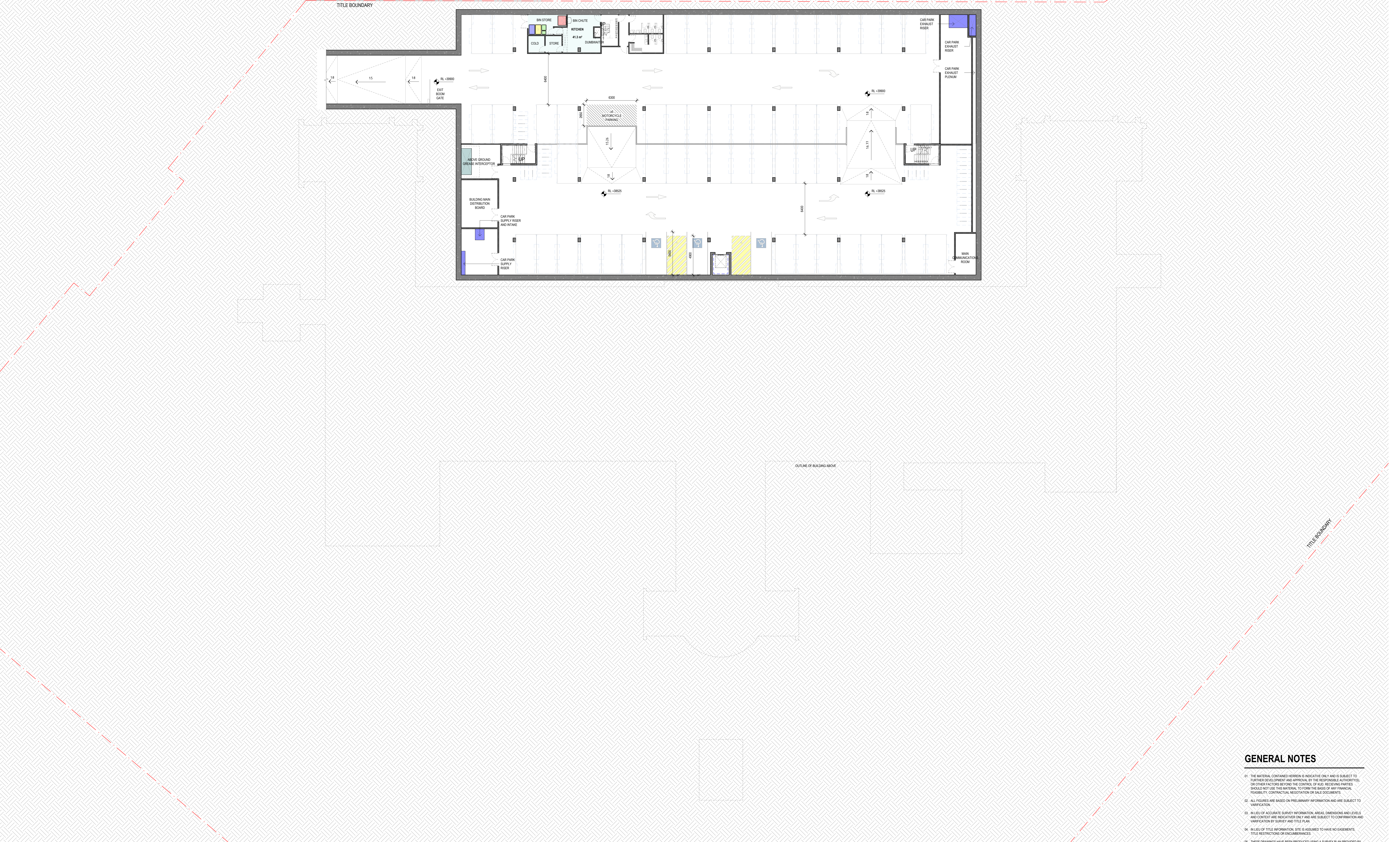
CLIENT NAME:
GREEK OTHODOX
ARCHDIOCESE

CONTRACTOR NAME:
-

TITLE:
GA PROPOSED BASEMENT 02

ADDRESS:
7 HARTINGTON STREET
PROJECT NO:
22-004

CHECKED BY: BK
DRAWN BY: FDN
DATE: 21/08/25
SCALE: 1:150
SHEET NO.: 0 A-TP3003



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09. MINIMUM 50M² OF COMMUNAL FOOD PRODUCTION AREA WITHIN THE DEVELOPMENT.

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CLIENT NAME:
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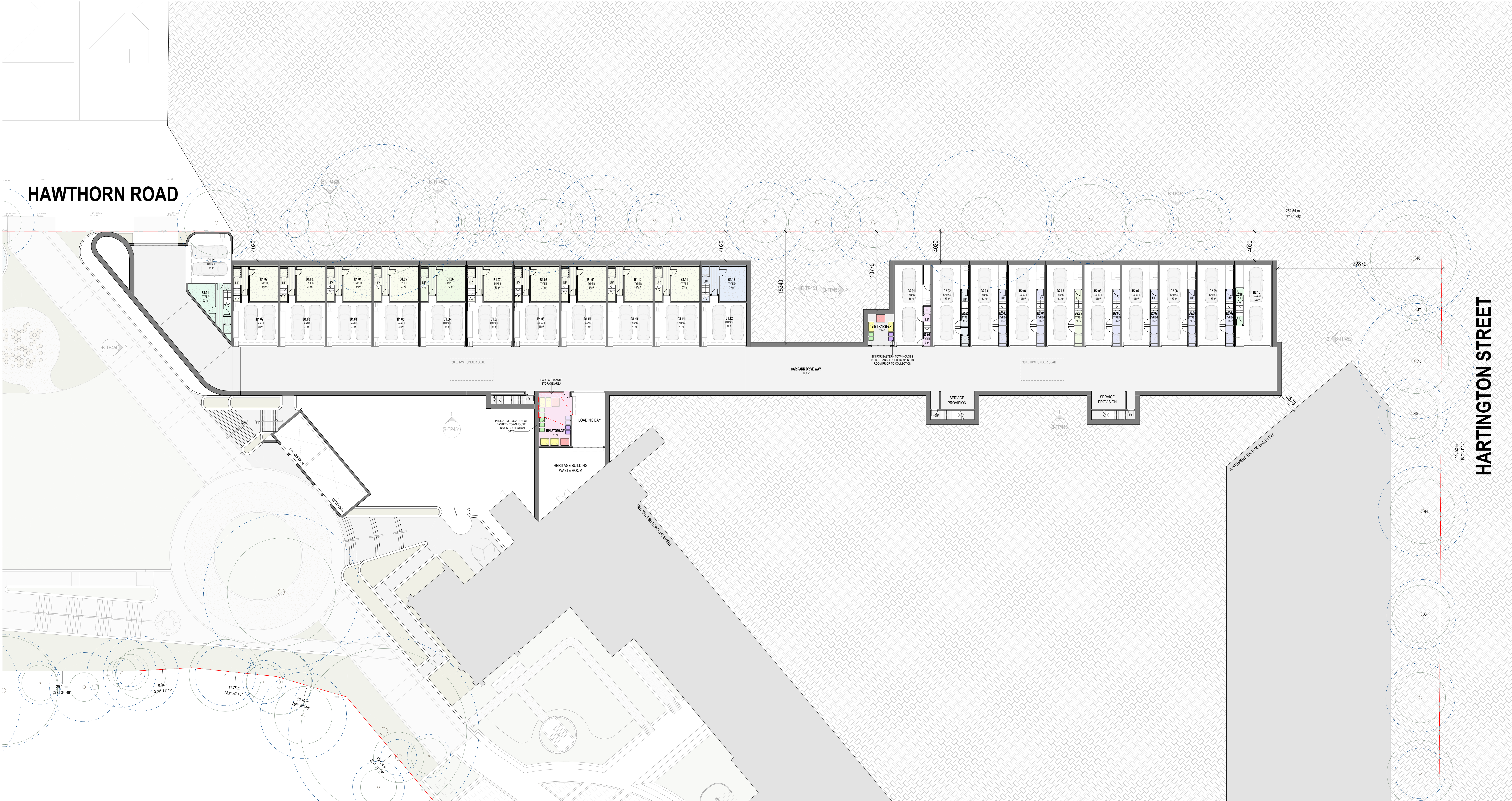
CONTRACTOR NAME:
-

TITLE:
GA PROPOSED BASEMENT 01

ADDRESS:
7 HARTINGTON STREET

PROJECT NO:
22-004

CHECKED BY: BK
DRAWN BY: FSN
@A0 (50% @ A2)
1: 150
REV: 0
SHEET NO: A-TP3004



SUSTAINABILITY MANAGEMENT PLAN

01. NON-TRAFFICABLE ROOF AREAS TO BE DIRECTED INTO A 60,000-LITRE RAINWATER TANK CONNECTED TO ALL TOILETS AND LANDSCAPE IRRIGATION.
02. TERRACES (INCLUDING PLANTER) TO BE DIRECTED INTO RANGING AREAS TOTALLING 317M². MINIMUM 1,200MM DEEP RANGING AREAS WITH 50MM OF EXTENDED DETENTION SPACES.
03. SECURE RESIDENTIAL SPACES 22, RESIDENTIAL VISITOR SPACES 5.
04. CARPARK VENTILATION FANS ARE TO BE CONTROLLED BY CO SENSORS.
05. DOUBLE GLAZING (OR BETTER) TO BE USED.
06. AN EV CHARGING STATION WILL BE INSTALLED AT PRACTICAL COMPLETION.
07. THE DEVELOPMENT WILL INCLUDE ELECTRICAL CAPACITY PROVISIONS FOR EV FUTUREPROOFING TO THE RESIDENTIAL CARPARKING SPACES.
08. ONE FORMAL CAR SHARING SPACE IS TO BE ALLOCATED FOR THE DEVELOPMENT.
09. TAP AND FLOOR WASTE TO BE PROVIDED ON EVERY BALCONY AND COURTYARD.
10. 60M² OF COMMUNAL FOOD PRODUCTION AREA FOR APARTMENTS AND TOWNHOUSES.

GENERAL NOTES - SITE

- SITE**
01. DRAWINGS TO BE READ IN CONJUNCTION WITH CIVIL DOCUMENTATION AND OTHER RELATED DRAWINGS.
 02. REMAIN OF UNDERGROUND SERVICES. THE CONTRACTOR WILL LOCATE ALL SERVICES ON SITE PRIOR TO COMMENCEMENT OF WORK.
 03. REFER TO CIVIL AND LANDSCAPE DRAWINGS FOR ROAD PAVING SETOUT AND LEVELS.
 04. INDICATE UNDERGROUND SERVICES RELATING TO PROPOSED STORMWATER DRAINAGE AND ON-SITE STORAGE HAVE BEEN BROWN DASHED.
 05. CONTRACTOR TO CONFIRM ALL EXISTING SERVICE LOCATIONS.
 07. PROPERTY BOUNDARY AND COTTON LEVEL ARE TO BE REINSTATED TO THE ORIGINAL LEVELS AS DEFINED BY VICROADS AND/OR LOCAL AUTHORITY.
 08. ALL DRAINS PENETRATING FOOTINGS OR ANY OTHER CONCRETE OR MASONRY WORK ARE TO BE SLOPED TO ALLOW FOR SETTLEMENT OF STRUCTURE AND/OR GROUND MOVEMENT (TYPICAL HEAVE AND SIGH OUTLINED IN GEOTECHNICAL ENGINEERING SOIL REPORT).
 09. LANDSCAPING AS PER LANDSCAPE ARCHITECT'S DESIGN UNLESS OTHERWISE NOTED. SPOT LEVELS SHOWN ON SITE PLAN ARE INDICATIVE AND SHOULD BE READ IN CONJUNCTION WITH LANDSCAPE ARCHITECT'S DOCUMENTATION AND DETAILS.
- TREE PROTECTION**
10. PRIOR TO COMMENCEMENT OF WORKS, SET UP A TREE PROTECTION ZONE (RPZ). TREE PROTECTION ZONES ARE TO BE IN ACCORDANCE WITH THE ARBORIST REPORT. TREE PROTECTION PLAN AND/OR AS 4701 TREE PROTECTION MEASURES MAY INCLUDE FENCING, MULCH OR GROUND PROTECTION AND MUST BE IN PLACE FOR THE DURATION OF THE WORKS.
 11. TREE PROTECTION ZONES ARE INDICATIVELY SHOWN WITH DASHED CIRCLES AND ARE TO BE CALCULATED IN ACCORDANCE WITH AS 4071-2009 AND INCLUDE AREAS ABOVE AND BELOW GROUND.
 12. AVOID ANY WORKS IN THE TREE PROTECTION ZONE AND ENSURE ANY DEMOLITION, EXCAVATION AND CONSTRUCTION WORKS UNDERTAKEN WITHIN THE TREE PROTECTION ZONE DO NOT CAUSE DAMAGE TO A TREE. THE FOLLOWING ACTIVITIES MUST BE RESTRICTED OR PREVENTED WITHIN THE TREE PROTECTION ZONE, UNLESS APPROVED BY AN ARBORIST AND/OR COUNCIL.

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Level 23/200 Dorch St, Cremorne VIC 3121
T: (03) 9429 1597

WRAP ENGINEERING

Fire Engineer
Carlton House, Suite 1, Level 9/289 Flinders Ln
Melbourne, VIC 3000 T: 04 0200 8819

Acorns Consultant (ODA)

Building Surveyor
Level 5, 136 Exhibition Street, Melbourne
VIC 3000
T: 03 9650 7899

SQUARE 1 ENGINEERING

FUNCTIONAL ACCESS SOLUTIONS PTY LTD

COUS

Town Planner
Level 5/65 Dover St, Cremorne VIC 3121
T: (03) 9429 3111

Traffic & Waste Engineer

Landscape Architect
34 Stuart St, Collegewood, VIC 3066
T: (03 7018 3100)

RATO CONSULTANTS

RATO CONSULTANTS

ACRE

ESD Consultant
285 Lennox Street, Richmond VIC 3121
T: 03 9444 5111

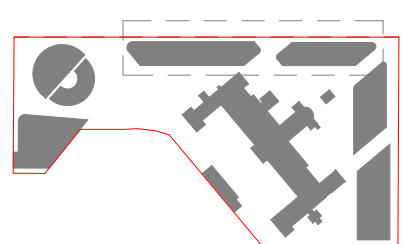
Land Surveyor

Arborist
24 Victoria Street, Richmond, VIC 3121
T: 03 9429 4855

GIW

JCA

JOHN PATRICK LANDSCAPE ARCHITECTS



CLIENT NAME:
GREEK ORTHODOX ARCHDIOCESE OF AUSTRALIA

CONTRACTOR NAME:

TITLE:
BASEMENT SITE PLAN

ADDRESS:
7 HARTINGTON STREET, NORTHCOLE

PROJECT NO.:
22-004

CHECKED BY: BK **DRAWN BY:** AV **@A0 (50% @ A2):** 1:200 **REV:** 0 **SHEET NO.:** B-TP051

PLANNING SUBMISSION

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Project Manager
Level 23 Newton St, Cremorne VIC 3121
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Structural & Civil Engineers
-

Service Engineer
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Traffic & Waste Engineer
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Landscape Architect
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RATO CONSULTANTS

RATO CONSULTANTS

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ESD Consultant
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Land Surveyor
Suite 9, 100 Moorabool Hwy, Ringwood VIC 3134
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Arboret
2/4 Victoria Street, Richmond, VIC 3121
T: 03 9429 4885

GIW

JCA

JOHN PATRICK LANDSCAPE ARCHITECTS

CLIENT NAME:
GREEK ORTHODOX
ARCHDIOCESE OF
AUSTRALIA

CONTRACTOR NAME:
-

TITLE:
GA - APARTMENT BASEMENT

ADDRESS:
7 HARTINGTON STREET

PROJECT NO:
22-004

CHECKED BY: BK **DRAWN BY:** AV **@A0 (50% @ A2):** 1:150 **REV:** 0 **SHEET NO:** C-TP300



SUSTAINABILITY MANAGEMENT PLAN

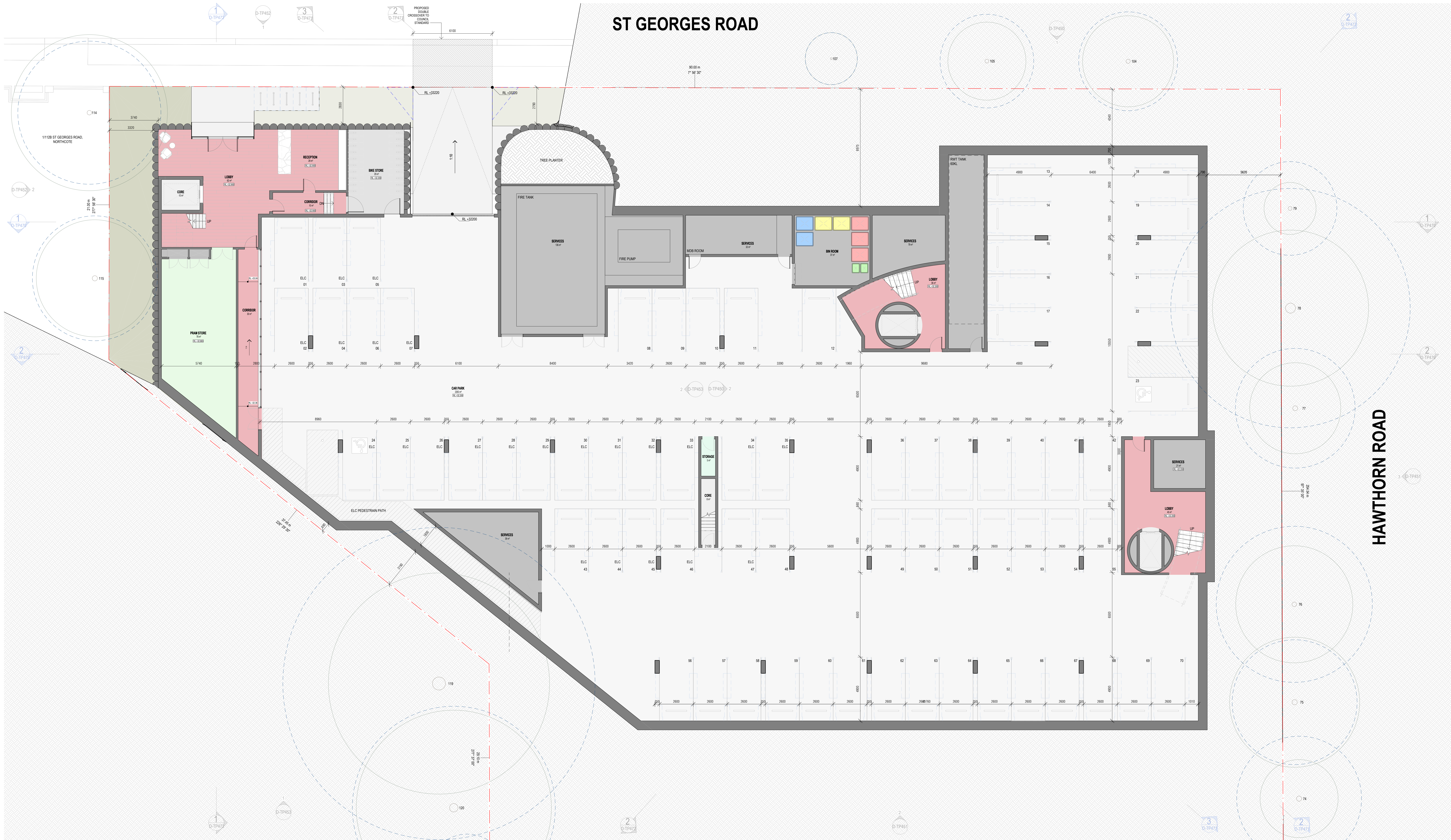
- NON-TRAFFICABLE ROOF AREAS TO BE DIRECTED INTO A 60,000-LITRE RAINWATER TANK CONNECTED TO ALL TOILETS AND LANDSCAPE IRRIGATION
- TERRACES (INCLUDING PLANTER) TO BE DIRECTED INTO RAINGARDENS TOTALLING 317M². MINIMUM 125MM DEEP RAINGARDEN WITH 30MM OF EXTENDED DETENTION
- SECURE RESIDENTIAL SPACES: 22 RESIDENTIAL VISITOR SPACES/5
- CARPARK VENTILATION FANS ARE TO BE CONTROLLED BY CO SENSORS
- DOUBLE GLAZING (OR BETTER) TO BE USED
- AN EV CHARGING STATION WILL BE INSTALLED AT PRACTICAL COMPLETION
- THE DEVELOPMENT WILL INCLUDE ELECTRICAL CAPACITY PROVISIONS FOR EV FUTUREPROOFING TO THE RESIDENTIAL CARPARKING SPACES
- ONE FORMAL CAR SHARING SPACE IS TO BE ALLOCATED FOR THE DEVELOPMENT
- TAP AND FLOOR WASTE TO BE PROVIDED ON EVERY BALCONY AND COURTYARD
- 6MM² OF COMMUNAL FOOD PRODUCTION AREA FOR APARTMENTS AND TOWNHOUSES
- COMMUNAL CLOTHESLINE TO BE PROVIDED TO ROOF TERRACE

DESCRIPTION

CODE	DESCRIPTION
---	TITLE BOUNDARY
RL +XXX	RELATIVE LEVEL TO AHD
SETBACK	BUILDING SETBACK
DNOTES FALL	DNOTES FALL
240L GLASS	240L GLASS
240L ORGANICS	240L ORGANICS
1100L RECYCLING	1100L RECYCLING
1100L GENERAL	1100L GENERAL
VISIBILITY SPLAY 2.5m X 2m	VISIBILITY SPLAY 2.5m X 2m

GENERAL NOTES

- THE MATERIAL CONTAINED HEREIN IS INDICATIVE ONLY AND IS SUBJECT TO FURTHER DEVELOPMENT AND APPROVAL BY THE RESPONSIBLE AUTHORITY(IES). NO OTHER FACTORS BEYOND THE CONTROL OF AHD, RECEIVING PARTIES SHOULD NOT USE THE MATERIAL TO FORM THE BASIS OF ANY FINANCIAL FEASIBILITY, CONTRACTUAL NEGOTIATION OR SALE DOCUMENTS.
- ALL FIGURES ARE BASED ON PRELIMINARY INFORMATION AND ARE SUBJECT TO VERIFICATION.
- IN LIEU OF ACCURATE SURVEY INFORMATION, AREAS, DIMENSIONS AND LEVELS AND CONTEXT ARE INDICATIVE ONLY AND ARE SUBJECT TO CONFIRMATION AND VERIFICATION BY SURVEY AND TITLE PLAN.
- IN LIEU OF TITLE INFORMATION, SITE IS ASSUMED TO HAVE NO EASEMENTS, TITLE RESTRICTIONS OR ENCUMBRANCES.
- THESE DRAWINGS HAVE BEEN PRODUCED USING A SURVEY PLAN PROVIDED BY THE CLIENT. ANY DIMENSIONS, SETOUTS, LOCATIONS ETC. RELATING TO BOUNDARIES, EASEMENTS OR SITE SERVICES ARE TO BE VERIFIED BY A SURVEYOR.
- ADJACENT PROPERTIES, WHERE INDICATED, ARE BASED ON PHOTOGRAPHIC CONTENT PROVIDED AND, AS SUCH, ARE NOT TO SCALE AND CANNOT BE RELIED UPON AS ACCURATE.



GENERAL NOTES

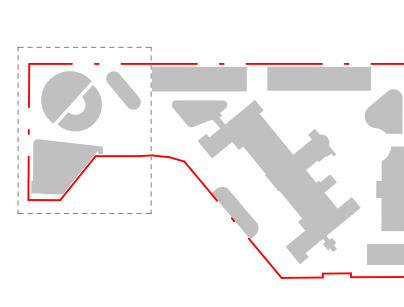
- THE MATERIAL CONTAINED HEREIN IS INDICATIVE ONLY AND IS SUBJECT TO FURTHER DEVELOPMENT AND APPROVAL BY THE RESPONSIBLE AUTHORITY(S), OR OTHER FACTORS BEYOND THE CONTROL OF AUD. RECEIVING PARTIES SHOULD NOT USE THIS MATERIAL TO FORM THE BASIS OF ANY FINANCIAL FEASIBILITY, CONTRACTUAL, NEGOTIATION OR SALE DOCUMENTS.
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- IN LIEU OF ACCURATE SURVEY INFORMATION, AREAS, DIMENSIONS AND LEVELS AND CONTEXT ARE INDICATIVE ONLY AND ARE SUBJECT TO CONFIRMATION AND VERIFICATION BY SURVEY AND TITLE PLAN.
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- THESE DRAWINGS HAVE BEEN PRODUCED USING A SURVEY PLAN PROVIDED BY THE CLIENT. ANY DIMENSIONS, SETBACKS, LOCATIONS ETC. RELATING TO BOUNDARIES, EASEMENTS OR SITE SERVICES ARE TO BE VERIFIED BY A SURVEYOR.
- ADJACENT PROPERTIES, WHERE INDICATED, ARE BASED ON PHOTOGRAPHIC CONTENT PROVIDED AND, AS SUCH, ARE NOT TO SCALE AND CANNOT BE RELIED UPON AS ACCURATE.

SUSTAINABILITY MANAGEMENT PLAN

- RAINWATER COLLECTION FROM NON-TRAFFICABLE ROOF AREAS TO BE DIRECTED INTO A 50,000-LITRE RAINWATER TANK CONNECTED TO ALL TOILETS AND LANDSCAPE IRRIGATION.
- RAINWATER FROM MINIMUM 3,500M² OF IMPERVIOUS GROUND AREA TO BE DIRECTED INTO RAINWATER TANKS.
- WINDOWS TO BE DOUBLE GLAZED.
- 20% OF CARPARKING SPACES TO HAVE ELECTRICAL CAPACITY PROVISION.

DESCRIPTION

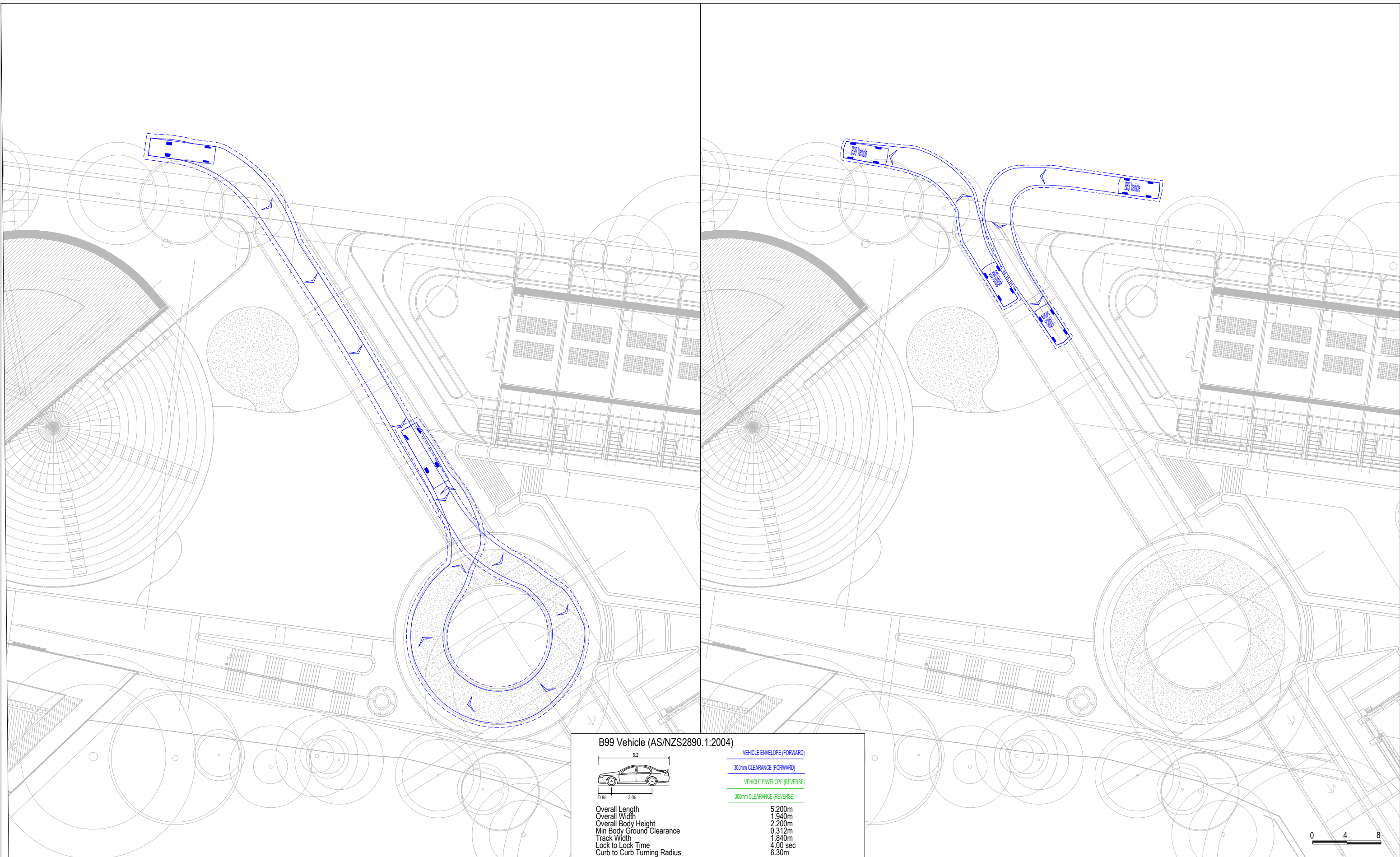
CODE	DESCRIPTION	CODE	DESCRIPTION
---	TITLE BOUNDARY	---	VISIBILITY SPAY 2.5m X 2m
RL - XXX	RELATIVE LEVEL TO AHD		
SETBACK	BUILDING SETBACK		
↓	DENOTES FALL		
1100L PAPER			
1100L RECYCLING			
1100L GENERAL			
240L ORGANICS			



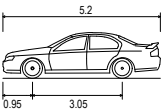
Appendix B Swept Path Assessment

C:\USERS\RACHEL\TAIRATO - CONSULTANTS\1917T - GENERAL\DESIGN\SKETCH\1917T - SK005\1917T - SK005 - A.DWG

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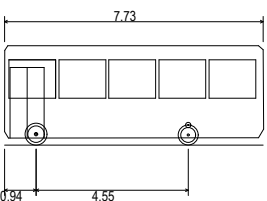
B99 Vehicle (AS/NZS2890.1:2004)



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

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

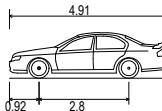
Mitsubishi Rosa 25 Seat Minibus (2022)



Overall Length 7.730m
Overall Width 2.070m
Overall Body Height 1.870m
Lock to Lock Time 4.00 sec
Curb to Curb Turning Radius 7.100m

VEHICLE ENVELOPE (FORWARD)
500mm CLEARANCE (FORWARD)
VEHICLE ENVELOPE (REVERSE)
500mm CLEARANCE (REVERSE)

B85 Vehicle (AS/NZS2890.1:2004)



Overall Length 4.910m
Overall Width 1.870m
Overall Body Height 1.421m
Min Body Ground Clearance 0.159m
Track Width 1.770m
Lock to Lock Time 4.00 sec
Curb to Curb Turning Radius 5.80m

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

Ground Level 7 Hartington Street, Northcote Swept Path Assessment

NOTE:
1) Base Plan Supplied By KUD
2) Maximum Design Speed 10km/h

RATIO REFERENCE
19797T-SK005-A

SHEET No.
1 of 13

PREPARED BY
R.T.

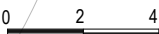
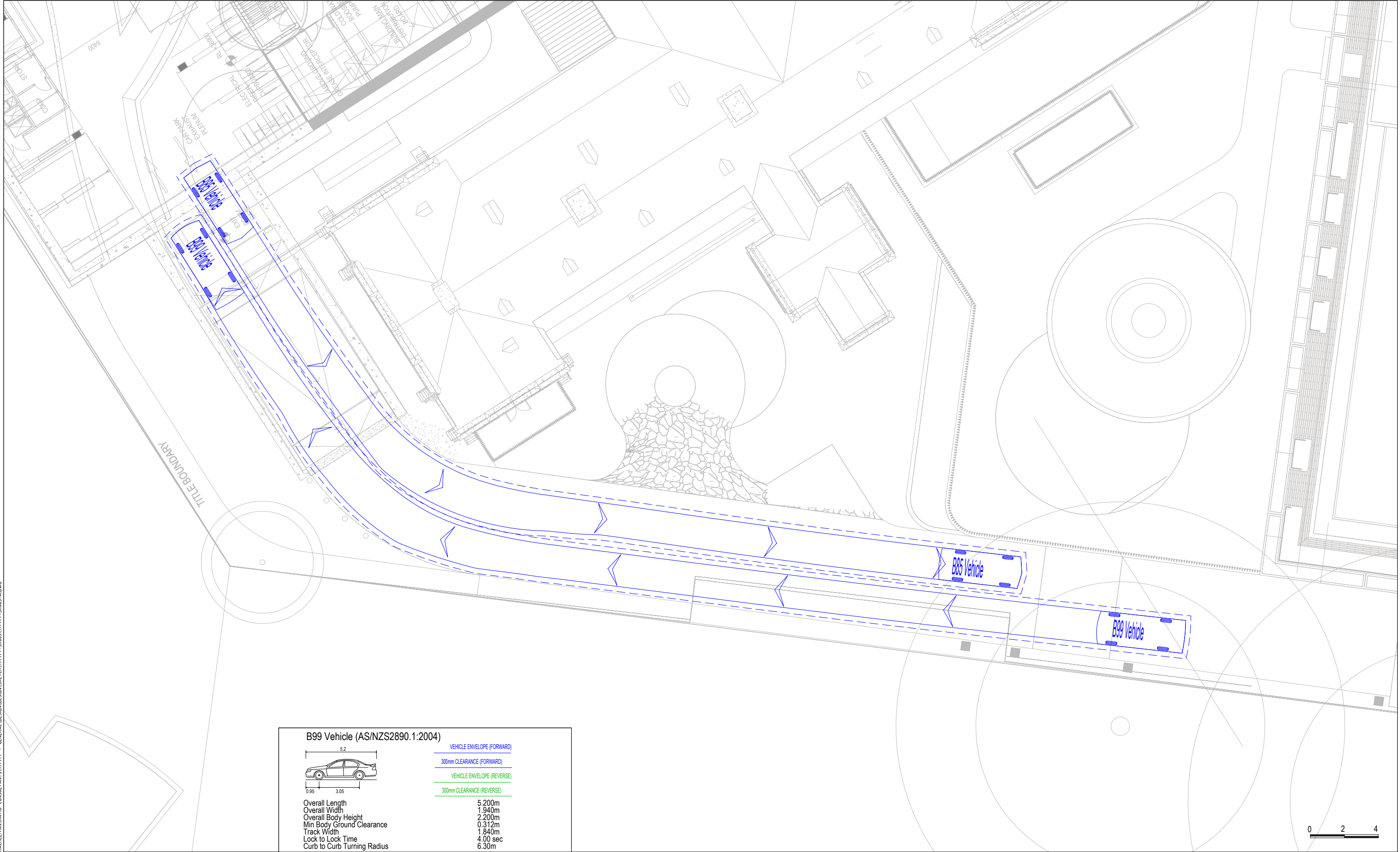
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DATE
12/08/2025



ratio:

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



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

B85 Vehicle (AS/NZS2890.1:2004)	
	VEHICLE ENVELOPE (FORWARD)
	300mm CLEARANCE (FORWARD)
	VEHICLE ENVELOPE (REVERSE)
	300mm CLEARANCE (REVERSE)
Overall Length	4.910m
Overall Width	1.421m
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

Ground to Building A Basement Level 7 Hartington Street, Northcote Swept Path Assessment

NOTE:
1) Base Plan Supplied By KUD
2) Maximum Design Speed 10km/h

RATIO REFERENCE
19797T-SK005-A

SHEET No.
2 of 13

PREPARED BY
R.T.

SCALE
1:200@A3

DATE
11/08/2025

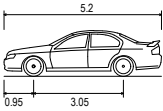


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B99 Vehicle (AS/NZS2890.1:2004)



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

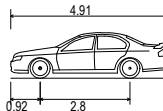
VEHICLE ENVELOPE (FORWARD)

300mm CLEARANCE (FORWARD)

VEHICLE ENVELOPE (REVERSE)

300mm CLEARANCE (REVERSE)

B85 Vehicle (AS/NZS2890.1:2004)



Overall Length	4.910m
Overall Width	1.870m
Overall Body Height	1.421m
Min Body Ground Clearance	0.159m
Track Width	1.770m
Lock to Lock Time	4.00 sec
Curb to Curb Turning Radius	5.80m

VEHICLE ENVELOPE (FORWARD)

300mm CLEARANCE (FORWARD)

VEHICLE ENVELOPE (REVERSE)

300mm CLEARANCE (REVERSE)

BUILDING A - Basement Level 1
7 Hartington Street, Northcote
Swept Path Assessment

NOTE:
1) Base Plan Supplied By KUD
2) Maximum Design Speed 10km/h

RATIO REFERENCE
19797T-SK005-A

SHEET No.
3 of 13

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R.T.

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LEVEL 5, 65 DOVER STREET
CREMORNE, VICTORIA 3121
TELEPHONE (03)9429 3111
FACSIMILE (03)9429 3011

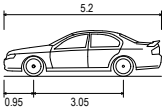


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CREMORNE, VICTORIA 3121
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FACSIMILE (03)9429 3011

B99 Vehicle (AS/NZS2890.1:2004)

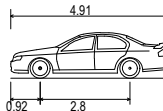


Overall Length
Overall Width
Overall Body Height
Min Body Ground Clearance
Track Width
Lock to Lock Time
Curb to Curb Turning Radius

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

5.200m
1.940m
2.200m
0.312m
1.840m
4.00 sec
6.30m

B85 Vehicle (AS/NZS2890.1:2004)



Overall Length
Overall Width
Overall Body Height
Min Body Ground Clearance
Track Width
Lock to Lock Time
Curb to Curb Turning Radius

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

4.910m
1.870m
1.421m
0.159m
1.770m
4.00 sec
5.80m

BUILDING A - Basement Level 2
7 Hartington Street, Northcote
Swept Path Assessment

NOTE:
1) Base Plan Supplied By KUD
2) Maximum Design Speed 10km/h

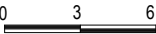
RATIO REFERENCE
19797T-SK005-A

SHEET No.
4 of 13

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R.T.

SCALE
1:200@A3

DATE
11/08/2025





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

Mini-Rear Loader Waste Collection Vehicle

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

Overall Length	6.345m
Body Width	1.700m
Overall Body Height	2.080m
Min Body Ground Clearance	0.205m
Track Width	1.670m
Lock to Lock Time	4.00 sec
Curb to Curb Turning Radius	6.450m

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

BUILDING B
7 Hartington Street, Northcote
Swept Path Assessment

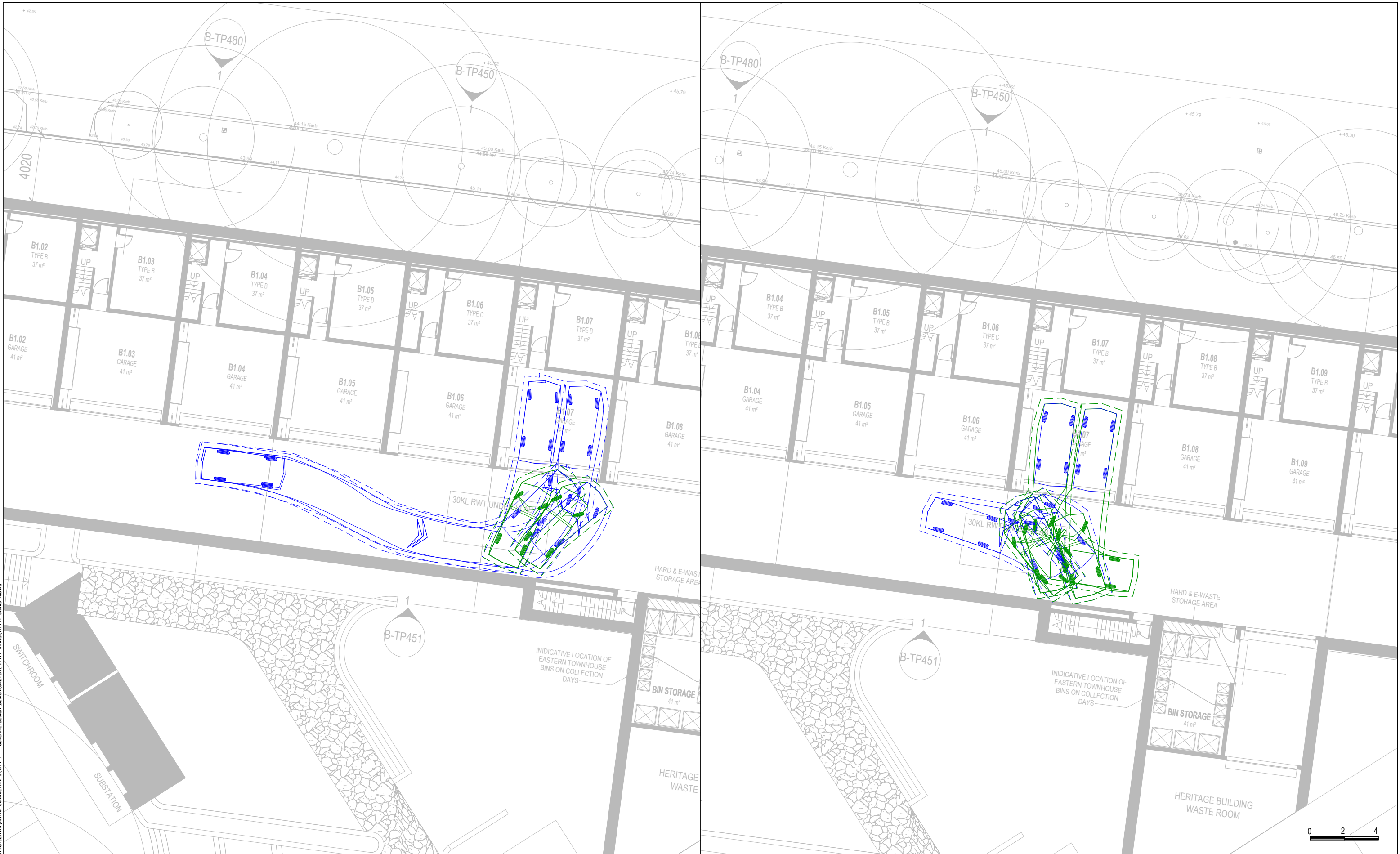
NOTE:
1) Base Plan Supplied By KUD
2) Maximum Design Speed 10km/h

RATIO REFERENCE 19797T-SK005-A	SHEET No. 5 of 13	PREPARED BY R.T.	SCALE 1:200@A3	DATE 11/08/2025
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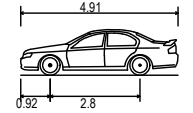


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TELEPHONE (03)9429 3111
FACSIMILE (03)9429 3011

B85 Vehicle (AS/NZS2890.1:2004)



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

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

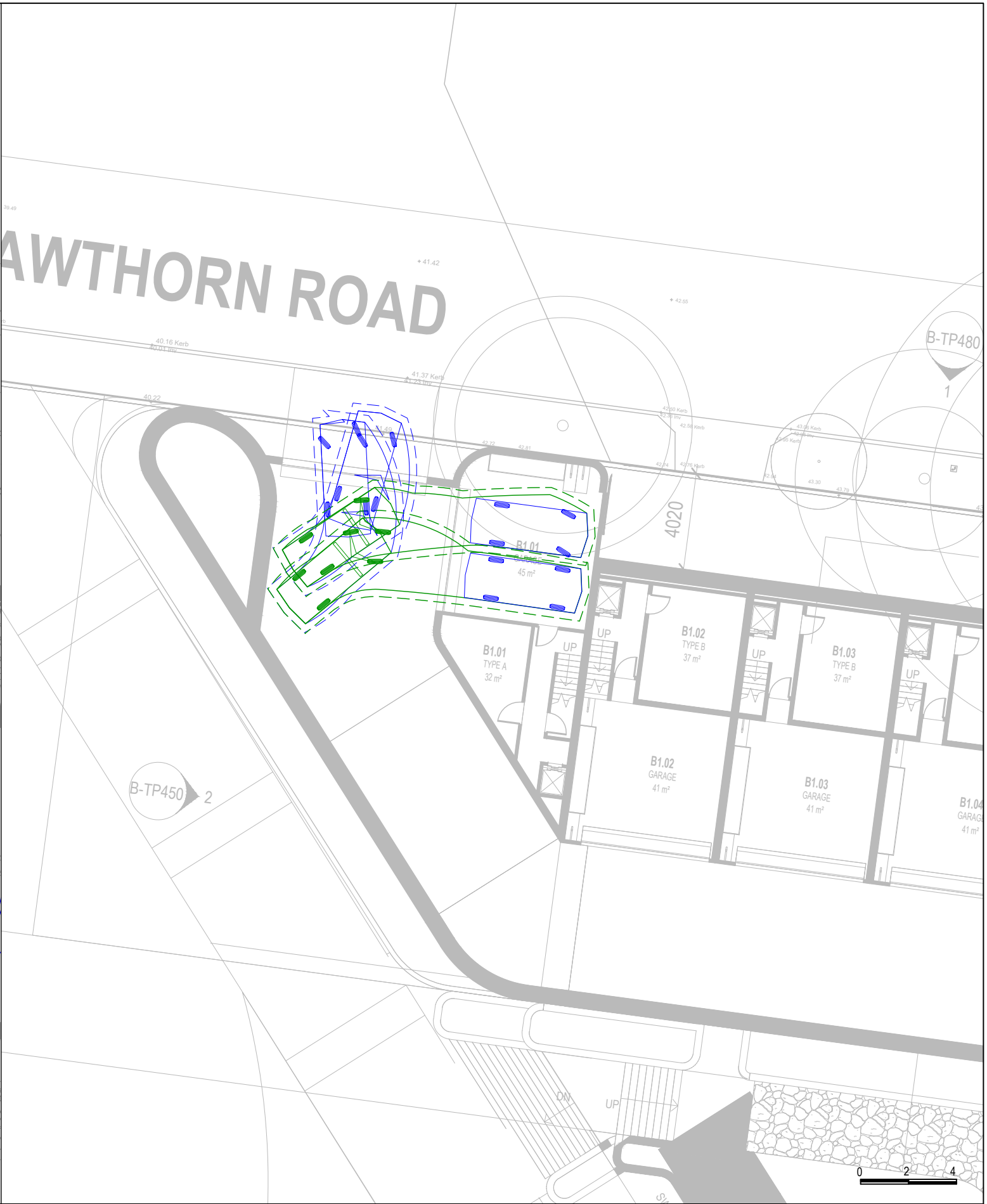
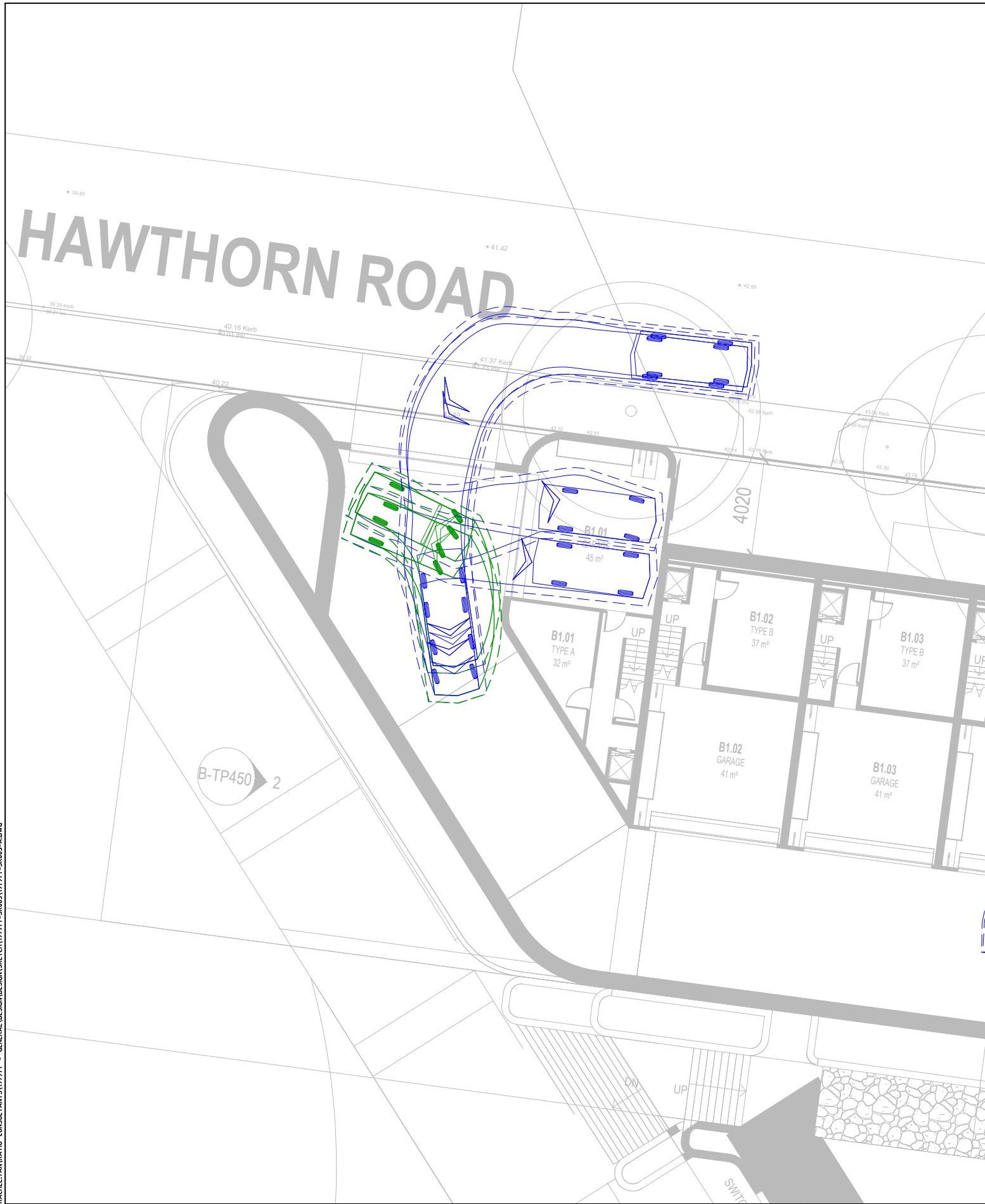
BUILDING B
7 Hartington Street, Northcote
Swept Path Assessment

NOTE:
1) Base Plan Supplied By KUD
2) Maximum Design Speed 10km/h

RATIO REFERENCE 19797T-SK005-A	SHEET No. 6 of 13	PREPARED BY R.T.	SCALE 1:200@A3	DATE 11/08/2025
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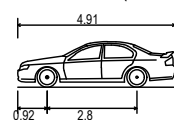


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ABN 005 422 104
LEVEL 5, 65 DOVER STREET
CREMORNE, VICTORIA 3121
TELEPHONE (03)9429 3111
FACSIMILE (03)9429 3011

B85 Vehicle (AS/NZS2890.1:2004)



Overall Length
Overall Width
Overall Body Height
Min Body Ground Clearance
Track Width
Lock to Lock Time
Curb to Curb Turning Radius

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

4.910m
1.870m
1.421m
0.159m
1.770m
4.00 sec
5.80m

BUILDING B

7 Hartington Street, Northcote

Swept Path Assessment

NOTE:
1) Base Plan Supplied By KUD
2) Maximum Design Speed 10km/h

RATIO REFERENCE
19797T-SK005-A

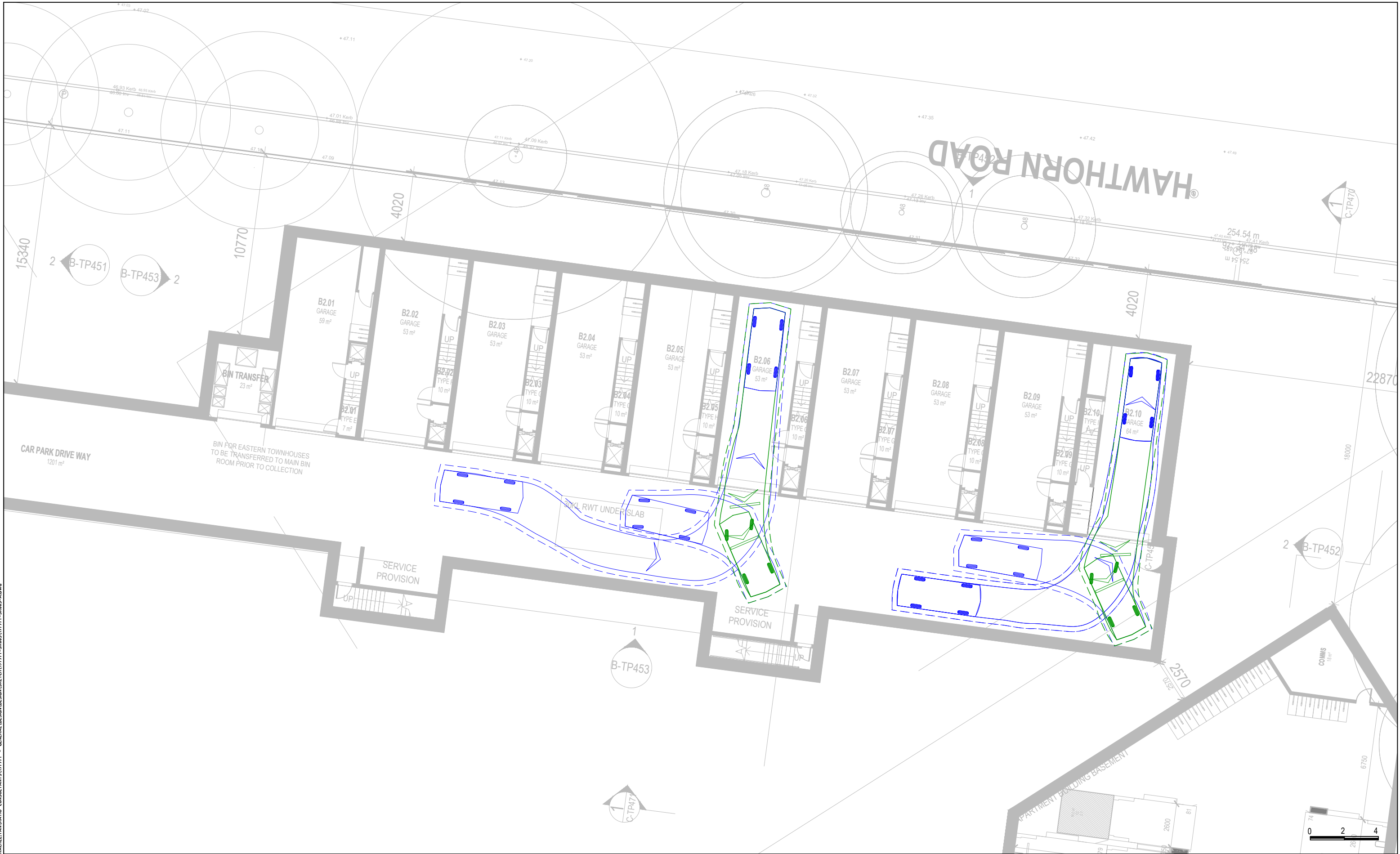
SHEET No.
7 of 13

PREPARED BY
R.T.

SCALE
1:200@A3

DATE
11/08/2025





RATIO CONSULTANTS PTY LTD
ABN 005 422 104
LEVEL 5, 65 DOVER 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 Overall Width Overall Body Height Min Body Ground Clearance Track Width Lock to Lock Time Curb to Curb Turning Radius	4.910m 1.870m 1.421m 0.159m 1.770m 4.00 sec 5.80m

BUILDING C
7 Hartington Street, Northcote
Swept Path Assessment

NOTE:
1) Base Plan Supplied By KUD
2) Maximum Design Speed 10km/h

RATIO REFERENCE
19797T-SK005-A

SHEET No.
8 of 13

PREPARED BY
R.T.

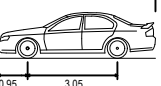
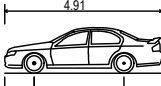
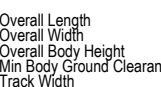
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11/08/2025

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RATIO CONSULTANTS PTY LTD
ABN 005 422 104
 LEVEL 5, 65 DOVER STREET
 CREMORNE, VICTORIA 3121
 TELEPHONE (03)9429 3111
 FACSIMILE (03)9429 3011

B99 Vehicle (AS/NZS2890.1:2004)	
	<u>VEHICLE ENVELOPE (FORWARD)</u>
	<u>300mm CLEARANCE (FORWARD)</u>
	<u>VEHICLE ENVELOPE (REVERSE)</u>
	<u>300mm CLEARANCE (REVERSE)</u>
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
B85 Vehicle (AS/NZS2890.1:2004)	
	<u>VEHICLE ENVELOPE (FORWARD)</u>
	<u>300mm CLEARANCE (FORWARD)</u>
	<u>VEHICLE ENVELOPE (REVERSE)</u>
	<u>300mm CLEARANCE (REVERSE)</u>
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

BUILDING C
7 Hartington Street, Northcote
Swept Path Assessment

NOTE:

- 1) Base Plan Supplied By KUD
- 2) Maximum Design Speed 10km/h

RATIO REFERENCE	SHEET No.	PREPARED BY	SCALE	DATE
19797T-SK005-A	9 of 13	R.T.	1:200@A3	11/08/2025



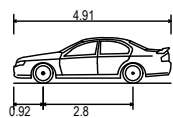
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ratio:

RATIO CONSULTANTS PTY LTD
ABN 005 422 104
LEVEL 5, 65 DOVER STREET
CREMORNE, VICTORIA 3121
TELEPHONE (03)9429 3111
FACSIMILE (03)9429 3011

B85 Vehicle (AS/NZS2890.1:2004)



Overall Length
Overall Width
Overall Body Height
Min Body Ground Clearance
Track Width
Lock to Lock Time
Curb to Curb Turning Radius

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

4.910m
1.870m
1.421m
0.159m
1.770m
4.00 sec
5.80m

BUILDING C

7 Hartington Street, Northcote

Swept Path Assessment

NOTE:
1) Base Plan Supplied By KUD
2) Maximum Design Speed 10km/h

RATIO REFERENCE
19797T-SK005-A

SHEET No.
10 of 13

PREPARED BY
R.T.

SCALE
1:200@A3

DATE
11/08/2025



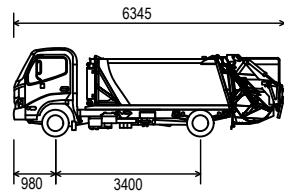
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ratio:

RATIO CONSULTANTS PTY LTD
ABN 005 422 104
LEVEL 5, 65 DOVER STREET
CREMORNE, VICTORIA 3121
TELEPHONE (03)9429 3111
FACSIMILE (03)9429 3011

Mini-Rear Loader Waste Collection Vehicle



VEHICLE ENVELOPE (FORWARD)

300mm CLEARANCE (FORWARD)

VEHICLE ENVELOPE (REVERSE)

300mm CLEARANCE (REVERSE)

Overall Length 6.345m
Body Width 1.700m
Overall Body Height 2.080m
Min Body Ground Clearance 0.205m
Track Width 1.670m
Lock to Lock Time 4.00 sec
Curb to Curb Turning Radius 6.450m

BUILDING C

7 Hartington Street, Northcote

Swept Path Assessment

NOTE:
1) Base Plan Supplied By KUD
2) Maximum Design Speed 10km/h

RATIO REFERENCE
19797T-SK005-A

SHEET No.
11 of 13

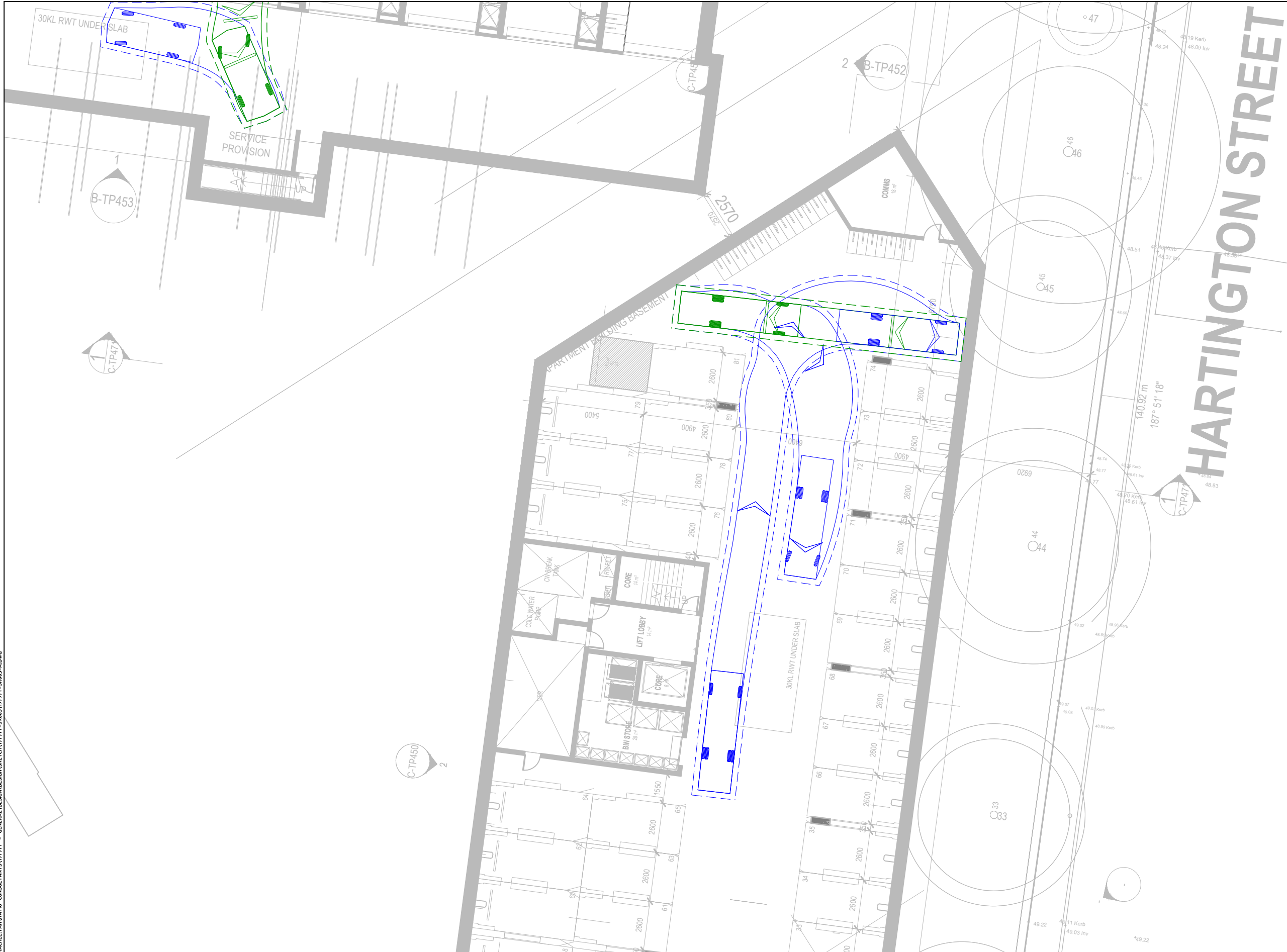
PREPARED BY
R.T.

SCALE
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DATE
11/08/2025



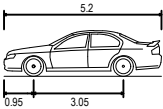
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RATIO CONSULTANTS PTY LTD
ABN 005 422 104
LEVEL 5, 65 DOVER STREET
CREMORNE, VICTORIA 3121
TELEPHONE (03)9429 3111
FACSIMILE (03)9429 3011

B99 Vehicle (AS/NZS2890.1:2004)

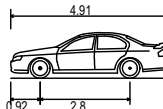


Overall Length
Overall Width
Overall Body Height
Min Body Ground Clearance
Track Width
Lock to Lock Time
Curb to Curb Turning Radius

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

5.200m
1.940m
2.200m
0.312m
1.840m
4.00 sec
6.30m

B85 Vehicle (AS/NZS2890.1:2004)



Overall Length
Overall Width
Overall Body Height
Min Body Ground Clearance
Track Width
Lock to Lock Time
Curb to Curb Turning Radius

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

4.910m
1.870m
1.421m
0.159m
1.770m
4.00 sec
5.80m

BUILDING D
7 Hartington Street, Northcote
Swept Path Assessment

NOTE:
1) Base Plan Supplied By KUD
2) Maximum Design Speed 10km/h

RATIO REFERENCE
19797T-SK005-A

SHEET No.
12 of 13

PREPARED BY
R.T.

SCALE
1:200@A3

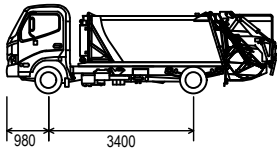
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ST GEORGES ROAD

Mini-Rear Loader Waste Collection Vehicle



VEHICLE ENVELOPE (FORWARD)

300mm CLEARANCE (FORWARD)

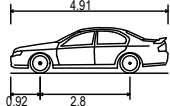
VEHICLE ENVELOPE (REVERSE)

300mm CLEARANCE (REVERSE)

Overall Length
Body Width
Overall Body Height
Min Body Ground Clearance
Track Width
Lock to Lock Time
Curb to Curb Turning Radius

6.345m
1.700m
2.080m
0.205m
1.670m
4.00 sec
6.450m

B85 Vehicle (AS/NZS2890.1:2004)



VEHICLE ENVELOPE (FORWARD)

300mm CLEARANCE (FORWARD)

VEHICLE ENVELOPE (REVERSE)

300mm CLEARANCE (REVERSE)

Overall Length
Overall Width
Overall Body Height
Min Body Ground Clearance
Track Width
Lock to Lock Time
Curb to Curb Turning Radius

4.910m
1.870m
1.421m
0.159m
1.770m
4.00 sec
5.80m

BUILDING D
7 Hartington Street, Northcote
Swept Path Assessment

NOTE:
1) Base Plan Supplied By KUD
2) Maximum Design Speed 10km/h

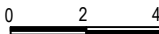
RATIO REFERENCE
19797T-SK005-A

SHEET No.
13 of 13

PREPARED BY
R.T.

SCALE
1:200@A3

DATE
11/08/2025



Appendix C SIDRA Modelling Results

MOVEMENT SUMMARY

 **Site: 101 [St Georges Rd / Hawthorn Rd - PostDev - AM (Site Folder: POST DEVELOPMENT SCENARIO)]**

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

St Georges Rd / Hawthorn Rd
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: St Georges Rd															
2	T1	All MCs	1052	2.3	1052	2.3	0.274	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach			1052	2.3	1052	2.3	0.274	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.8
East: Hawthorn Rd															
4	L2	All MCs	29	7.1	29	7.1	0.087	17.8	LOS C	0.3	2.1	0.71	1.00	0.71	45.7
Approach			29	7.1	29	7.1	0.087	17.8	LOS C	0.3	2.1	0.71	1.00	0.71	45.7
North: St Georges Rd															
7	L2	All MCs	24	4.3	24	4.3	0.468	5.7	LOS A	0.0	0.0	0.00	0.02	0.00	56.9
8	T1	All MCs	1776	2.0	1776	2.0	0.468	0.2	LOS A	0.0	0.0	0.00	0.01	0.00	59.6
Approach			1800	2.0	1800	2.0	0.468	0.3	NA	0.0	0.0	0.00	0.01	0.00	59.5
All Vehicles			2881	2.2	2881	2.2	0.468	0.4	NA	0.3	2.1	0.01	0.02	0.01	59.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

 **Site: 101 [St Georges Rd / Hawthorn Rd - PostDev - PM (Site Folder: POST DEVELOPMENT SCENARIO)]**

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

St Georges Rd / Hawthorn Rd
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: St Georges Rd															
2	T1	All MCs	1524	0.5	1524	0.5	0.392	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.7
Approach			1524	0.5	1524	0.5	0.392	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.7
East: Hawthorn Rd															
4	L2	All MCs	28	0.0	28	0.0	0.054	13.0	LOS B	0.2	1.3	0.58	0.95	0.58	48.5
Approach			28	0.0	28	0.0	0.054	13.0	LOS B	0.2	1.3	0.58	0.95	0.58	48.5
North: St Georges Rd															
7	L2	All MCs	17	0.0	17	0.0	0.362	5.6	LOS A	0.0	0.0	0.00	0.01	0.00	57.2
8	T1	All MCs	1388	0.8	1388	0.8	0.362	0.1	LOS A	0.0	0.0	0.00	0.01	0.00	59.7
Approach			1405	0.8	1405	0.8	0.362	0.2	NA	0.0	0.0	0.00	0.01	0.00	59.7
All Vehicles			2958	0.6	2958	0.6	0.392	0.3	NA	0.2	1.3	0.01	0.01	0.01	59.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▼ Site: 101v [St Georges Rd / Sumner Ave (West) - PostDev - AM (Site Folder: POST DEVELOPMENT SCENARIO)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

St Georges Rd / Sumner Ave (West)
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h %		Arrival Flows [Total HV] veh/h %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. Dist] veh m		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: St Georges Rd (nthbnd)															
1	L2	All MCs	27	3.8	27	3.8	0.276	5.7	LOS A	0.0	0.0	0.00	0.03	0.00	56.9
2	T1	All MCs	1018	2.4	1018	2.4	0.276	0.1	LOS A	0.0	0.0	0.00	0.02	0.00	59.6
3	R2	All MCs	12	0.0	12	0.0	0.276	5.8	LOS A	0.0	0.0	0.00	0.01	0.00	56.8
Approach			1057	2.4	1057	2.4	0.276	0.3	NA	0.0	0.0	0.00	0.02	0.00	59.6
East: Centre Median															
5	T1	All MCs	23	0.0	23	0.0	0.102	7.4	LOS A	0.3	2.3	0.71	0.86	0.71	44.4
6	R2	All MCs	20	0.0	20	0.0	0.102	10.7	LOS B	0.3	2.3	0.71	0.86	0.71	43.3
Approach			43	0.0	43	0.0	0.102	8.9	LOS A	0.3	2.3	0.71	0.86	0.71	43.9
West: Sumner Ave															
10	L2	All MCs	16	0.0	16	0.0	0.100	7.5	LOS A	0.3	2.4	0.62	0.82	0.62	50.1
11	T1	All MCs	42	0.0	42	0.0	0.100	10.1	LOS B	0.3	2.4	0.62	0.82	0.62	45.2
Approach			58	0.0	58	0.0	0.100	9.4	LOS A	0.3	2.4	0.62	0.82	0.62	47.1
All Vehicles			1158	2.2	1158	2.2	0.276	1.1	NA	0.3	2.4	0.06	0.09	0.06	58.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▼ Site: 101v [St Georges Rd / Site Access (East) - PostDev - AM
(Site Folder: POST DEVELOPMENT SCENARIO)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

St Georges Rd / Site Access (East)
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h %		Arrival Flows [Total HV] veh/h %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. Dist] veh m		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Site Access															
4	L2	All MCs	4	25.0	4	25.0	0.018	13.7	LOS B	0.1	0.4	0.78	0.86	0.78	45.0
5	T1	All MCs	1	0.0	1	0.0	0.018	28.3	LOS D	0.1	0.4	0.78	0.86	0.78	30.7
Approach			5	20.0	5	20.0	0.018	16.6	LOS C	0.1	0.4	0.78	0.86	0.78	42.7
North: St Georges Rd (sthbnd)															
7	L2	All MCs	7	14.3	7	14.3	0.469	5.9	LOS A	0.0	0.0	0.00	0.00	0.00	56.5
8	T1	All MCs	1754	2.0	1754	2.0	0.469	0.2	LOS A	0.0	0.0	0.00	0.02	0.00	59.5
9	R2	All MCs	43	2.4	43	2.4	0.469	5.9	LOS A	0.0	0.0	0.00	0.03	0.00	29.7
Approach			1804	2.0	1804	2.0	0.469	0.3	NA	0.0	0.0	0.00	0.02	0.00	58.7
West: Centre Median															
11	T1	All MCs	1	0.0	1	0.0	0.556	42.8	LOS E	1.8	12.4	0.96	1.05	1.27	21.9
12	R2	All MCs	54	0.0	54	0.0	0.556	53.1	LOS F	1.8	12.4	0.96	1.05	1.27	21.6
Approach			55	0.0	55	0.0	0.556	52.9	LOS F	1.8	12.4	0.96	1.05	1.27	21.6
All Vehicles			1864	2.0	1864	2.0	0.556	1.9	NA	1.8	12.4	0.03	0.05	0.04	57.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▼ Site: 101v [St Georges Rd / Sumner Ave (West) - PostDev - PM (Site Folder: POST DEVELOPMENT SCENARIO)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

St Georges Rd / Sumner Ave (West)
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h %		Arrival Flows [Total HV] veh/h %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. Dist] veh m		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: St Georges Rd (nthbnd)															
1	L2	All MCs	175	0.0	175	0.0	0.441	5.7	LOS A	0.0	0.0	0.00	0.12	0.00	56.2
2	T1	All MCs	1495	0.5	1495	0.5	0.441	0.2	LOS A	0.0	0.0	0.00	0.07	0.00	59.1
3	R2	All MCs	35	0.0	35	0.0	0.441	5.9	LOS A	0.0	0.0	0.00	0.03	0.00	56.5
Approach			1704	0.4	1704	0.4	0.441	0.8	NA	0.0	0.0	0.00	0.07	0.00	58.7
East: Centre Median															
5	T1	All MCs	38	0.0	38	0.0	0.381	26.8	LOS D	1.2	8.6	0.92	1.01	1.11	30.7
6	R2	All MCs	24	0.0	24	0.0	0.381	29.9	LOS D	1.2	8.6	0.92	1.01	1.11	30.1
Approach			62	0.0	62	0.0	0.381	28.0	LOS D	1.2	8.6	0.92	1.01	1.11	30.5
West: Sumner Ave															
10	L2	All MCs	14	0.0	14	0.0	0.270	10.1	LOS B	0.9	6.2	0.87	0.97	0.98	43.2
11	T1	All MCs	49	0.0	49	0.0	0.270	23.9	LOS C	0.9	6.2	0.87	0.97	0.98	35.5
Approach			63	0.0	63	0.0	0.270	20.9	LOS C	0.9	6.2	0.87	0.97	0.98	37.8
All Vehicles			1829	0.4	1829	0.4	0.441	2.5	NA	1.2	8.6	0.06	0.14	0.07	57.0

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▼ Site: 101v [St Georges Rd / Site Access (East) - PostDev - PM
(Site Folder: POST DEVELOPMENT SCENARIO)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

St Georges Rd / Site Access (East)
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
East: Site Access															
4	L2	All MCs	2	0.0	2	0.0	0.010	8.6	LOS A	0.0	0.2	0.70	0.75	0.70	48.5
5	T1	All MCs	2	0.0	2	0.0	0.010	14.8	LOS B	0.0	0.2	0.70	0.75	0.70	27.5
Approach			4	0.0	4	0.0	0.010	11.7	LOS B	0.0	0.2	0.70	0.75	0.70	38.5
North: St Georges Rd (sthbnd)															
7	L2	All MCs	1	0.0	1	0.0	0.365	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	57.3
8	T1	All MCs	1351	0.9	1351	0.9	0.365	0.1	LOS A	0.0	0.0	0.00	0.03	0.00	59.5
9	R2	All MCs	60	0.0	60	0.0	0.365	5.8	LOS A	0.0	0.0	0.00	0.06	0.00	29.6
Approach			1412	0.8	1412	0.8	0.365	0.4	NA	0.0	0.0	0.00	0.03	0.00	58.2
West: Centre Median															
11	T1	All MCs	4	0.0	4	0.0	0.388	16.7	LOS C	1.3	9.3	0.89	1.00	1.11	34.2
12	R2	All MCs	80	0.0	80	0.0	0.388	21.9	LOS C	1.3	9.3	0.89	1.00	1.11	33.5
Approach			84	0.0	84	0.0	0.388	21.7	LOS C	1.3	9.3	0.89	1.00	1.11	33.6
All Vehicles			1500	0.8	1500	0.8	0.388	1.6	NA	1.3	9.3	0.05	0.09	0.06	56.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

 **Site: 101 [St Georges Rd / Westbourne Gr - PostDev - AM**
(Site Folder: POST DEVELOPMENT SCENARIO)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

St Georges Rd / Westbourne Gr
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: St Georges Rd															
2	T1	All MCs	1057	2.4	1057	2.4	0.275	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach			1057	2.4	1057	2.4	0.275	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.8
East: Westbourne Gr															
4	L2	All MCs	69	0.0	69	0.0	0.172	15.9	LOS C	0.6	4.2	0.70	1.00	0.70	46.9
Approach			69	0.0	69	0.0	0.172	15.9	LOS C	0.6	4.2	0.70	1.00	0.70	46.9
North: St Georges Rd															
7	L2	All MCs	85	0.0	85	0.0	0.471	5.7	LOS A	0.0	0.0	0.00	0.06	0.00	56.7
8	T1	All MCs	1725	2.1	1725	2.1	0.471	0.2	LOS A	0.0	0.0	0.00	0.03	0.00	59.4
Approach			1811	2.0	1811	2.0	0.471	0.4	NA	0.0	0.0	0.00	0.03	0.00	59.3
All Vehicles			2937	2.1	2937	2.1	0.471	0.7	NA	0.6	4.2	0.02	0.04	0.02	59.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

 **Site: 101 [St Georges Rd / Westbourne Gr - PostDev - PM
(Site Folder: POST DEVELOPMENT SCENARIO)]**

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

St Georges Rd / Westbourne Gr
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: St Georges Rd															
2	T1	All MCs	1704	0.4	1704	0.4	0.438	0.2	LOS A	0.0	0.0	0.00	0.00	0.00	59.7
Approach			1704	0.4	1704	0.4	0.438	0.2	NA	0.0	0.0	0.00	0.00	0.00	59.7
East: Westbourne Gr															
4	L2	All MCs	56	0.0	56	0.0	0.089	11.8	LOS B	0.3	2.3	0.53	0.95	0.53	49.2
Approach			56	0.0	56	0.0	0.089	11.8	LOS B	0.3	2.3	0.53	0.95	0.53	49.2
North: St Georges Rd															
7	L2	All MCs	154	0.7	154	0.7	0.372	5.7	LOS A	0.0	0.0	0.00	0.13	0.00	56.2
8	T1	All MCs	1280	0.8	1280	0.8	0.372	0.1	LOS A	0.0	0.0	0.00	0.06	0.00	59.3
Approach			1434	0.8	1434	0.8	0.372	0.7	NA	0.0	0.0	0.00	0.06	0.00	58.9
All Vehicles			3194	0.6	3194	0.6	0.438	0.6	NA	0.3	2.3	0.01	0.05	0.01	59.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

▼ Site: 101v [St Georges Rd / Sumner Ave (West) - PostDev - AM (Site Folder: POST DEVELOPMENT SCENARIO)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

■ Network: N101 [St Georges Rd / Sumner Ave / Site Access - PostDev - AM (Network Folder: Post-Dev)]

St Georges Rd / Sumner Ave (West)
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist]				
South: St Georges Rd (nthbnd)															
1	L2	All MCs	27	3.8	27	3.8	0.276	5.7	LOS A	0.0	0.0	0.00	0.03	0.00	56.9
2	T1	All MCs	1018	2.4	1018	2.4	0.276	0.1	LOS A	0.0	0.0	0.00	0.02	0.00	59.6
3	R2	All MCs	12	0.0	12	0.0	0.276	5.8	LOS A	0.0	0.0	0.00	0.01	0.00	59.6
Approach			1057	2.4	1057	2.4	0.276	0.3	NA	0.0	0.0	0.00	0.02	0.00	59.6
East: Centre Median															
5	T1	All MCs	23	0.0	23	0.0	0.102	7.4	LOS A	0.3	2.3	0.71	0.86	0.71	44.4
6	R2	All MCs	20	0.0	20	0.0	0.102	10.7	LOS B	0.3	2.3	0.71	0.86	0.71	43.3
Approach			43	0.0	43	0.0	0.102	8.9	LOS A	0.3	2.3	0.71	0.86	0.71	43.9
West: Sumner Ave															
10	L2	All MCs	16	0.0	16	0.0	0.100	7.5	LOS A	0.3	2.4	0.62	0.82	0.62	50.1
11	T1	All MCs	42	0.0	42	0.0	0.100	10.1	LOS B	0.3	2.4	0.62	0.82	0.62	45.9
Approach			58	0.0	58	0.0	0.100	9.4	LOS A	0.3	2.4	0.62	0.82	0.62	47.6
All Vehicles			1158	2.2	1158	2.2	0.276	1.1	NA	0.3	2.4	0.06	0.09	0.06	58.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akcelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Project: C:\Users\rachel.tan\Ratio Consultants\19797T - General\Work\Analysis\SIDRA\19797T-SID01.sip9

MOVEMENT SUMMARY

▼ Site: 101v [St Georges Rd / Sumner Ave (West) - PostDev - PM (Site Folder: POST DEVELOPMENT SCENARIO)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

■ Network: N101 [St Georges Rd / Sumner Ave / Site Access - PostDev - PM (Network Folder: Post-Dev)]

St Georges Rd / Sumner Ave (West)
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh. veh	Dist]				
			veh/h	%	veh/h	%	v/c	sec			m				km/h
South: St Georges Rd (nthbnd)															
1	L2	All MCs	175	0.0	175	0.0	0.441	5.7	LOS A	0.0	0.0	0.00	0.12	0.00	56.2
2	T1	All MCs	1495	0.5	1495	0.5	0.441	0.2	LOS A	0.0	0.0	0.00	0.07	0.00	59.1
3	R2	All MCs	35	0.0	35	0.0	0.441	5.9	LOS A	0.0	0.0	0.00	0.03	0.00	59.2
Approach			1704	0.4	1704	0.4	0.441	0.8	NA	0.0	0.0	0.00	0.07	0.00	58.8
East: Centre Median															
5	T1	All MCs	38	0.0	38	0.0	0.381	26.8	LOS D	1.2	8.6	0.92	1.01	1.11	30.7
6	R2	All MCs	24	0.0	24	0.0	0.381	29.9	LOS D	1.2	8.6	0.92	1.01	1.11	30.1
Approach			62	0.0	62	0.0	0.381	28.0	LOS D	1.2	8.6	0.92	1.01	1.11	30.5
West: Sumner Ave															
10	L2	All MCs	14	0.0	14	0.0	0.270	10.1	LOS B	0.9	6.2	0.87	0.97	0.98	43.2
11	T1	All MCs	49	0.0	49	0.0	0.270	23.9	LOS C	0.9	6.2	0.87	0.97	0.98	35.7
Approach			63	0.0	63	0.0	0.270	20.9	LOS C	0.9	6.2	0.87	0.97	0.98	38.0
All Vehicles			1829	0.4	1829	0.4	0.441	2.5	NA	1.2	8.6	0.06	0.14	0.07	57.1

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akcelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

 **Site: 101 [Westbourne Gr / Hartington St - PostDev - AM (Site Folder: POST DEVELOPMENT SCENARIO)]**

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Westbourne Gr / Hartington St
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
East: Westbourne Gr															
5	T1	All MCs	76	1.4	76	1.4	0.030	0.1	LOS A	0.1	0.9	0.05	0.08	0.05	59.1
6	R2	All MCs	25	8.3	25	8.3	0.030	6.1	LOS A	0.1	0.9	0.21	0.36	0.21	53.7
Approach			101	3.1	101	3.1	0.030	1.6	NA	0.1	0.9	0.09	0.15	0.09	57.6
North: Hartington St															
7	L2	All MCs	49	0.0	49	0.0	0.043	8.2	LOS A	0.2	1.1	0.13	0.91	0.13	51.1
9	R2	All MCs	44	2.4	44	2.4	0.059	9.8	LOS A	0.2	1.6	0.36	0.88	0.36	50.3
Approach			94	1.1	94	1.1	0.059	9.0	LOS A	0.2	1.6	0.24	0.90	0.24	50.7
West: Westbourne Gr															
10	L2	All MCs	12	0.0	12	0.0	0.029	5.5	LOS A	0.0	0.0	0.00	0.12	0.00	56.5
11	T1	All MCs	101	1.0	101	1.0	0.029	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	59.5
Approach			113	0.9	113	0.9	0.029	0.6	NA	0.0	0.0	0.00	0.06	0.00	59.2
All Vehicles			307	1.7	307	1.7	0.059	3.5	NA	0.2	1.6	0.10	0.35	0.10	55.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

 **Site: 101 [Westbourne Gr / Hartington St - PostDev - PM (Site Folder: POST DEVELOPMENT SCENARIO)]**

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Westbourne Gr / Hartington St
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
East: Westbourne Gr															
5	T1	All MCs	62	0.0	62	0.0	0.032	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
6	R2	All MCs	45	0.0	45	0.0	0.039	6.4	LOS A	0.2	1.1	0.31	0.57	0.31	51.9
Approach			107	0.0	107	0.0	0.039	2.7	NA	0.2	1.1	0.13	0.24	0.13	56.3
North: Hartington St															
7	L2	All MCs	20	0.0	20	0.0	0.018	8.2	LOS A	0.1	0.4	0.13	0.91	0.13	51.1
9	R2	All MCs	29	3.6	29	3.6	0.045	10.8	LOS B	0.2	1.2	0.43	0.88	0.43	49.7
Approach			49	2.1	49	2.1	0.045	9.7	LOS A	0.2	1.2	0.31	0.89	0.31	50.3
West: Westbourne Gr															
10	L2	All MCs	58	0.0	58	0.0	0.058	5.6	LOS A	0.0	0.0	0.00	0.31	0.00	54.9
11	T1	All MCs	163	1.3	163	1.3	0.058	0.0	LOS A	0.0	0.0	0.00	0.10	0.00	59.1
Approach			221	1.0	221	1.0	0.058	1.5	NA	0.0	0.0	0.00	0.15	0.00	57.9
All Vehicles			378	0.8	378	0.8	0.058	2.9	NA	0.2	1.2	0.08	0.28	0.08	56.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.