



SSD-70283710: 1 Crescent Street, Holroyd

Transport Impact Assessment - Response to Submissions

Prepared for:

Tiberius (Holroyd) Pty Ltd (ABN 61 061 131 959) atf
the Holroyd Unit Trust (ABN 42 891 308 354)

14 November 2025

The Transport Planning Partnership

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APPENDICES

- A. ARCHITECTURAL PLANS**
- B. CAR PARK REVIEW**
- C. SIDRA ANALYSIS**

Abbreviations

Abbreviation	Definition
AHD	Australian Height Datum
BCA	Building Code of Australia
CCC	Cumberland City Council
CTMP	Construction Traffic Management Plan
DCP	Development Control Plan Cumberland Development Control Plan 2021 (CDCP 2021)
DPHI	Department of Planning, Housing and Infrastructure
EIS	Environmental Impact Statement
EP&A Act	Environmental Planning and Assessment Act 1979
CLEP	Local Environmental Plan Cumberland Local Environmental Plan 2021 (CLEP 2021)
LGA	Local Government Area
LoS	Level of Service
SEARs	Secretary's Environmental Assessment Requirements
PCC	Parramatta City Council
SEPP (Housing) 2021	State Environmental Planning Policy (Housing) 2021
SSDA	State Significant Development Application
TfNSW	Transport for New South Wales
The Guide 2002	The Guide to Traffic Generating Developments, October 2002
The Guide 2024	The Guide to Transport Impact Assessment, November 2024
The site	1 Crescent Street, Holroyd
TIA	Transport Impact Assessment
TTPP	The Transport Planning Partnership

1 Introduction

This report has been prepared on behalf of Tiberius (Holroyd) Pty Ltd in association with a State Significant Development Application (SSDA) for a proposed mixed-use development at 1 Crescent Street, Holroyd (the site).

The report responds to matters raised by the Department of Planning, Housing and Infrastructure (DPHI), Cumberland City Council, other State government authorities /agencies, utility service providers and the community during public exhibition of SSD-70283710.

The report also assesses the proposed amendments to the original proposal, including changes to the following:

- Stage A – Mixed use podium, Buildings 1 to 3 and supporting infrastructure
- Stage B – Buildings 4 and 5 and supporting infrastructure
- Stage C – Buildings 6 and 7 and supporting infrastructure

The proposed changes extend beyond minor refinements which can be accommodated via a Submissions Report. As a result, a combined Submissions and Amendment Report has been prepared and consent sought from DPHI to amend the SSDA as per section 37 of the Environmental Planning and Assessment Regulation 2021 (the Regulation).

To understand the cumulative impact of the above design refinements, the project description has been updated to reflect the proposed amendments to the scheme as originally lodged with DPHI for assessment.

The amended description is provided as follows:

- Site establishment works, tree removal, site preparation, earthworks and excavation, services augmentation, and remediation works.
- Development of seven residential buildings comprising four shop top housing buildings and three residential flat buildings as outlined below:
 - Buildings 1-3 are integrated with an eastern mixed-use podium building, while Building 4 is situated above mixed residential / commercial space, offering shop-top housing.
 - Buildings 5-7 consist of residential flat buildings.
- Delivery of 15% of the total floor space as affordable housing to be distributed across each of the 7 residential buildings, or within a consolidated building proposed proportionately as buildings are developed.
- Approximately 134,208 m² total floor space comprising:
 - A total of 2,496 m² retail GFA and approximately 2,710 m² commercial GFA.

- 1,374 residential apartments
- Communal amenity facilities for residents.
- Building services areas.
- Activation of Crescent Street through a mix of amenity areas and pockets of open space.
- Shared car parking for Buildings 1 to 3 and the commercial and retail tenancies within the podium.
- Shared car parking for Buildings 4 to 7 within the above ground parking structures adjoining Buildings 4 to 5 and 6 to 7.
- Landscaping and accompanying place making works including:
 - Public open space, hard and soft landscape works.
 - Ground and rooftop communal open space.
 - Publicly accessible through-site links.
 - At grade car parking for the park, forecourt and retail areas.
 - Vehicle access via a new internal publicly accessible road and vehicle accessway.
 - New pedestrian footpaths and access arrangements to the site.
 - Café tenancy within park-side structure.
- Staged completion of a public park.
- Associated works involving the widening of Crescent Street and upgrades to the Crescent Street and Woodville Road intersection.

Table 1 below identifies the relevant matters raised by DPHI / Cumberland City Council, Transport for NSW and Parramatta City Council sets out the Applicant's response to these submissions.

Table 1.1: Response to Submissions

Issue	Traffic Transport and Accessibility	Applicant Response	Addressed in
PARRA-2	Parking and Traffic Congestion The proposed development is located in close proximity to the major intersections of M4, Parramatta Road, Church Street and Woodville Road. The proposal will result in approximately 1,600 parking spaces and a traffic generation of up to 771 inbound trips in the evening peak across a two hour window. This is a concerning increase in traffic of which the vast majority will be travelling through this intersection. Further to this, it is apparent that the proposed development will result in increased congestion along Parramatta Road, including local roads connecting to Parramatta Road which will create additional delays for residents in the Parramatta LGA. Accordingly, consideration should be given as to whether this site is suited for a development of this scale without other measures being taken to improve the flow of traffic in the surrounding state road network. The TIA must provide further detail on the impacts of this volume of traffic and suggested mitigation measures.	The project team has been working with TfNSW for over 7 years on this project to mitigate the impacts on the road network. Substantial traffic modelling was required to be undertaken during the assessment stage to provide TfNSW comfort that the impacts could be mitigated. The impacts on the road network will be mitigated through additional traffic lanes on Crescent Street, the introduction of a shuttle bus service to Harris Park and Parramatta and travel demand management directed by a Green Travel Plan to encourage residents, staff and visitors to use sustainable travel modes..	Refer to Green Travel Plan - SSD-70283710: 1 Crescent Street, Holroyd Green Travel Plan, 10 December 2024
PARRA-3	Site Access At the SEARs stage, Council raised concerns regarding motorists travelling southbound in Church Street, using the existing driveway in Crescent Street to perform a U-turn to access the M4 in the westbound direction. This behaviour is likely to continue, however, with the proposed development in place, there may be increased conflict with pedestrians on the footpath and vehicles exiting the driveway. The proposal now includes widening of Crescent Street to have 2-3 eastbound lanes past the development's driveway and a dedicated right turn lane into the site. This will likely result in the continued use of this section of road for motorists to perform a U-turn. Further to this, it is apparent that the queuing in Crescent Street in the AM peak will extend beyond the eastern driveway post development. As such, there will be instances where motorists are turning right out of or into the	The driveway is currently unused and is therefore attractive to drivers performing U turns. Once the driveway is reopened for the new development, then drivers would be discouraged from using the driveway as a U-turn facility and are therefore more likely to use the roundabout in Walpole Street or find other routes. It is recommended to install "No U Turn" signs at the driveway and back up with police enforcement.	Section 3

Issue	Traffic Transport and Accessibility	Applicant Response	Addressed in
	driveway between queued traffic which will significantly impact their sight lines. Given this, the TIA must further consider the road safety implications of their development and propose measures to minimise the impacts on road safety. It is suggested that the eastern driveway be made left in left out via a median island and that a roundabout be installed at the western driveway to allow motorists to safely perform a U-turn.		
PARRA-4	Active Transport Active transport links are considered essential to service the proposed development and particularly to link to Harris Park Train Station. In this regard, it is noted that there is a missing signalised pedestrian leg in Boundary Street at the intersection with Church Street and Raymond Street. Accordingly, the TIA must perform an assessment of a future upgrading of this traffic signals at this intersection to improve pedestrian safety and connectivity.	The most direct route to walk to Harris Park Train Station does not use Church Street. The existing underpass under the M4 avoids Church Street and the signalised intersection. There is no clear nexus between this development and the provision of a pedestrian crossing at Boundary Street / Church Street.	-
TfNSW-1-1	Road Widening of Crescent Street and Traffic Signal Works at Woodville Road - TfNSW notes that as part of the proposal Crescent Street will be widened to provide 3 approach lanes in Crescent Street at the traffic control signals (TCS) with Woodville Road (classified road) which is consistent with the Planning Proposal and requires modifications to the existing traffic signal layout which requires separate TfNSW approval under section 87 (4) of the Roads Act, 1993. - TfNSW is of the view that on road safety grounds, the proposed length of the road widening on Crescent Street should be designed as follows: - three lane eastbound arrangement in Crescent Street commencing east of the eastern driveway with Crescent to Woodville Road - two lane eastbound arrangement in Crescent Street commencing east of the western driveway up to the eastern driveway.	The third lane will be a parking lane up until the eastern driveway. This has been clarified in the response to submissions documentation which clarifies the layout of the intersection. The design has been adopted as part of the previously issued road widening package. Any required changes to traffic signal or lighting plans are outside the scope of the BG&E road widening package. These works will be carried out in accordance with TfNSW requirements and will be subject to a separate approval under section 87(4) of the Roads Act 1993, which may involve a broader redesign of the Crescent Street / Woodville Road intersection to suit the new kerb alignment.	Section 3.2.2
TfNSW-1-2	"Proposed Condition: The proposed Traffic Control Signal upgrade at the intersection of Woodville Road / Crescent Street and associated road widening of The	The applicant accepts the proposed condition.	-

Issue	Traffic Transport and Accessibility	Applicant Response	Addressed in
	Crecent shall be designed to meet TfNSW requirements. The Traffic Control Signal (TCS) plans shall be drawn by a suitably qualified person and endorsed by a suitably qualified practitioner. The submitted design shall be in accordance with Austroads Guide to Road Design in association with relevant TfNSW supplements (available on https://roads-waterways.transport.nsw.gov.au/business-industry/partners-suppliers/document-types/supplements-austroads-guides/road-design.html). The certified copies of the TCS design and civil design plans shall be submitted to TfNSW for consideration and approval prior to the release of a Construction Certificate and commencement of road works. Please send all documentation to development.sydney@transport.nsw.gov.au. TfNSW fees for administration, plan checking, civil works inspections and project management shall be paid by the developer prior to the commencement of works. The developer will be required to enter a Works Authorisation Deed (WAD) for the abovementioned works."		
TfNSW 2-1	Proposed Driveways in Crescent Street - TfNSW note that there are two driveways proposed in Crescent Street for vehicular access (i.e. western and driveway driveways). TfNSW raises road safety and traffic flow concerns with the proposed eastern driveway in Crescent Street, which is located on a bend near Woodville Road and permits all turning movements into and out of the site. TfNSW is concerned with potential queuing of the right turn bay extending out of the bay and potentially impacting on the operation of the right turn into Crescent Street from Woodville Road, which has been recently constructed by TfNSW. - TfNSW raises road safety concerns relating to the turning movements at the eastern driveway. Vehicles turning right into the driveway from Crescent Street are required to turn across 3 opposing traffic lanes	- Access to the site has been provided in this location on all plans since 2015 including for the approved rezoning. - It was the location which served the entire previous development for the car parking and servicing function and was not known to cause issues. - Traffic modelling has shown that the queueing suggested by TfNSW beyond the driveway will not generally occur after the upgrade of the Woodville Road / Crescent Street intersection.	Section 3

Issue	Traffic Transport and Accessibility	Applicant Response	Addressed in
	uncontrolled from a short right turn bay and vehicles turning right out the site are required to turn across 5 opposing lanes. "		
TfNSW-2-2	Amendment: TfNSW recommends that the access arrangement be amended, as part of the Response to Submissions (RtS) as follows: • Restrict traffic movements at the eastern driveway in Crescent Street by providing a self-enforcing, left in/left out arrangement with all right turn movements into the development from Crescent Street being permitted only from the western driveway. • Adjustments to the internal street arrangement so that all traffic turning right into the site can access the car parking spaces from the western driveway. This may require an extension of the right turn bay proposed at the western driveway to accommodate the volume of right turning traffic generated by the development	This proposed arrangement would have significant impacts on the functionality and staging. Further, it would divert more traffic including heavy vehicles past residential areas of the development and require significant widening of internal roadways to allow two-way traffic flow. Again, modelling has shown that right turns into the eastern driveway will be acceptable and not queue back beyond the proposed turn bay.	Section 3
TfNSW-3-1	Proposed Shuttle Bus • During the Planning Proposal for the rezoning of the site, TfNSW raised concerns regarding the traffic generation of the site and the impact on the classified road network given that the site is not located near public transport and as such, future residents would be forced to rely upon private vehicle use. • To address the traffic impacts, the Applicant proposed the use of shuttle bus services between the site, Harris Park and Parramatta train stations. • In the 'Response to submissions report and recommendation for finalisation of the Planning Proposal at 1 Crescent Street, Holroyd' dated 22nd February 2022, the applicant advised that they were committed to the provision of the shuttle bus with the funding and operation arrangements described as follows: • Whilst the traffic report proposes the use of a shuttle bus, the traffic report states that 'This shuttle bus service has been provided with the provision of a bus bay and costs shared between body corporates in the development'. TfNSW raise concerns about the longevity of the	The proponent accepts a condition of consent requiring the shuttle bus service to be funded and operated privately by the development (including successors in title) for the life of the project. The shuttle bus will form a mandatory element of the Green Travel Plan, which is enforceable and subject to regular review. Funding and operation will be incorporated into the Owners Corporation budget / building management structure, ensuring it is maintained on an ongoing basis in the same way as private waste collection or building services.	Section 4

Issue	Traffic Transport and Accessibility	Applicant Response	Addressed in
	provision of the shuttle bus (which needs to be provided in perpetuity to mitigate the traffic impacts of the development) if it is under the control of a body corporate, as the decision to fund/operate or abandon the shuttle bus service would be reliant on the body corporate by laws."		
TfNSW-3-2	TfNSW requests further information, in the RtS, on mechanisms or potential conditions that could be imposed to ensure that the shuttle bus is privately funded and operated in perpetuity as required to mitigate the traffic generated from the development."	The proponent accepts a condition of consent requiring the shuttle bus service to be funded and operated privately by the development (including successors in title) for the life of the project. The shuttle bus will form a mandatory element of the Green Travel Plan, which is enforceable and subject to regular review. Funding and operation will be incorporated into the Owners Corporation budget / building management structure, ensuring it is maintained on an ongoing basis in the same way as private waste collection or building services.	Section 4
TfNSW-4-1	Construction Pedestrian and Traffic Management Plan TfNSW raises concerns with the impact of construction vehicle traffic on the surrounding transport network.	A Construction Pedestrian and Traffic Management Plan (CPTMP) will be prepared in consultation with TfNSW prior to the issue of any relevant Construction Certificate. For clarity, each CPTMP will relate only to the scope of works authorised under that Construction Certificate, so that construction traffic and access arrangements can be appropriately tailored to the staging of the development.	-
TfNSW-4-2	Proposed Conditions: TfNSW recommends the following condition to be included in any consent issued by the Department: Prior to the issue of any construction certificate, the applicant shall prepare a Construction Pedestrian and Traffic Management Plan (CPTMP) in consultation with TfNSW. The CPTMP needs to specify matters including, but not limited to, the following:	The applicant agrees with this proposed condition.	-

Issue	Traffic Transport and Accessibility	Applicant Response	Addressed in
	▪ To mitigate the impact of construction traffic and reduce interaction with other projects, all access to the site shall be provided from Crescent Street only. ▪ Proposed haulage routes and construction vehicle access arrangements. ▪ Predicted number of construction vehicle movements, detail of vehicle types and demonstrate that proposed construction vehicle movements can be accommodated within the context of road changes in the surrounding area. ▪ Identify any potential impacts to general traffic, cyclists, pedestrians, and bus services within the vicinity of the site from construction vehicles during the construction of the proposed works. ▪ Identify the cumulative construction activities of the development and other projects within or around the development site. ▪ Proposed measures to minimise the cumulative impacts on the surrounding road network should be clearly identified and included in the CPTMP. ▪ Construction program and construction methodology, including any construction staging. ▪ Consultation strategy for liaison with surrounding stakeholders and other developments under construction.		

Issue	Traffic Transport and Accessibility	Applicant Response	Addressed in
	▪ Details of crane arrangements including location of any crane(s) and crane movement plan. ▪ Proposed construction hours. ▪ A detailed plan of any proposed hoarding and/or scaffolding. ▪ Provide the direct contact details to businesses and residents impacted by the construction work and TfNSW via development.ctmp.cjp@transport.nsw.gov.au to resolve issues during construction in real time. The applicant is responsible for ensuring the builder's direct contact number is current during any stage of construction; and Submit a copy of the final plan to TfNSW for endorsement via development.ctmp.cjp@transport.nsw.gov.au"		
DPHI-1	Would create more congestion and problems in the area with more traffic leading into the M4 and Parramatta Road. This would also impact already under strain public transport facilities to the Woodville Road Area.	TTPP has been working with TfNSW on the modelling since 2019 and they gave concurrence of the Planning Proposal stage in 2023. The applicant also proposes to provide a shuttle bus service to Parramatta and Harris Park. Additional capacity anticipated on the rail network with the opening of the Sydney Metro West.	Section 6
DPHI-2	Would also create more issues with regards to noise and pollution in the area.	Refer to E-labs acoustic consultant's response in relation to noise. Noise modelling has been updated.	-
WH-1-1 (withheld)	Road and Traffic Congestion: The road infrastructure in and around Granville is already under immense strain, particularly along Parramatta Road and Woodville Road. These areas experience heavy congestion during peak hours, and additional high-density developments will exacerbate this issue. Despite some existing public transport options, such as bus routes along Woodville Road, these services are insufficient to meet current demand, let alone accommodate the increased population from this development."	Project will implement travel demand measures such as walking connections, provision of shuttle bus and bicycle amenities. Refer to the Green Travel Plan: - Provision of bicycle parking and end of trip facilities - Public Transport Notice Board - Shuttle Bus Service.	Section 4

Issue	Traffic Transport and Accessibility	Applicant Response	Addressed in
		- Provide residents with Transport Access Guide. - Review and update the Green Travel Plan - Walking and cycling connections to the surrounding active transport network.	
WH-1-2	Lack of Proper Bus Stops on Woodville Road: Woodville Road lacks adequate bus stops with proper facilities for commuters. This makes public transport less accessible and discourages its use as a viable alternative to private vehicles. Improvements in this area are critical to support any new development in the region."	The proposal is proposing shuttle buses from the site to local destinations to directly assist with promoting transport use other than cars. The site has also been assessed to be within 800m walking distance to Harris Park Station. Further, the site also has a connection to the regional cycling network through a proposed pedestrian cyclist bridge over A'Becketts Creek.	Section 4
SDRP-7-A	a. Minimise the fragmentation between the retail space and the park by reducing the extent of the Lane as much as possible by reducing car spaces, testing alternative driveway arrangements and turning options.	The parking is provided partially to service the adjacent supermarket. This area will be a low speed shared zone area. The design has been refined to minimise the impact of the Lane and strengthen the connection between the retail frontage and the park. Car parking is focused on meeting the operational requirements of the supermarket and adjoining retail, ensuring viability of these uses. The lane itself will operate as a low-speed, shared zone with priority given to pedestrians and cyclists, and its design has been tested with alternative turning and access arrangements to ensure safety and efficiency. These refinements result in a cohesive interface where the retail edges and parkland are visually and physically connected, while retaining the necessary access arrangements to support the supermarket and retail uses.	-
CC-4-A	Car parking Pursuant to s.19(2)(e) and (f) of the Housing SEPP, the residential development requires a total of 1,230 car spaces while the proposal provides for 1,480 spaces, an excess of 250 spaces. Under the definition	The housing SEPP is for minimum parking. However, the parking provision is less than the site specific DCP maximum rates.	Section 5

Issue	Traffic Transport and Accessibility	Applicant Response	Addressed in
	of gross floor area, a concession is granted for car parking to meet requirements of the consent authority, but that concession does not extend to parking provided in excess of the consent authority's requirements. Those additional 250 spaces amount to 3,240m ² of gross floor area (assumed 2.4m x 5.4m x 250). Of this, Council estimates and attributes 1,620m ² to each of the W1 and W5 FSR areas."	The proposal will also be less than the CC LEP maximum rates for 1 Crescent Street. For the revised proposal the minimum under the Housing SEPP is 1413 car spaces and the maximum	
CC-8-B	The eastern driveway is located too close to Woodville Road and will result in poor safety and efficiency outcomes.	The driveway access has been assessed and would meet adequate requirements. Further, the driveway has been modelled and shows no adverse effects. The right turn bays are adequate.	Section 3
CC-8-C	The driveway's proposed location and the limited capacity of a proposed right turn treatment from Crescent Street into the driveway may create a queue spill back onto Woodville Road.	This is the location of the existing driveway. It is some 100m west from the Woodville Road intersection.	Section 3
CC-8-D	The queue on Crescent Street from the Woodville Road signalised intersection is likely to queue past the proposed driveway and therefore the opportunities to turn into the eastern driveway will be limited.	Right turn bay will be provided. Modelling indicates that it has enough capacity to store right-turning queues. Aimsun modelling was undertaken for the peak two hours of the morning (7:00am – 9:00am) and evening (4:00pm – 6:00pm) weekday periods. While the Sidra Intersection covers the peak morning (7:00am – 8:00am) and afternoon (5:00pm – 6:00pm) peak traffic hours.	Section 3
CC-8-E	Driveway dimensions allow for one lane in and one lane out which will be insufficient to satisfy traffic generation.	With the intersection upgrade, the modelling indicates that this is not the case.	Section 3
CC-9	Loading bays The 'general loading dock' appears to be deficient in area and detail to accommodate parking, loading and manoeuvring requirements for trucks required for the 2,500m ² of retail space and 5,000m ² of non-retail commercial space. If the general area is utilised by a number of trucks and a further truck then arrives in a forward direction, there appears to be deficient space for that truck to either turn and exit or enter a waiting phase while other truck/s manoeuvre out of the area (if at all possible). Creating a logjam of delivery vehicles and possibly	Loading bay has been redesigned and includes a turntable to manage movement of vehicles.	Section 5.4

Issue	Traffic Transport and Accessibility	Applicant Response	Addressed in
	forcing some trucks to reverse out of the loading area creates significant safety issues.		
CC-20-A	Traffic and movement It is unclear in the documentation that road design mitigates traffic generation created by the development and will burden the capacity of Crescent Street. Further information is required for the Department to consider this, as it is a critical issue for the safe and effective operation of the site should the development application be recommended for approval.	The project has been working with Transport for NSW for over 7 years on this project to mitigate the impacts on the road network. Substantial traffic modelling was required to provide TfNSW comfort that the impacts could be mitigated. The impacts on the road network will be mitigated through additional traffic lanes on Crescent Street, the introduction of a shuttle bus service to Harris Park and Parramatta and travel demand management directed by a Green Travel Plan.	Section 6 Section 4
CC-25-1	Parking generally There is an absence of any motor cycle parking which is unrealistic, especially so for considering socio demographics and the number of occupants associated with affordable housing.	Motorcycle parking is not being provided. Potential at CC stage to convert car spaces to motorcycle spaces if required.	Section 5
CC-25-2	Parking generally Each of the parking spaces should be numbered according to the land-use user group for clarity. In addition, parking space provision for each parking level for each Block (phase) should be presented in a tabular form for clarity. The architectural plan of parking area does not provide clarity for review of provision.	The car parking plans have been updated. Parking spaces have been labelled as V for visitor, R for retail, C for commercial and B01, B02, B03 B04 for B05 for residential buildings and CW for car wash bays.	Section 5
CC-25-3	Parking generally The parking spaces and the aisle widths must be dimensioned appropriately for clarity. In addition, the finished floor level must also be shown on the floor plan and at each change of gradient. This includes the finished surface level at each change of gradient along the ramps."	Car park review has included dimensions. Residential aisles are 5.8m wide and 6.2m for retail which comply with AS2890.1. Dimensions of car spaces have been reviewed and checked by TTPP and are attached in Appendix B.	Section 5
CC-25-4	Parking generally It is also noted that the parking spaces at lower basement for central block (Phase 2) appear to be used as dual land-use type (residential/commercial). This raises concern for the security for the residential user group. The residential parking area must be secured and controlled access. The commercial user access must not be allowed into the residential parking area.	Car park has changed substantially. Public parking has now been separated from the retail and commercial uses in Stage A.	Section 5

Issue	Traffic Transport and Accessibility	Applicant Response	Addressed in
CC-25-5	Parking generally It is recommended that the parking spaces allocation for commercial use be provided in the vicinity of the commercial area proportionately for ease of access in this respect the majority of the commercial parking space be locate within the eastern side block (Phase 1)."	Car park has changed substantially. Public parking has now been separated from the retail and commercial uses. Commercial parking is now provided on the first floor of parking.	Section 5
CC-25-6	Parking generally For safety/security the vehicular access to the residential parking area should secured and controlled. The parking area in particular the central block should have a restricted access to the residential parking area and not be accessible by commercial user type. There are several disabled parking spaces at each parking level for eastern side block (Phase 1) which do not comply with AS2890.6-2009."	Residential car parking will now be on a separate level. Car parking dimensions have been reviewed. The dimensions of spaces generally comply. However, columns in the shared space may create an obstruction and would need to be referred to a DDA consultant on the appropriateness of accessible spaces at CC stage.	Section 5
CC-25-7	Parking generally The location of security gate to the residential parking area at lower ground level for eastern side block results in obstruction free flow of internal traffic. The security gate should be relocated towards the parking area.	Car park layouts have been updated. Swept paths indicate that some modifications would be required at the CC stage in Stage B and C buildings so that vehicles can access the security gates.	Section 5
CC-25-8	Parking generally The car park compliance drawings (Transport Assessment Report 3) indicates that there are several non-compliance matters as indicated on those drawing including the aisle width and the manoeuvring clearance requirements (Figures 13, 14, 15, 26). The unobstructed manoeuvring of vehicle while another vehicle in opposite direction must be demonstrated.	Car park layouts have changed substantially. Swept paths for the revised design have been provided. The car park has substantially improved however we note some areas in Stage C and B would need to be refined to allow two-way flow near entrances.	Section 5
DHPI-A-2-C	c) reallocate additional parking to visitor parking (noting only 1 space per 81 apartments is currently proposed).	The provision of visitor bays at a rate of 1 space per 65 apartments is considered acceptable based on the following site-specific constraints and considerations: - Accommodating more visitor parking would add to the above-ground parking structures, which would affect the perceived bulk and scale of the proposal. - Priority has been given to allocating the compliant number of parking bays to residents rather than visitors.	Section 5

Issue	Traffic Transport and Accessibility	Applicant Response	Addressed in
		Approximately 140m in length of unrestricted parking that could accommodate some 20 visitor car spaces is located south-west of the site. Further the site provides public parking for retail and at grade parking for the parkland areas.	
DHPI-A-5-B	"b) reconsider whether a turning head is required, noting vehicles using the internal road would be limited to residents / visitor cars (i.e. not larger service vehicles). If required, explore alternatives less intrusive options.	Turning head is required for parking aisles longer than 6 car spaces. Car parking will serve both the park and supermarket, so may have high turnover. Therefore a turning head is required for efficient movement of vehicles into and out of this parking area.	Section 5
DPHI-B-11-A	a) whether the proposed on street surface car parking spaces (internal roads) are included within, or additional to, the proposed total car parking space (1,616 spaces)	Surface car parking is external to the parking calculations with exception of the visitor spaces located outside Stage B.	Section 5
DPHI-B-11-B	b) whether the Building 4/5 podium car parking is to be shared between residential and commercial uses. If so, justify this arrangement, including in response to Council's objection to such an arrangement and clarify how the interaction of the two uses would be managed and residential security would be maintained.	Building 4/5 will have a small commercial tenancy of 125m ² which requires three car spaces. These spaces would be used by employees and would not be accessed by general public.	Section 5
DPHI-B-11-C	c) how future staff and visitors of the retail and commercial units would be prevented from being able to access the Building 1/2/3 podium residential parking levels and how this would be managed	Residential parking would be located on a separate level in stage A. Level 1 is public parking for retail and commercial uses while levels 2 and above will be for residents. The revised parking improved as it clearly differentiates between the retail car parking and the residential parking on other levels.	Section 5
DPHI-B-12	Provide further consideration to the space, access and manoeuvrability within the Building 1/2/3 loading dock, in particular:	Loading dock has been redesigned to include a vehicle turntable to allow access for trucks.	Section 5
DPHI-B-12-A	a) it is not possible for HRVs to exit from the (N/S oriented) 'front loading supermarket' and 'rear loading residential' spaces when the (E/W oriented) 'rear loading residential' HRV space is occupied	Loading dock has been redesigned to include a vehicle turntable to allow access for trucks.	Section 5
DPHI-B-12-B	b) swept path analysis of a vehicle entering/exiting the (E/W oriented) 'rear loading residential' HRV space has not been provided	Loading dock has been redesigned to include a vehicle turntable to allow access for trucks.	Section 5

Issue	Traffic Transport and Accessibility	Applicant Response	Addressed in
DPHI-B-12-C	c) the width of the vehicle entrance to the loading dock would only allow one vehicle to enter/exit the dock at the one time. In addition, it is not clear whether vehicles could enter/exit via the entrance if the loading dock spaces were occupied.	It is recommended that loading dock management plan is put in place to manage truck movements into and out of the loading dock.	Section 5
DPHI-B-16-C	c) consider the potential operational noise impact of the operation of the loading dock on future residential occupants within apartments, particularly within podium level and at Buildings 3 and 4	Refer to the E-Labs acoustic response. Additional noise modelling has been undertaken.	Section 5
DPHI-B-12-E	e) provide any necessary additional mitigation measures, or loading dock time restrictions to address potential noise impacts identified in the preceding queries.	It is recommended that loading dock management plan is put in place to manage truck movements into and out of the loading dock.	Section 5

2 Site Context

The land to which this SSDA relates is located at 1 Crescent Parklands, Holroyd (**the site**). The site is legally described as Lot 700 in Deposited Plan 1241836.

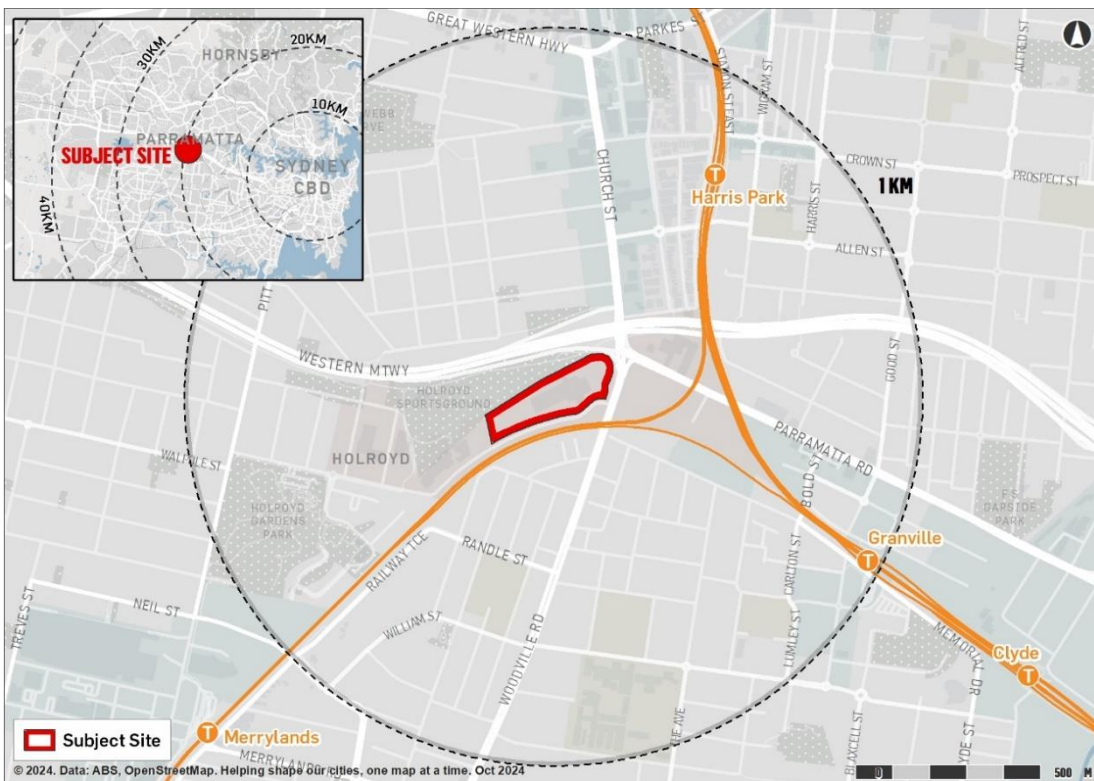
The site comprises an irregularly shaped allotment with an area of 36,353m² and has a primary frontage to Crescent Street to the south and a frontage to Woodville Road to the east. The northern boundary of the site adjoins the Holroyd Sportsground with the M4 Motorway beyond.

The site is located in the Cumberland Local Government Area (**LGA**) and is currently vacant and cleared after WesTrac ceased operations of an industrial facility at the site in early 2018. The site contains existing scattered pockets of landscaped vegetation, predominately located along the site's southern and eastern boundaries to Crescent Street and Woodville Road.

The site is bounded by Parramatta Road/Church Street/Woodville Road intersection to the north east, Woodville Road to the east and Crescent Street to the south. The northern frontage of the site faces the Holroyd Sportsground and the M4 Motorway beyond. It is noted that the eastern portion of the site fronting Woodville Road has been identified for potential future acquisition by Transport of NSW for future planned intersection upgrades to Woodville/Parramatta Road/M4.

A Location Plan including the site is provided in Figure 2.1 and an aerial photo of the site is provided in Figure 2.2.

Figure 2.1: Location Plan



Source: Urbis, 2024

Figure 2.2: Aerial Photography



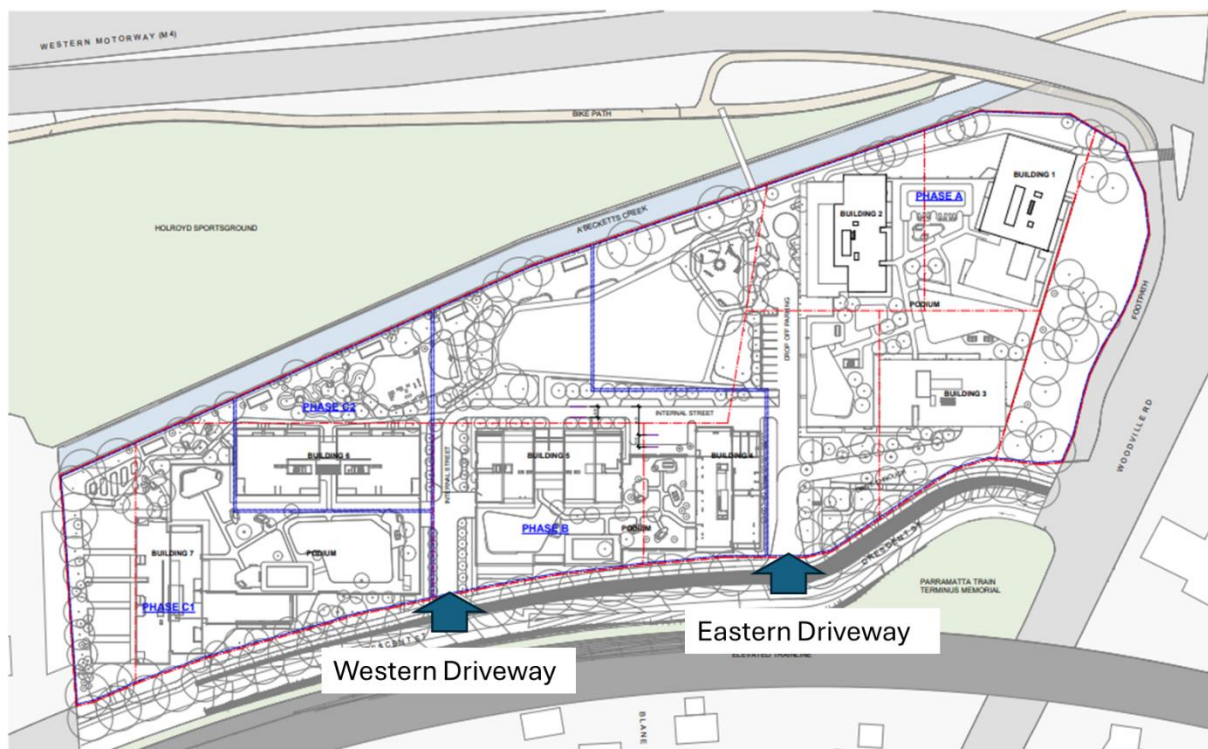
Source: Urbis, 2024

3 Site Vehicle Access

3.1 Overview

The proposed driveways are located some 100m west from Woodville Road and a second access 250m west from Woodville Road (see Figure 3.1). Eastern driveway is mostly to serve Stage A of the development, which provides access to the buildings with retail, commercial premises and residential flats. The second access is to provide access to Stages B and C, which are dedicated to residential dwellings.

Figure 3.1: Driveway Locations



The driveway locations have not been modified by the amended proposal as the vehicle access arrangements proposed as part of the SSDA reduced the need for internal vehicle trips and allows the development to function as a staged construction development.

3.2 Safety

Two safety issues have been raised about the location of the eastern driveway :

- Being too close to the curve and too close to the signalised intersection.
- Right-turning vehicles crossing a number of lanes.

These issues have been clarified, confirming the geometry of the road and considering sight distance.

3.2.1 Right Turning Traffic

The upgrade of Crescent Street will provide two through lanes and a parking lane eastbound. The traffic modelling indicates that there would be low delays and adequate gaps in traffic to allow vehicles to turn right out of the development.

3.2.2 Sight Distance

The minimum sight distance requirement of 45m for a speed limit of 50km/h is achieved as per AS2890.1. Sight distances are shown in Figure 3.2. The proposed location of the driveway is located further east of the existing driveway and would allow for adequate sight distance in both directions. Further traffic from the east would be travelling relatively slowly as they negotiate the curves and the turn from Woodville Road, some 90m to the east.

Figure 3.2: Sight Distance Assessment

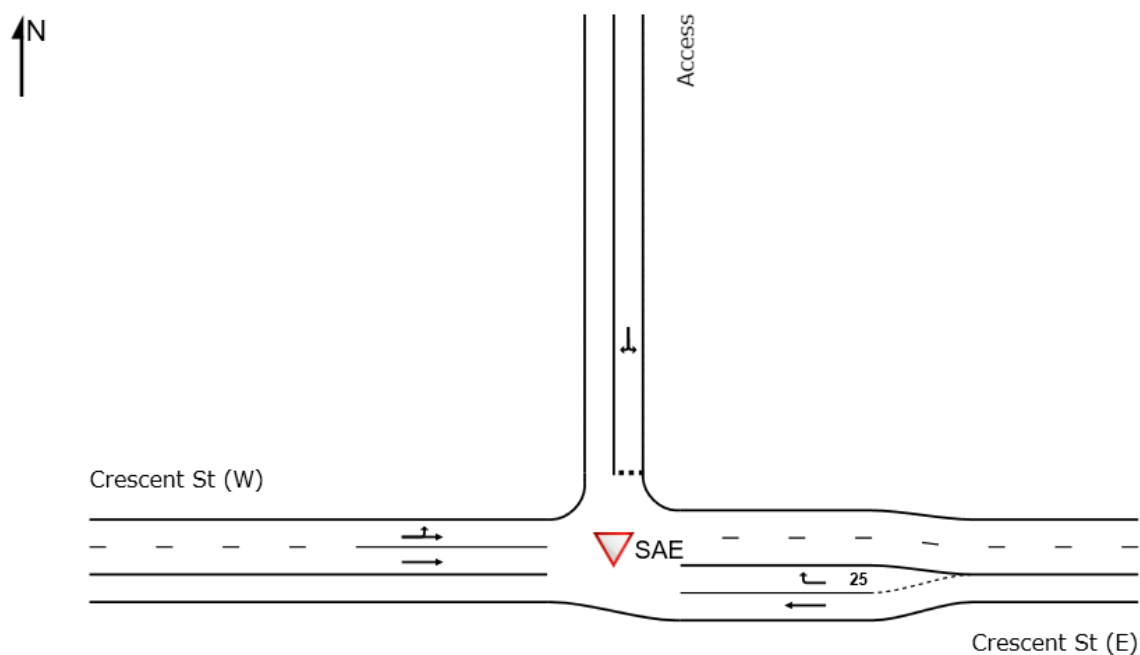


3.3 Operational Performance

The concerns about the operational impacts of the driveway have been addressed in the previous modelling that was undertaken and presented in the SSDA Traffic and Transport report. The driveways were modelled both in Sidra 9 and Aimsun. This modelling has been undertaken in consultation with Transport for NSW as part of the planning proposal for the site.

The access driveways have been modelled as a network. The eastern driveway was modelled with two through lanes on the Crescent, as shown in Table 1.1. The third lane will become parking

Figure 3.3: Sidra Driveway intersection design



The modelling queuing results are shown in Table 3.1 for the 95th percentile queue.

Table 3.1: 95th Percentile Queues

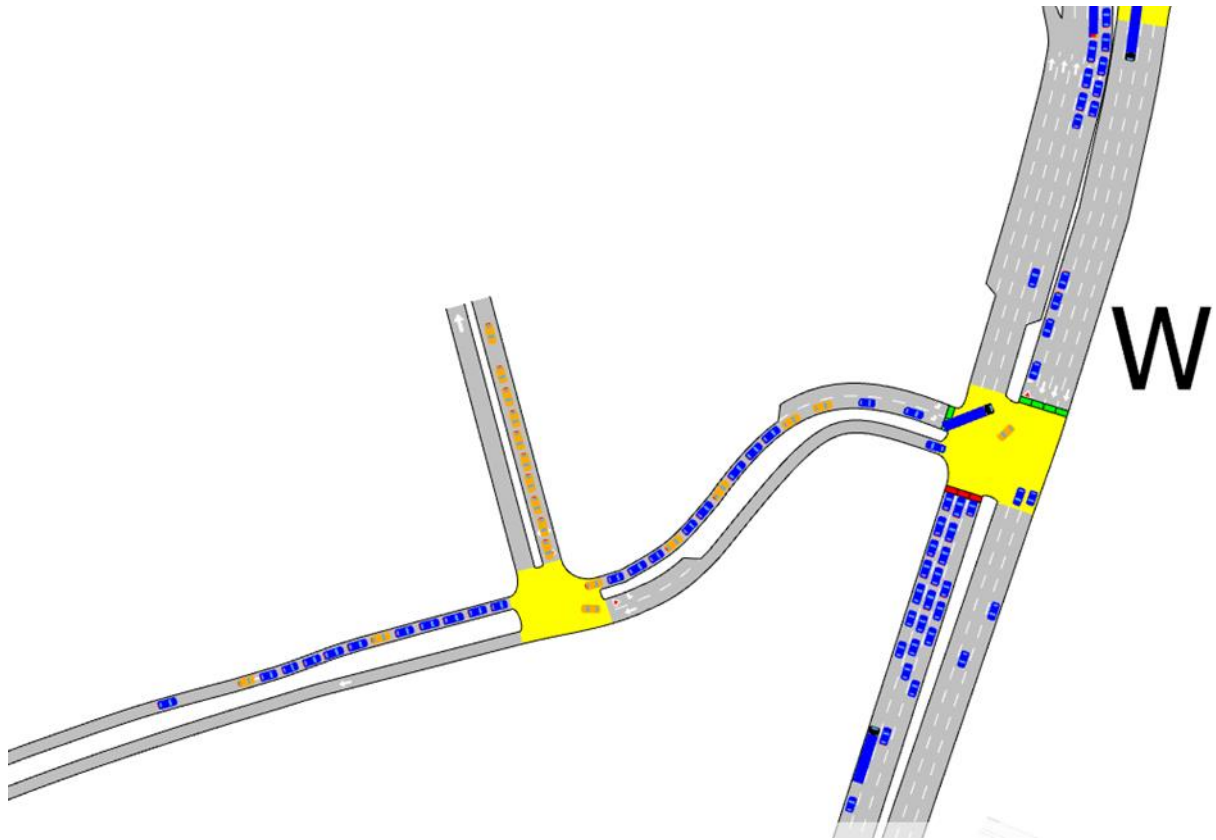
Time Period	Right Turn from Crescent Street		Driveway Exit Lane	
	Vehicles	Distance	Vehicles	Distance
Morning Peak	0.6	4.3m	3.5	25m
Evening Peak	0.9	6.1m	2.8	19.8m
Saturday Peak	0.2	1.7	1.2	8.7m

The model indicates that the queues into and out of the site from the eastern driveway would be minimal with average queues less than 1 vehicle and the queue out of the site up to 25m which can be contained within the access road. The proposed right turn bay and exit driveway are therefore considered to be adequate for the proposed development.

The intersections were also modelled in the Aimsun model that was used to test the impacts on the State Road Network for the planning proposal.

The queues without the upgrade of Crescent Street indicate that queues would extend past the driveway Figure 3.4.

Figure 3.4: Without Upgrade Queues in Crescent Street



However, with the proposed upgrade the queues are reduced significantly and are not forecast to extend past the driveway as shown in Figure 3.5 and Figure 3.6. (Note the driveway was modelled as two lanes in Aimsun but refined to one lane in Sidra.

Figure 3.5: With Upgrade Morning Peak

08:28:47

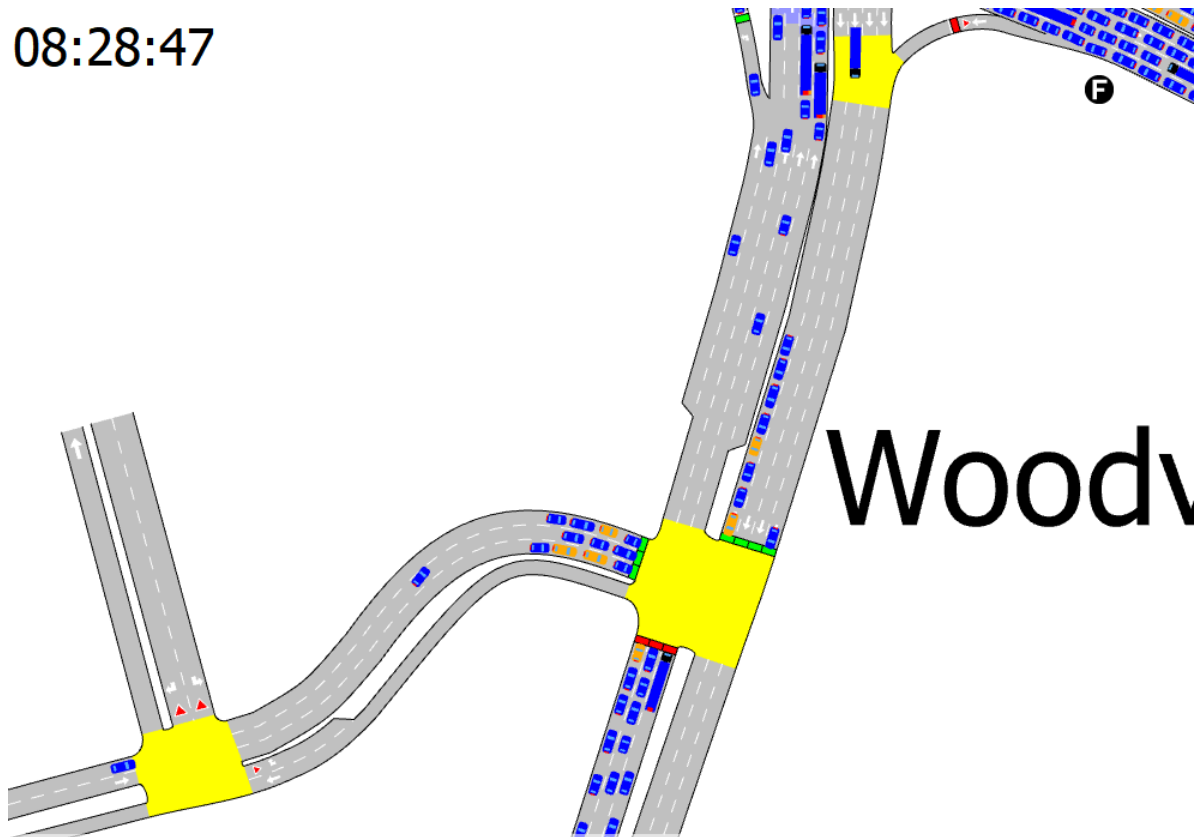


Figure 3.6: With Upgrade Evening Peak

17:29:21



The modelling forecasts that the queues would not extend past the driveway with the proposed upgrade of Crescent Street.

The location of the driveway would not likely to impact the operation of the roadway. Notwithstanding when there are delays on the M4 Motorway, Parramatta Road due to crashes and breakdowns may at times cause queuing in Crescent Street. In these circumstances, it is recommended that 'keep clear' pavement parkings may reduce delays for right-turning vehicles into the development.

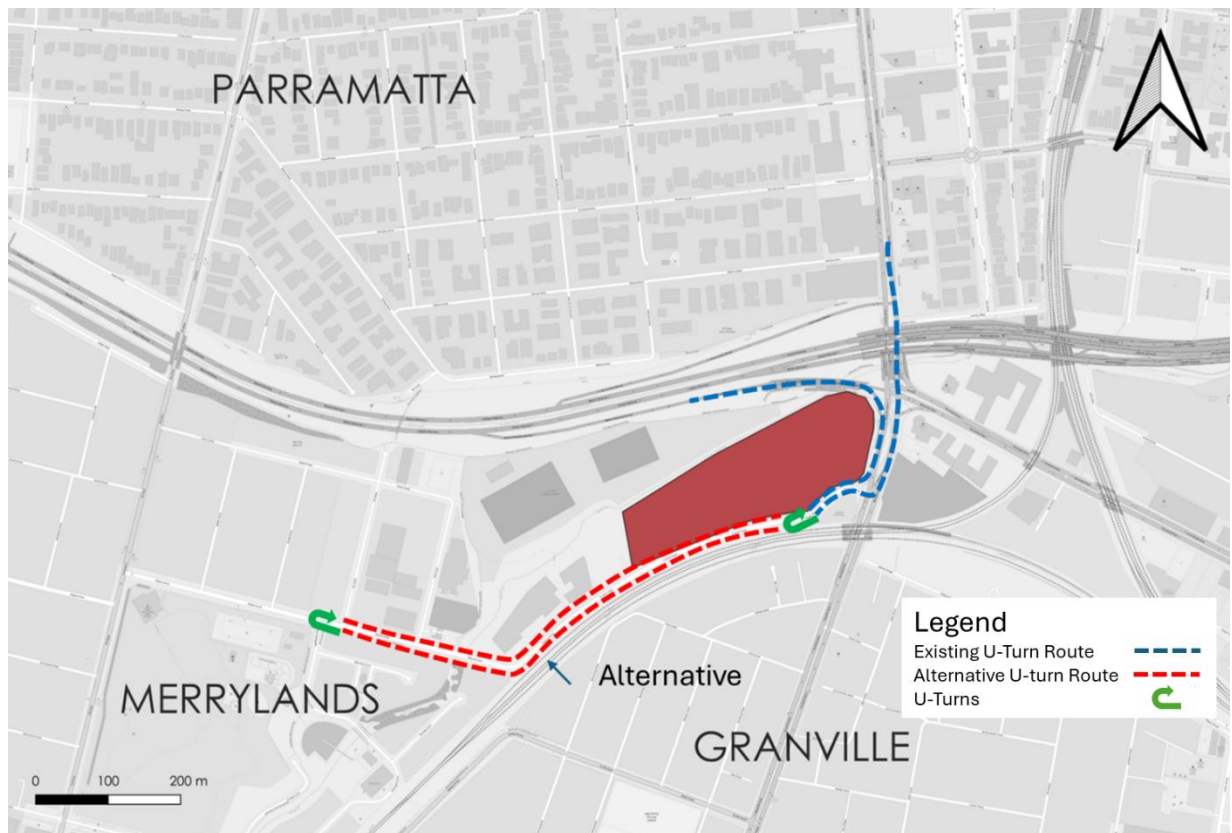
3.4 U-Turning Vehicles

Since the site has been disused, the driveway for the site has been used by vehicles from the north that are trying to enter the M4 Motorway travelling westbound. They do this because the right turn from Church Street to the M4 Motorway has been banned and this is an attractive route. This movement is shown in Figure 3.7.

It is estimated that once the site becomes operational, the driveway will no longer become attractive and drivers will find other ways to turn around, including using the roundabout in Walpole Street or finding other ramps to enter the M4 Motorway.

To further address this issue, it is recommended to provide no U-Turn sign at the driveways and may require enforcement to prevent drivers from performing a U-Turn at this location.

Figure 3.7: M4 Alternative Access Route



4 Shuttle Bus Service

A shuttle bus is being proposed to encourage the use of public transport as part of a travel demand management initiative. The shuttle bus is one of the key recommendations of the "Green Travel Plan".

This response to submissions seeks to clarify more of the details of the shuttle bus service.

4.1 Frequency of Services

Ultimately, it is proposed that the shuttle bus will operate every 15 minutes during peak periods (6:30-9:30 am and 4:00-7:00 pm, Monday to Friday) using two buses providing direct services between the site and Parramatta Station. During off-peak daytime and weekends, the shuttle will operate every 30 minutes using a single bus on a loop connecting the site, Harris Park Station and Parramatta Station.

From completion of the first phase until completion of the second phase of the development, the shuttle service will operate with a single bus covering both peak and off-peak periods, providing 30-minute services on a loop connecting the site, Harris Park Station and Parramatta Station. The uplift to the end-state two-bus service will occur once sufficient resident population and non-residential uses are established.

4.2 Bus Stop Locations

- Parramatta Station – George Street shuttle bay adjacent to the station interchange (public bus set-down area currently used by private shuttles).
- Harris Park Station – Station Street near the pedestrian entrance to the station. These locations are within existing transport interchanges and will be confirmed with Council/TfNSW at the detailed design stage

4.3 Mechanism for Future Shuttle Bus Services

The proponent will accept a condition of consent requiring the shuttle bus service to be funded and operated privately by the development (including successors in title) for the life of the project. The shuttle bus will form a mandatory element of the Green Travel Plan, which is enforceable and subject to regular review.

Funding and operation will be incorporated into the Owners Corporation budget / building management structure, ensuring it is maintained on an ongoing basis in the same way as private waste collection or building services.

5 Loading Dock Management

A detailed loading dock management plan is recommended for the site to help manage the operation of the loading dock and reduce impacts.

Loading dock management plans typically include the following measures:

- Hours of operation suitable for the development.
- Rules of behaviour within the loading dock such as is keeping passages and roadway clear.
- A booking management system to allocate loading areas within the loading dock
- Noise and environmental management.
- Monitoring and Reviewing
- Complaints, incidents and record keeping
- Security
- Responsibilities of staff and stakeholders.

In addition to these measures, it is suggested that storage or lockers could be provided in loading dock area to minimise the length of stay within the loading dock so that deliveries could be left in the lockers to be picked up by tenants.

6 Parking Assessment

6.1 Car Parking Requirement

The car parking requirements for different development types are set out in Cumberland City Council's *Cumberland Development Control Plan (DCP) 2021*. This replaces the Holroyd Development Control Plan (2013), which was used to assess the Planning Proposal for the site.

However, as part of the Cumberland Local Environment Plan 2021 (CLEP) Provision 6.21 alternative parking rates are stipulated for the development at 1 Crescent Street, Holroyd. The rates are maximum requirements and are outlined below:

Residential accommodation:

- Studio: 0.6 spaces
- 1 bedroom: 0.9 spaces / dwelling
- 2 bedrooms: 1.2 spaces / dwelling
- 3 or more bedrooms: 1.5 spaces / dwelling
- Visitor parking: 1 space / 5 dwellings

Commercial:

- 1 space / 70m²

Retail:

- 1 space / 50m²

On 14 December 2023, the NSW Government implemented in-fill affordable housing reforms to encourage private developers to boost affordable housing and deliver more market housing. Developments are required to be within 800m walking distance of an accessible area and a minimum of 10% - 15 % of the development to be used for affordable housing for 15 years. The development is located 743m from Harris Park Station.

As part of the SEPP (Housing) 2021 in-fill affordable housing provisions, the affordable housing units can be assessed under the following minimum car parking rates:

- 1 bedroom: at least 0.4 spaces / dwelling
- 2 bedrooms: at least 0.5 spaces / dwelling
- 3 or more bedrooms: at least 1 space / dwelling

Under the SEPP (Housing) 2021, the following parking rates can be used for units not used for affordable housing:

- 1 bedroom: at least 0.5 spaces / dwelling

- 2 bedrooms: at least 1 spaces / dwelling
- 3 or more bedrooms: at least 1.5 space / dwelling

For the purposes of this assessment, the development has been assessed under both the SEPP (Housing) 2021 parking rates and the CLEP maximum rates.

A breakdown of the number of affordable and non-affordable residential dwellings for each phase and the overall development is provided in Table 6.1.

Table 6.1: Dwelling Type Yield and Mix

Dwelling Type	Stage A	Stage B	Stage C	Overall
Residential – Non-affordable Units				
1 bedroom	46	28	72	146
2 bedrooms	374	153	223	750
3+ bedrooms	163	51	44	258
Overall	583	232	339	1154
Residential – Affordable Units				
1 bedroom	13	12	12	37
2 bedrooms	75	29	37	140
3+ bedrooms	26	6	10	42
Overall	114	47	59	220

In total, it is proposed that there would be 1,561 car spaces provided on site, of which 1,323 would be for the non-affordable units, retail and commercial office components, which is below the CLEP maximum rates and 127 car spaces under the affordable units SEPP rates. The SEPP rates and the CLEP rates have been considered separately as the SEPP rates are minimums while the CLEP rates are maximums.

Table 6.2 summarises the CLEP maximum parking requirement and provision for the overall development and Table 6.3 summarises the SEPP (Housing) 2021 minimum parking requirement for the development. Note that in the absence of the SEPP (Housing) 2021 rates for commercial and retail premises the CLEP rates have been used instead.

Table 6.2: LEP Car Parking Requirement – Overall

Proposed Use	Size	LEP Parking Provision Rate	LEP Required Maximum Parking Spaces	Provided Spaces
Residential				
1 bedroom	183 dwellings	0.9 spaces per dwelling	164	1450
2 bedrooms	891 dwellings	1.2 spaces per dwelling	1069	
3+ bedrooms	300 dwellings	1.5 spaces per dwelling	450	
Visitors	1374 dwellings	1 per 5 units	274	24
Residential –Sub-total	1374 dwellings	-	1948	1474
Commercial premises				
Commercial	2710 m ² GFA	1 per 70m ² GFA	38	37
Retail premises				
Retail	2,496 m ² GFA	1 per 50m ² GFA	50	50
Total Spaces Generated			2036	1563

Table 6.3: SEPP (Housing) 2021 Car Parking Requirement – Overall

Proposed Use	Size	SEPP Parking Provision Rate	SEPP Required Minimum Parking Spaces	Provided Spaces
Residential – Affordable Units				
1 bedroom	37 dwellings	0.4 spaces per dwelling	15	127
2 bedrooms	141 dwellings	0.5 spaces per dwelling	71	
3+ bedrooms	42 dwellings	1 space per dwelling -	42	
Residential Affordable –Sub-total	220 dwellings		128	
Residential – Non-affordable Units				
1 bedroom	146 dwellings	0.5 spaces per dwelling	73	1323
2 bedrooms	750 dwellings	1 space per dwelling	750	
3+ bedrooms	254 dwellings	1.5 space per dwelling -	387	
Residential Non-affordable –Sub-total	1154 dwellings		1210	
Residential Visitors				
Visitors	1374 dwellings	No rate	0	24
Commercial premises				
Commercial	2710m ² GFA	1 per 70m ² GFA	38	37
Retail premises				
Retail	2496m ² GFA	1 per 50m ² GFA	50	50
Total Spaces Generated			1413	1561

The car parking controls outlined in the Housing SEPP establish the minimum amount of parking required for dwellings used for affordable housing and those not used for affordable housing. The proposal complies with these controls by exceeding the minimum requirement.

Conversely, Clause 6.21(4)(c) of the Cumberland Local Environmental Plan 2021 (CLEP) specifies maximum car parking rates for residential accommodation. The proposal also complies with these controls by providing less than the maximum allowable parking.

As a result, the proposed car parking provision is considered acceptable, as it exceeds the minimum requirements of the Housing SEPP while remaining below the maximum limits set by the CLEP.

The proposed development results in the following indicative car parking requirements as summarised below for each Stage. It is noted that the parking calculations for each Stage when summed up differ slightly from Table 6.2 and Table 6.3 due to rounding when applying the rates to smaller yields, however, as each phase has its own car park it was deemed that assessing each on its own basis was a more appropriate method than assessing the parking for the whole development.

The proposal includes 24 visitor bays, which complies with the maximum visitor parking bay rate established in the Cumberland LEP. The provision of visitor bays at a rate of 1 space per 65 apartments is considered acceptable based on the following site-specific constraints and considerations:

- Accommodating more visitor parking would add to the above-ground parking structures, which would affect the perceived bulk and scale of the proposal.
- Priority has been given to allocating the compliant number of parking bays to residents rather than visitors.
- Approximately 140m in length of unrestricted parking that could accommodate some 20 visitor car spaces is located south-west of the site.

Further the site provides public parking for retail and at grade parking for the park land areas.

The site will provide a total of 5 wash bays:

- Stage A 3 wash bays
- Stage B 1 wash bays
- Stage C 1 wash bays

The site has also allowed for 2 car share space that will be accessible to the general public.

6.1.1 Stage A (Building 1, 2 & 3)

Table 6.4 summarises the CLEP maximum parking requirement and provision for the overall development and Table 6.5 summarises the SEPP (Housing) 2021 minimum parking requirement for the development. Note that in absence of the SEPP (Housing) 2021 rates for commercial and retail premises the CLEP rates have been used instead.

Table 6.4: LEP Car Parking Requirement – Stage A

Proposed Use	Size	LEP Parking Provision Rate	LEP Required Maximum Parking Spaces	Provided Spaces
Residential				
1 bedroom	59 dwellings	0.9 spaces per dwelling	53	766
2 bedrooms	449 dwellings	1.2 spaces per dwelling	538	
3+ bedrooms	189 dwellings	1.5 spaces per dwelling	283	
Visitors	697 dwellings	1 per 5 units	139	15
Residential –Sub-total	697 dwellings	-	1013	781
Commercial premises				
Commercial	2505 m ² GFA	1 per 70m ² GFA	36	34
Retail premises				
Retail	2496 m ² GFA	1 per 50m ² GFA	50	50
Total Spaces Generated			1089	865

Table 6.5: SEPP (Housing) 2021 Car Parking Requirement – Stage A

Proposed Use	Size	SEPP Parking Provision Rate	SEPP Required Minimum Parking Spaces	Provided Spaces
Residential – Affordable Units				
1 bedroom	13 dwellings	0.4 spaces per dwelling	5	69
2 bedrooms	75 dwellings	0.5 spaces per dwelling	38	
3+ bedrooms	26 dwellings	1 space per dwelling -	26	
Residential Affordable –Sub-total	114 dwellings		69	
Residential – Non-affordable Units				
1 bedroom	46 dwellings	0.5 spaces per dwelling	23	697
2 bedrooms	374 dwellings	1 space per dwelling	374	
3+ bedrooms	163 dwellings	1.5 space per dwelling -	245	
Residential Non-affordable –Sub-total	583 dwellings		642	
Residential Visitors				
Visitors	697 dwellings	No rate	0	15
Commercial premises				
Commercial	2505 m² GFA	1 per 70m² GFA	36	34
Retail premises				
Retail	2496 m² GFA	1 per 50m² GFA	50	50
Total Spaces Generated			778	865

6.1.2 Stage B (Building 4 & 5)

Table 6.6 summarises the CLEP maximum parking requirement and provision for the overall development and Table 6.7 summarises the SEPP (Housing) 2021 minimum parking requirement for the development. Note that in absence of the SEPP (Housing) 2021 rates for commercial and retail premises the CLEP rates have been used instead.

Table 6.6: LEP Car Parking Requirement – Stage B

Proposed Use	Size	LEP Parking Provision Rate	LEP Required Maximum Parking Spaces	Provided Spaces
Residential				
1 bedroom	40 dwellings	0.9 spaces per dwelling	36	275
2 bedrooms	182 dwellings	1.2 spaces per dwelling	218	
3+ bedrooms	57 dwellings	1.5 spaces per dwelling	85	
Visitors	279 dwellings	1 per 5 units	55	4
Residential –Sub-total	279 dwellings	-	394	280
Commercial premises				
Commercial	205m ² GFA	1 per 70m ² GFA	3	3
Total Spaces Generated			397	282

Table 6.7: SEPP (Housing) 2021 Car Parking Requirement – Phase B

Proposed Use	Size	SEPP Parking Provision Rate	SEPP Required Minimum Parking Spaces	Provided Spaces
Residential – Affordable Units				
1 bedroom	12 dwellings	0.4 spaces per dwelling	5	25
2 bedrooms	29 dwellings	0.5 spaces per dwelling	14	
3+ bedrooms	6 dwellings	1 space per dwelling -	6	
Residential Affordable –Sub-total	47 dwellings		25	
Residential – Non-affordable Units				
1 bedroom	28 dwellings	0.5 spaces per dwelling	14	250
2 bedrooms	153 dwellings	1 space per dwelling	153	
3+ bedrooms	51 dwellings	1.5 space per dwelling -	77	
Residential Non-affordable –Sub-total	232 dwellings		244	
Residential Visitors				
Visitors	242 dwellings	No rate	0	4
Commercial premises				
Commercial	205m ² GFA	1 per 70m ² GFA	3	3
Total Spaces Generated			269	282¹

¹ excludes wash bay

6.1.3 Stage C (Building 6 & 7)

Table 6.8 summarises the CLEP maximum parking requirement and provision for the overall development, and Table 6.9 summarises the SEPP (Housing) 2021 minimum parking requirement for the development. Note that in the absence of the SEPP (Housing) 2021 rates for commercial and retail premises the CLEP rates have been used instead.

Table 6.8: LEP Car Parking Requirement – Stage C

Proposed Use	Size	LEP Parking Provision Rate	LEP Required Maximum Parking Spaces	Provided Spaces
Residential				
1 bedroom	84 dwellings	0.9 spaces per dwelling	75	409
2 bedrooms	260 dwellings	1.2 spaces per dwelling	312	
3+ bedrooms	54 dwellings	1.5 spaces per dwelling	81	
Visitors	398 dwellings	1 per 5 units	79	5
Total Spaces Generated			547	414

Table 6.9: SEPP (Housing) 2021 Car Parking Requirement – Stage C

Proposed Use	Size	SEPP Parking Provision Rate	SEPP Required Minimum Parking Spaces	Provided Spaces
Residential – Affordable Units				
1 bedroom	12 dwellings	0.4 spaces per dwelling	5	34
2 bedrooms	37 dwellings	0.5 spaces per dwelling	19	
3+ bedrooms	10 dwellings	1 space per dwelling -	10	
Residential Affordable –Sub-total	58 dwellings		34	
Residential – Non-affordable Units				
1 bedroom	72 dwellings	0.5 spaces per dwelling	36	375
2 bedrooms	223 dwellings	1 space per dwelling	223	
3+ bedrooms	44 dwellings	1.5 space per dwelling -	66	
Residential Non-affordable –Sub-total	339 dwellings		325	
Residential Visitors				
Visitors	398 dwellings	No rate	0	5
Total Spaces Generated			359	414

6.1.4 At Grade Car Parking

There are some 23 at grade car spaces. Of which 9 are allocated to commercial and visitor spaces, 8 for retail. These have been included and accounted in the previous car parking numbers.

An additional 7 car spaces are not allocated to the buildings but provide additional parking for the parklands. This on-street parking would not generate traffic significant compared to what has been assessed and the turnover of a handful of spaces would have no effect on traffic modelling results.

The parkland provides amenities primarily for local residents within a reasonable walking distance of the site or can be used in conjunction with visits to the commercial units, and will not generate additional traffic/parking demand on its own.

Additional traffic modelling is not required because the park is part of the integrated precinct, trips to the open space are assumed to be primarily internal capture (i.e. made by people already on site or within walking distance).

Further, the traffic generation assumptions for the development were extensively vetted with Transport for NSW during the planning proposal stage.

6.2 Accessible Parking Requirement

Cumberland City Council's (Council) Cumberland Development Control Plan (DCP) 2021 does not stipulate an accessible parking requirement. In absence of this, the requirements from the Building Codes of Australia have been adopted.

The classification for each land use and associated required accessible spaces of the development is:

- Residential: Class 2 Nil
- Commercial Office: Class 5 1 space for every 100 car parking spaces
- Retail: Class 6 1 space for every 50 car parking spaces

Based on these rates there would be one accessible space provided for the commercial office, and one space for the retail use.

Furthermore, every adaptable unit (20% of units) will receive 1 accessible parking space, resulting in 290 accessible parking spaces for adaptable units.

6.3 Bicycle Parking

The bicycle parking requirements for different development types are set out in Cumberland City Council's (Council) Cumberland Development Control Plan (DCP) 2021.

To assess employee bicycle parking, an assumption of one employee per 20m² GFA has been used. This is based upon the employee density rates from the *Guide to Traffic Generating Developments* (RTA 2002).

An assessment of the DCP bicycle parking requirements for the proposed development against the provision showing indicative levels of bicycle parking is summarised in Table 6.10.

Table 6.10: Bicycle parking Requirement

Proposed Use		Size	DCP Bicycle Parking Provision Rate	DCP Required Bicycle Parking Spaces	Provided Spaces
Residential	Residents	1,374 units	1 space per 3 dwellings	458	458
	Visitors	1,374 units	1 space per 3 dwellings	458	384
Commercial – Business and Office	Employees	2496m ² GFA	1 space per 10 employees	12	12
	Visitors	2496m ² GFA	1 space per 750m ² over 1000m ²	3	3
Commercial – Retail (within MU1 zone)	Employees	2,710m ² GFA	1 space per 10 employees	13	13
	Visitors	2,710m ² GFA	1 space per 750m ² over 1000m ²	2	2
Total Spaces Generated				947	872

872 bicycle parking spaces are provided in dedicated secure bicycle parking areas. This is a shortfall from DCP. All the residential, commercial and retail bicycle spaces will be provided. The shortfall will apply to visitor bicycle parking which will not have the same demand as resident bicycle parking. The provision of bicycle parking is further broken down by stage as shown in Table 6.11.

Table 6.11: Bicycle parking breakdown by stage

Proposed Use		Stage A	Stage B	Stage C
Residential	Residents	232	93	148
	Visitors	209	12	148
Commercial – Business and Office	Employees	12	-	-
	Visitors	3	-	-
Commercial – Retail (within MU1 zone)	Employees	13	-	-
	Visitors	2	-	-
Total Spaces Generated		471	105	296

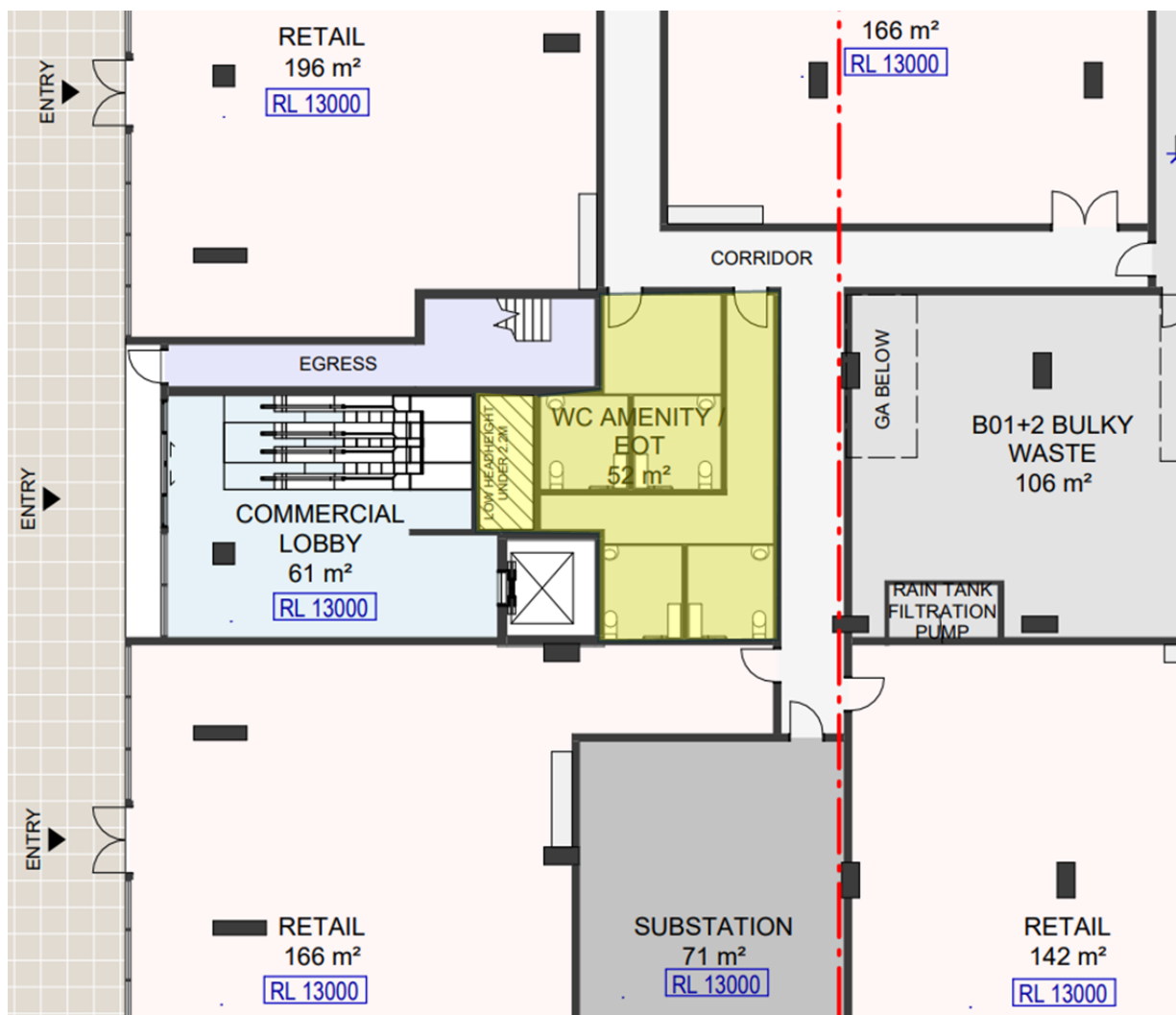
The proponent acknowledges the importance of 'end of trip' facilities in supporting active and sustainable transport options. For the non-supermarket retail uses it is proposed to provide end of trip facilities which will be provided in phase 1. The facilities would include:

- A Unisex Accessible Bathroom
- 2 x Unisex Accessible Bathroom / Shower with shower, toilet and washbasins.

The location of the facilities on the lower ground level is shown in Figure 6.1.

The 1500m² supermarket would provide facilities within the supermarket tenancy and small commercial space beneath building 4 would have access to phase 1 or provide their own end of trips facilities within the tenancy.

Figure 6.1: End of Trip Facilities



End-of-trip facilities for commercial office tenancies will be supplied within the individual tenancies. Cumberland City Council DCP does not prescribe rates and therefore it is proposed that future tenants would provide facilities at a rate of:

- 2 showers per 20 bicycle spaces
- 1 locker per bicycle space.

This is commensurate with rates prescribed by other LGA's in Sydney as shown in Table 6.12.

Table 6.12: Bicycle Shower Facilities Rates

Proposed Use	Rate
North Sydney Council	2 Showers per 20 Bicycle Spaces
City of Sydney Council	2 Showers per 20 Bicycle Spaces
Bayside Council	1 Shower per 7 Bicycle Spaces
Northern Beaches	1 Shower per 10 Bicycle Spaces

The exact quantity and location of these end of trip facilities will be determined during a future fit-out development application.

6.4 Loading and Servicing Requirements

The loading requirements for commercial and residential developments are set out in Cumberland City Council's (Council) Cumberland Development Control Plan (DCP) 2021. The relevant loading bay requirements from the DCP are presented below:

Business and office premises:

- 1 space / 4000m² GFA up to 20,000m² GFA
- 1 space / 8000m² GFA thereafter

Retail premises – shops and food and drink premises

- 1 space / 400m² GFA up to 2,000m² GFA
- 1 space / 1,000m² GFA thereafter

The requirements for loading bays for the development, based upon the DCP rates is provided in Table 6.13.

Table 6.13: Loading Bay Requirements

Proposed Use	Size	DCP Loading Bay Provision Rate	DCP Required Loading Bays	Provided Loading Bays
Business and office premises	2500m ²	1 space / 4000m ² GFA up to 20,000m ² GFA 1 space / 8000m ² GFA thereafter	1	7
Retail premises – shops and food and drink premises	2500m ²	1 space / 400m ² GFA up to 2,000m ² GFA 1 space / 1,000m ² GFA thereafter	5	
Residential	1,374 units	-	-	
Total Loading Bays Generated			6	7

The site will provide three 12.5m long Heavy Rigid Vehicle spaces, and two 8.8m long Medium Rigid Vehicle spaces in the loading dock.

Two additional loading spaces will be provided at grade that would service the residential apartments and service garbage trucks and deliveries bringing the total on-site to 7 service bays.

A loading dock management plan is recommended to reduce the impacts of noise and the potential for trucks to arrive when all loading bays are occupied.

6.5 Car Park Layout

The proposed car park layout and design is to comply with design requirements set out in the relevant Australian Standard for car parking facilities, namely AS2890.1:2004 and AS2890.6:2009.

Specifically, AS2890.1:2004 requires the following minimum car space dimensions for each land use:

- Residential car parking space is required to be 2.4m wide by 5.4m long with an aisle width of 5.8m wide.
- Commercial car spaces are required to be 2.4m wide by 5.4m long with an aisle width of 6.2m wide
- Retail car parking spaces are required to be 2.6m wide by 5.4m long with an aisle width of 6.6m wide.

Similarly, AS2890.6:2022 which relates to the design of accessible car spaces for people with mobility impairments, requires both the accessible car parking spaces and the adjacent shared area to each have dimensions of 2.4m wide by 5.4m long with an aisle width of 5.8m wide.

All ramps have been generally designed in accordance with AS2890.1:2004 and AS2890.2:2018, and adequate headroom has been provided for all vehicles accessing the site and car park.

The loading dock has been designed generally in accordance with AS2890.2:2018. With

Swept path analysis of the critical areas within the proposed car park and loading areas has been conducted using design vehicles including the Australian Standard 4.91m long B85 vehicle, 5.2m long B99 vehicle, and 12.5m long heavy rigid vehicle. The analysis found that the design vehicles will be able to circulate around the car park and access the service areas satisfactorily. The architectural car park layout plans are provided in **Appendix A** with swept paths and car park assessment are provided in **Appendix B**.

Overall, the car park reference scheme demonstrates the future car parking layout will generally comply with the Australian Standards.

7 Traffic Assessment

7.1 Traffic Generation

The yields for the development have been updated by the amended proposal. It is proposed that there will be an increase in the number of residential units and reduction in commercial/ office floor space yield. The retail has remained relatively similar to the previous proposal.

The proposed amended yields are as follows:

- Residential: 1,374 units
- Commercial/Office: 2,710 m² GFA floor space
- Retail: 2,496 m² GFA floor space (i.e. 2,121m² GLFA floor space²)

It is noted that the proposal provides 119 additional residential dwellings but the commercial / office component is reduced by some 2500 m².

The retail GFA), for the development is 2496m² but for the purposes of traffic generation and modelling Gross Leasable Floor Area (GLFA) is used, which is 2,121m² for the development. This is in line with The Guide 2024 which states that "*Gross leasable floor area is preferred to gross floor area for this land use category, because it refers most specifically to the factor that generates/ attracts trips. As a guide, about 75% of the gross floor area is deemed gross leasable floor area.*"

An extensive traffic modelling exercise was undertaken in 2021 during the planning proposal stage of the project. At that time, traffic generation rates, traffic distributions and the use of discounted traffic flows was discussed and agreed with TfNSW to underpin the modelling of the Crescent Street / Woodville Road / Parramatta Road intersection. The rates agreed in the planning proposal have been retained for this analysis.

7.1.1 Residential

Traffic generation estimates for the proposed mixed-use development have been sourced from the *Guide to Traffic Generating Developments* (RMS 2002) & its supplementary technical direction (TDT 2013/04a). The following peak hour traffic generation rates have been used:

- High density residential flat buildings – 0.29 trips per unit for AM/PM

² GLFA is the metric used for traffic generation calculations

This traffic generation was previously adopted in the planning proposal after considerable discussion with TfNSW about the validity of the traffic generation rates. Hence no changes have been made to traffic generation associated with the residential component of the development compared to the planning proposal.

The Guide 2002 or 2024 does not stipulate weekend Saturday trip rates. As such, for a conservative measure the same residential trip rate has also been adopted for the Saturday peak hour.

7.1.2 Retail

The retail traffic generation has been based on the Roads and Maritime (now TfNSW) Trip Generation Surveys Small Suburban Shopping Centres Analysis Report and Data Report, Bitzios Consulting (November 2018). SLR Consulting agreed with the use of following retail traffic generation rates based on the average rates for all surveyed Sydney sites greater than 2,000 m² GLFA:

- 7.84 trips/100m² GLFA in the AM peak hour
- 10.77 trips/100m² GLFA in the PM peak hour

Consistent with the above approach, the weekend Saturday peak hour was calculated as:

- 11.71 trips/100m² GLFA in the SAT peak hour

Given the TfNSW suburban shopping centre sites are isolated and do not have substantial number of residential developments around and therefore generate a high level of car-based trips.

By contrast, the proposed development would serve the basic retail needs and contain a substantial number of trips within the site without creating vehicular trips. Having said this, TTPP has adopted a trip reduction factor of 10% to compensate for trips between the residential development and retail development. This trip reduction factor has previously been agreed by the Tiberius peer reviewer (SLR Consulting).

The assumption of 10% is considered more conservative than the 20% originally used by TTPP but we note that Parramatta Westfield is located within a 5–10-minute drive as is Merrylands Town Centre, and consequently it is anticipated that the catchment of the retail development proposed will be relatively local within those people wanting more shopping opportunities travelling to Parramatta or Merrylands.

7.1.3 Commercial / Office

The office traffic generation has been based on the RMS (TfNSW) Technical Direction (TDT 2013/04a):

- 1.6 trips per 100m² GFA in the AM peak hour

- 1.2 trips per 100m² GFA in the PM peak hour

However, previous TfNSW comments regarding the office AM peak trip rate stated the following:

*"The office trip generation rates utilised were 1.6 car trips per 100m² (AM) and 1.2 car trips per 100m² (PM). These values were as suggested in TDT 2013/04a, although the Technical Direction also notes that most of the surveyed sites had access to the rail network. One of those surveyed sites that was not near a rail station (Norwest; surveyed prior to NW Metro opening) showed a much higher AM car trip generation rate of **2.75** (but a comparable PM rate of 1.17). Given the poor accessibility of the development site to the 3 nearest rail stations, the use of a **slightly higher AM trip rate should be further considered.**"*

On the above basis, a trip rate of 2.75 trips per 100m² GFA in the AM peak hour has been adopted.

A 5% trip reduction has been adopted to compensate for trips between the commercial and the retail reflecting the multi-purpose trips associated with workers who visit the retail shops and/or live in the residential component of the site. The use of 5% trip reduction has also previously been agreed by the Tiberius peer reviewer (SLR Consulting).

Commercial / office uses typically do not operate on weekend Saturdays. As such, no trip generation rates have been adopted.

7.1.4 Traffic Generation Summary

A summary of traffic generation is provided as follows in Table 7.1 using the same trip rates and trip reduction rates that were approved by TfNSW in earlier assessments. Traffic generation is compared to the previous traffic assessment.

Table 7.1: Summary of Traffic Generation (vehicles per hour)

Land use	Yield	AM Peak Hour		PM Peak Hour		SAT Peak Hour		Trip Reduction Rate
		Trip Rate	Traffic Generation	Trip Rate	Traffic Generation	Trip Rate	Traffic Generation	
Residential	1,255 units	0.29 trips/unit	398	0.29 trips/unit	398	0.29 trips/unit	398	0%
Retail	2,122 m ² GLFA*	7.84 trips/100m ² GLFA	150	10.77 trips/100m ² GLFA	206	11.71 trips/100m ² GLFA	224	10%
Office	5,000 m ² GFA	2.75 trips/100m ²	70	1.2 trips/100m ²	30	-	0	5%
Total			635		635		622	
Previous			645		627		588	
Difference			-10		+8		+34	

*GLFA is assumed to be 85% of GFA

The quantum of traffic generated by the revised scheme is comparable to the previous assessment. Therefore, the traffic modelling has not been updated for this response to submissions and the findings of the previous assessment remain valid for consideration of the road network implications of the amended development proposal.

8 Conclusion

The above traffic impact assessment response to submission has been prepared to accompany a masterplan and development application for a mixed-use development at 1 Crescent Street, Holroyd.

The key findings of this response addressed are summarised as follows:

- The proposal has been modified as follow:
 - A total of 2,496 m² retail GFA and approximately 2,710 m² commercial GFA.
 - 1,374 residential apartments
 - Communal amenity facilities for residents.
 - Building services areas.
- The eastern driveway has been assessed and found to have minimal impact on the road network and adequate sight distance. The location of the driveway is deemed to be acceptable and minimises the internal impacts of traffic.
- A shuttle bus would be provided as part of the travel demand management. The applicant is willing to accept a condition of consent for the building owners to fund the shuttle service for perpetuity in a similar way to private garbage collection.
- The car parking has been updated to address the issues raised. The provision of car parking will be less than the CLEP maximum provision and more than the planning SEPP requirements.
- Residential parking will be separated from retail and commercial parking.
- Loading dock will now provide a turntable to assist with truck movements.
- The modified development yield would generate a similar volume of traffic compared to the SSDA and planning proposal schemes.

Overall, the traffic and parking aspects of the proposed development would be satisfactory. The amended proposal has improved on elements of the design, including car parking layout, loading dock arrangements, while maintaining or improving the amenity of the park.

Appendix A

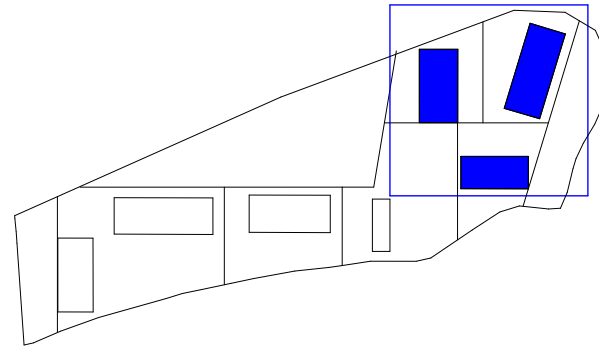
Architectural Plans



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B	SSDA Submission Update	20/11/24
C	SSDA Submission Update	13/12/24
D	SSDA Submission Update	23/01/25
E	SSDA RTS Submission	04/09/25
F	SSDA RTS Submission	12/09/25
G	SSDA RTS Submission	19/09/25

Notes

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Project
Crescent Parklands

Client
Tiberius (Holroyd) Pty Ltd (as trustee
for the Holroyd Unit Trust)

Issuer
W-B
WOODS BAGOT

Project number
121784

Size check
25mm

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DS

Sheet size
A1

Scale
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Sheet title
Ground Floor Plan

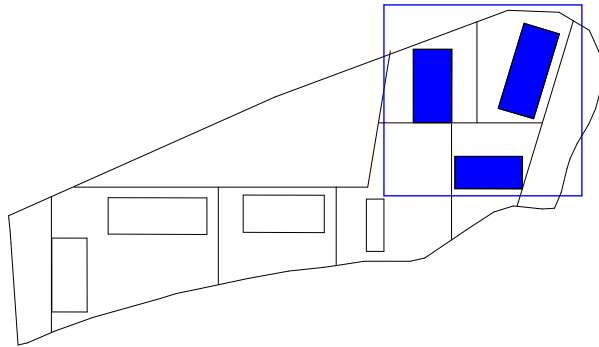
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Status
For information

Revision
G



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B	SSDA Submission Update	SSDA Submission Update	20/11/24
C	SSDA RTS Submission	SSDA RTS Submission	04/09/25
D	SSDA RTS Submission	SSDA RTS Submission	12/09/25
E	SSDA RTS Submission	SSDA RTS Submission	19/09/25

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A1

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1 : 250

Sheet title
Level 1

Sheet number
CP-AR-1-2201

Status
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Revision
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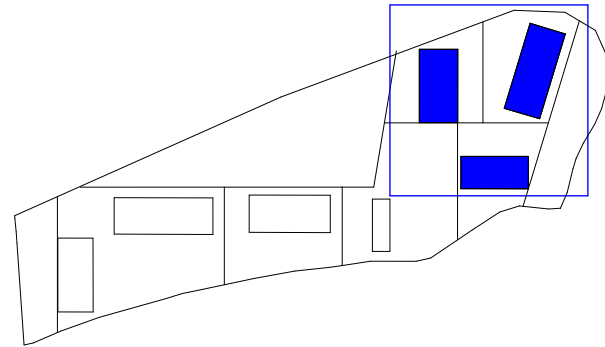
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C		SSDA RTS Submission	04/09/25
D		SSDA RTS Submission	12/09/25
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Sheet title
Level 2

Sheet number
CP-AR-1-2202
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Revision
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Scale

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Recent revision history

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A		SSDA Submission	08/11/24
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C		SSDA Submission Update	13/12/24
D		SSDA RTS Submission	04/09/25
E		SSDA RTS Submission	12/09/25
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A1

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CP-AR-2-2202

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Revision

F



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F		SSDA RTS Submission	19/09/25																													

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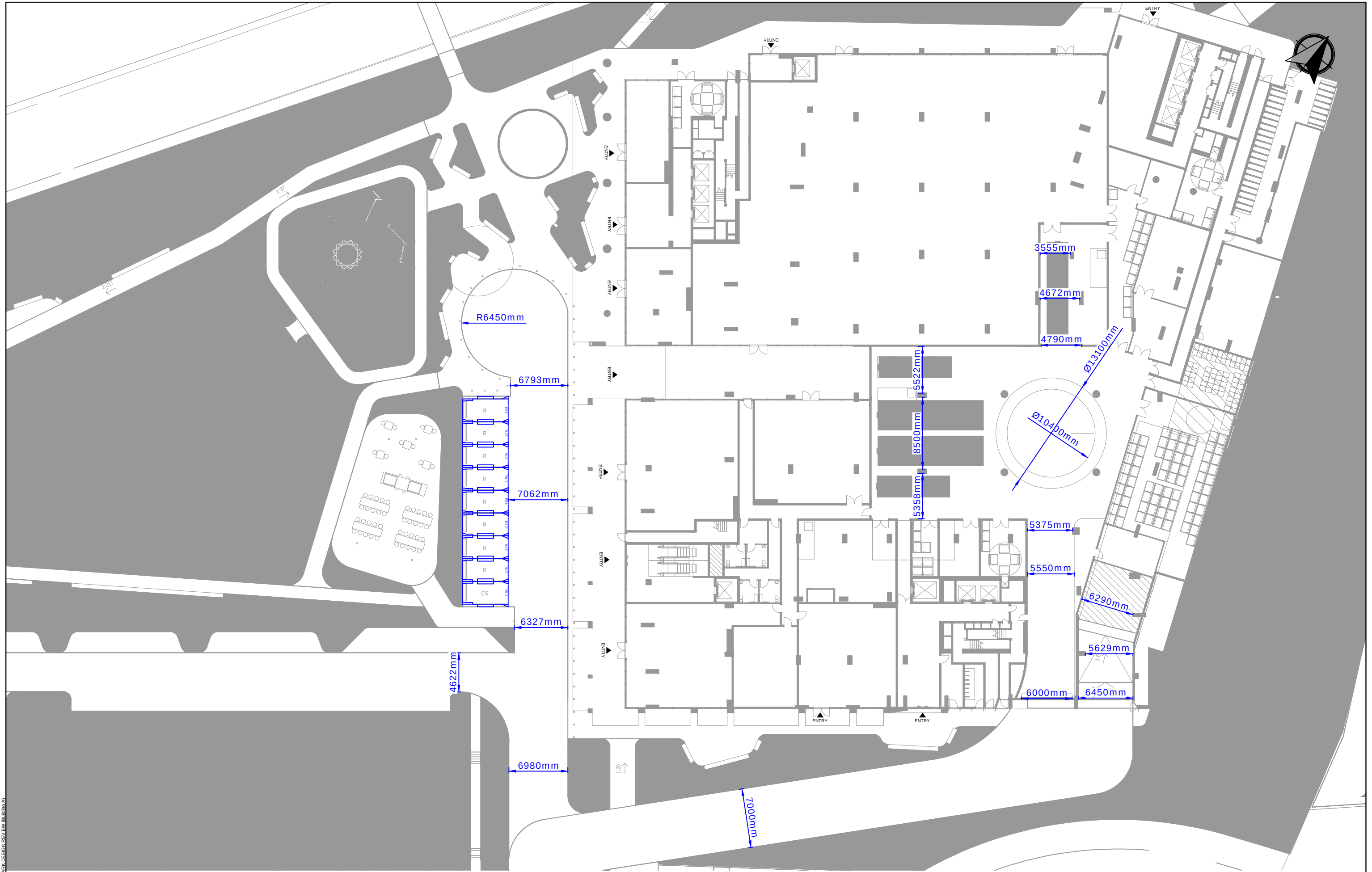


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B	SSDA Submission Update	20/11/24																													
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E	SSDA RTS Submission	12/09/25																													
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Appendix B

Car Park Review



REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	JJ	SR	SR	07/11/25



PROJECT	1 CRESCENT STREET, HOLROYD BUILDING A
TITLE	CAR PARK DESIGN REVIEW GROUND FLOOR

DWG No. 16241CAD33- FIGURE 1		
DATE STAMP 7 November 2025		
PROJECT No. 16241	SCALE 1:400 @A3	REV. A

Filename: 16241CAD33-25107-CAR PARK DESIGN REVIEW (Building A)



NOTES:

ENSURE THE FOLLOWING MINIMUM HEADROOM CLEARANCES ARE PROVIDED TO ANY STRUCTURE, SERVICES, SIGNAGE, ETC. IN ACCORDANCE WITH AS2890.1, AS2890.2, AND AS2890.6:

- ABOVE LOADING AREA AND AREAS ACCESSIBLE BY SERVICE TRUCKS - 4.5m
- ABOVE DISABLED CAR SPACES AND SHARED AREA - 2.5m
- ABOVE CAR SPACES, RAMPS AND AISLES - 2.2m

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	JJ	SR	SR	07/11/25



PROJECT	1 CRESCENT STREET, HOLROYD BUILDING A
TITLE	CAR PARK DESIGN REVIEW LEVEL 1

DWG No.	16241CAD33- FIGURE 2
DATE STAMP	7 November 2025
PROJECT No.	16241
SCALE	1:300 @A3
REV.	A



Filename: 16241CAD33-25107-CAR PARK DESIGN REVIEW (Building A)

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	JJ	SR	SR	07/11/25



PROJECT	1 CRESCENT STREET, HOLROYD BUILDING A	
TITLE	CAR PARK DESIGN REVIEW LEVEL 2	

DWG No. 16241CAD33- FIGURE 3		
DATE STAMP 7 November 2025		
PROJECT No. 16241	SCALE 1:400 @A3	REV. A



TITLE

CAR PARK DESIGN REVIEW
LEVEL 3 - 6 (TYPICAL)

DATE STAMP	7 November 2025
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PROJECT No.	SCALE	REV.
16241	1:400 @A3	A



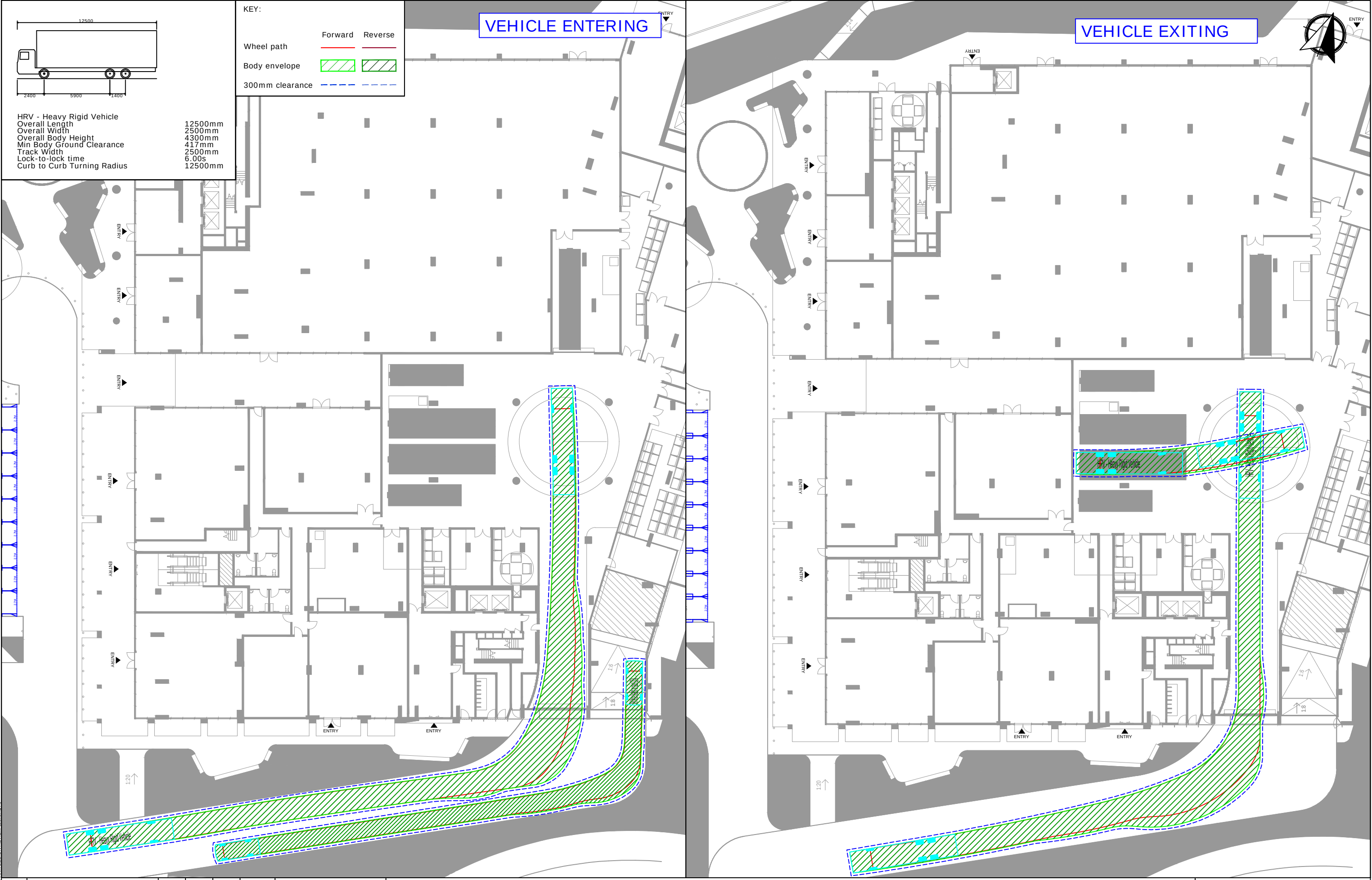
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REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	JJ	SR	SR	07/11/25



PROJECT	1 CRESCENT STREET, HOLROYD BUILDING A
TITLE	CAR PARK DESIGN REVIEW LEVEL 7

DWG No. 16241CAD33- FIGURE 5		
DATE STAMP 7 November 2025		
PROJECT No. 16241	SCALE 1:400 @A3	REV. A



REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	JJ	SR	SR	07/11/25

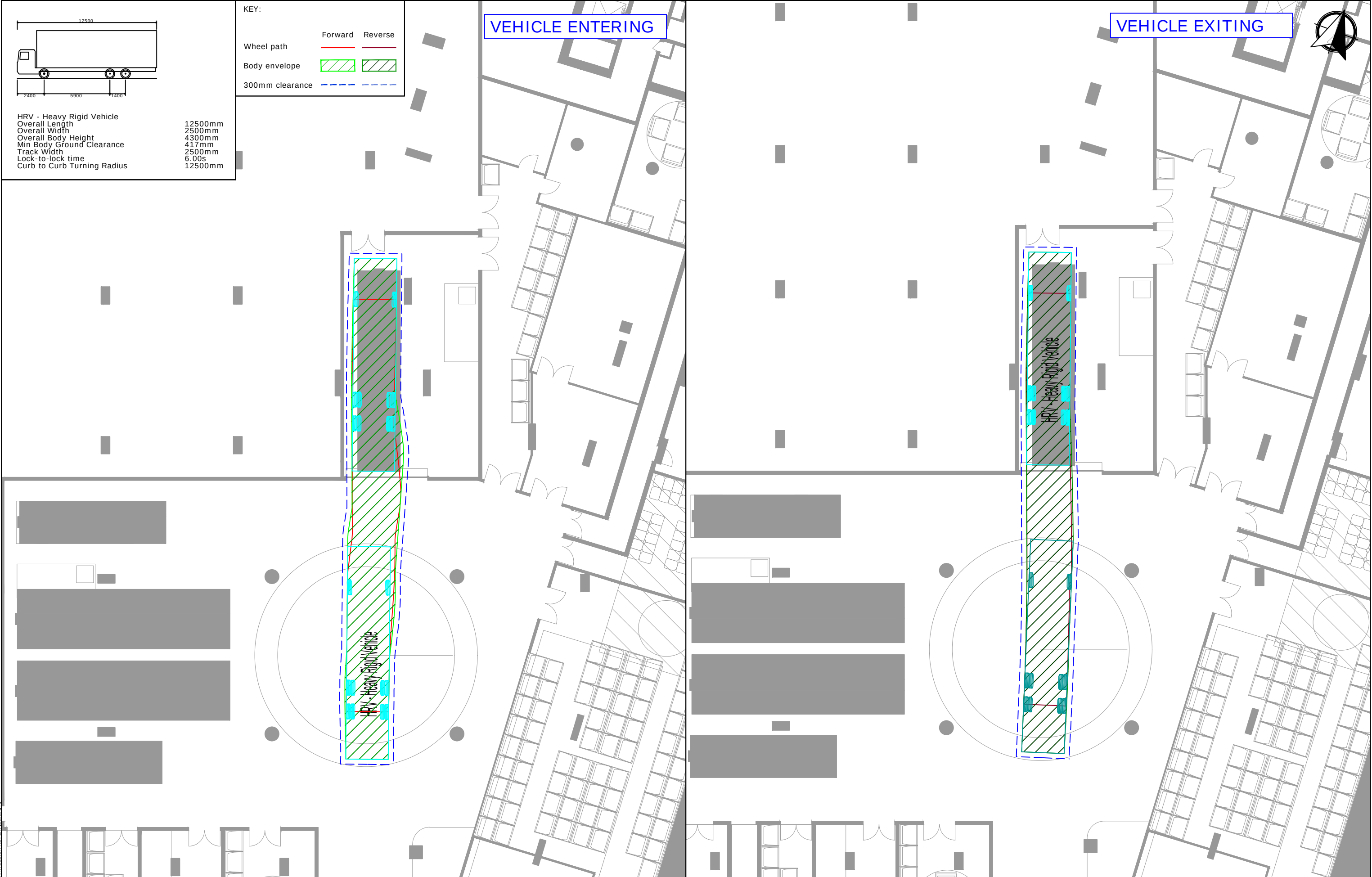


PROJECT
1 CRESCENT STREET, HOLROYD
BUILDING A

TITLE
SWEEP PATH ANALYSIS - GROUND FLOOR
12.5M HEAVY RIGID VEHICLE (HRV)

DWG No. 16241CAD33-FIGURE 6		
DATE STAMP 7 November 2025		
PROJECT No. 16241	SCALE 1:400 @A3	REV. A

Filename: 16241CAD33-25107-CAR PARK DESIGN REVIEW (Building A)



HRV - Heavy Rigid Vehicle
Overall Length 12500mm
Overall Width 2500mm
Overall Body Height 4300mm
Min Body Ground Clearance 417mm
Track Width 2500mm
Lock-to-lock time 6.00s
Curb to Curb Turning Radius 12500mm

KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	JJ	SR	SR	07/11/25



PROJECT

1 CRESCENT STREET, HOLROYD
BUILDING A

TITLE

SWEPT PATH ANALYSIS - GROUND FLOOR
12.5M HEAVY RIGID VEHICLE (HRV)

DWG No. 16241CAD33- FIGURE 7		
DATE STAMP 7 November 2025		
PROJECT No. 16241	SCALE 1:200 @A3	REV. A

Filename: 16241CAD33-25107-CAR PARK DESIGN REVIEW (Building A)



8800

1500 5000

MRV - Medium Rigid Vehicle
Overall Length 8800mm
Overall Width 2500mm
Overall Body Height 3633mm
Min Body Ground Clearance 428mm
Track Width 2500mm
Lock-to-lock time 4.00s
Curb to Curb Turning Radius 10000mm

KEY:

	Forward	Reverse
Wheel path	—	—
Body envelope	▨	▨
300mm clearance	- - -	- - -

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	JJ	SR	SR	07/11/25



PROJECT	1 CRESCENT STREET, HOLROYD BUILDING A
TITLE	SWEPT PATH ANALYSIS - GROUND FLOOR 8.8M MEDIUM RIGID VEHICLE (MRV)

DWG No. 16241CAD33- FIGURE 8		
DATE STAMP 7 November 2025		
PROJECT No. 16241	SCALE 1:400 @A3	REV. A

Filename: 16241CAD33-25107-CAR PARK DESIGN REVIEW (Building A)



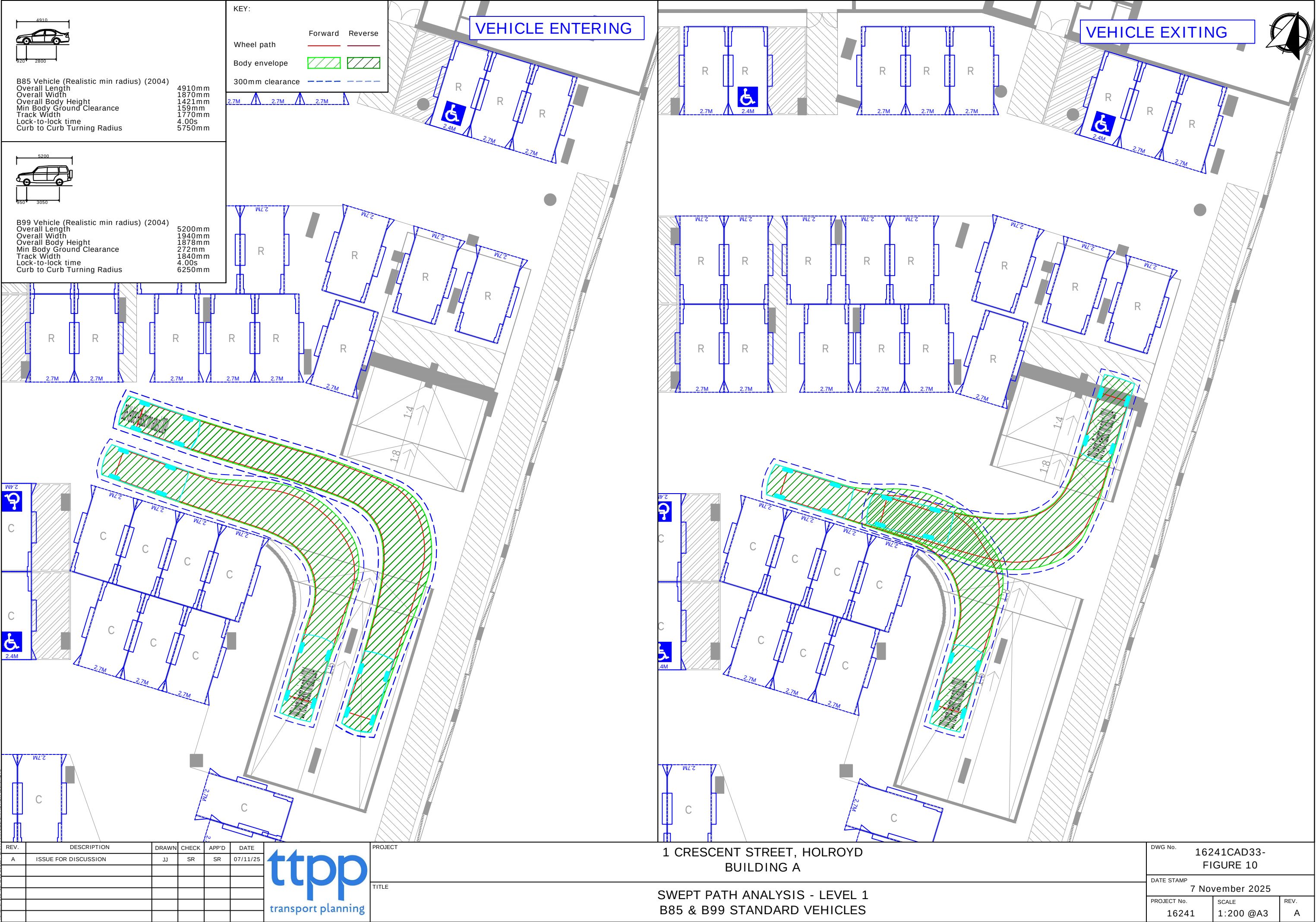
REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	JJ	SR	SR	07/11/25



PROJECT	1 CRESCENT STREET, HOLROYD BUILDING A
TITLE	SWEPT PATH ANALYSIS - GROUND FLOOR 8.8M MEDIUM RIGID VEHICLE (MRV)

DWG No.	16241CAD33- FIGURE 9		
DATE STAMP 7 November 2025			
PROJECT No. 16241	SCALE 1:400 @A3	REV. A	

Filename: 16241CAD33-25107-CAR PARK DESIGN REVIEW (Building A)



4910

920 2800

B85 Vehicle (Realistic min radius) (2004)

Overall Length	4910mm
Overall Width	1870mm
Overall Body Height	1421mm
Min Body Ground Clearance	159mm
Track Width	1770mm
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	5750mm

5200

950 3050

B99 Vehicle (Realistic min radius) (2004)

Overall Length	5200mm
Overall Width	1940mm
Overall Body Height	1878mm
Min Body Ground Clearance	272mm
Track Width	1840mm
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6250mm

KEY:

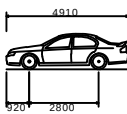
Wheel path	Forward	Reverse
Body envelope		
300mm clearance		

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	JJ	SR	SR	07/11/25



PROJECT	1 CRESCENT STREET, HOLROYD BUILDING A
TITLE	SWEPT PATH ANALYSIS - LEVEL 1 B85 & B99 STANDARD VEHICLES

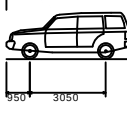
DWG No.	16241CAD33- FIGURE 10
DATE STAMP	7 November 2025
PROJECT No.	16241
SCALE	1:200 @A3
REV.	A



4910
920 2800

B85 Vehicle (Realistic min radius) (2004)

Overall Length	4910mm
Overall Width	1870mm
Overall Body Height	1421mm
Min Body Ground Clearance	159mm
Track Width	1770mm
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	5750mm



5200
950 3050

B99 Vehicle (Realistic min radius) (2004)

Overall Length	5200mm
Overall Width	1940mm
Overall Body Height	1878mm
Min Body Ground Clearance	272mm
Track Width	1840mm
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6250mm

KEY:

Wheel path

Forward

Reverse

Body envelope

300mm clearance



REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	JJ	SR	SR	07/11/25



PROJECT

1 CRESCENT STREET, HOLROYD
BUILDING A

TITLE

SWEPT PATH ANALYSIS - LEVEL 2
B85 & B99 STANDARD VEHICLES

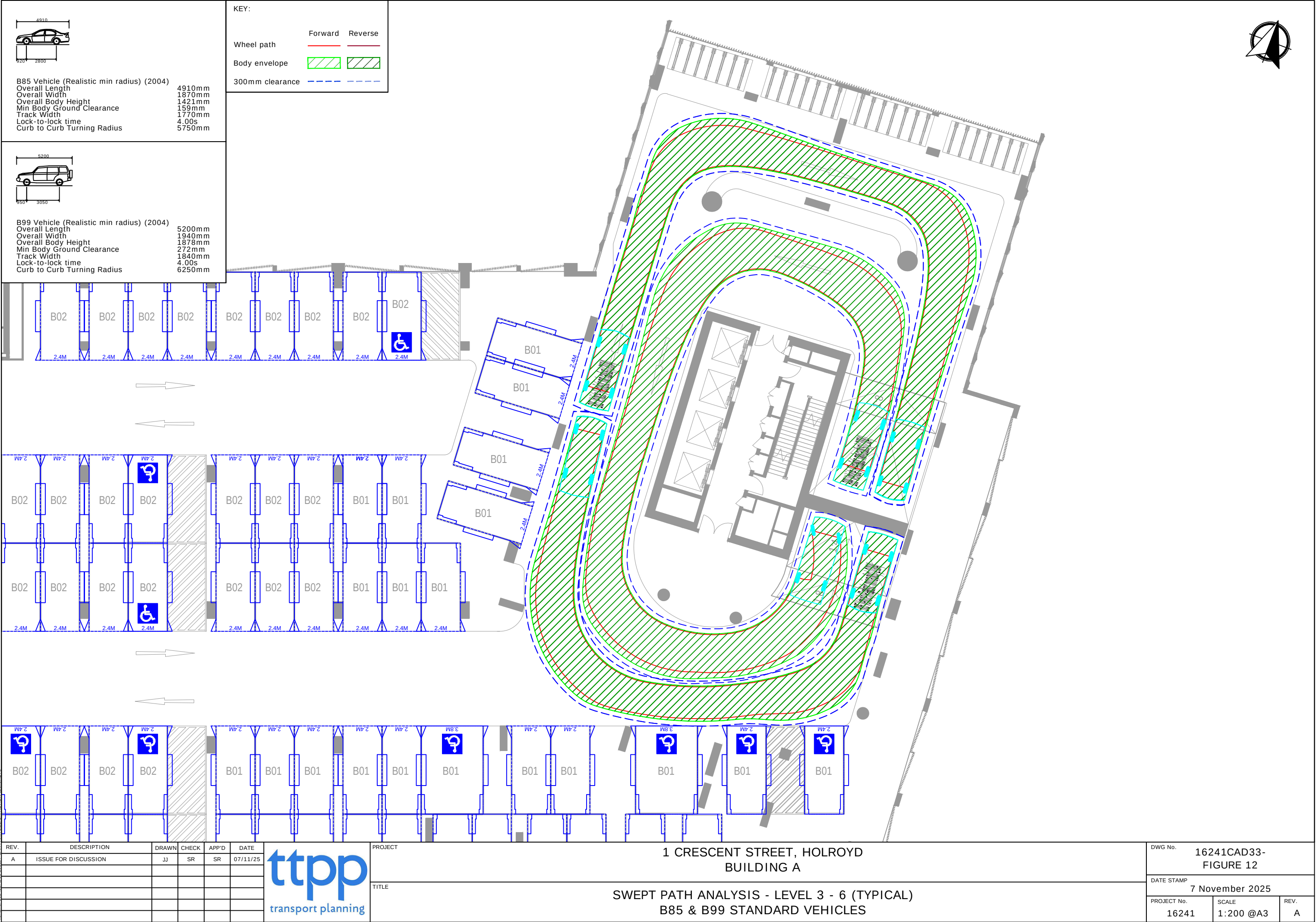
DWG No. 16241CAD33-
FIGURE 11

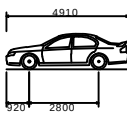
DATE STAMP
7 November 2025

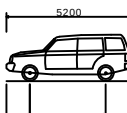
PROJECT No. 16241

SCALE 1:200 @A3

REV. A



	
B85 Vehicle (Realistic min radius) (2004)	
Overall Length	4910mm
Overall Width	1870mm
Overall Body Height	1421mm
Min Body Ground Clearance	159mm
Track Width	1770mm
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	5750mm

	
B99 Vehicle (Realistic min radius) (2004)	
Overall Length	5200mm
Overall Width	1940mm
Overall Body Height	1878mm
Min Body Ground Clearance	272mm
Track Width	1840mm
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6250mm

KEY:		
	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		

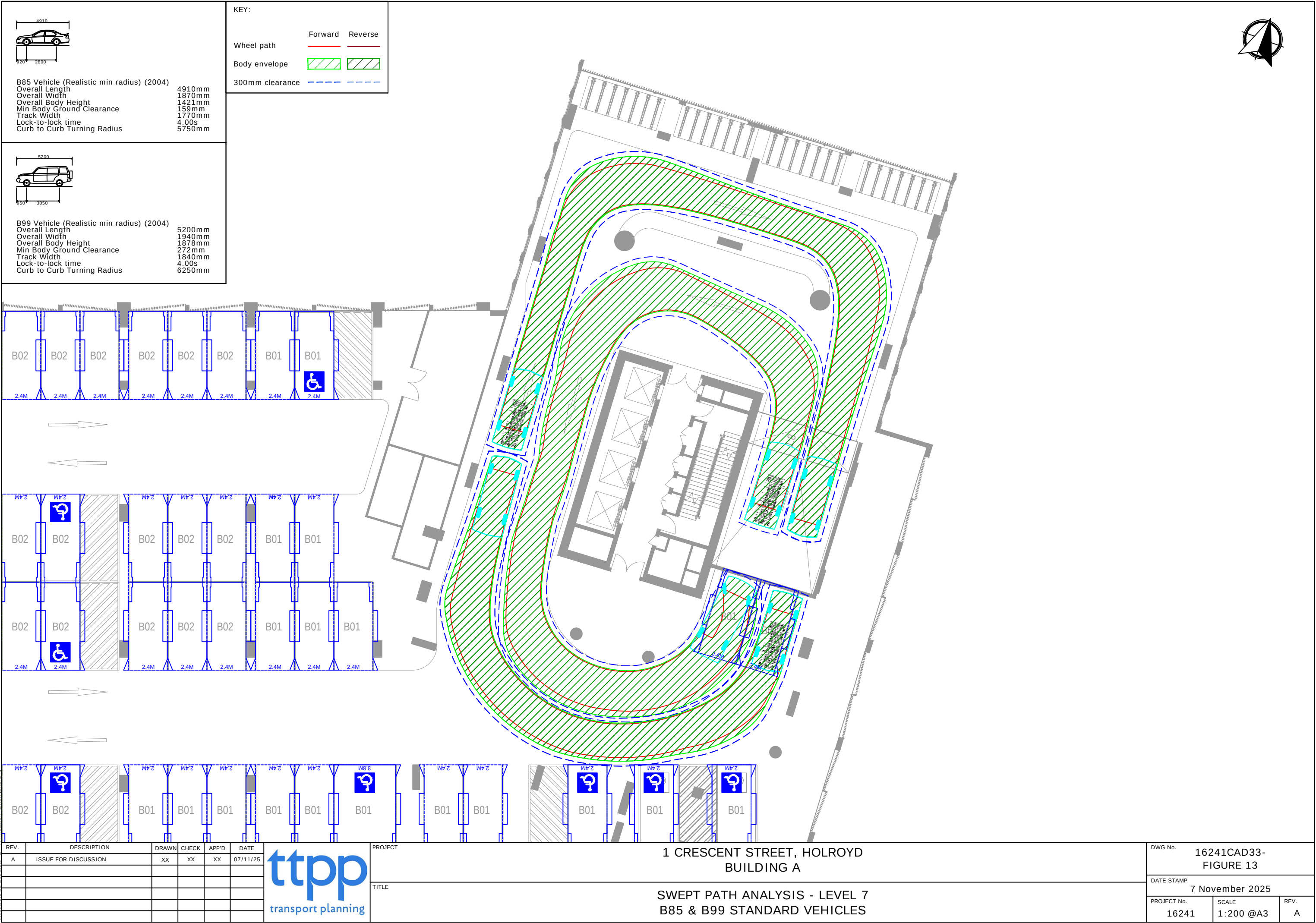
REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	JJ	SR	SR	07/11/25

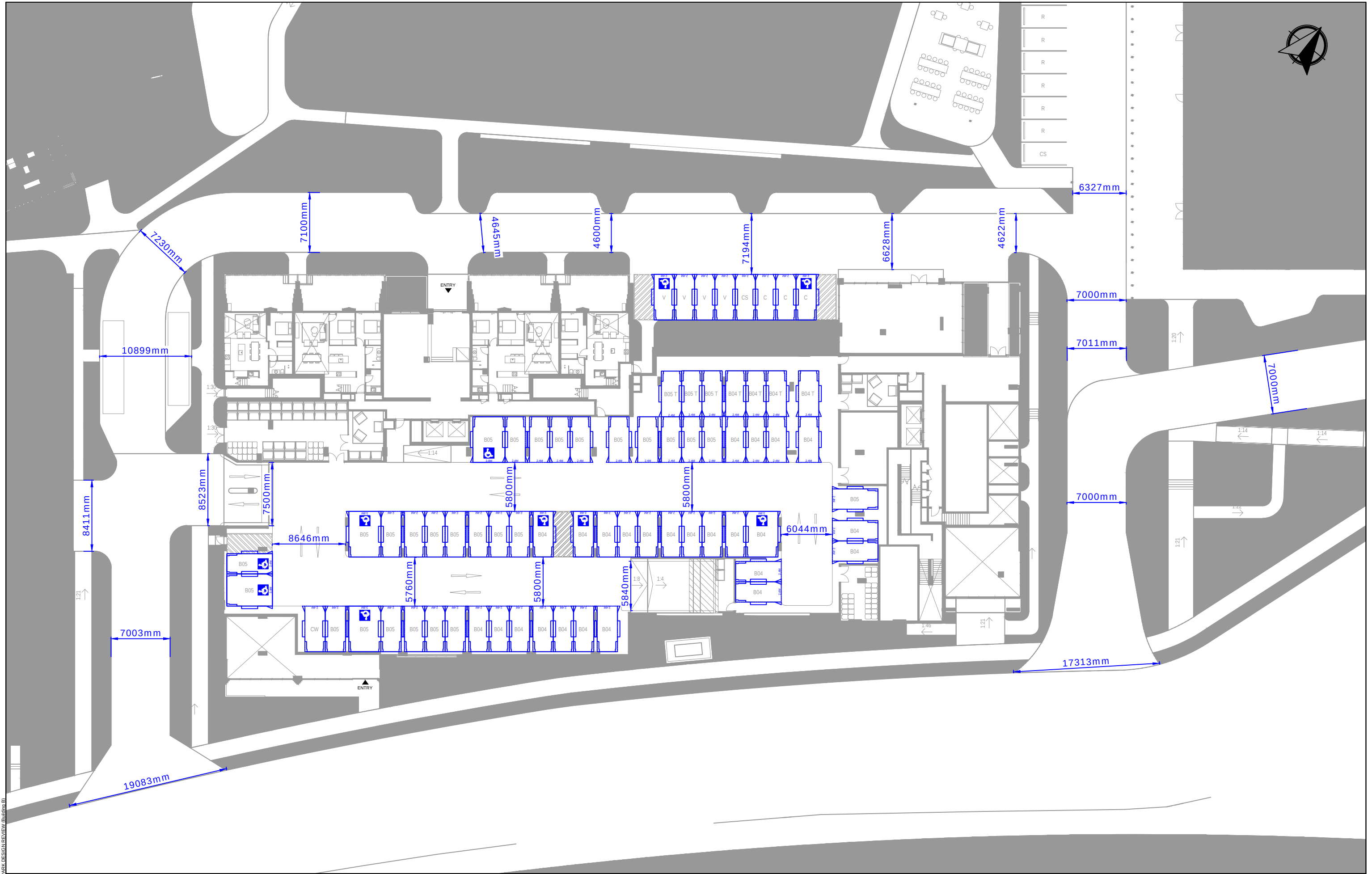


PROJECT		1 CRESCENT STREET, HOLROYD BUILDING A
TITLE		SWEPT PATH ANALYSIS - LEVEL 3 - 6 (TYPICAL) B85 & B99 STANDARD VEHICLES

DWG No. 16241CAD33- FIGURE 12		
DATE STAMP 7 November 2025		
PROJECT No. 16241	SCALE 1:200 @A3	REV. A

Filename: 16241CAD33-25107-CAR PARK DESIGN REVIEW (Building A)



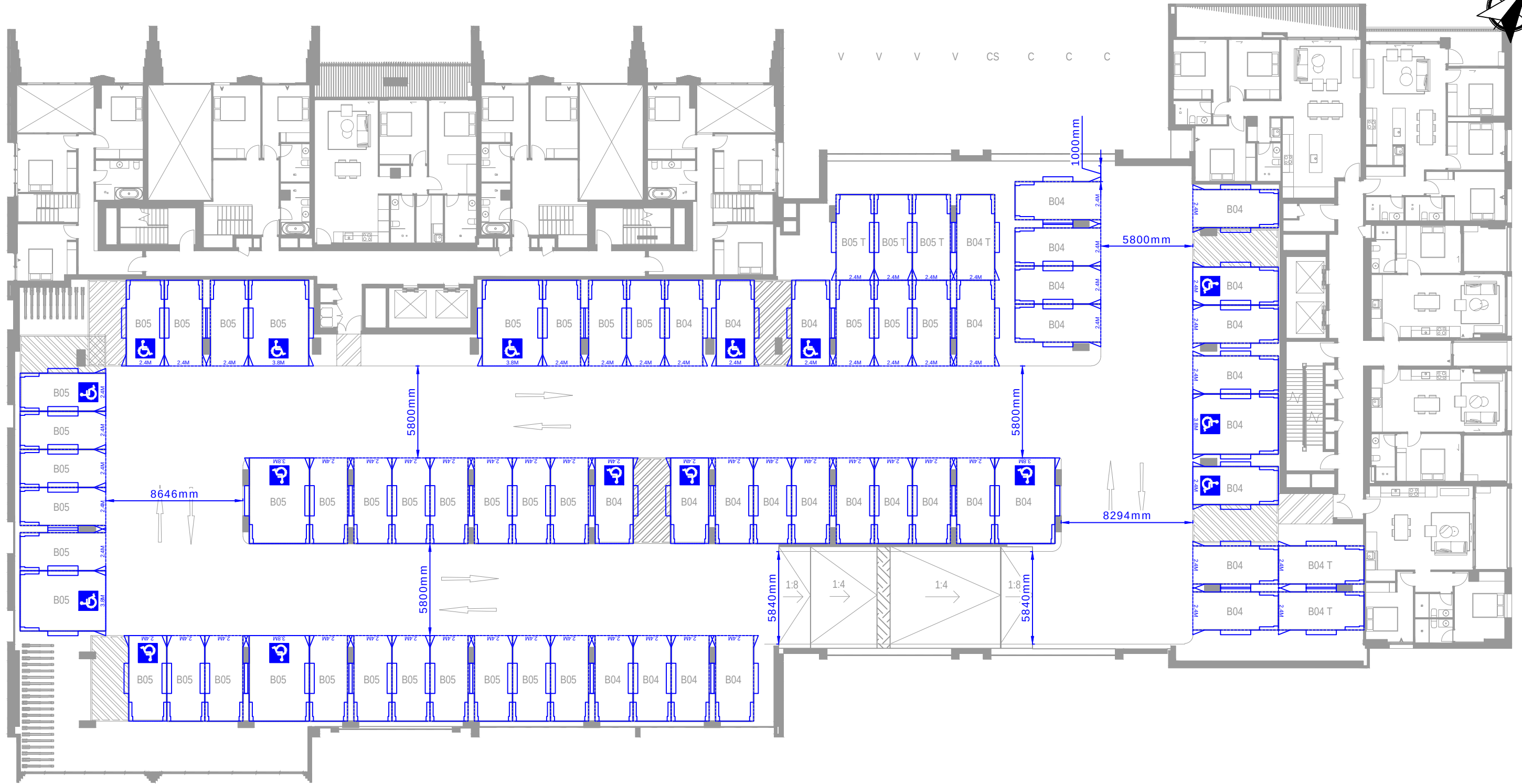


REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	JJ	SR	SR	07/11/25



PROJECT	1 CRESCENT STREET, HOLROYD BUILDING B
TITLE	CAR PARK DESIGN REVIEW GROUND FLOOR

DWG No.		16241CAD34- FIGURE 1	
DATE STAMP 7 November 2025			
PROJECT No. 16241	SCALE 1:400 @A3	REV. A	



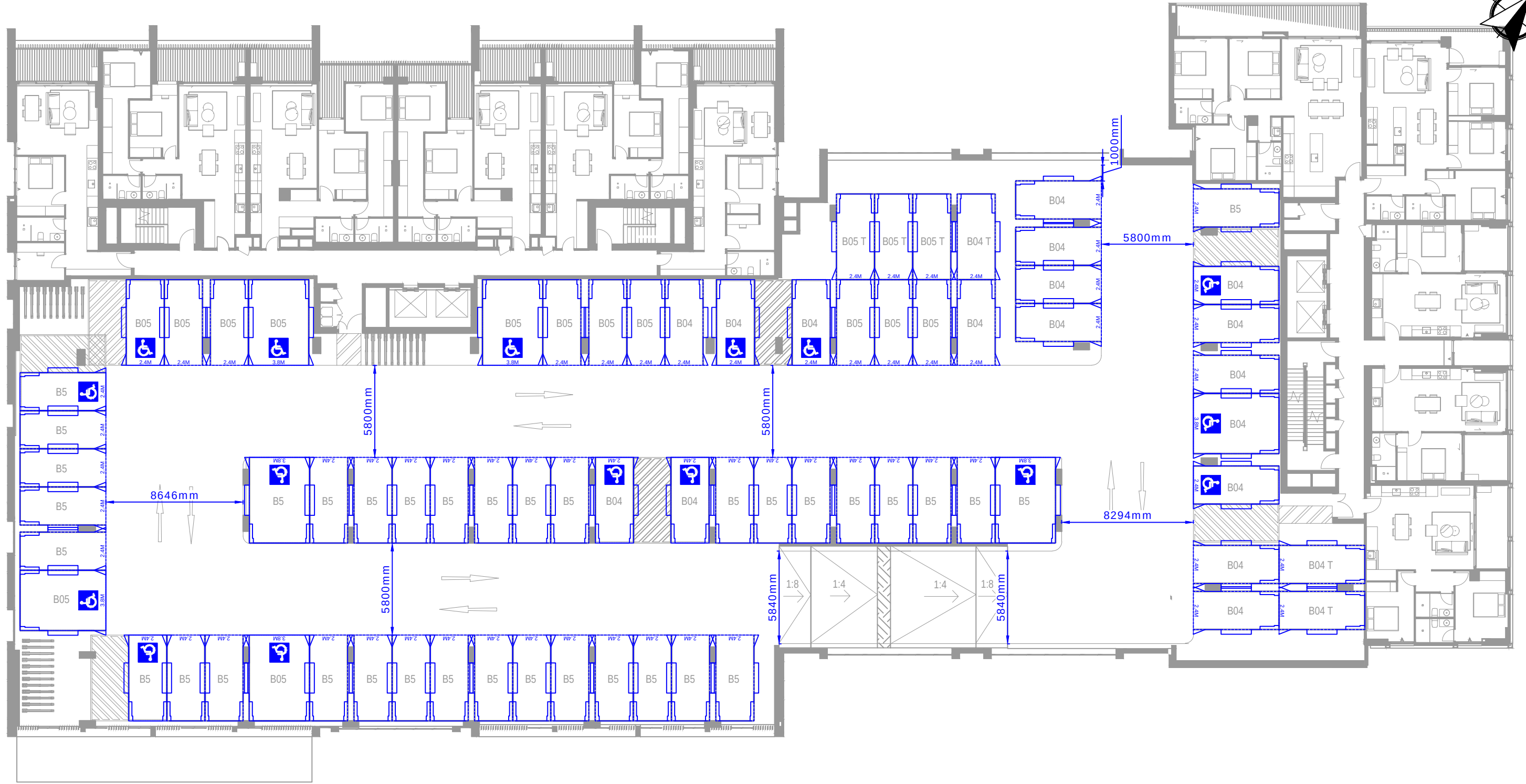
Filename: 16241CAD34-25107-CAR PARK DESIGN REVIEW (Building B)

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	JJ	SR	SR	07/11/25



PROJECT	1 CRESCENT STREET, HOLROYD BUILDING B
TITLE	CAR PARK DESIGN REVIEW LEVEL 1

DWG No. 16241CAD34- FIGURE 2		
DATE STAMP 7 November 2025		
PROJECT No. 16241	SCALE 1:250 @A3	REV. A



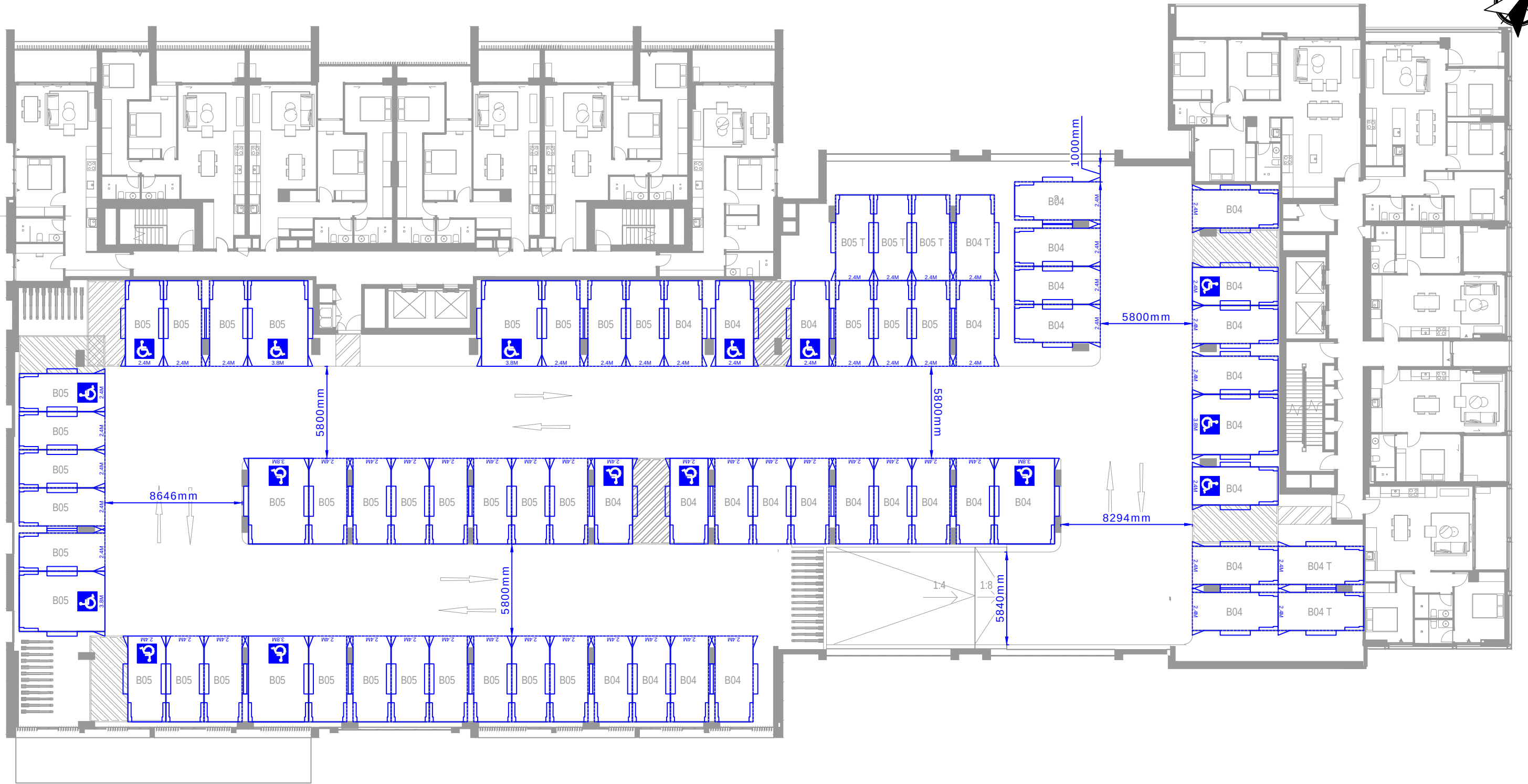
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REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	JJ	SR	SR	07/11/25



PROJECT	1 CRESCENT STREET, HOLROYD BUILDING B
TITLE	CAR PARK DESIGN REVIEW LEVEL 2

DWG No. 16241CAD34- FIGURE 3		
DATE STAMP 7 November 2025		
PROJECT No. 16241	SCALE 1:250 @A3	REV. A



Filename: 16241CAD34-25107-CAR PARK DESIGN REVIEW (Building B)

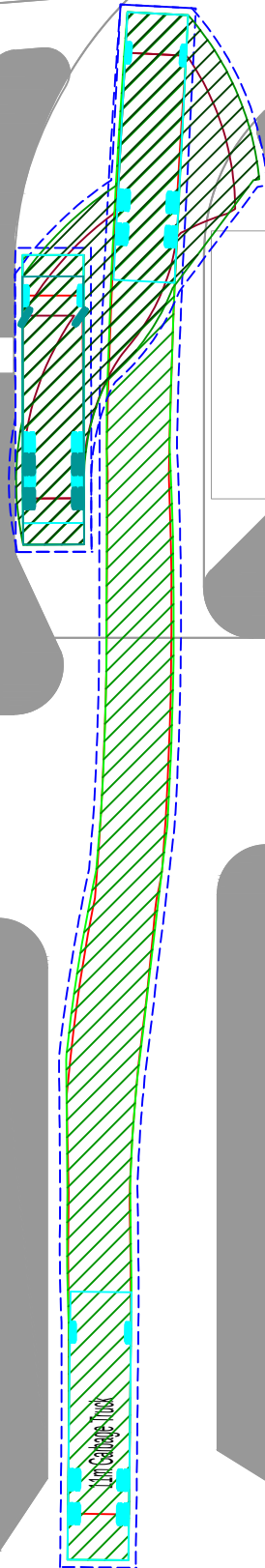
REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	JJ	SR	SR	07/11/25



PROJECT	1 CRESCENT STREET, HOLROYD BUILDING B
TITLE	CAR PARK DESIGN REVIEW LEVEL 3

DWG No.		16241CAD34- FIGURE 4	
DATE STAMP 7 November 2025			
PROJECT No. 16241	SCALE 1:250 @A3	REV. A	

VEHICLE ENTERING

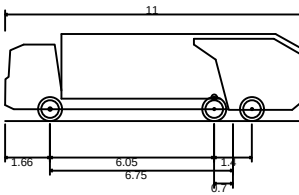


VEHICLE EXITING



KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		



11m Garbage Truck
Overall Length 11.000m
Overall Width 2.500m
Overall Body Height 3.205m
Min Body Ground Clearance 0.410m
Track Width 2.500m
Lock to lock time 6.00s
Kerb to Kerb Turning Radius 11.000m

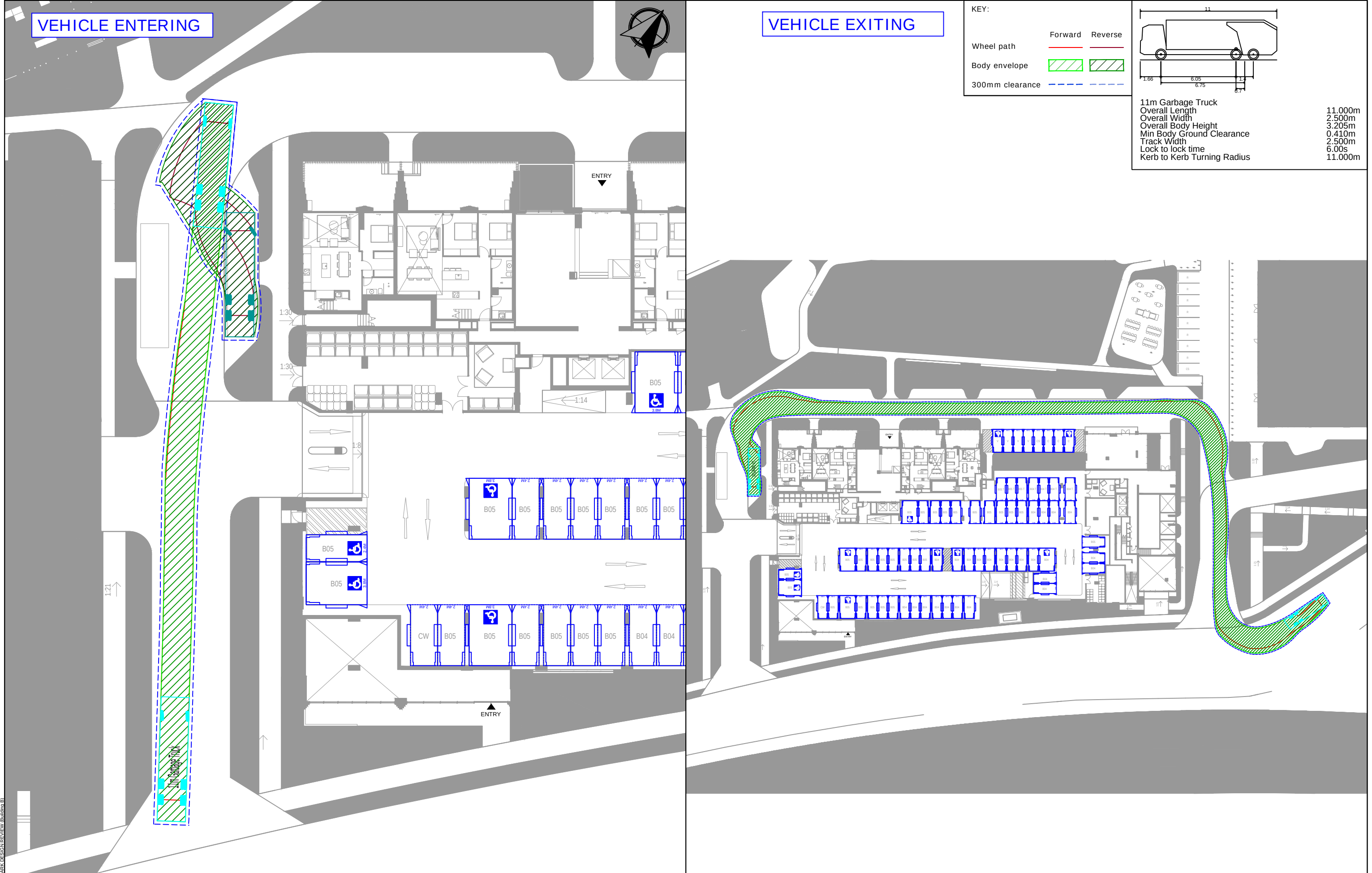
REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	JJ	SR	SR	07/11/25



PROJECT	1 CRESCENT STREET, HOLROYD BUILDING B
TITLE	SWEPT PATH ANALYSIS - GROUND FLOOR 11M GARBAGE TRUCK

DWG No.	16241CAD34- FIGURE 5		
DATE STAMP 7 November 2025			
PROJECT No. 16241	SCALE 1:300 @A3	REV. A	

Filename: 16241CAD34-25107-CAR PARK DESIGN REVIEW (Building B)

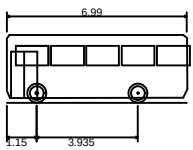


REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	JJ	SR	SR	07/11/25



PROJECT	1 CRESCENT STREET, HOLROYD BUILDING B		
TITLE	SWEPT PATH ANALYSIS - GROUND FLOOR 11M GARBAGE TRUCK		

DWG No. 16241CAD34- FIGURE 6	
DATE STAMP 7 November 2025	
PROJECT No. 16241	SCALE 1:300 @A3
REV. A	



Toyota Coaster
Overall Length
Overall Width
Overall Body Height
Min Body Ground Clearance
Track Width
Lock to lock time
Kerb to Kerb Turning Radius

6.990m
2.080m
2.635m
0.185m
2.080m
6.00s
7.200m

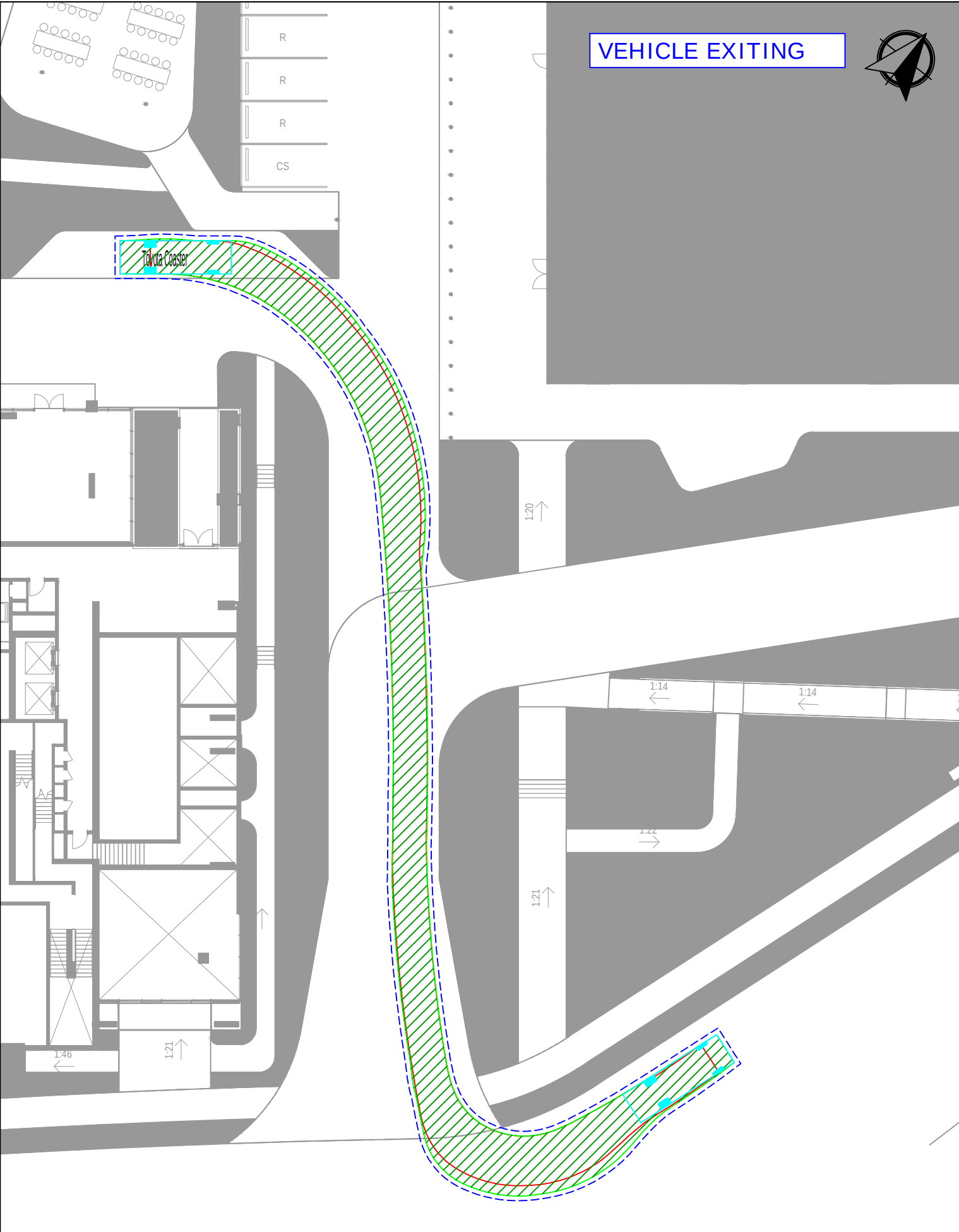
KEY:

	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		

VEHICLE EXITING



VEHICLE EXITING

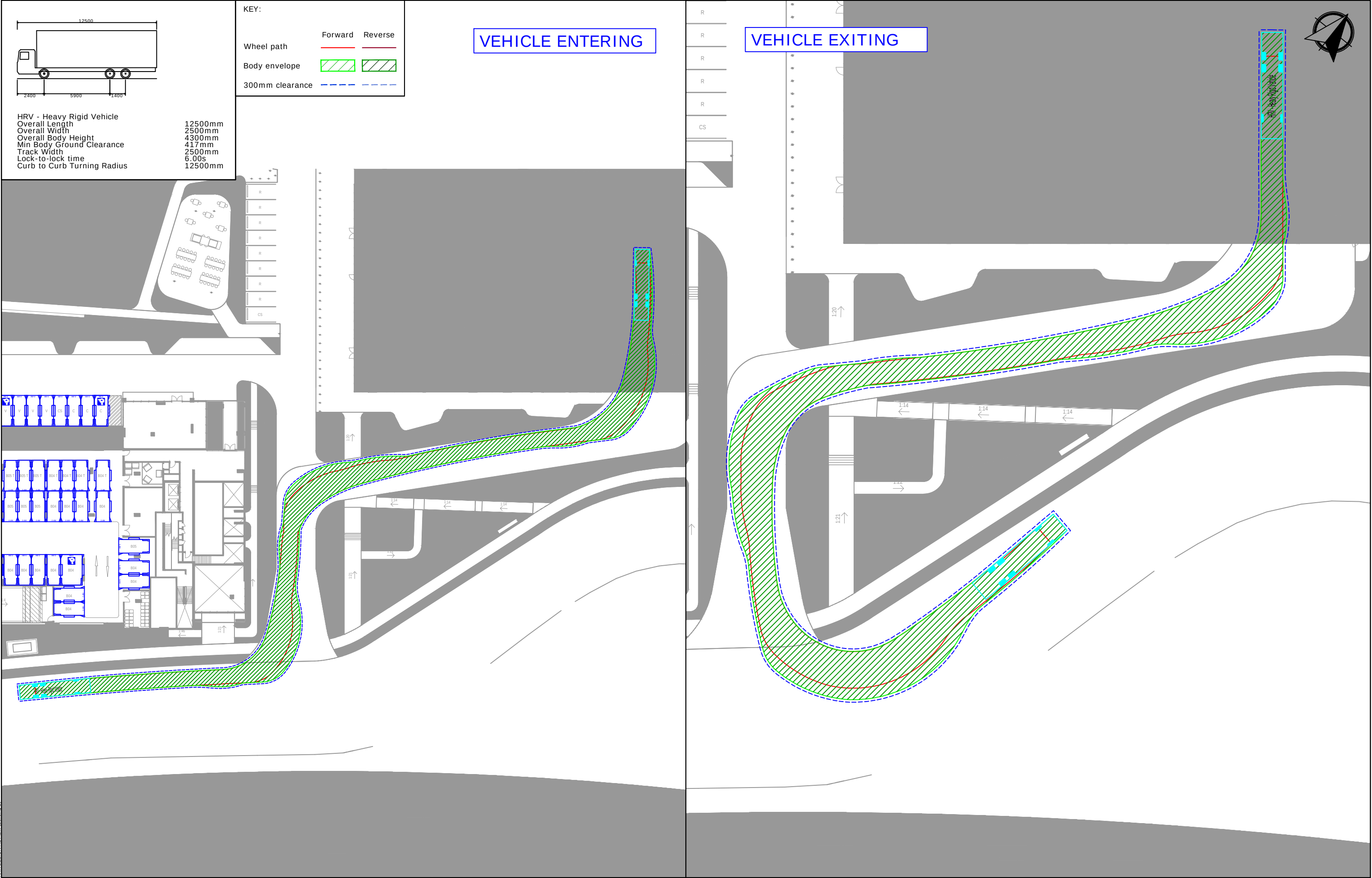


REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	JJ	SR	SR	07/11/25



PROJECT	1 CRESCENT STREET, HOLROYD BUILDING B
TITLE	SWEPT PATH ANALYSIS - GROUND FLOOR 6.99M BUS

DWG No.	16241CAD34- FIGURE 7
DATE STAMP	7 November 2025
PROJECT No.	16241
SCALE	1:700 @A3
REV.	A



REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	JJ	SR	SR	07/11/25



PROJECT	1 CRESCENT STREET, HOLROYD BUILDING B	
TITLE	SWEPT PATH ANALYSIS - GROUND FLOOR 12.5M HEAVY RIGID VEHICLE (HRV)	

DWG No. 16241CAD34- FIGURE 8	
DATE STAMP 7 November 2025	
PROJECT No. 16241	SCALE 1:600 @A3
REV. A	

Filename: 16241CAD34-25107-CAR PARK DESIGN REVIEW (Building B)



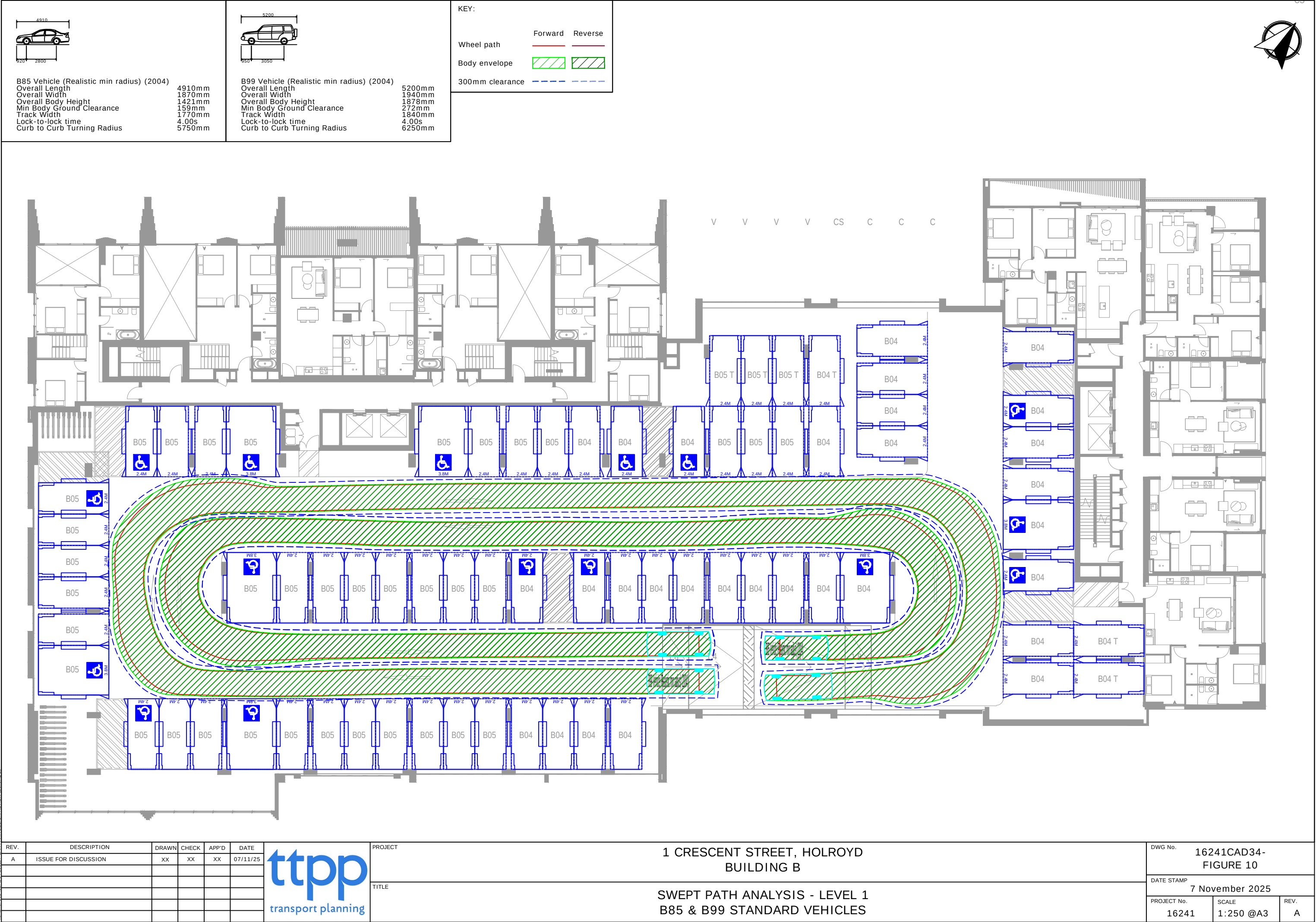
REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	JJ	SR	SR	07/11/25

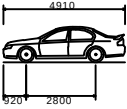
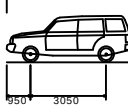


PROJECT	1 CRESCENT STREET, HOLROYD BUILDING B	
TITLE	SWEEP PATH ANALYSIS - GROUND FLOOR B85 & B99 STANDARD VEHICLES	

DWG No. 16241CAD34- FIGURE 9	
DATE STAMP 7 November 2025	
PROJECT No. 16241	SCALE 1:250 @A3
REV. A	

Filename: 16241CAD34-25107-CAR PARK DESIGN REVIEW (Building B)



	
B85 Vehicle (Realistic min radius) (2004)	B99 Vehicle (Realistic min radius) (2004)
Overall Length	4910mm
Overall Width	1870mm
Overall Body Height	1421mm
Min Body Ground Clearance	159mm
Track Width	1770mm
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	5750mm

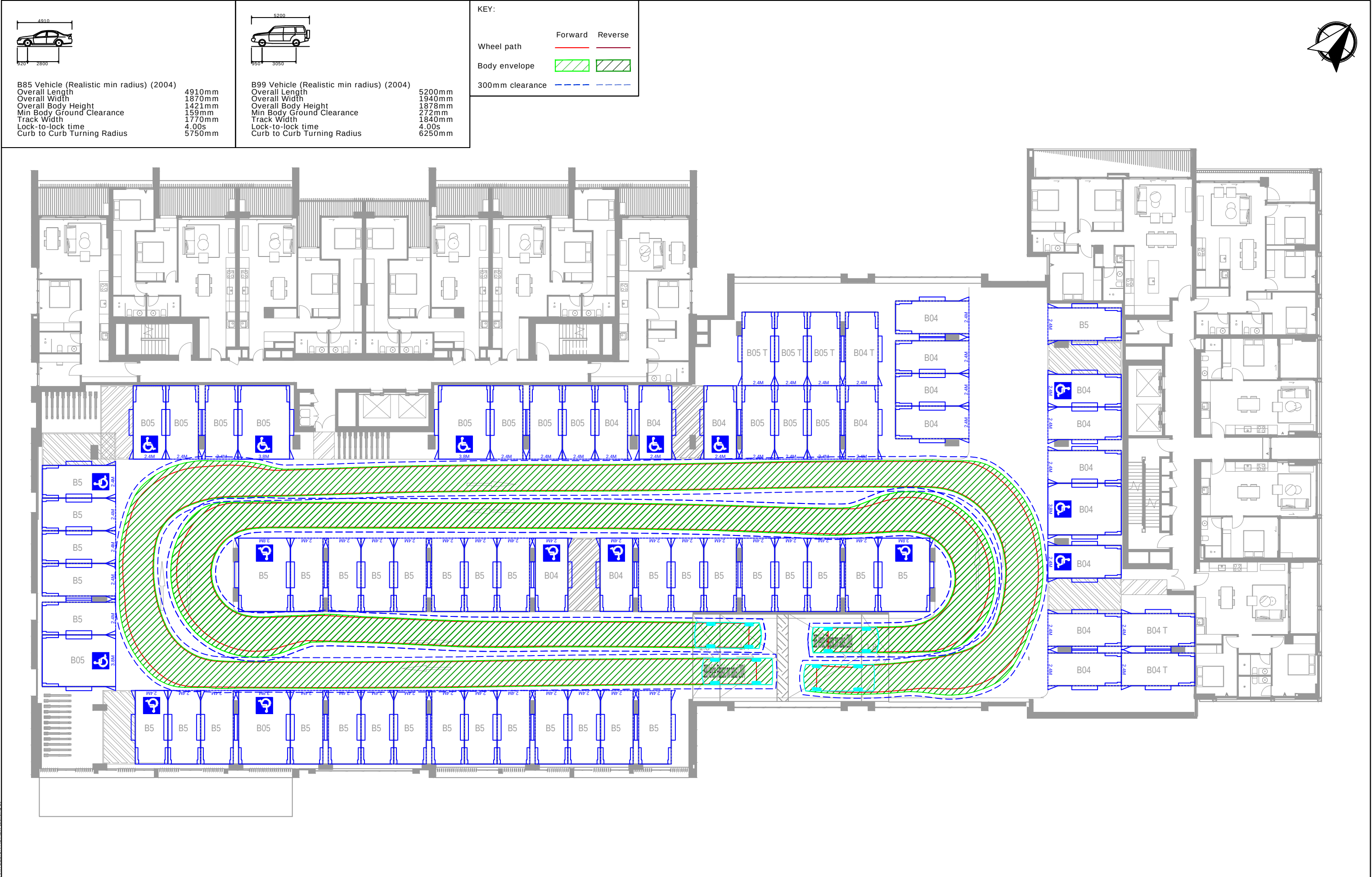
KEY:		
Wheel path	Forward	Reverse
Body envelope		
300mm clearance		

REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	XX	XX	XX	07/11/25



PROJECT	1 CRESCENT STREET, HOLROYD BUILDING B
TITLE	SWEPT PATH ANALYSIS - LEVEL 1 B85 & B99 STANDARD VEHICLES

DWG No.		16241CAD34- FIGURE 10	
DATE STAMP 7 November 2025			
PROJECT No.	SCALE	REV.	
16241	1:250 @A3	A	



B85 Vehicle (Realistic min radius) (2004)	B99 Vehicle (Realistic min radius) (2004)
Overall Length	4910mm
Overall Width	1870mm
Overall Body Height	1421mm
Min Body Ground Clearance	159mm
Track Width	1770mm
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	5750mm

KEY:	
Wheel path	Forward Reverse
Body envelope	
300mm clearance	

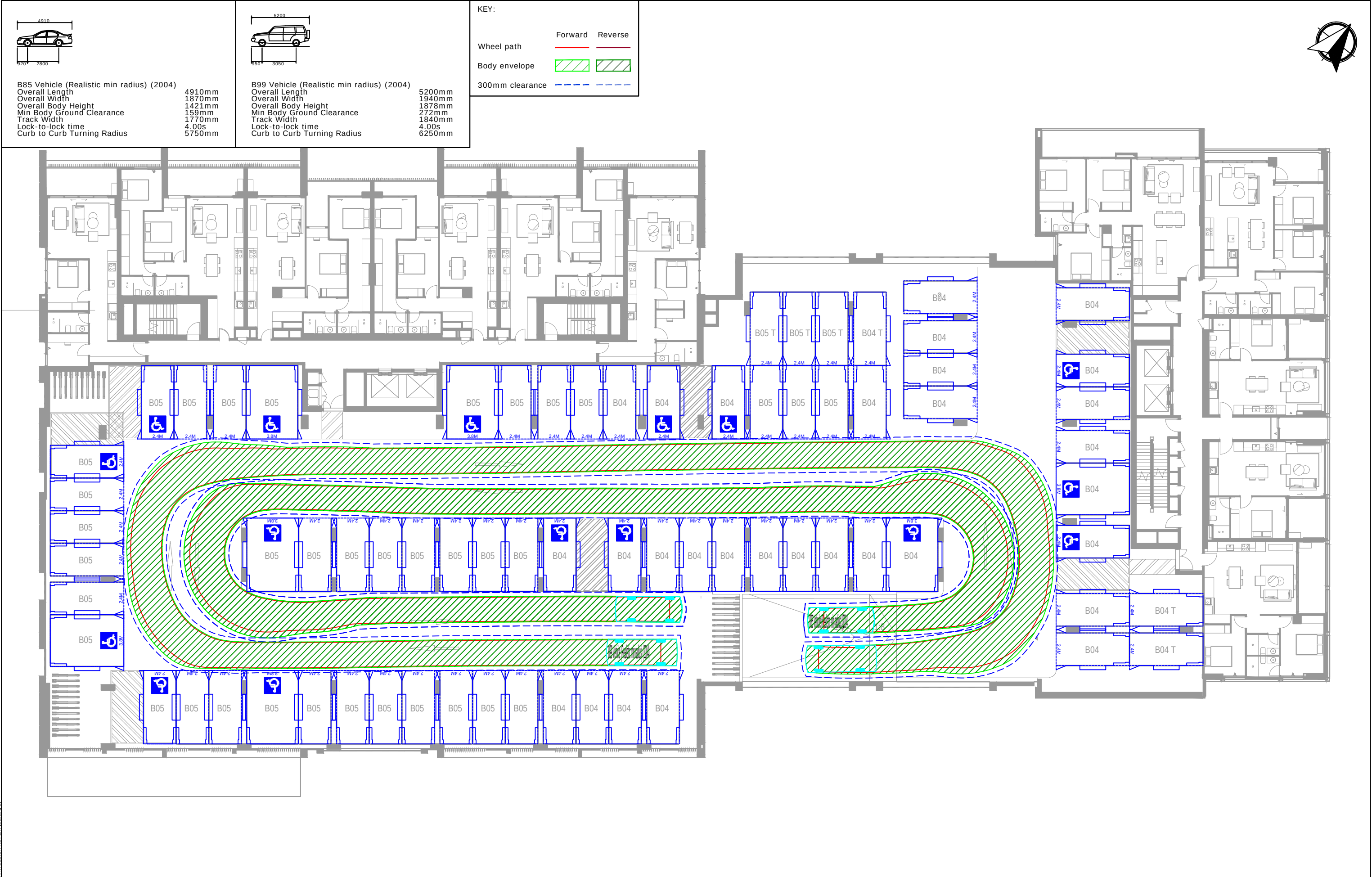
REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	JJ	SR	SR	07/11/25



PROJECT	1 CRESCENT STREET, HOLROYD BUILDING B
TITLE	SWEPT PATH ANALYSIS - LEVEL 2 B85 & B99 STANDARD VEHICLES

DWG No.		16241CAD34- FIGURE 11	
DATE STAMP 7 November 2025			
PROJECT No.	SCALE	REV.	
16241	1:250 @A3	A	

Filename: 16241CAD34-25107-CAR PARK DESIGN REVIEW (Building B)



B85 Vehicle (Realistic min radius) (2004)	B99 Vehicle (Realistic min radius) (2004)
Overall Length	4910mm
Overall Width	1870mm
Overall Body Height	1421mm
Min Body Ground Clearance	159mm
Track Width	1770mm
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	5750mm

KEY:	
Wheel path	Forward Reverse
Body envelope	
300mm clearance	

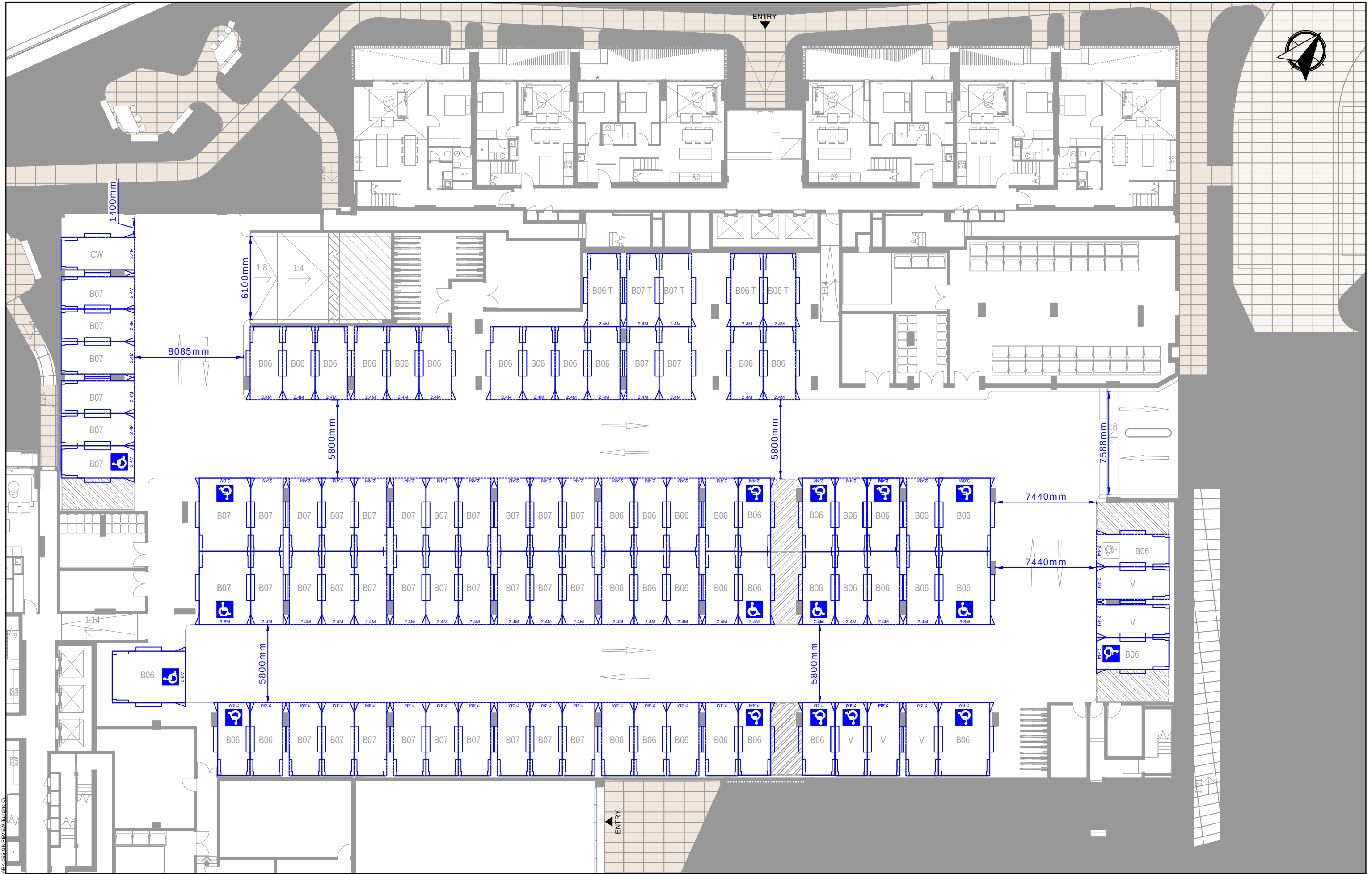
REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	JJ	SR	SR	07/11/25



PROJECT	1 CRESCENT STREET, HOLROYD BUILDING B
TITLE	SWEPT PATH ANALYSIS - LEVEL 3 B85 & B99 STANDARD VEHICLES

DWG No. 16241CAD34- FIGURE 12	
DATE STAMP 7 November 2025	
PROJECT No. 16241	SCALE 1:250 @A3
REV. A	

Filename: 16241CAD34-25107-CAR PARK DESIGN REVIEW (Building B)



REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	JJ	SR	SR	07/11/25



PROJECT	1 CRESCENT STREET, HOLROYD BUILDING C	
TITLE	CAR PARK DESIGN REVIEW GROUND FLOOR	

DWG No. 16241CAD35- FIGURE 1	
DATE STAMP 7 November 2025	
PROJECT No. 16241	SCALE 1:250 @A3
REV. A	



REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	JJ	SR	SR	07/11/25



PROJECT	1 CRESCENT STREET, HOLROYD BUILDING C	
TITLE	CAR PARK DESIGN REVIEW LEVEL 1	

DWG No. 16241CAD35- FIGURE 2		
DATE STAMP 7 November 2025		
PROJECT No. 16241	SCALE 1:250 @A3	REV. A

Filename: 16241CAD35-25107-CAR PARK DESIGN REVIEW Building C



REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	JJ	SR	SR	07/11/25



PROJECT	1 CRESCENT STREET, HOLROYD BUILDING C	
TITLE	CAR PARK DESIGN REVIEW LEVEL 2	

DWG No. 16241CAD35- FIGURE 3	
DATE STAMP 7 November 2025	
PROJECT No. 16241	SCALE 1:250 @A3
REV. A	

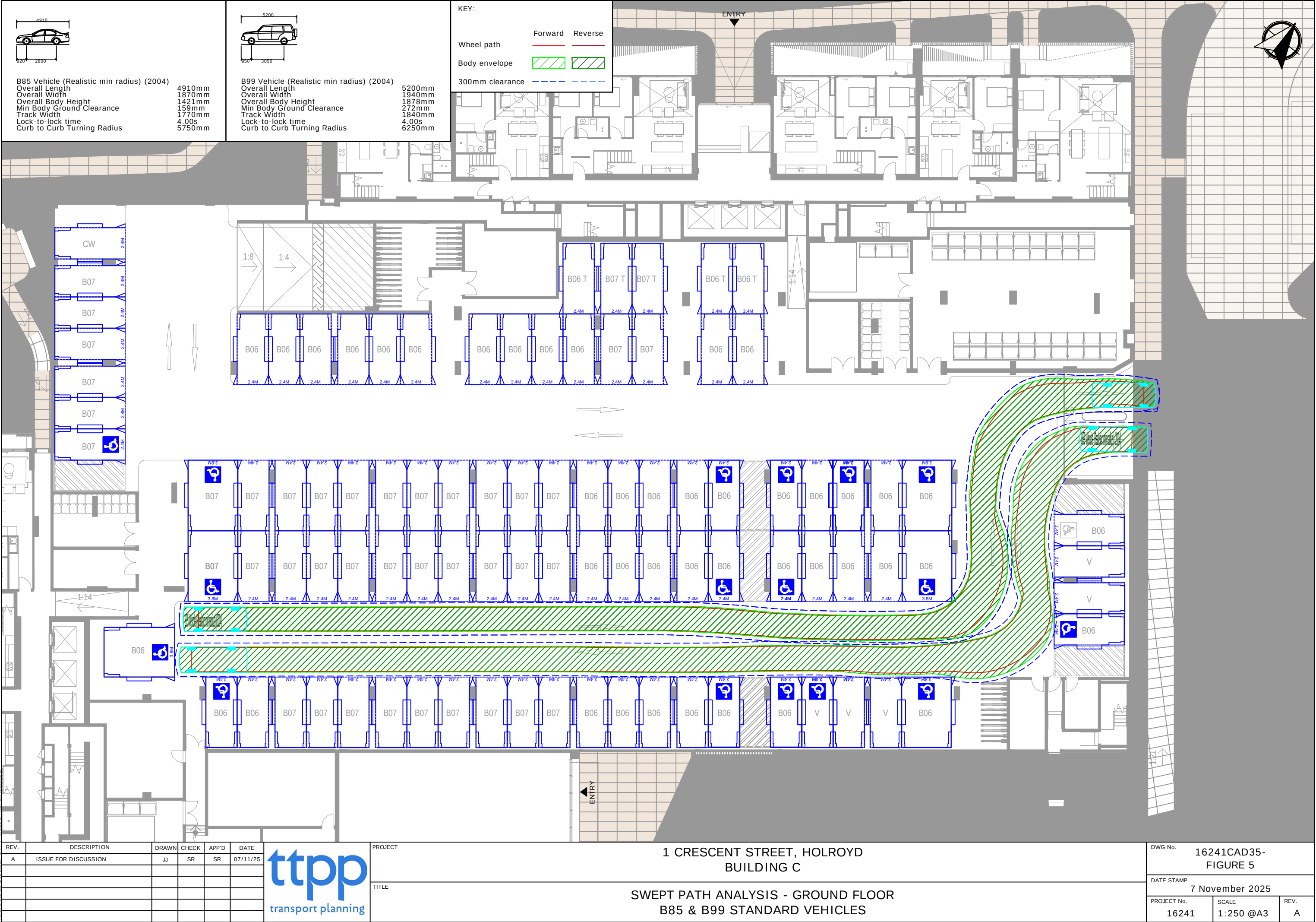


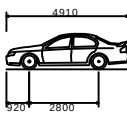
REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	JJ	SR	SR	07/11/25

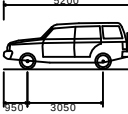


PROJECT	1 CRESCENT STREET, HOLROYD BUILDING C	
TITLE	CAR PARK DESIGN REVIEW LEVEL 3	

DWG No. 16241CAD35- FIGURE 4		
DATE STAMP 7 November 2025		
PROJECT No. 16241	SCALE 1:250 @A3	REV. A



	B85 Vehicle (Realistic min radius) (2004)
Overall Length	4910mm
Overall Width	1870mm
Overall Body Height	1421mm
Min Body Ground Clearance	159mm
Track Width	1770mm
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	5750mm

	B99 Vehicle (Realistic min radius) (2004)
Overall Length	5200mm
Overall Width	1940mm
Overall Body Height	1678mm
Min Body Ground Clearance	272mm
Track Width	1840mm
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6250mm

KEY:		
Wheel path	Forward	Reverse
Body envelope		
300mm clearance		

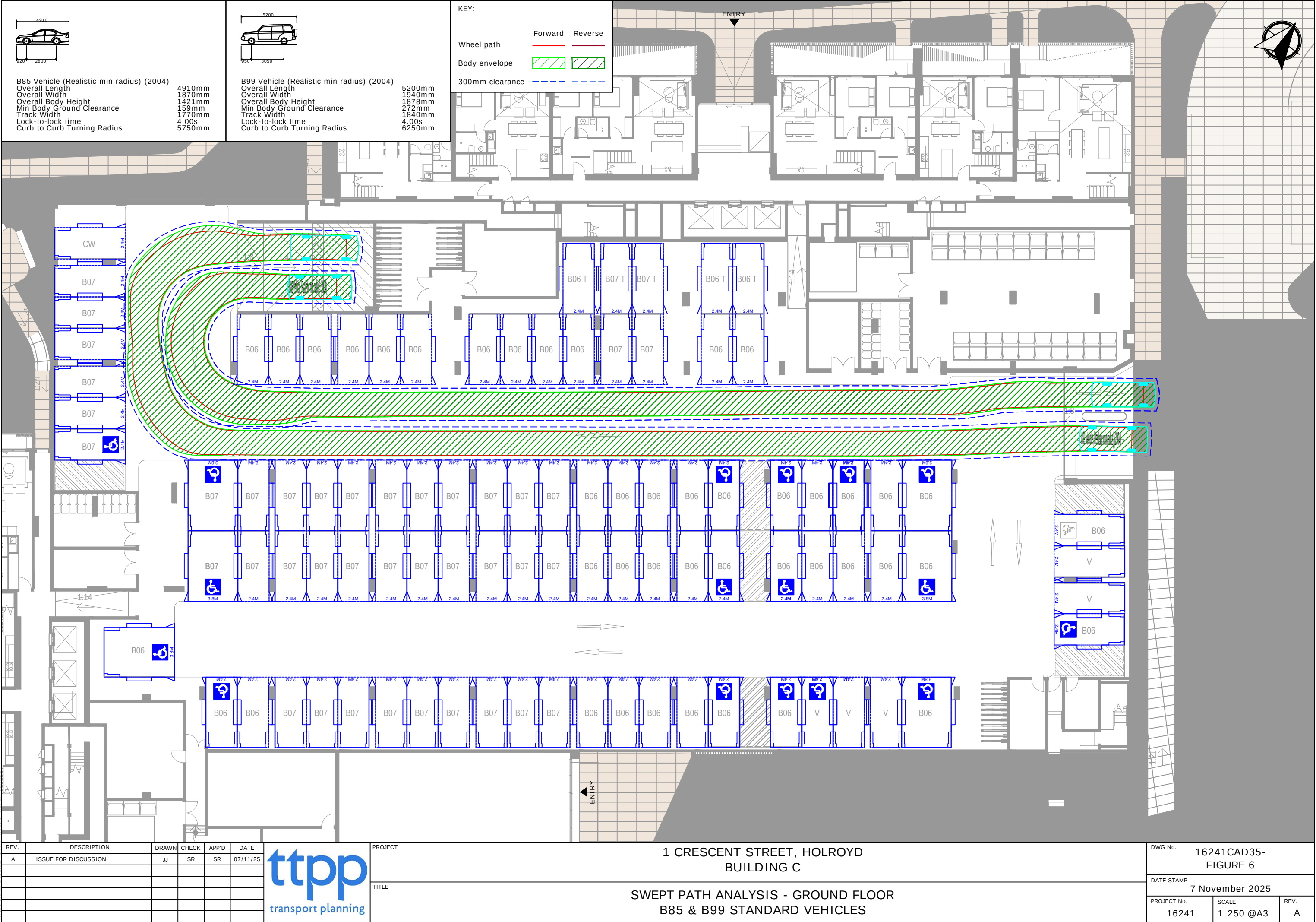
REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	JJ	SR	SR	07/11/25



PROJECT	1 CRESCENT STREET, HOLROYD BUILDING C
TITLE	SWEPT PATH ANALYSIS - GROUND FLOOR B85 & B99 STANDARD VEHICLES

DWG No.	16241CAD35- FIGURE 5
DATE STAMP	7 November 2025
PROJECT No.	16241
SCALE	1:250 @A3
REV.	A

Filename: 16241CAD35-25107-CAR PARK DESIGN REVIEW Building C



REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	JJ	SR	SR	07/11/25



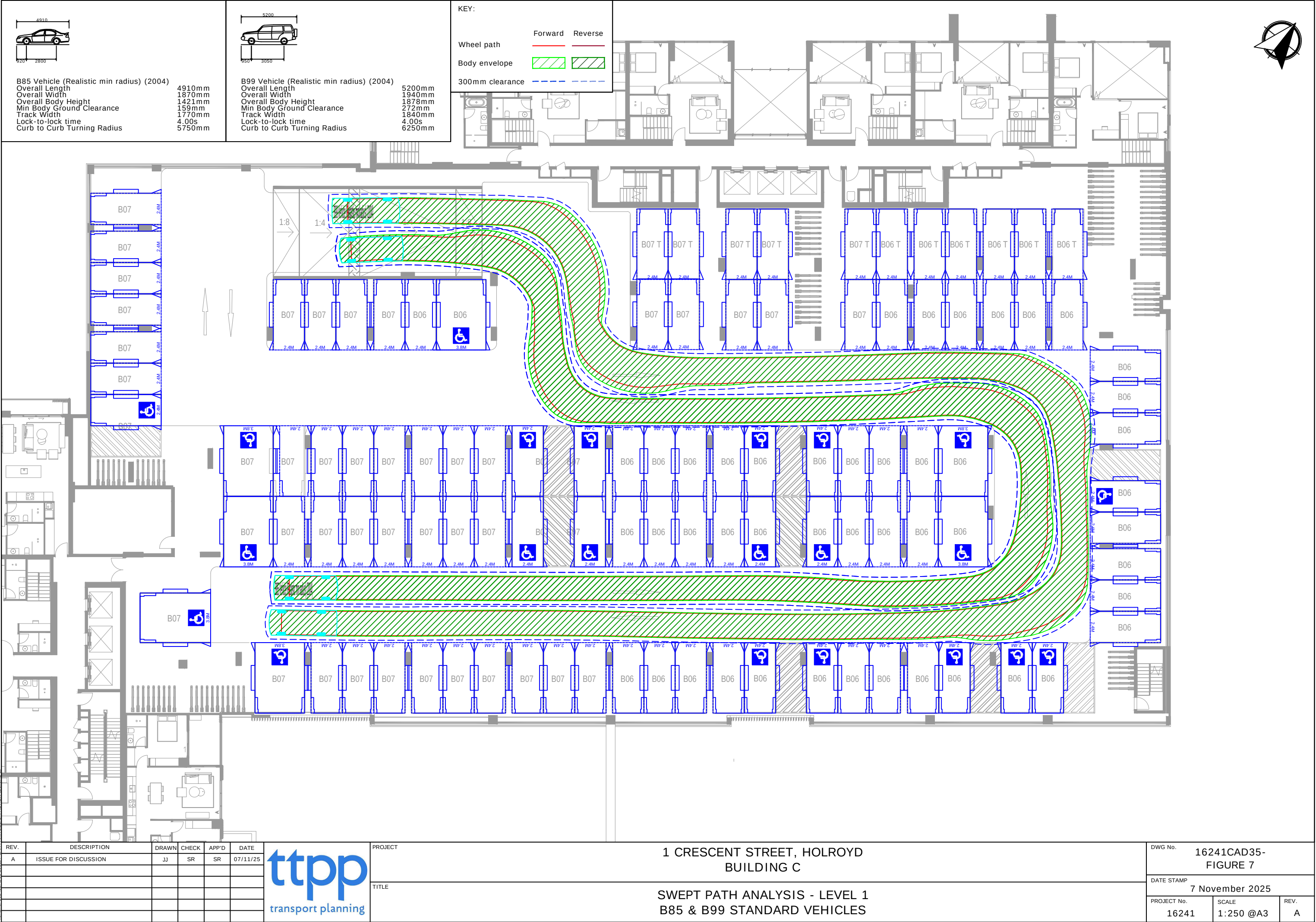
PROJECT

1 CRESCENT STREET, HOLROYD
BUILDING C

TITLE

SWEPT PATH ANALYSIS - GROUND FLOOR
B85 & B99 STANDARD VEHICLES

DWG No. 16241CAD35- FIGURE 6		
DATE STAMP 7 November 2025		
PROJECT No. 16241	SCALE 1:250 @A3	REV. A



B85 Vehicle (Realistic min radius) (2004)

Overall Length	4910mm
Overall Width	1870mm
Overall Body Height	1421mm
Min Body Ground Clearance	159mm
Track Width	1770mm
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	5750mm

B99 Vehicle (Realistic min radius) (2004)

Overall Length	5200mm
Overall Width	1940mm
Overall Body Height	1678mm
Min Body Ground Clearance	272mm
Track Width	1840mm
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6250mm

KEY:

Wheel path	Forward	Reverse
Body envelope		
300mm clearance		

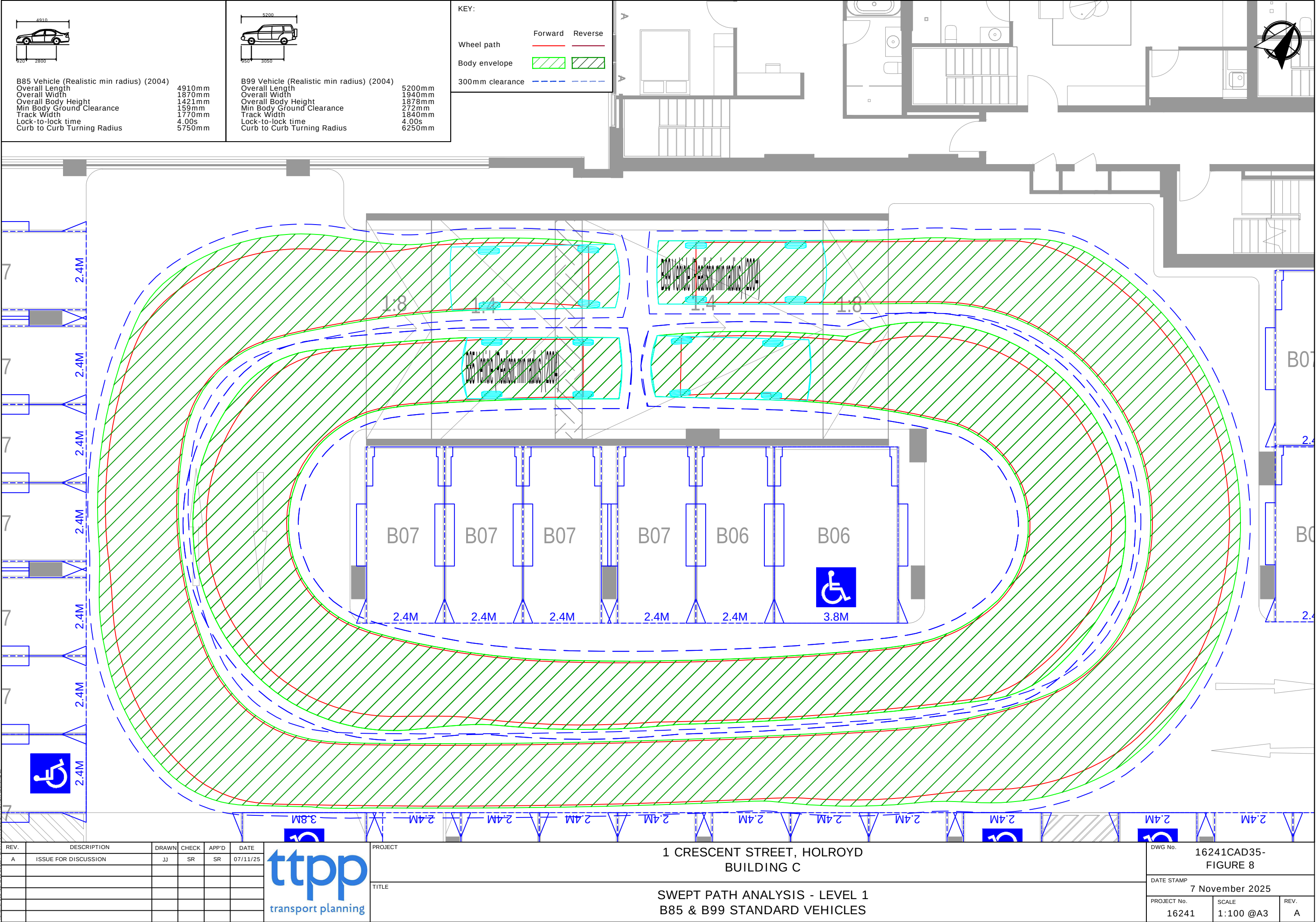
REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	JJ	SR	SR	07/11/25

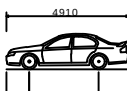


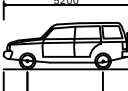
PROJECT	1 CRESCENT STREET, HOLROYD BUILDING C
TITLE	SWEPT PATH ANALYSIS - LEVEL 1 B85 & B99 STANDARD VEHICLES

DWG No.	16241CAD35- FIGURE 7		
DATE STAMP	7 November 2025		
PROJECT No.	SCALE	REV.	
16241	1:250 @A3	A	

Filename: 16241CAD35-25107-CAR PARK DESIGN REVIEW Building C



	B85 Vehicle (Realistic min radius) (2004)
Overall Length	4910mm
Overall Width	1870mm
Overall Body Height	1421mm
Min Body Ground Clearance	159mm
Track Width	1770mm
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	5750mm

	B99 Vehicle (Realistic min radius) (2004)
Overall Length	5200mm
Overall Width	1940mm
Overall Body Height	1878mm
Min Body Ground Clearance	272mm
Track Width	1840mm
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6250mm

KEY:	
Wheel path	Forward Reverse
Body envelope	 
300mm clearance	

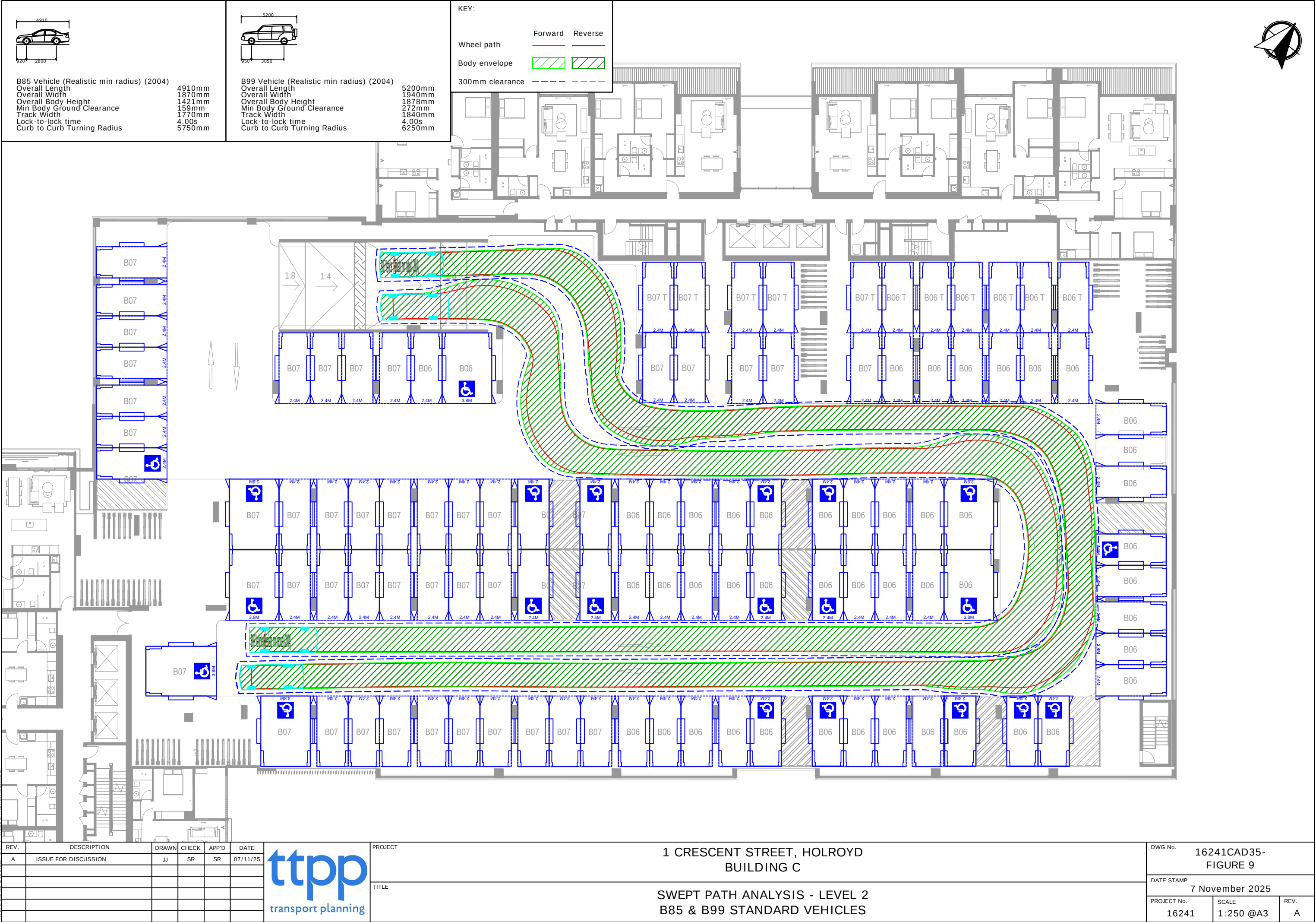
REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	JJ	SR	SR	07/11/25



PROJECT	1 CRESCENT STREET, HOLROYD BUILDING C
TITLE	SWEPT PATH ANALYSIS - LEVEL 1 B85 & B99 STANDARD VEHICLES

DWG No.	16241CAD35- FIGURE 8
DATE STAMP	7 November 2025
PROJECT No.	16241
SCALE	1:100 @A3
REV.	A

Filename: 16241CAD35-25107-CAR PARK DESIGN REVIEW Building C



B85 Vehicle (Realistic min radius) (2004)	
Overall Length	4910mm
Overall Width	1870mm
Overall Body Height	1421mm
Min Body Ground Clearance	159mm
Track Width	1770mm
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	5750mm

B99 Vehicle (Realistic min radius) (2004)	
Overall Length	5200mm
Overall Width	1940mm
Overall Body Height	1978mm
Min Body Ground Clearance	272mm
Track Width	1840mm
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6250mm

KEY:	
Wheel path	Forward Reverse
Body envelope	
300mm clearance	

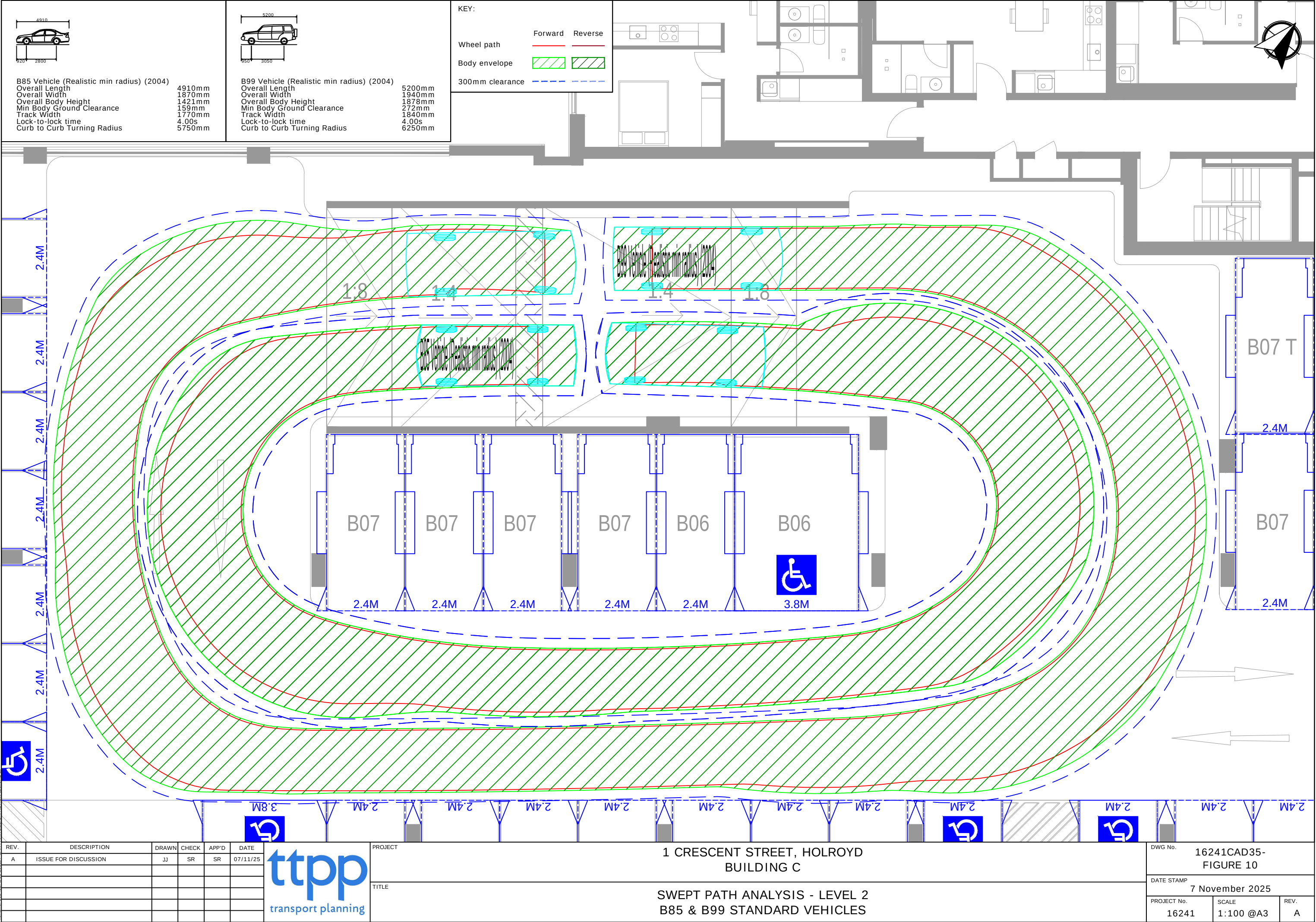
REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	JJ	SR	SR	07/11/25

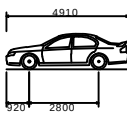
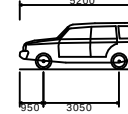


PROJECT	1 CRESCENT STREET, HOLROYD BUILDING C
TITLE	SWEPT PATH ANALYSIS - LEVEL 2 B85 & B99 STANDARD VEHICLES

DWG No. 16241CAD35- FIGURE 9	
DATE STAMP 7 November 2025	
PROJECT No. 16241	SCALE 1:250 @A3
REV. A	

Filename: 16241CAD35-25107-CAR PARK DESIGN REVIEW Building C



	
B85 Vehicle (Realistic min radius) (2004)	B99 Vehicle (Realistic min radius) (2004)
Overall Length	4910mm
Overall Width	1870mm
Overall Body Height	1421mm
Min Body Ground Clearance	159mm
Track Width	1770mm
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	5750mm

KEY:	Forward	Reverse
Wheel path		
Body envelope		
300mm clearance		

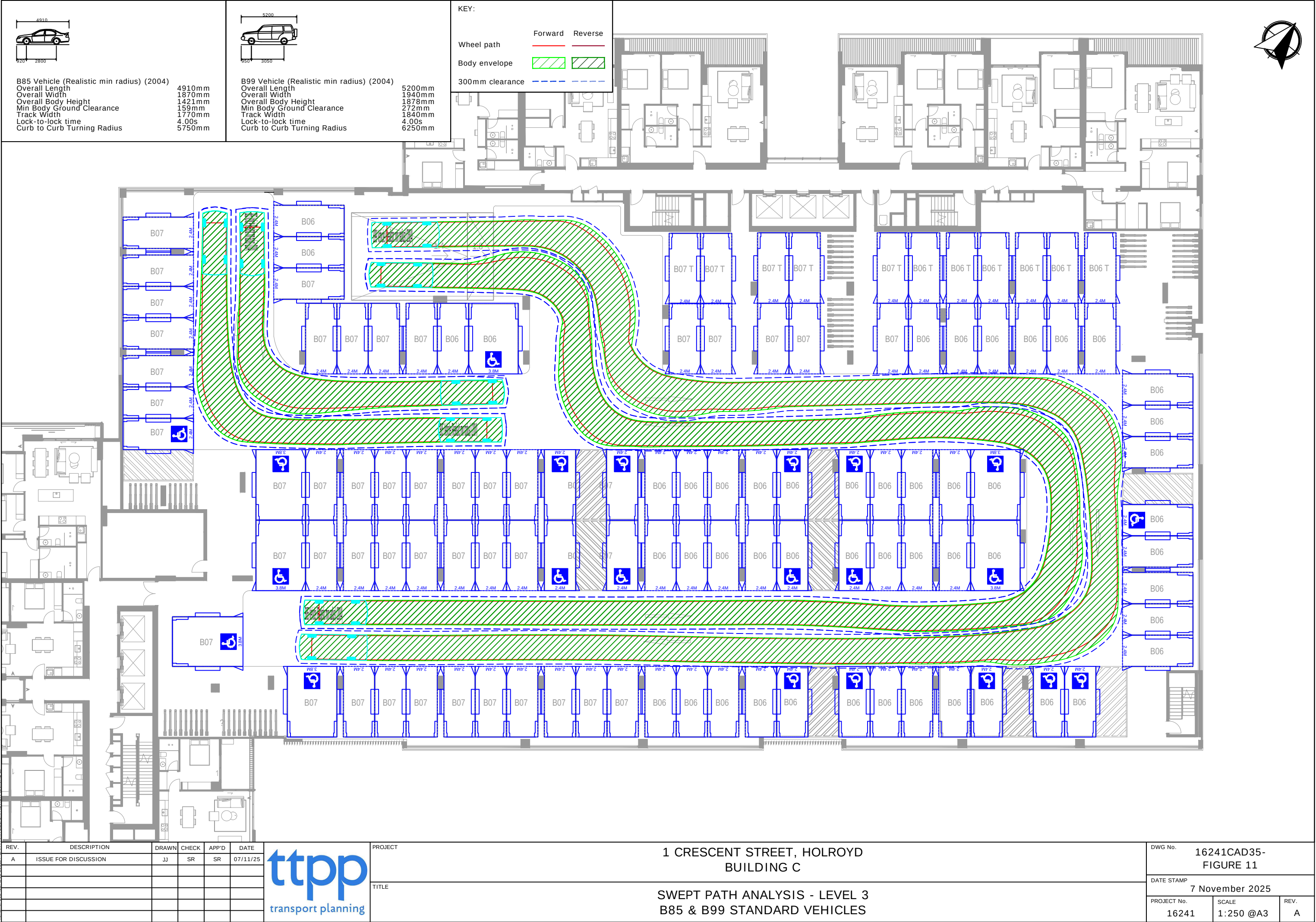
REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	JJ	SR	SR	07/11/25



PROJECT	1 CRESCENT STREET, HOLROYD BUILDING C
TITLE	SWEPT PATH ANALYSIS - LEVEL 2 B85 & B99 STANDARD VEHICLES

DWG No.	16241CAD35- FIGURE 10		
DATE STAMP	7 November 2025		
PROJECT No.	SCALE	REV.	
16241	1:100 @A3	A	

Filename: 16241CAD35-25107-CAR PARK DESIGN REVIEW Building C



REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	JJ	SR	SR	07/11/25



PROJECT	1 CRESCENT STREET, HOLROYD BUILDING C
TITLE	SWEPT PATH ANALYSIS - LEVEL 3 B85 & B99 STANDARD VEHICLES

DWG No.		16241CAD35- FIGURE 11	
DATE STAMP 7 November 2025			
PROJECT No.	SCALE	REV.	
16241	1:250 @A3	A	

Appendix C

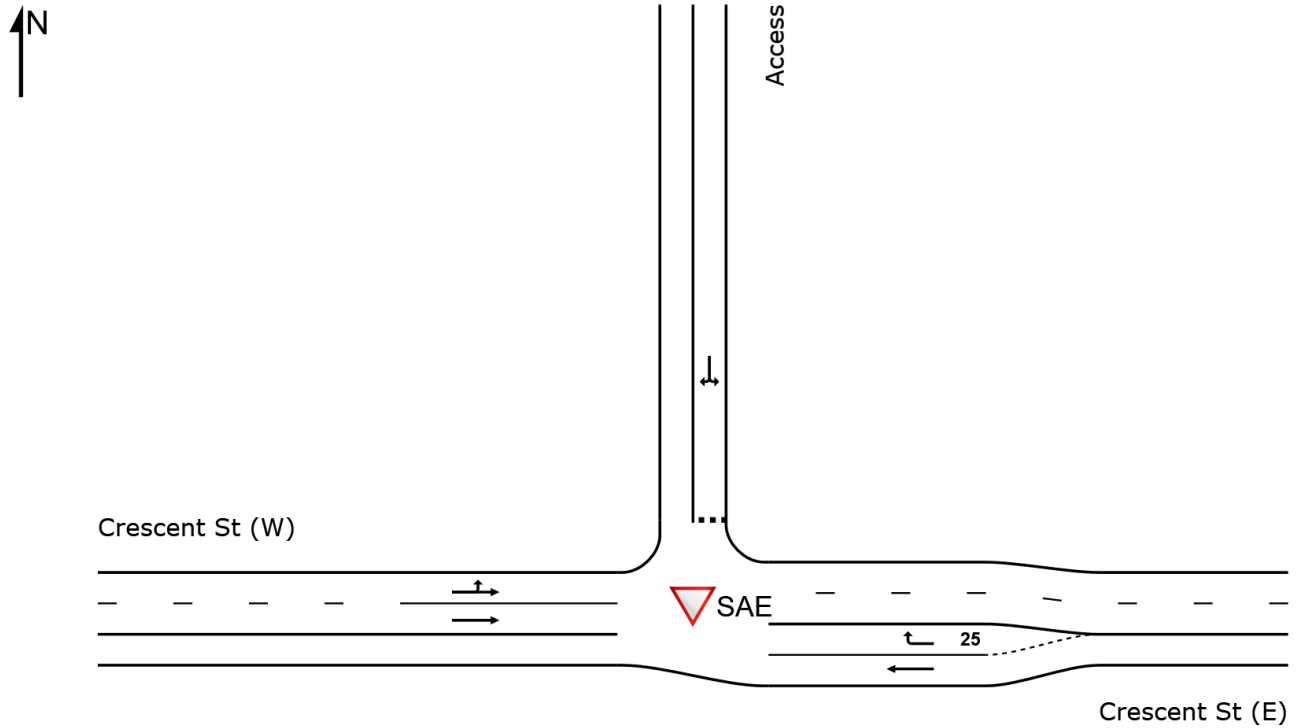
SIDRA Analysis

SITE LAYOUT

▽ Site: SAE [46.Site Access (E) (Site Folder: Site Access Points AM)]

Site Category: -
Give-Way (Two-Way)

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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Organisation: TTPP - THE TRANSPORT PLANNING PARTNERSHIP | Licence: NETWORK / 1PC | Created: Tuesday, 16 September 2025 9:11:33 PM

Project: C:\Users\stephen.read\OneDrive - THE TRANSPORT PLANNING PARTNERSHIP PTY LTD\16241 Crescent Parklands\07 Modelling Files\SIDRA\SIDRA 9\2023\16241-Crescent Parklands-250916 RTS.sip9

MOVEMENT SUMMARY

Site: SAE [50.Site Access (E) (Site Folder: Site Access Points SAT)]

Network: N101 [SAT (Network Folder: General)]

Site Category: -
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %	v/c	sec		[Veh. veh	Dist m				km/h
East: Crescent St (E)														
5	T1	523	3.0	523	3.0	0.276	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
6	R2	121	0.0	121	0.0	0.203	8.3	LOS A	0.2	1.7	0.48	0.73	0.48	41.6
Approach		644	2.4	644	2.4	0.276	1.6	NA	0.2	1.7	0.09	0.14	0.09	44.7
North: Access														
7	L2	93	0.0	93	0.0	0.534	8.8	LOS A	1.2	8.7	0.30	0.68	0.51	35.5
9	R2	127	0.0	127	0.0	0.534	23.1	LOS B	1.2	8.7	0.30	0.68	0.51	34.3
Approach		220	0.0	220	0.0	0.534	17.1	LOS B	1.2	8.7	0.30	0.68	0.51	34.8
West: Crescent St (W)														
10	L2	99	0.0	99	0.0	0.082	4.6	LOS A	0.0	0.0	0.00	0.35	0.00	46.2
11	T1	367	3.0	367	3.0	0.082	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	48.6
Approach		466	2.4	466	2.4	0.082	1.0	NA	0.0	0.0	0.00	0.11	0.00	47.6
All Vehicles		1331	2.0	1331	2.0	0.534	3.9	NA	1.2	8.7	0.09	0.22	0.13	41.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: SAE [46.Site Access (E) (Site Folder: Site Access Points AM)]

Network: N101 [AM (Network Folder: General)]

Site Category: -
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %	v/c	sec		[Veh. veh	Dist] m				km/h
East: Crescent St (E)														
5	T1	229	3.0	229	3.0	0.121	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	50.0
6	R2	135	0.0	135	0.0	0.184	8.2	LOS A	0.6	4.3	0.54	0.77	0.54	41.3
Approach		364	1.9	364	1.9	0.184	3.0	NA	0.6	4.3	0.20	0.29	0.20	42.9
North: Access														
7	L2	132	0.0	132	0.0	0.561	9.0	LOS A	3.5	24.4	0.58	0.91	1.01	36.9
9	R2	146	0.0	146	0.0	0.561	19.8	LOS B	3.5	24.4	0.58	0.91	1.01	35.8
Approach		278	0.0	278	0.0	0.561	14.7	LOS B	3.5	24.4	0.58	0.91	1.01	36.4
West: Crescent St (W)														
10	L2	88	0.0	88	0.0	0.165	4.6	LOS A	0.0	0.0	0.00	0.15	0.00	47.8
11	T1	539	3.0	539	3.0	0.165	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	48.3
Approach		627	2.6	627	2.6	0.165	0.7	NA	0.0	0.0	0.00	0.08	0.00	48.1
All Vehicles		1269	1.8	1269	1.8	0.561	4.4	NA	3.5	24.4	0.18	0.32	0.28	42.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: SAE [48.Site Access (E) (Site Folder: Site Access Points Network: N101 [PM (Network PM)] Folder: General)]

Site Category: -
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %	v/c	sec		[Veh. veh	Dist] m				km/h
East: Crescent St (E)														
5	T1	552	3.0	552	3.0	0.290	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
6	R2	158	0.0	158	0.0	0.266	8.6	LOS A	0.9	6.1	0.50	0.77	0.53	41.3
Approach		709	2.3	709	2.3	0.290	1.9	NA	0.9	6.1	0.11	0.17	0.12	44.0
North: Access														
7	L2	79	0.0	79	0.0	0.519	8.8	LOS A	2.8	19.8	0.17	0.60	0.29	34.9
9	R2	117	0.0	117	0.0	0.519	24.4	LOS B	2.8	19.8	0.17	0.60	0.29	33.6
Approach		196	0.0	196	0.0	0.519	18.1	LOS B	2.8	19.8	0.17	0.60	0.29	34.2
West: Crescent St (W)														
10	L2	131	0.0	131	0.0	0.083	4.6	LOS A	0.0	0.0	0.00	0.45	0.00	45.4
11	T1	341	3.0	341	3.0	0.083	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	49.1
Approach		472	2.2	472	2.2	0.083	1.3	NA	0.0	0.0	0.00	0.15	0.00	47.1
All Vehicles		1377	1.9	1377	1.9	0.519	4.0	NA	2.8	19.8	0.08	0.22	0.10	41.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network 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: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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