Inspiring Innovation in Parking and Transport

Transport Impact Statement

36 Clarke Crescent, Joondalup

Project number 12020

February 2024

Contents

1 Introduction

Level5Design (L5D) has been commissioned by Harvey Norman to prepare a Transport Impact Statement (TIS) for the expansion of the Harvey Norman Store in Joondalup. The proposal includes the extension of the current showroom and the construction of an additional floor, providing further showroom space and parking area ('the Development'). Core to the development will be advancing the existing shopfront forward and increasing the ground floor show room space to provide an additional 3,003 m^2.

This TIS has been prepared in accordance with the Western Australian Planning Commission (WAPC) *Transport Impact Assessment Guidelines for Developments: Volume* 4 - Individual *Developments* (2016) and the checklist is included in Appendix A. The Guidelines promote a three-level assessment process, where the required level of assessment is dependent on the likely level of impact, as follows (and as shown in Figure 1.1):

- Low impact – less than 10 peak hour trips, no assessment required,
- Moderate impact – between 10 and 100 peak hour trips, Transport Impact Statement required, and
- High Impact – more than 100 peak hour trips, full Transport Impact Assessment required.

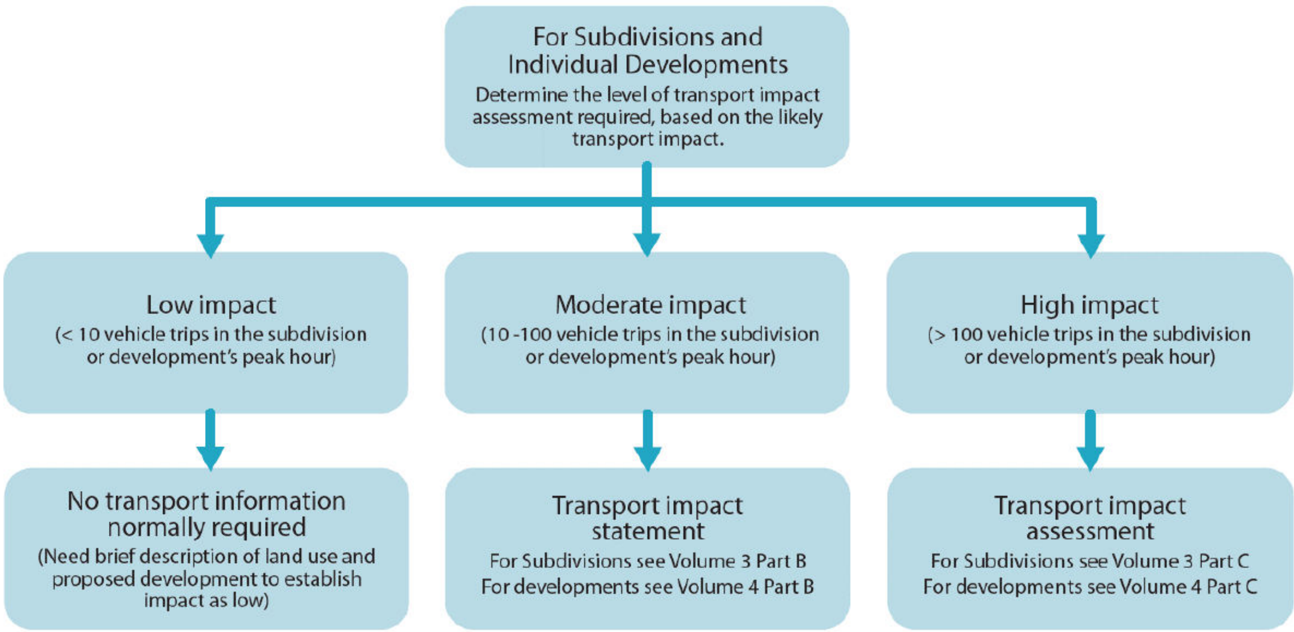

Figure 1.1 - Level of Transport Impact Assessment Required
(Source: WAPC Transport Impact Assessment Guidelines 2016)

The additional traffic generated by the Development has been determined to be between 10 and 100 vehicles during peak hour periods and therefore, a less comprehensive Transport Impact Statement (TIS) is required. Nonetheless, to be thorough and ensure all significant traffic impacts are considered, many of the requirements for a Transport Impact Assessment (TIA) have been undertaken. This higher level of assessment also recognises the need to properly assess the proposed changes to the immediate surrounding road network.

2 Existing Situation

2.1 Existing Site

The Subject Site (the 'Site') is located 36 Clarke Crescent, within the City of Joondalup ('the City'). An aerial image of the Subject Site is shown in Figure 2.1. The Site currently hosts the Harvey Norman Joondalup Store (the 'Store') and its car park, comprising 238 bays. Landscaping with trees and a footpath line the western border of the Site.

The Site is bounded by Joondalup Drive to the west, the Joondalup Train line to the east, and health/retail centres to the north and south. These areas are encapsulated by the Clarke Crescent and Onslow Place Roads. The Site is currently accessible via three crossovers at the eastern and southern borders of the Site, all connecting the Site to Clarke Crescent.

Figure 2.1 - Existing Subject Site (Source: Google Maps, 2023, Annotated for Presentation)

2.2 Site Context

The Store is located close to the centre of Joondalup, within 1 km of Lakeside Joondalup Shopping City and Edith Cowan University, and within 2 kms of HBF Arena.

The opening hours of the Store are 11/12 AM to 5 PM Sunday and Monday, 9 AM to 5/5:30 PM Tuesday, Wednesday, Friday and Saturday, and 9 AM to 9 PM Thursday.

The Store currently has 7,049 m^2 of net lettable floor area, comprising showroom and warehouse space. The Store also features of a 238-bay parking lot. A floorplan of the existing site is provided in Appendix B.

Figure 2.2 shows the location of the Site in the context of the City of Joondalup, with all natural and man-made features shown.

Figure 2.2 - Site in Surroundings (Source: Google Maps, 2023, Annotated for Presentation)

Figure 2.3 shows the location of the Site in the context of the surrounding road and public open space networks.

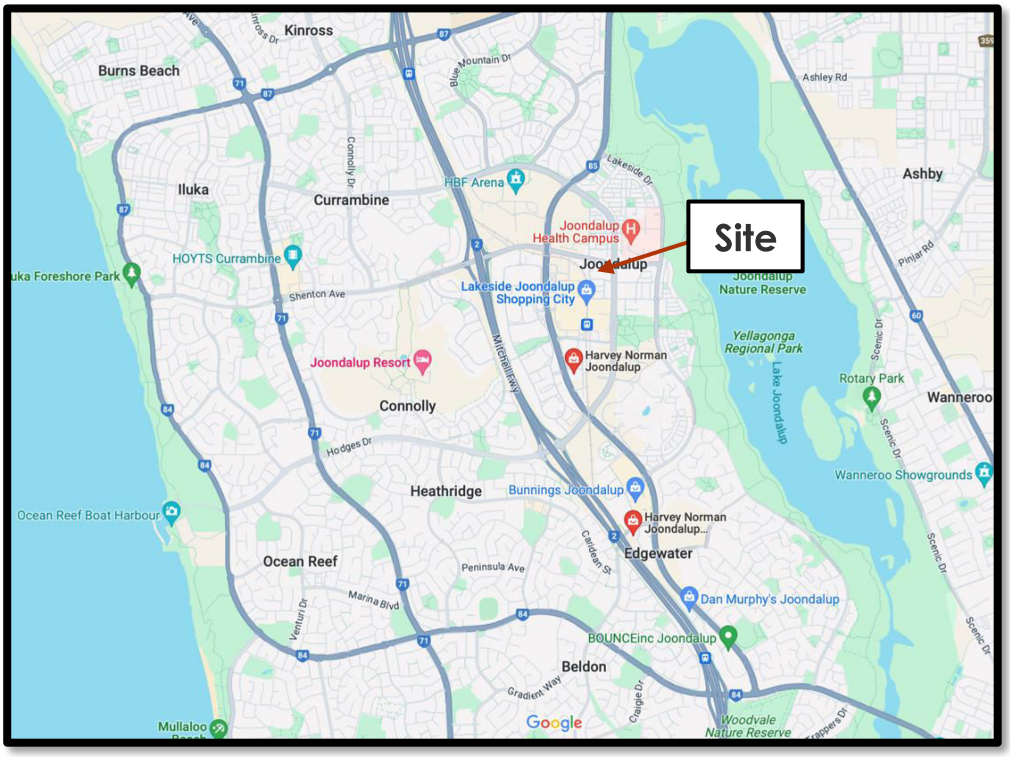

Figure 2.3 - Site Relative to Surrounding Road & Public Open Space Networks
(Source: Google Maps, 2023, Annotated for Presentation)

2.3 Surrounding Area Use & Zoning

Figure 2.4 shows a section of the zoning map for the suburb of Joondalup City, featuring the area surrounding the Site. Zones marked in light beige with blue outlines are indicated to be “Centre Zones”, which are zones specified to be areas designated for future development as activity centres as specified in the City of Joondalup’s Local Planning Scheme No. 3 (LPS3).

Currently in these zones are the Harvey Norman Joondalup Store along with other commercial tenancies including Lakeside Joondalup Shopping City, Bunnings Joondalup, Sydney Tools and Edith Cowan University. The Site is firmly situated within Joondalup’s main Centre Zone, with no other zones present within a 600-metre radius.

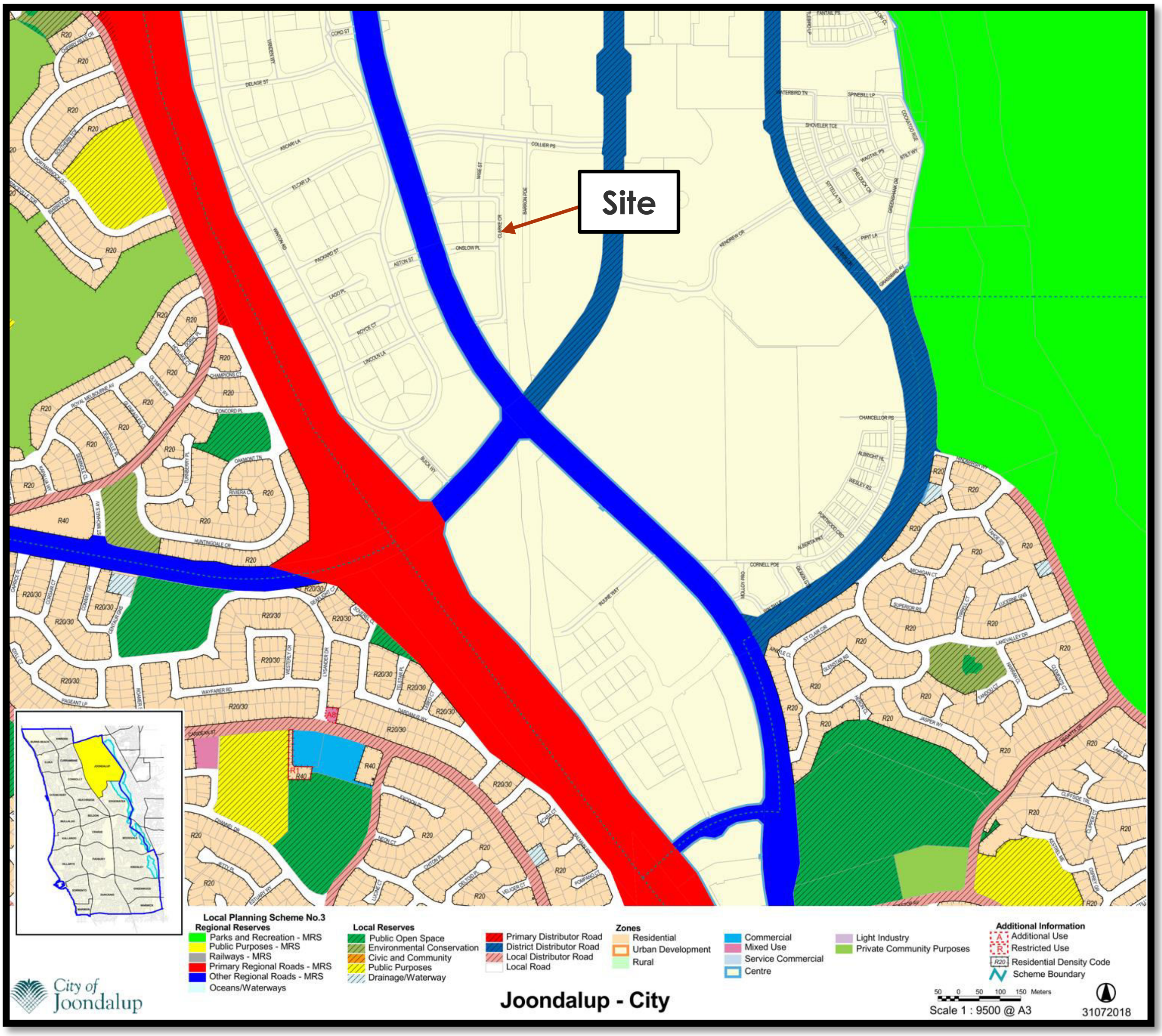

Figure 2.4 - Local Planning Scheme (Source: City of Joondalup, ‘Scheme Map - Joondalup City’)

2.4 Existing Business

Harvey Norman Joondalup operates as a prominent bulky goods retail establishment in the central Joondalup area, showcasing consumer electronics, furniture, bedding, and home appliances. The Joondalup store prioritises a spacious layout. This design allows customers to physically explore the range of offerings in person. The Store currently has 7,049 m^2 of net lettable floor area (NLA), consisting of showroom space, staff amenities, two offices, a loading bay and warehouse storage.

2.5 Nearby Development Applications

The details of recent developments and proposals within the vicinity of the Development are presented below.

2.5.1 Lot 45 (8) Elcar Lane, Joondalup

A 3-storey mixed-use development proposed on the south-western side of Joondalup Drive is being reconsidered for determination. This development is forecast to have negligible impact on the roads providing direct access to the Harvey Norman Joondalup site.

2.5.2 Lot 500 (60) Shenton Avenue, Joondalup

The expansion of the existing public hospital north of Shenton Avenue. This is reasonably distant from the Harvey Norman Joondalup site and will have negligible impact on access to the Site.

2.5.3 Lot 500 (60) Shenton Avenue, Joondalup (Private Hospital)

The expansion of existing private hospital north of Shenton Avenue. This is reasonably distant from the Harvey Norman Joondalup site. It will also have negligible impact on access to the Site.

2.5.4 Black Spot Project (Hodges Drive/Joondalup Drive/Grand Boulevard Intersection)

The City of Joondalup currently has a Blackspot project planned at the Hodges Drive/Joondalup Drive/Grand Boulevard intersection. The project is designed to improve traffic flow and efficiency by undertaking the following modifications to the intersection:

- Installing an additional right turn lane from Hodges Drive into Joondalup Drive Southbound, resulting in a double right turn,
- Extending the right-hand slip lane from Joondalup Drive into Hodges Drive for improved accessibility and capacity,
- Implementing fresh road markings and new signage for the Mitchell Freeway entrance and exit ramps,
- Demarcating the cycle lanes with green paint, and
- Updating pedestrian crossing facilities to ensure compliance with MRWA standards.

Construction for these modifications is scheduled from late 2024/25 to the 2025/26 Financial year. They are expected to help improve the operation of the surrounding road network and will deliver positive traffic improvement outcomes.

2.6 Existing Road Network

The road classification in the vicinity of the Site as classified by the MRWA Metropolitan Functional Road Hierarchy (MFRH) is shown in Figure 2.5.

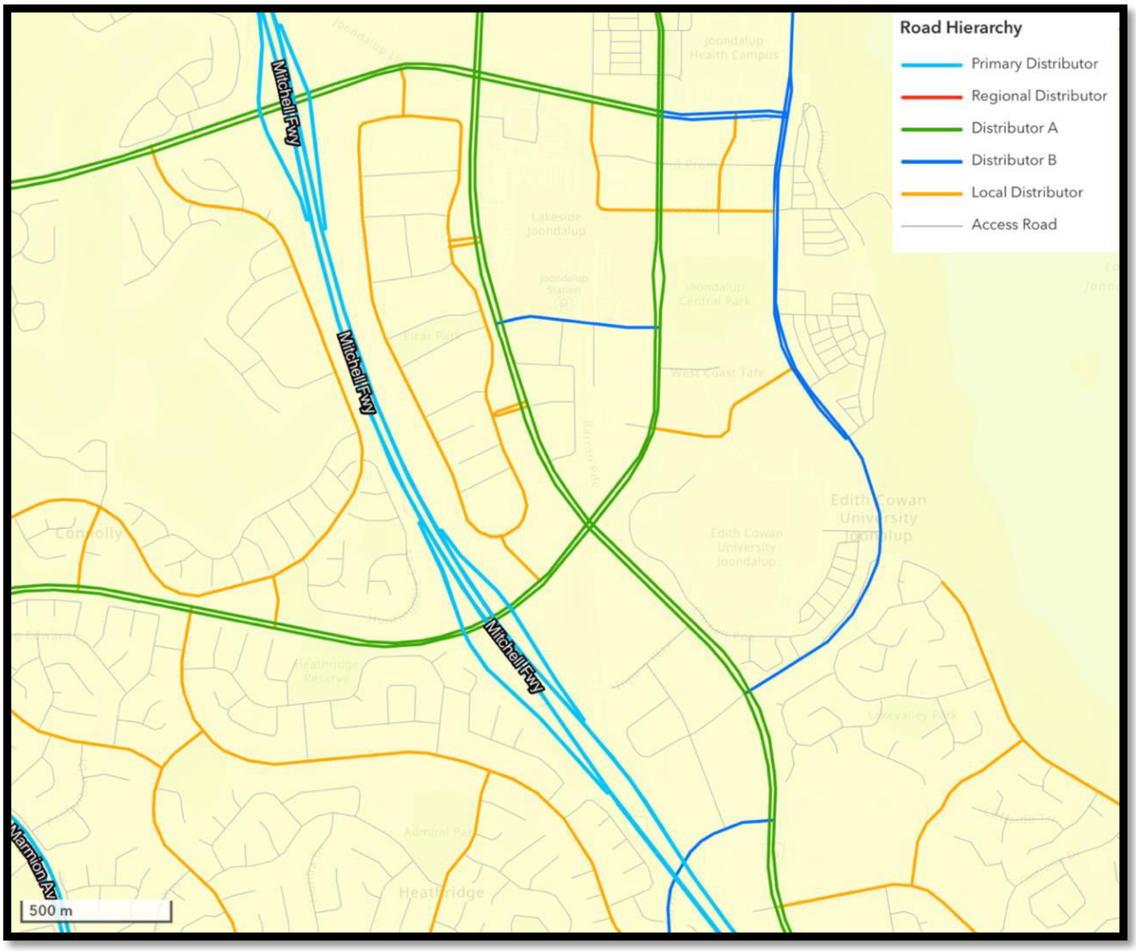

Figure 2.5 - Road Network Classification (Source: MRWA Road Information Mapping System)

2.6.1 Mitchell Freeway

Mitchell Freeway is classified as a 'Primary Distributor'. The road is under the jurisdiction of Main Roads and is a six-lane divided carriageway. The posted speed on Mitchell is 100 km/h.

2.6.2 Hodges Drive/Grand Boulevard

Hodges Drive is classified as a 'Distributor Type A'. The road is under the jurisdiction of the City of Joondalup. It has a 4-lane dual carriageway with a wide median and space for protected turns. The road has paved footpaths on both sides of the road. The pathway on the southern side is wider and lane-marked for cyclists. The kerb-to-kerb width is 25 m, a large amount of this width being made up of a wide median island and the slip lanes at the Mitchell Freeway and Joondalup Drive intersections. The posted speed limit is 70 km/h.

2.6.3 Joondalup Drive

Joondalup Drive is classified as a 'Distributor Type A'. It comes under the jurisdiction of the City of Joondalup. It is also a 4-lane dual carriageway with a wide median and protected turns. The road passes the Site on the western side. There are paved footpaths marked for cyclists on both sides of the road in the vicinity of the Site and the kerb-to-kerb width of the road is approximately 25 m. It has a posted speed limit of 70 km/h.

2.6.4 Collier Pass

Collier Pass is classified as 'Distributor B' road that comes under the jurisdiction of the City of Joondalup. The road connects Joondalup Drive to Grand Boulevard. It is a 2-lane road with a central medium providing protected right-turns. The road also has footpaths on both sides and parallel parking on the southern side. The kerb-to-kerb width of the road is approximately 15 m. It has a posted speed limit of 50 km/h.

2.6.5 Wise Street

Wise Street is classified as an 'Access Road' that comes under the jurisdiction of the City of Joondalup. The road connects Collier Pass to Clarke Crescent. It is a 2-lane road with footpaths and parallel parking on both sides. The kerb-to-kerb width of the road is approximately 7 m. It has a posted speed limit of 50 km/h.

2.6.6 Clarke Crescent

Clarke Crescent is classified as an 'Access Road' that comes under the jurisdiction of the City of Joondalup. It is a 2-lane side-street branching from Joondalup Drive South, encircling the Site and the retail block to the north of the Site. It re-joins Joondalup Drive further south past the Site. The road has footpaths and parallel parking on both sides, and the kerb-to-kerb width of the road is approximately 7 m. It has a posted speed limit of 50 km/h. The road bounds the Site to the east and south, providing access to the Site via 3 crossovers: two to the car park, and one to the service area.

2.6.7 Onslow Place

Onslow Place is classified as an 'Access Road' that comes under the jurisdiction of the City of Joondalup. It is a 2-lane cul-de-sac that is linked to Clarke Crescent and bounds the Site to the north. The road also has footpaths and parallel parking on both sides, and the kerb-to-kerb width of the road is approximately 7 m. It has a posted speed limit of 50 km/h.

Table 2.1 - Summary of Road Network Characteristics

Road Name	Road Hierarchy		Road Network			
	Road Hierarchy	Capacity (2-way vph) [1]	Road Configuration	No. and width of paved verge / footpath	Kerb to kerb Width	Posted Speed (km/h)
Hodges Drive	Distributor A	3,800	4-Lane divided carriageway with wide median and protected right turns.	2 x 4 m	25 m	70
Joondalup Drive	Distributor A	3,800	4-Lane divided carriageway with wide median and protected right turns.	2 x 4 m	25 m	70
Collier Pass	Distributor B	300	2-Lane	2 x 4 m	15 m	50
Wise Street	Access Road	300	2-Lane	2 x 4 m	7 m	50
Clarke Crescent	Access Road	300	2-Lane	2 x 3 m	7 m	50
Onslow Place[2]	Access Road	300	2-Lane	2 x 3 m	7 m	50

[1] Based on Austroads Guide to Traffic Management Part 3 and the MRWA Functional Road Hierarchy. For a 60 km/hr District Distributor it assumes 1,000 vehicles per hour per lane for the median lane of a divided road with interrupted flow, 900 vehicles per hour per lane for a kerbside lane with interrupted flow or a median lane on an undivided road or where adjacent to a parking lane, and 600 vehicles per lane where the lane has occasional parked vehicles. For a Local Distributor it assumes 6,000 vehicles per day two-way, and for a residential local Access Road it assumes 3,000 vehicles per day two-way with the peak hour being one tenth of the daily traffic volume.

2.7 Existing Traffic Volumes

The weekday PM peak hour in the vicinity of the Site is typically between 4 pm and 5 pm. The weekend peak hour is typically between 12.30 pm and 1.30 pm.

Traffic data reproduced from the Main Roads TrafficMap is presented in Table 2.2. Traffic data provided by the City of Joondalup is presented in Table 2.3.

Table 2.2 - Existing Traffic Volumes from Main Roads TrafficMap

Road Network	Avg. Weekday AM peak (vph)	Avg. Weekday PM peak (vph)	Avg. Daily Traffic Volume (vpd)	Percent HRV (%)
Mitchell Freeway (Nth) (At Shenton Ave Bridge) (2021/22 Data)	1,675 (7 AM-8 AM)	3,297 (3 PM-4 PM)	33,888	12.7%
Mitchell Freeway (Sth) (At Shenton Ave Bridge) (2021/22 Data)	2,833 (5 AM-6 AM)	2,007 (3 PM-4 PM)	32,601	9.2%
Hodges Drive (West of Joondalup Dr) (2020/21 Data)	2,369 (8 AM-9 AM)	2,717 (3 PM-4 PM)	31,289	4.2%
Joondalup Drive (North of Hodges Dr) (2021/22 Data)	2,332 (10 AM–11 AM)	2,439 (3 PM-4 PM)	27,026	7.5%
Joondalup Drive (North of Shenton Ave) (2021/22 Data)	1,611 (8 AM-9 AM)	1,981 (3 PM-4 PM)	21,208	5.2%
Shenton Avenue (East of Joondalup Dr) (2021/22 Data)	1,340 (8 AM-9 AM)	1,584 (3 PM-4 PM)	19,108	6.0%

Table 2.3 - Existing Traffic Volumes from the City of Joondalup

Road	Survey Location	Avg. Daily Traffic Volume (vpd)
Clarke Crescent	East of Joondalup Drive (June 2021 Data)	1,335
	South of Onslow Place (April 2019 Data)	1,450
	East of Wise Street (April 2019 Data)	1,421
Joondalup Drive	North of Hodges Drive (Oct 2022 Data)	24,828
Wise Street	South of Collier Pass (June 2021)	1,315

Traffic surveys were conducted in the busy peak periods of the Site on both a weekday and weekend period as follows:

- Saturday, 13 January 2024, 12.30-1.30pm
- Monday, 15 January 2024, 4-5pm

Traffic counts were conducted at the intersections of:

- The southern entry point to the Site from Clarke Crescent,
- The eastern entry point to the Site from Clarke Crescent, and
- Joondalup Drive and Clarke Crescent (Sth) – turning traffic only.

The total amount of inbound traffic to the Site was between 34 and 71 vehicles per hour, and the total amount of outbound traffic was between 49 and 68 vehicles per hour. The busiest peak period for the Site was the weekend peak hour. The busiest period for the surrounding road network was the weekday evening (PM) peak hour. The maximum amount of traffic counted at any point along Clarke Crescent was 224 vehicles in one hour.

Due to the nature of the traffic counting process, it was possible to identify the traffic generation rate for the existing Harvey Norman store, which is as follows:

- Weekend peak hour of adjacent road network – 1.97 trips per 100 m^2 NLA (split 51% inbound and 49% outbound)
- Weekday PM peak hour of adjacent road network – 1.18 trips per 100 m^2 NLA (split 59% inbound and 41% outbound)

2.8 Existing Access Arrangements

The Site can currently be accessed directly from three crossovers on Clarke Crescent approximately 50, 100 and 200 metres from the southern intersection of Clarke Crescent with Joondalup Drive. Two crossovers (south and east) provide access to the parking lot and have a 2-lane capacity but are not lane-marked. The remaining crossover (northeast) provides service vehicle/truck access to the store warehouse for deliveries and is also used for customer pickups. Each crossover location is presented in Figures 2.6, 2.7 and 2.8.

Figure 2.6 – South Entrance to Site from Clarke Crescent (Source: Apple Maps)

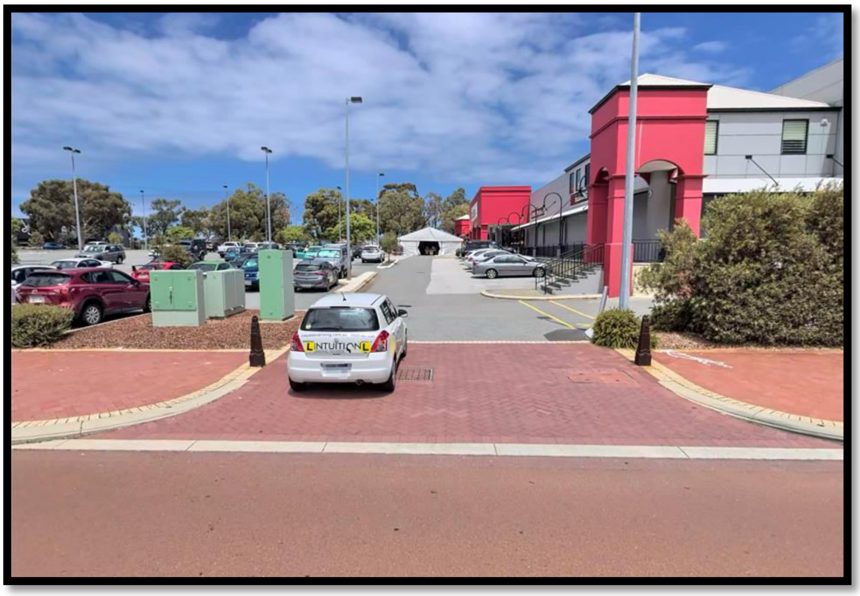

Figure 2.7 - East Entrance to Site from Clarke Crescent (Source: Apple Maps)

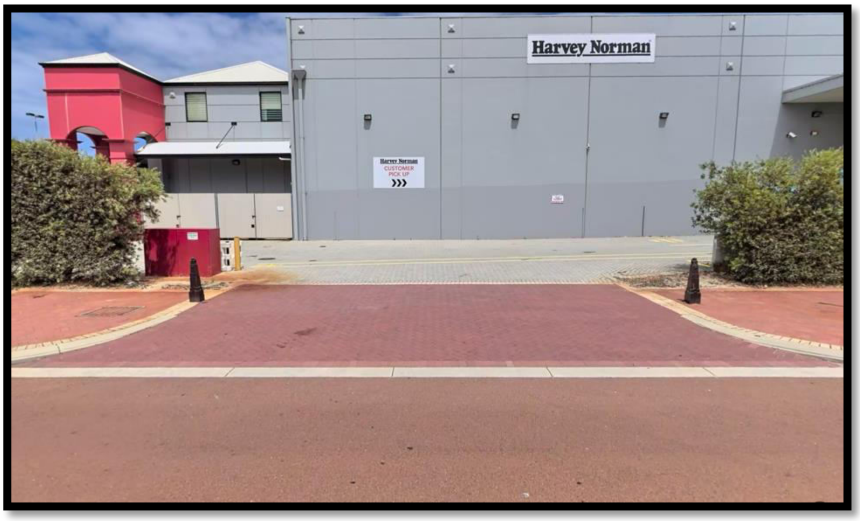

Figure 2.8 - Northeast Entrance to the Site (service area) from Clarke Crescent (Source: Apple Maps)

2.9 Existing Intersection and Crossover Operations

The intersection of Joondalup Drive and Clarke Crescent, as well as the two existing points of access to the Site from Clarke Crescent, were assessed in reference to the existing traffic levels.

All currently operate at a high level of service (Level of Service A) with delays of less than 10 seconds in the peak periods. The analysis indicates that there is plenty of spare capacity to accommodate additional traffic.

2.10 Existing Parking Situation

The Site currently provides 238 off-street parking bays including two accessible bays for people with disabilities and three short-term 'pick and collect' parking bays.

In addition, 51 on-street public parallel parking bays are situated on Onslow Place and in Clarke Crescent immediately adjacent to the Site.

A spot parking utilisation survey was conducted on site during the weekday and weekend peak periods for the adjacent road network including:

- 1.30pm on Saturday, 13 January 2024
- 4.00pm on Monday, 15 January 2024

The survey results revealed a parking utilisation of 19% on the Saturday (22% off-street and 6% on-street) and 20% on the Monday (22% off-street and 12% on-street). The existing parking supply is therefore heavily underutilised both on and off-street and there is significant spare capacity available.

The results also indicate a current demand for parking of one car parking bay per approximately 136 m^2 NLA. This includes both the demand for on and off-street parking with very little on-street parking in demand and being utilised.

3 The Proposed Development

3.1 Land Use Proposals

The proposed development involves the addition of approximately 3,003 m^2 of 'bulky goods' floor space over the southern part of the Site (the current car park) to advance the storefront further south. In addition, the proposal includes plans to install a first-floor parking area over the northern part of the Site with parking and rooftop access directly to the Store.

The car parking capacity is proposed to reduce from an existing 238 bays to 186 bays and will include 6 accessible parking bays. A one-way ramp system with separated up and down ramps is proposed to provide vehicular access to the first-floor level parking. The development will also provide 13 motorbike parking bays and 24 secure bicycle spaces.

The proposal also includes relocating the main eastern crossover to a location further to the southeast aligning with the new storefront location. There are also various other modifications to the landscaping and pedestrian pathways that are proposed. An artistic impression of the proposed development is given in Figure 3.1.

After the completion of the development, the Site will host a Medium Bulky Goods Showroom, totalling 10,052 m^2 of net lettable area (NLA). Figures 3.2 and 3.3 show the proposed site layout plan for the development.

Figure 3.1 – Artistic impression of Site from Clarke Crescent (Source: Leffler Simes)

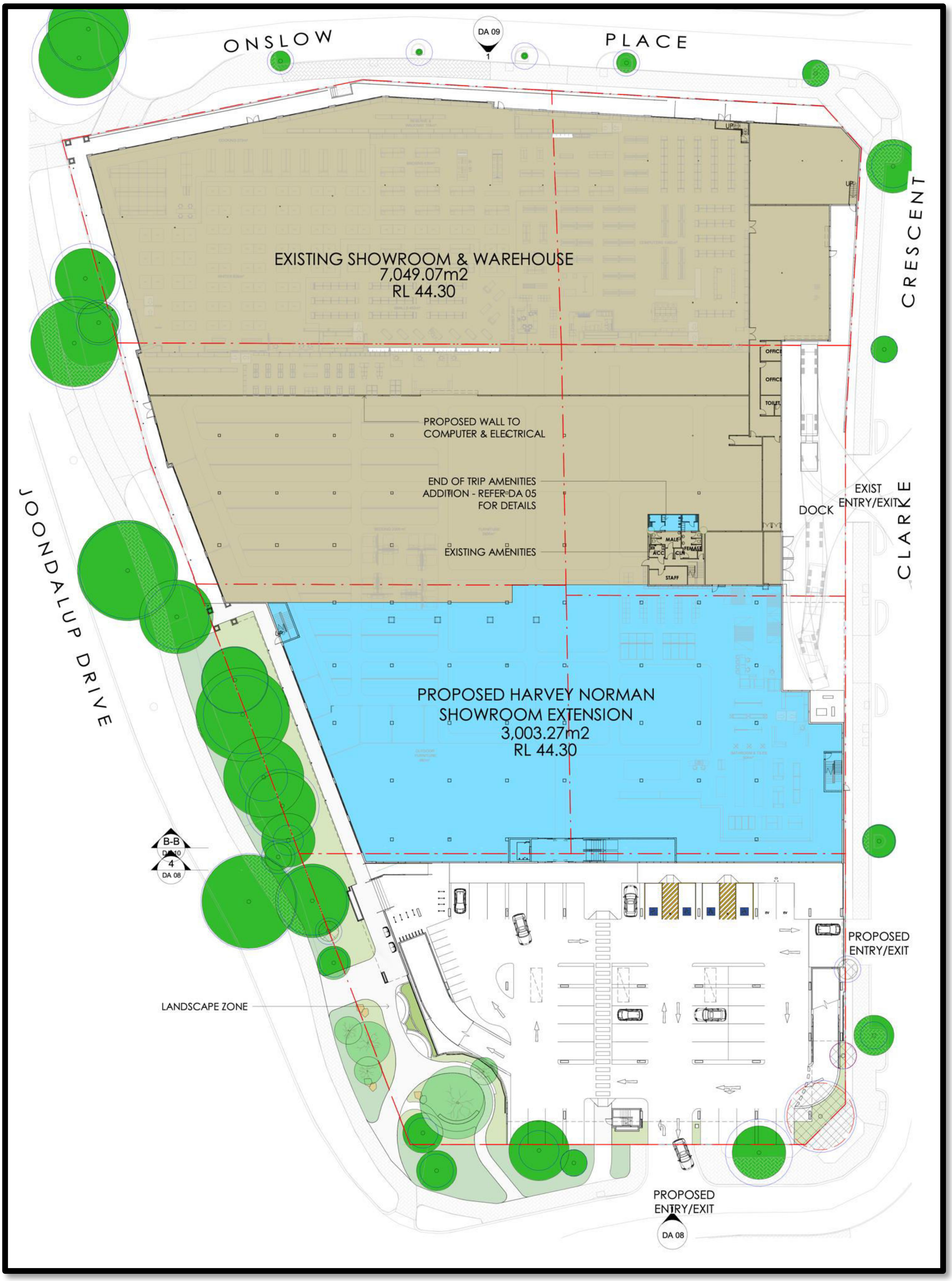

Figure 3.2 – Proposed Ground Floor Plan (Courtesy of Leffler Simes Architects)

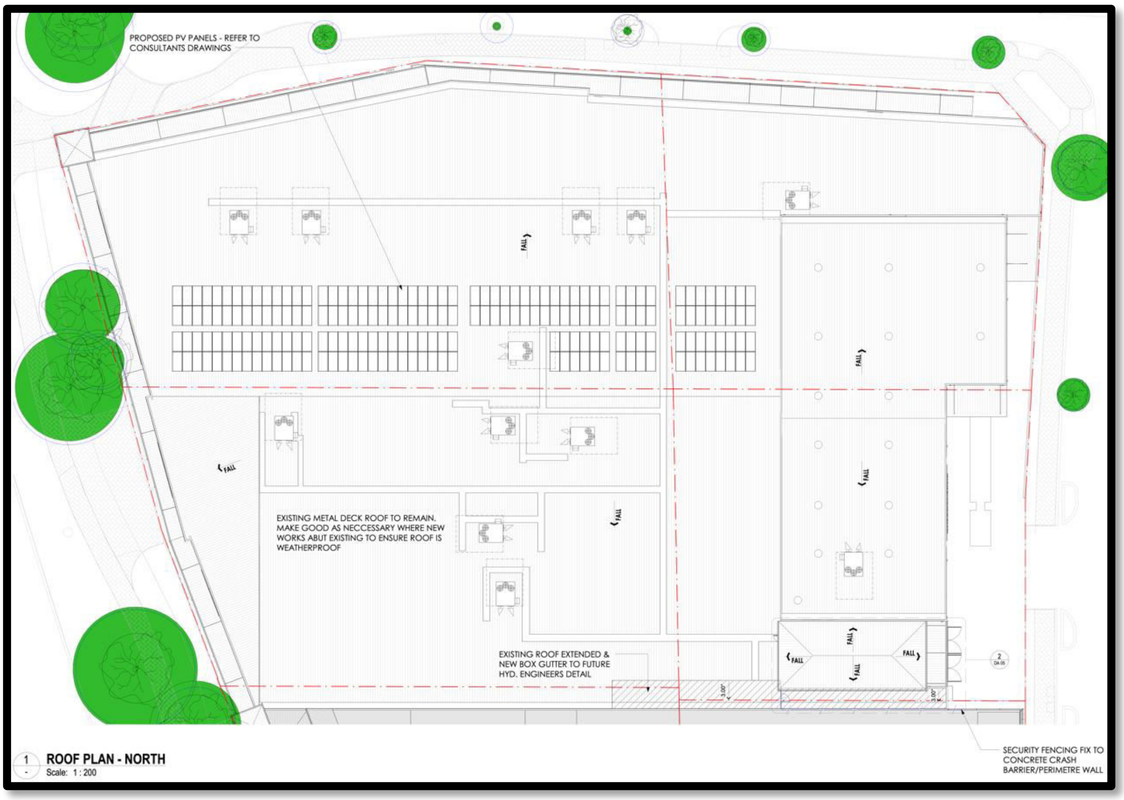

Figure 3.3a – Proposed 1st Floor Plan North (Courtesy of Leffler Simes Architects)

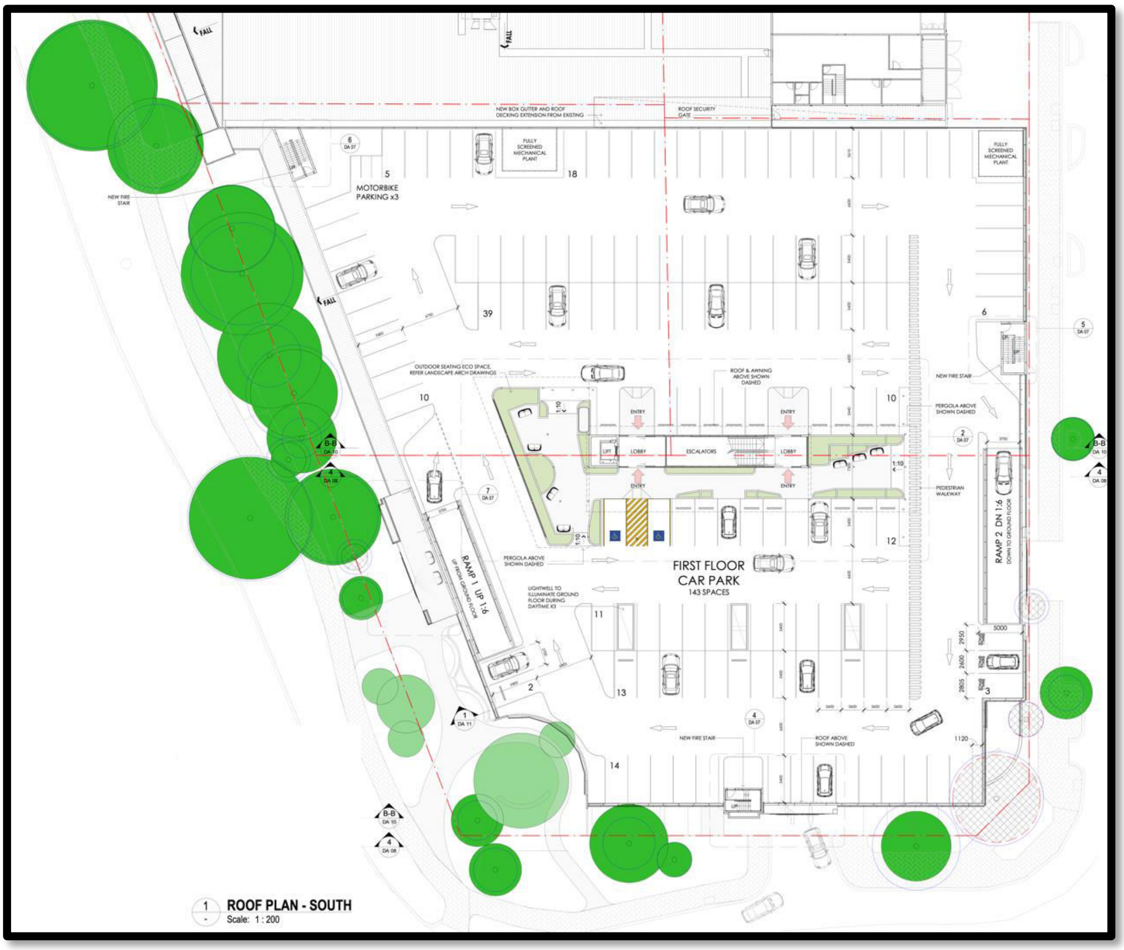

Figure 3.3b – Proposed 1st Floor Plan South (Courtesy of Leffler Simes Architects)

3.2 Proposed Site Access Arrangements

The Site is presently accessible through three crossovers located at the south, east and northeast of the Site, all connected to Clarke Crescent. The south and northeast crossovers will undergo minor adjustments, while the eastern crossover is proposed to be relocated further south. Importantly, all crossovers shall maintain their existing capacity and functionality with the new arrangements.

The south crossover (1) is proposed to undergo reconfiguration to expand the width on the exterior side. The eastern crossover (2) is proposed to be relocated approximately 42 m southward to align with the new storefront location. Dimensions for this crossover shall remain unchanged. Pavers at the site of the new crossover shall be recovered and reused to pave the walkway where the east crossover previously existed.

Both proposed main entries to the Site are shown encircled in Figure 3.3. Swept path analyses are provided in Appendix K.

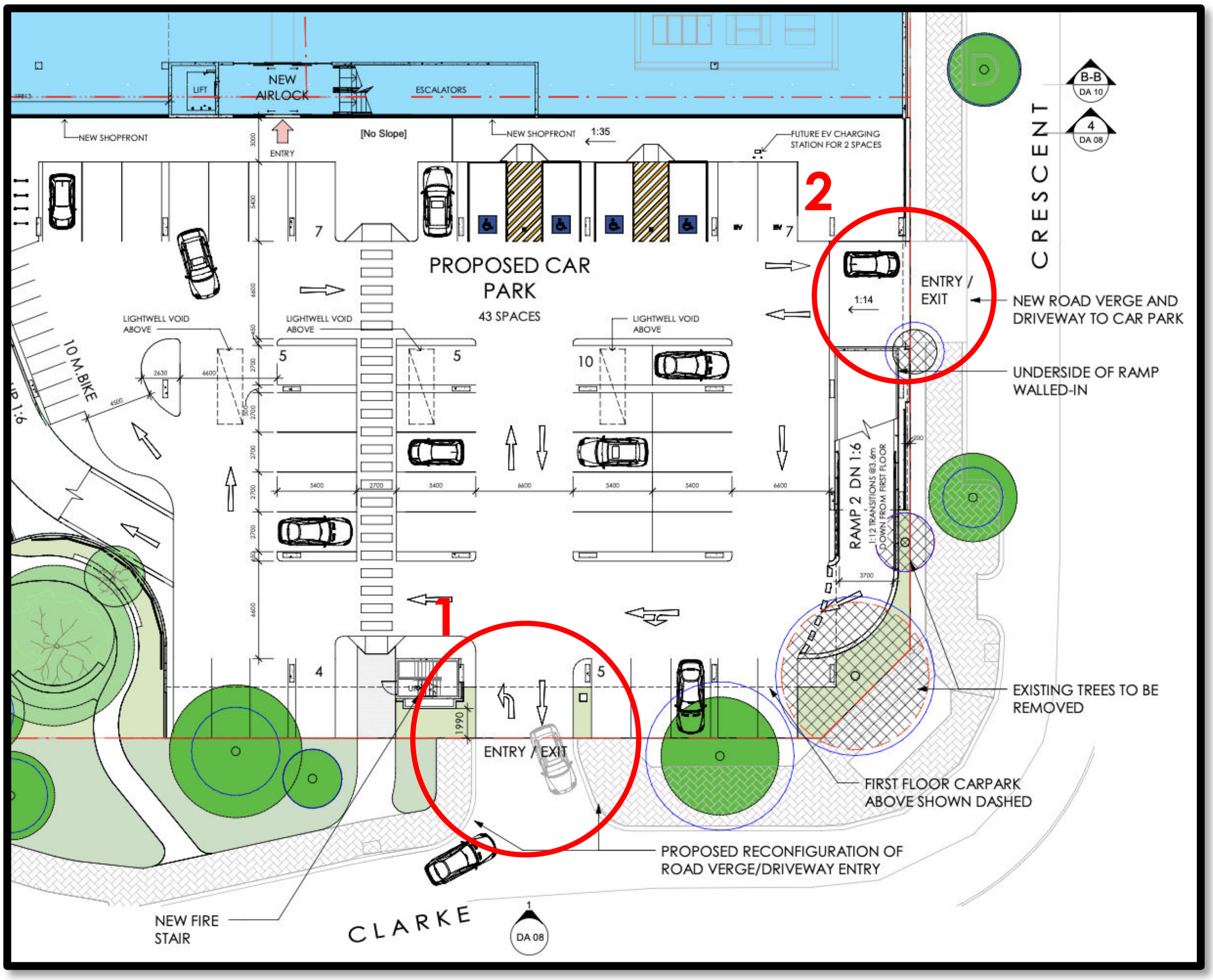

Figure 3.4 – Proposed Parking Lot Crossover Reconfigurations

4 Servicing of the Site

4.1 Proposed Future Proofing for Service Deliveries of the Future

The future of road freight in activity centres is likely to be shaped by a combination of technological advances, shifting customer preferences, and government policies aimed at reducing carbon emissions and promoting more sustainable and healthy outcomes for communities.


Figure 4.1: Example of future right-sized automated delivery vehicle

A recent trend is towards electrification of delivery fleets, which is helping to reduce emissions and operating costs, and improve air quality. We are also seeing an increasing move towards micro-deliveries and the use of smaller vehicles to service demand. This is because customers are increasingly demanding faster, more flexible and more environmentally friendly delivery services, such as same-day, and on-demand deliveries, which is driving the need for more agile and efficient supply chain operations. The use of right-sized road freight is allowing companies to address these challenges as it is more cost effective because it allows businesses to optimise their delivery routes and reduce the number of partially loaded vehicles, leading to lower fuel costs, improved profitability and less empty or partially loaded vehicles on the roads. This is allowing these companies to become more competitive. Hence, the use of smaller and more efficient vehicles for last-mile deliveries is expected to be increasingly important. Perth bucks this trend to a certain extent as it is one of the most geographically long, spacious and low-density cities in the world. Consequently, there continues to be a need to accommodate larger goods vehicles albeit the amount of dedicated space allocated to them in the future will need to be less than before.

The design of the development has been prepared with acknowledgement of both the existing requirements and the needs of the future.

4.2 Proposed Service Vehicle Access

It is intended for large service vehicles (19 m articulated trucks) to enter the Site from Clarke Crescent predominantly via the northeastern crossover (3), encircled in Figure 4.2.

The suit the design of the local road network, the service dock has been orientated to the south parallel to Clarke Crescent. This alignment ensures that large trucks arriving at the Site from the north, via Clarke Crescent and Wise Street, are correctly aligned to enter the service dock and reverse efficiently into the loading bay. To maintain ease of access for service vehicles, the proposal includes an extension of area dedicated to the service dock further south before reaching the boundary of the Store expansion.

Swept path analyses are provided in Appendix E.

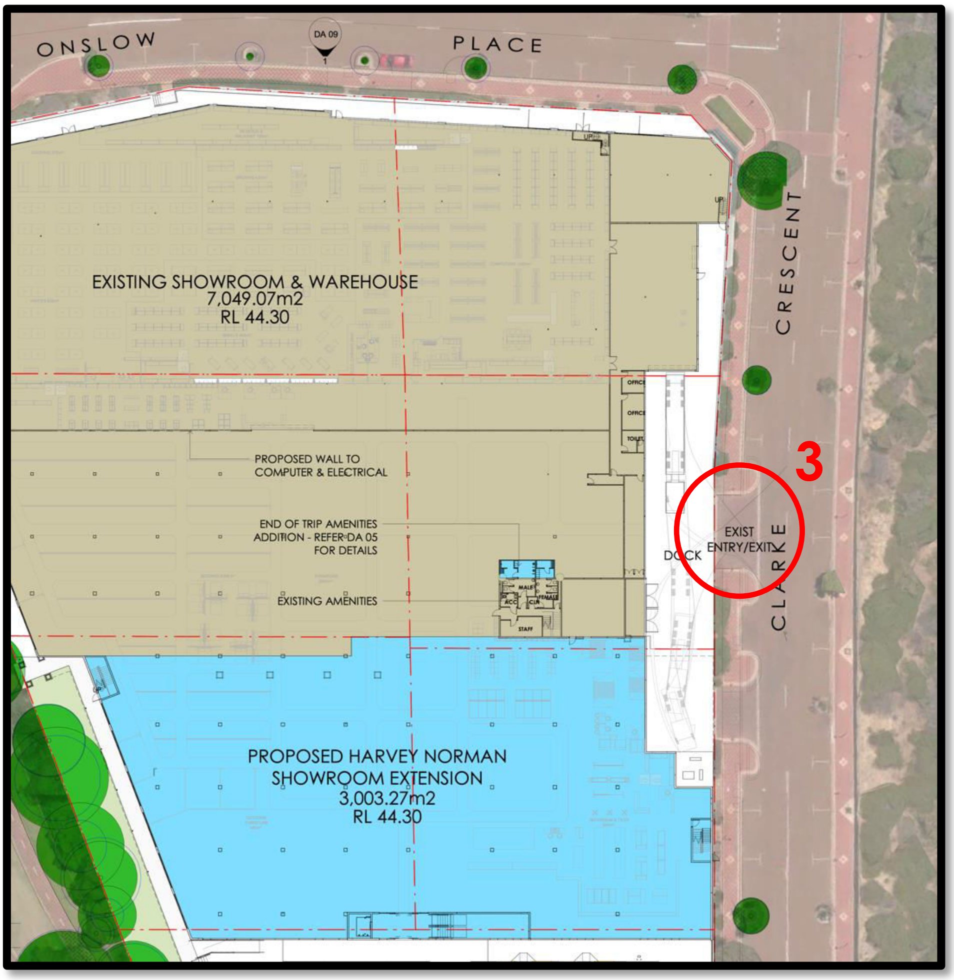

Figure 4.2 – Loading Dock Crossover

4.3 Proposed Waste Collection

All waste collection will occur via the designated loading area as shown in Figure 4.2. Diagrams illustrating the swept paths of large service trucks moving through and turning around in the loading area and adjacent spaces are given in Appendix E. Sufficient room has been provided for these trucks to safely enter and exit to/from Clarke Crescent while remaining in forward gear.

Waste pickups will be undertaken using a commercial waste collection service. The specifications for waste collection vehicles used by the major waste collection companies in Western Australia are given in Table 4.3. Allowance has been made in the design for large articulated trucks to conveniently access the Site. These vehicles are larger than the biggest commercial waste collection vehicle used in Perth and therefore the manoeuvring room for waste collection vehicles will be sufficient to provide safe and convenient access.

Table 4.3 – Commercial Waste Collection Vehicle Dimensions – Rear Lift

Vehicle Dimensions	Remondis	Cleanaway	Veolia
Height during bin lifting (m)	3.4 m	4.3 m	3.4 m
Width (m)	2.5 m	3.0 m	2.5 m
Length during operation (m)	12.5 m	11.5 m	11.6 m

4.4 Pick up and drop off (PUDO) facilities

There are a number of on-street parking bays on Clarke Crescent that can be used for short-term PUDO. These bays are often utilised for this sort of activity now and can continue to be used by small utility vehicles and vans servicing the Site in the future.

5 Traffic Analysis of Development Area

The traffic generation rates used for the analysis have been obtained from directly relevant survey data and checked against recognised and relevant technical documents. The trip generation, distribution and intersection capacity analysis have been conducted for the periods coinciding with the peaks for the adjacent road networks.

5.1.1 Trip Generation Rates

The trip generation for the proposed development was calculated using data specific to the Harvey Norman store in Joondalup identified from traffic surveys conducted in January 2024. These surveys revealed:

- A weekend trip generation coinciding with the peak hour of the adjacent road network of 1.97 trips per 100 m^2 NLA (split 51% inbound and 49% outbound)
- A weekday trip generation coinciding with the PM peak hour of the adjacent road network of 1.18 trips per 100 m^2 NLA (split 59% inbound and 41% outbound)

This data was compared with generic trip generation data sourced from the following documents:

- Western Australian Planning Commission (WAPC) *Transport Impact Assessment Guidelines for Developments: Volume 5 – Technical Guidance (2016)*,
- Institute of Transportation Engineering (ITE) Trip Generation Manual (11th Edition), and
- Transport for NSW (RMS) Guide to Traffic Generating Developments Updated Traffic Surveys (2013).

There is no directly relevant land use contained in the WAPC guidelines. Neither the 'commercial', 'industrial' nor the 'retail (non-food)' trip generation rates contained in that document are directly relevant to 'bulky goods stores'. Likewise, the ITE do not have a directly relevant trip generation rate. The RTA have generic trip generation rates more specific to 'bulky goods stores' and these trip generation rates are listed in Table 3.1 for a weekday and Table 3.3 for the weekend. This generic trip generation rates reinforce that the surveyed trip generation rates are approximately of the right order. Due to the peculiarities of the site and the way people travel to and from it, the surveyed rates are the most appropriate for use in the future trip generation forecasting exercise.

To be conservative, the surveyed trip generation rates were increased by 10% nominally to allow for the survey days being lower than the equivalent annual average travel days.

5.1.2 Weekday Analysis

The PM peak hour of the adjacent road network was determined to be in the afternoon between 4 PM and 5 PM. The survey rates that were used are highlighted in Table 5.1.

Table 5.1 Trip Generation Rates (Weekday)[2]

Land Use	Source	AM Peak	IN	OUT	PM Peak	IN	OUT
HN Joondalup	Surveys	-	-	-	1.44 trips per 100 m^2 GFA	59%	41%
Bulky Goods Retail[3]	TfNSW/RMS	-	-	-	1.31 trips per 100 m^2 GFA	-	-

[2] A conversion rate of 90 m^2 NLA to 100 m^2 GFA was used.

[3] Average of all survey sites for the Network PM peak

Floor areas were taken from the latest development plans supplied by the Applicant (dated May 2023) as per Figure 3.1.

Bulky Goods stores do not operate or generate significant traffic during the AM peak of the surrounding road network. This is reinforced in the TfNSW trip generation document, which states that "the morning site peak hour does not generally coincide with the network peak hour". The AM peak hour period was therefore not considered a relevant analysis period for this development proposal.

The trip generation rates in Table 5.1 have been used to calculate estimates of proposed weekday peak hour traffic numbers that are shown in Table 5.2.

Table 5.2 Estimated Trip Generation Rates (Weekday)

Land Use	NLA	PM Peak	IN	OUT
Current Harvey Norman (Commercial)	7,049 m^2	102	60	42
Total Trips Existing Harvey Norman Site		102	60	42
New Harvey Norman (Commercial)	10,052 m^2	145	85	60
Total Trips Proposed Harvey Norman Site		145	85	60
Net Difference (Proposed - Existing) for Harvey Norman Site		+43	+25	+18

5.1.3 Weekend Analysis

The weekend trip generation rates were determined for the peak hour time from 12:30 to 1.30 pm. This was based on the average of the peaks of traffic count sites in the immediate surrounding road network.

The trip generation rate highlighted in Table 5.3 has been used to calculate estimates of proposed weekend peak hour traffic numbers that are shown in Table 5.4.

Table 5.3 Trip Generation Rates (Weekend)

Land Use	Source	Peak	IN	OUT
HN Joondalup	Surveys	2.41 trips per 100 m^2 GFA	51%	49%
Bulky Goods Retail[4]	TfNSW/RMS	2.48 trips per 100 m^2 GFA	50%	50%

Table 5.4 Estimated Trip Generation Rates (Weekend)

Land Use	NLA	Peak	IN	OUT
Current Harvey Norman (Commercial)	7,049 m^2	170	87	83
Total Trips Existing Harvey Norman Site		170	87	83
New Harvey Norman (Commercial)	10,052 m^2	242	124	118
Total Trips Proposed Harvey Norman Site		242	124	118
Net Difference (Proposed - Existing) for Harvey Norman Site		+72	+37	+35

[4] Average of all survey sites for the Weekend Vehicle Network Peak

5.2 Traffic Distribution

The forecast traffic distribution for the Development has been based on:

1. The results of the January 2024 traffic surveys,
2. The local spread of population (based on 2022 data provided by the City of Joondalup Community Profile) - see Figure 5.2, and
3. The configuration of the broader road network.

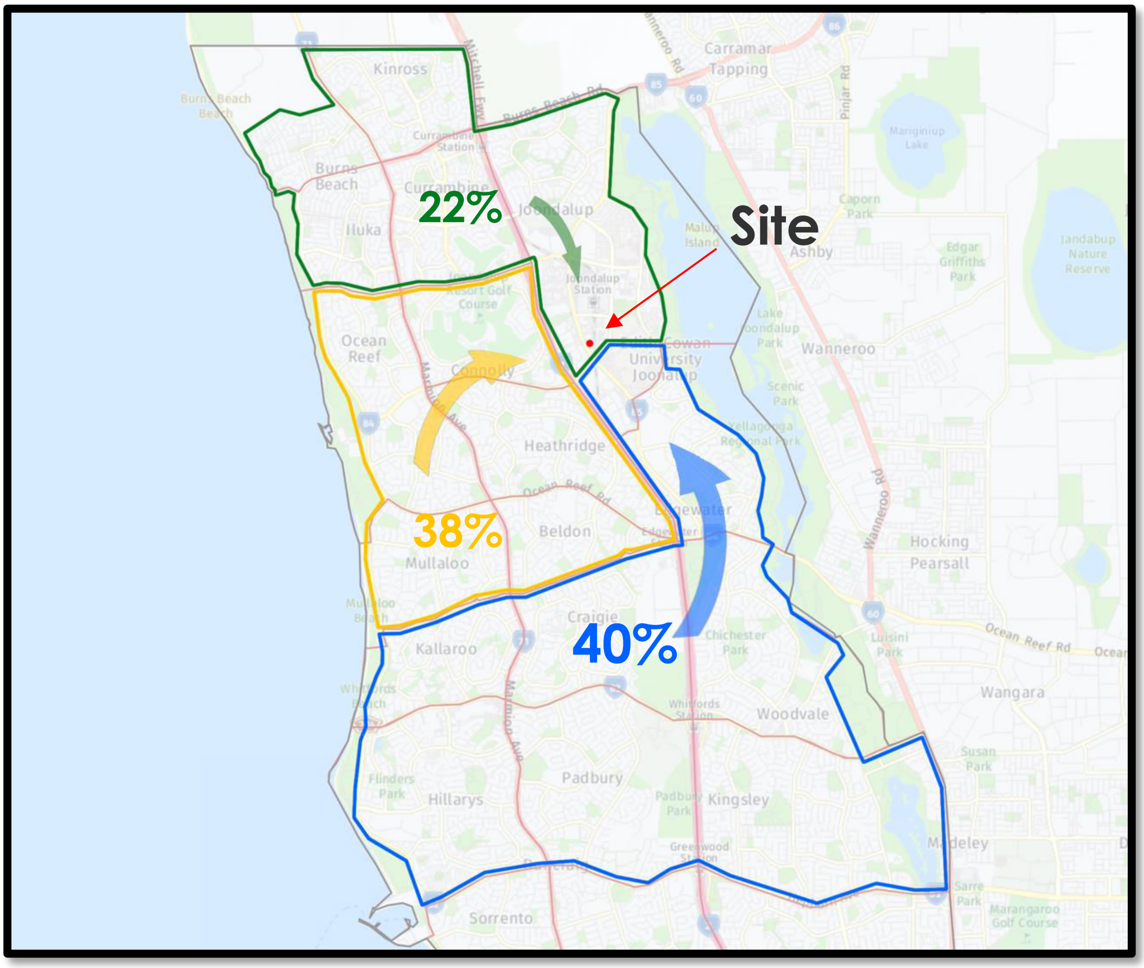

Figure 5.2: Broad Population Distribution

This information indicates that the majority of inbound traffic (85-90%) will enter the Site from Joondalup Drive turning left into the Clarke Cres (Sth) crossover. About 80% of this traffic will turn right and 20% will turn left into Clarke Crescent from Joondalup Drive. The remainder of inbound traffic will approach from the north along Clarke Crescent equally split between the two main crossovers to the Site.

The data also indicates that in excess of 50% of traffic outbound from the Site will turn right out of the Site using the same Clarke Cres (Sth) crossover and then left onto Joondalup Drive heading south. About 15% will exit right from the other eastern crossover to the Site and then left onto Joondalup Drive. The remaining 35% of outbound traffic will travel north using Clarke Crescent to connect to Wise Street and Collier Pass.

The traffic generated by the proposed development was distributed onto the local road network in line with these distribution findings.

5.3 Intersection Capacity Analysis

This section provides an analysis of the existing traffic conditions on the surrounding road network. It is important to understand the baseline conditions upon which to assess the impact of the proposed development.

The key intersections and access points that were considered in the traffic analysis are:

1. Collier Pass/Grand Blvd,
2. Joondalup Dr/Grand Blvd/Hodges Dr,
3. Joondalup Dr/Clarke Cr Sth, and
4. Joondalup Dr/Collier Pass.

In addition, the two main points of access to the site were assessed including:

5. The southern entry point (1) to the Site from Clarke Crescent, and
6. The eastern entry point (2) to the Site from Clarke Crescent.

The analysis assessed the following parameters of intersection performance:

- **Degree of Saturation (DOS):** Degree of Saturation is a measure of how much physical capacity is being used compared to the theoretical capability of a particular movement, approach, or overall intersection. A DOS of 1.0 equates to full theoretical capacity although in some instances this level is exceeded in practice. SIDRA sets a maximum acceptable DOS of 0.90 for signalized intersections and 0.95 for an unsignalized intersection.
- **Average Delay:** This measure is the average delay per vehicle in seconds experienced by all vehicles in a particular lane, approach, or for the intersection as a whole. For severely congested intersections the average delay begins to climb exponentially. An unsignalized intersection can be considered as operating at capacity when the average delay exceeds 40 seconds.
- **Queue Length:** This is the 95th percentile length of approach queues (the maximum queue length that will not be exceeded for 95 percent of the time). It provides the indication of the likely impact of queues blocking back and impacting on upstream intersections and accesses.
- **Level of Service (LOS):** A qualitative measure describing the operational conditions at an intersection and the perception by motorists. LOS is expressed with levels from A to F. LOS A indicates an excellent level of service with minimal delays to drivers. Values of B through D are acceptable in normal traffic conditions. LOS E and F are typically considered undesirable.

The analysis criteria used in the analysis are given in Table 5.5. Note that only one of the analysis criteria need to be met to trigger the LOS category, e.g. average delay. The capacity analysis was undertaken in accordance with well accepted Austroads[5] guidance.

The analysis contained in this report is based on intersection configuration and signalling information obtained from aerial imagery and the Main Roads TrafficMap.

[5] In accordance with Austroads Guide to Traffic Management Part 2: Traffic Theory Concepts

Table 5.5 - SIDRA Analysis Criteria

Level of Service (LOS)		Unsignalized		Signalized	
		DOS	Ave Delay	DOS	Ave Delay
A	Excellent	<=0.50	<10	<=0.60	<10
B	Very Good	0.50-0.70	10-15	0.60-0.70	10-20
C	Good	0.70-0.80	15-25	0.70-0.90	20-35
D	Acceptable	0.80-0.90	25-35	0.90-0.95	35-55
E	Poor	0.90-1.00	35-50	0.95-1.00	55-80
F	Very Poor	>1.00	>50	>1.00	>80

The WAPC Transport Assessment Guidelines for Developments (Volume 4) suggests that an intersection is considered to be materially affected if flows on any leg increase my more than 10% or any individual movement by more than 20% overall. None of the four key intersections investigated have forecast increases in traffic flows that exceed these levels. Consequently, the intersections cannot be considered to be materially affected and they will continue to operate at similar capacity utilisation levels as at present.

The capacity of the entries/crossovers to the Site were also checked and all continue to operate at high levels of service. Their practical absorption capacity is in excess of 300 vehicles per hour, which exceeds the number of vehicles forecast to be entering and exiting at each of these points under a worst-case scenario in the peak hour. They continue to enjoy a high level of Service (LOS A) with delays to all turning traffic of less than 5 to 10 seconds in the busiest peak periods.

5.4 Impact on Surrounding Roads

Reference to the WAPC Transport Assessment Guidelines for Developments (Volume 4) states that "where a traffic increase as a result of a proposed development is less than 10% of current road capacity, it would not normally have a material impact". The proposed development adds less than 100 vehicles per hour or less than 10% of capacity to any individual section of Joondalup Drive in any of its busiest peak periods.

The increase in forecast traffic varies depending on the time period, with the traffic generated during the weekend peak having the greatest overall impact. The increase in traffic due to the development is modest by comparison to the impact caused by the growth in through traffic on the road network over the same time period, particularly on Joondalup Drive and Mitchell Freeway.

Joondalup Drive is a 4-lane divided carriageway with a wide median and protected turning spots. It is forecast to continue to function within its operational capacity even with the forecast increase in traffic levels from the development.

Surrounding access streets including Clarke Crescent, and Wise Street will not be significantly impacted by the development and will continue to operate well within their environmental traffic capacity.

5.5 Summary of Traffic Impacts

Based on the assessments undertaken it is concluded that the development will not significantly impact on the operation of surrounding roads and intersections and the road network will continue to operate satisfactorily. No changes are required to either the capacity of the road network or the geometry due to the construction and operation of this development.

6 Proposed Parking Arrangements

6.1 Car Parking Provision / Supply

It is proposed that 186 car parking bays be provided off-street. It is also proposed that 6 accessible bays for people with disabilities be provided with adjacent shared spaces in accordance with AS2890 (set). In addition:

- 24 secure bicycle racks/lockers have been positioned throughout the Site at convenient locations, and
- 13 motorcycle/ scooter bays have been provided at central locations on the Site.

6.2 Car Parking Demand and Regulatory Requirements

The parking requirements for the proposed development have been calculated based on the requirements as defined by City of Joondalup "*Joondalup Activity Centre Plan*[6]," reproduced in Table 6.1.

The required parking provision is presented in Table 6.2.

Table 6.1 Car, Bicycle and Motorcycle Parking Provision Rates

Land Use	Minimum Number of Car Parking Bays	Minimum Number of Bicycle Parking Spaces	Minimum Number of Motorcycle Parking Spaces
Non-Residential Development	1 per 75 m^2 NLA	For employees: 1 per 750 m^2 NLA, For visitors: 1 per 1,000 m^2 NLA	10% of required car bays shall each be replaced by 2 motorcycle/scooter bays. The car bay requirement shall be reduced accordingly.

Table 6.2 Minimum Car Parking Provisions for Proposed Development

Land Use	NLA	Car Parking Provision Minimum	Bicycle Parking Provision Minimum	Motorcycle Parking Provision Minimum
Proposed Bulky Goods Development (Harvey Norman Showroom)	10,052 m^2	128[7]	23.5	13
Total Parking Provided		186	24	13
Parking Excess/(Deficit)		(58)	0	0

[6] Joondalup Activity Centre Plan, City of Joondalup, November 2021.

[7] Car parking provision requirements have been reduced by 6.5 bays to compensate for 13 motorcycle parking bays being provided on site.

The current proposals (refer Figures 3.1 and 3.2), indicate the provision of 186 car parking bays on the Site. This represents an excess of 58 car parking bays relative to the minimum 128 car parking bays required by the City in their Joondalup Activity Centre Plan.

However, based on the existing rate of parking demand for the Site of one car parking bay per 136 m^2 NLA (refer Section 2.10) it is estimated that the future demand for parking on the Site will be 74 car parking bays. This forecast assumes the same rate of parking demand as identified for the existing Harvey Norman Joondalup operation from the January 2024 parking surveys. Therefore, the City of Joondalup prescribed parking requirements far exceed the forecast parking demand, and in that context, the proposed parking supply is considered satisfactory.

As the Site is in a mixed-use commercial area where many trips have multiple purposes, it is also likely that the parking demand for each use will be lower than for an isolated site. This suggests that the demand for parking in the future may be lower than forecast. Considering the relatively low demand for parking, and the community desire for more sustainable transport outcomes, there is good justification for providing less parking dedicated on the Site than prescribed. To that end, there is an action contained in the Green Travel Plan (refer Section 9.3) recommending a reduction in the parking provision for the Site.

Finally, it is also noted that there are 33 on-street parking bays surrounding the Site that are currently heavily underutilised. These car parking bays will also be available to users of the Site and can provide spare parking capacity in peak periods.

6.3 Parking for People with Disabilities

As more than 100 and less than 200 total car parking spaces are proposed to be provided for the development there is a requirement to designate a minimum of 4 accessible car parking spaces as ACROD bays / dedicated to people with disabilities. The proposals designate 6 of the 186 off-street car parking bays as accessible/ACROD bays with an adjacent shared space.

6.4 Bicycle & Motorcycle Parking Arrangements

Bicycle parking is proposed to be provided on the Site consistent with the provisions of the Green Travel Plan provided in Appendix J. In total, 24 secure bicycle racks have been positioned throughout the Site at convenient locations. This provision is consistent with the requirements of the *Joondalup Activity Centre Plan*. Some of this bike parking should be provided with capacity for electric bike recharging.

Due to the bulky goods nature of the Site, it is unlikely that there will be much demand for motorcycle or scooter parking. This is because bulky goods cannot be easily transported by motorcycles or scooters. Despite the reality of this situation, a provision of 13 motorcycle/ scooter bays have been provided at central locations on the Site. It is forecast that this motorcycle parking provision will be sufficient to exceed the demand for motorcycle parking on the Site. In addition, motorcyclists can park in underutilised car parking bays.

6.5 Truck Parking Arrangements and Access

The truck parking provided on the Site is provided in the service dock on the eastern side of the Harvey Norman building. This parking is incorporated in the loading and unloading area.

The swept paths of trucks moving throughout the Site have been analysed and are presented in Appendix E. In all cases the Site has been designed to be able to accommodate the safe and convenient movement of a 19 m articulated truck along the major circulating roads throughout the development. Waste trucks and other smaller service vehicles are also fully accommodated.

7 Public Transport Facilities

7.1 Existing Public Transport Facilities

The Site is not directly serviced by any bus routes albeit there are several located along Grand Boulevard. The nearest train station is Joondalup Train Station located within an easy 500 m walk of the Site. All bus stops and transit stations are marked in red in Figure 7.1. The current public transport facilities, particularly rail, are considered excellent for servicing both the existing and proposed developments.

Figure 7.1 - Public Transport Stops & Stations in the Vicinity of the Site (Source: Google Maps, January 2024)

7.2 Future Public Transport Facilities

Currently there are no plans to change the existing public transport services and facilities in the vicinity of the Site. Section 9.3 identifies a number of initiatives to encourage the use of public transport and other non-transport modes.

8 Pedestrian / Cycle Networks & Facilities

8.1 Existing Pedestrian / Cycle Network

Walking access to the Site is presently provided via an existing footpath network along all roads adjourning the Site, including facilities along both Clarke Crescent (including Onslow Place) and Joondalup Drive.

Pedestrian crossovers over Joondalup Drive exist at the Aston Street and Clarke Crescent junctions to allow pedestrians to cross safely. The current pedestrian/cycleway network is considered adequate for both the existing and proposed situations.

Figure 8.1 shows the local footpath and cycleway network in the vicinity of the Site.

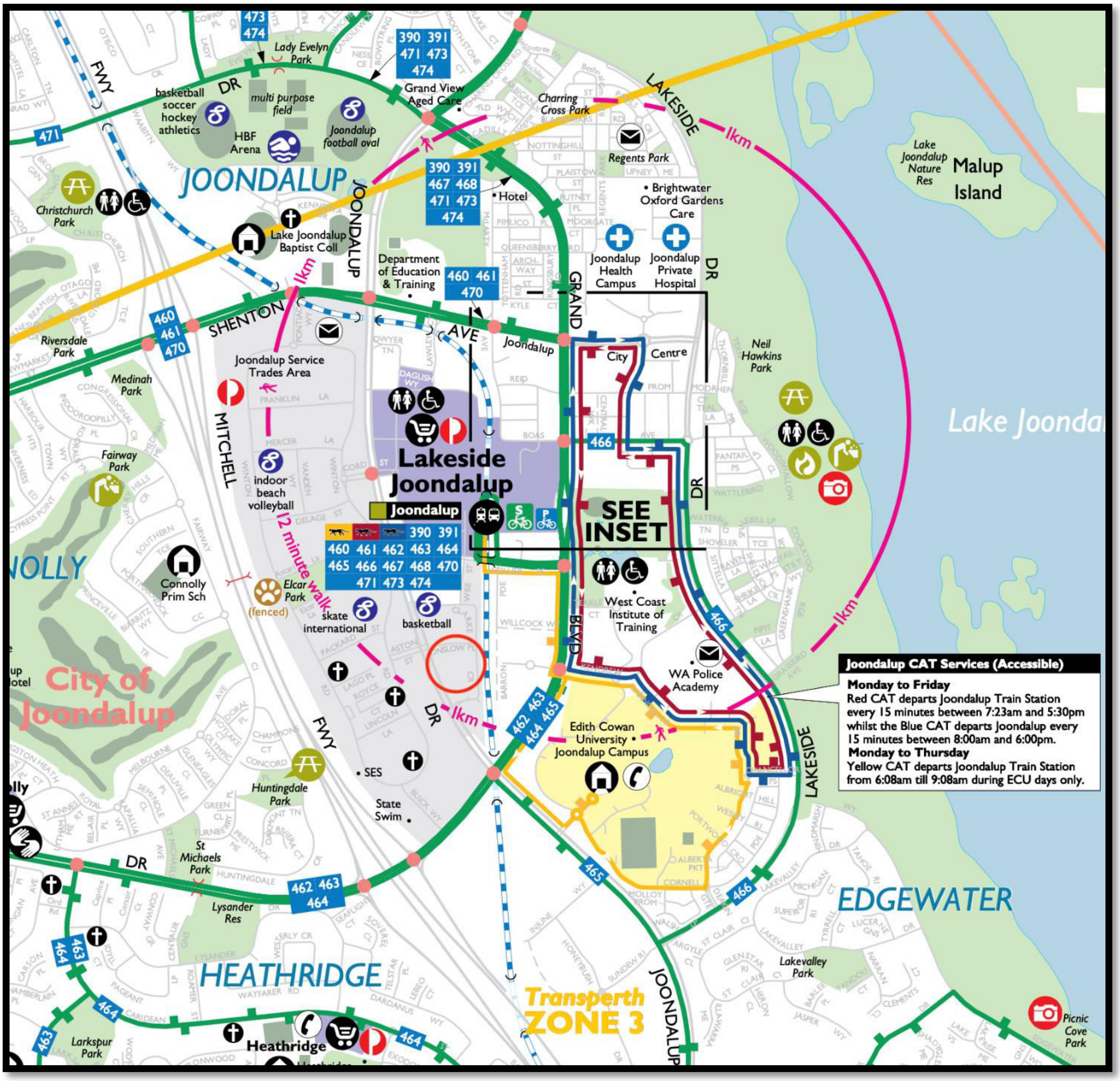

Figure 8.1 Existing Footpath and Cycling Network

8.2 Joondalup Bike Plan

The City of Joondalup Bike Plan (2016-2021) recognises that creating the right social environment to support bike riding is equally important as creating the right physical environment. Creating positive outcomes for bike riding and maximising the number of people riding requires the coupling of strategic infrastructure improvements (including bike paths, bike lanes, signage, lighting, and end-of-trip facilities) with promotion and education that gets people excited and motivated about riding. This includes:

- Encouraging consideration of bike access, bike parking and end-of-trip facilities in new and redeveloped buildings within the City, and
- Improving bike connectivity and bike infrastructure within the Joondalup City Centre.

8.3 Future Pedestrian / Cycle Network

The City of Joondalup has confirmed that there are no changes proposed to modify the existing pedestrian and cycle networks in the vicinity of the Site. However, within the Site are a series of pedestrian footpaths which have been incorporated in the proposed design. This includes new and pre-existing pathways surrounding the perimeter of the Site and crossing the Site parallel to the new storefront. A new pathway winding through the proposed social area/landscaped area to the east of the reduced ground-floor car park will complement existing street pathways. Pre-existing pathways shall remain largely as they exist with minor alterations.

An outdoor eco space/social area is proposed to be installed across the midsection of the Level 1 parking area, adjacent to the 1st floor entrance lobby and escalators. Pedestrian facilities that are proposed include the following, as presented in Figure 8.2:

- An 'eco zone; outside the first-floor entrance to the Harvey Norman store comprising a sheltered area, seating and raised gardens adjacent the Store entrance.
- A paved corner statement on the west side of the extended storefront with landscaping and a seating area.

Figure 8.2 - Joondalup Drive & Clarke Crescent Aerial Corner Statement

8.4 Encouraging Walking

The proposed development incorporates a range of pedestrian friendly elements including good pedestrian connections to the footpath network, generous entry and lobby spaces, wide parking aisles for the safe movement of pedestrians, etc.

8.5 Encouraging the Use of Scooters and Micromobility

Technological advancements, such as electric scooters and other forms of shared micro-mobility, have the potential to replace many short car trips and facilitate increased levels of activity.

Micro-mobility, particularly in the form of e-scooters and e-bikes, is gaining popularity in Australia as a convenient, environmentally friendly, and affordable option for short distance trips. The trend is emerging faster in our suburban activity centres. These modes fill an important gap in the transport system providing alternative options for localised travel.

Electric scooters (see Figure 8.3) are suited to short rides, including as a "last-mile" vehicle.

Provision shall be made within the development for easy access by this mode of travel including secure on-site storage.

Figure 8.3 – Electric Scooters

8.6 End of Trip Facilities

The proposed development includes an end of trip facility for the storage of bicycles as well as showers, lockers, and other amenities.

Other bicycle friendly initiatives such as the use of cargo bikes are being actively pursued as part of a Green Travel Plan for the Site (refer Section 8.2).

In the intricate interplay between retail and commercial precincts, end-of-trip facilities are essential not only for enhancing retail accessibility but also for mitigating potential impacts on the adjacent local streets.

These facilities have the potential to improve access, easing local impacts, and promoting sustainability through encouraging alternative modes of transport.

The expanded Harvey Norman store is expected to witness a steady flow of staff and visitors. End-of-trip facilities that encourage cycling and walking can mitigate impacts generated by vehicular traffic, making the precinct more liveable for others in the precinct.

The introduction of end-of-trip facilities can lead to slower vehicular speeds in the surrounding residential streets. This traffic calming effect contributes to pedestrian safety and residential amenity.

The provision of end-of-trip facilities that incentivize cycling and walking can significantly reduce carbon emissions by decreasing the number of vehicles on the road. This translates into improved air quality, reduced traffic congestion, and alignment with national and international sustainability goals.

By facilitating alternative transportation modes, end-of-trip facilities help reduce the demand for on-street parking spaces. Fewer parked cars on the street contribute to a more visually appealing environment, positively impacting the overall aesthetics of the adjacent residential and local centre precincts.

End-of-trip facilities encourage visitors and staff to incorporate physical activity into their daily routines. This proactive approach can lead to healthier lifestyles. Accessible end-of-trip facilities, including showers and changing rooms, also allow staff and visitors to freshen up after their commutes, promoting physical and mental well-being.

The inclusion of end of trip facilities in the development not only benefits site access but also sets a positive precedent for future developments in similar commercial contexts across the City of Joondalup.

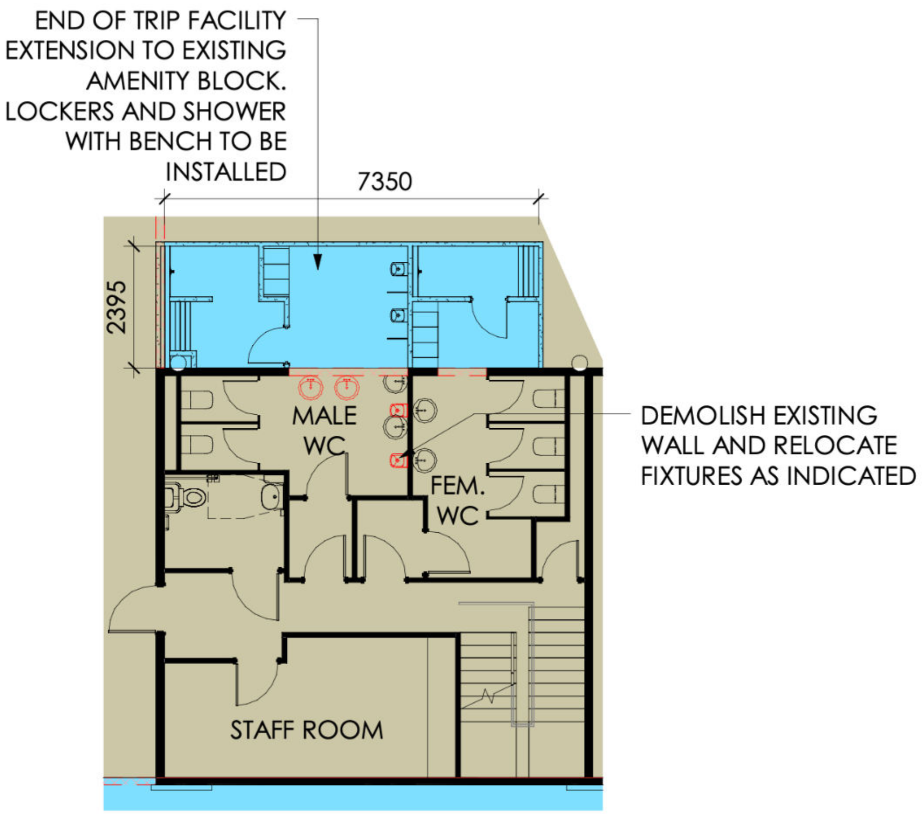

Figure 8.4 – Proposed Ground Floor End-of-Trip Facility

9 Other Considerations

9.1 Crash Assessment

A search of the Main Roads Crash Database was undertaken for the period from January 2019 to January 2024 (6 Year Period). A search was conducted for each of the following roads including intersections:

- Joondalup Drive, from Grand Boulevard/Hodges Drive to Collier Pass,
- Hodges Drive, from Mitchel Freeway to Joondalup Drive,
- Shenton Avenue, from Joondalup Drive to Grand Boulevard,
- Collier Pass, from Joondalup Drive to Grand Boulevard,
- Wise Street,
- Onslow Place (no data), and
- Clarke Crescent.

Table 9.1: Joondalup Drive, from Grand Boulevard/Hodges Drive to Collier Pass (Distributor A)

Type of Crash	Fatal	Hospital	Medical	Major Property Damage	Minor Property Damage	Total
Rear End	-	-	18	55	31	104
Hit Object	-	-	1	2	-	3
Right Turn Thru	1	3	13	15	3	35
Right Angle	-	-	4	5	4	13
Sideswipe	-	-	-	5	4	9
Undefined	-	-	-	4	1	5
Total	1	3	36	86	43	169

The section of Joondalup Drive from Grand Boulevard to Collier Pass has experienced a significant number of crashes within the 6-year period analysed. The most prevalent type being rear end collisions, constituting 104 out of 169 total crashes. Right Turn Thru crashes also contribute substantially to the total, including one fatal incident and 35 crashes in total.

Table 9.2: Hodges Drive, from Mitchel Freeway to Joondalup Drive (Distributor A)

Type of Crash	Fatal	Hospital	Medical	Major Property Damage	Minor Property Damage	Total
Rear End	-	-	19	47	27	93
Hit Object	-	-	1	2	-	3
Right Turn Thru	-	-	3	2	1	6
Right Angle	-	-	-	1	2	3
Sideswipe	-	-	1	5	6	12
Undefined	-	-	-	3	2	5
Total	0	0	24	60	38	122

A total of 122 crashes occurred on the section of Hodges Drive between Mitchell Freeway and Joondalup Drive. Rear-end collisions dominate, totalling 93 incidents, with a considerable portion leading to medical treatment and major property damage.

Table 9.3: Collier Pass, from Joondalup Drive to Grand Boulevard (Distributor B)

Type of Crash	Fatal	Hospital	Medical	Major Property Damage	Minor Property Damage	Total
Rear End	-	-	4	8	7	19
Hit Object	-	-	-	2	-	2
Hit Pedestrian	-	-	1	-	-	1
Right Turn Thru	1	2	8	19	1	31
Right Angle	-	-	5	10	1	16
Sideswipe	-	-	-	13	1	14
Total	1	2	18	52	10	83

83 crashes occurred between Collier Pass, between Joondalup Drive and Grand Boulevard. Right-turn-thru crashes stand out in terms of frequency and severity, with 1 fatal incident and 2 hospitalisations.

Table 9.4: Wise Street (Access Road)

Type of Crash	Fatal	Hospital	Medical	Major Property Damage	Minor Property Damage	Total
Rear End	-	-	1	-	-	1
Right Angle	-	-	1	2	-	3
Sideswipe Down	-	-	-	-	1	1
Undefined	-	-	-	2	1	3
Total	0	0	2	4	2	8

Table 9.5: Clarke Crescent (Access Road)

Type of Crash	Fatal	Hospital	Medical	Major Property Damage	Minor Property Damage	Total
Rear End	-	-	-	3	-	3
Right Turn Thru	-	-	2	2	1	5
Right Angle	-	-	1	-	-	1
Total	0	0	3	5	1	9

Wise Street and Clarke Crescent both have been the site of relatively far fewer incidents. While the overall count is modest, the predominant crash types are right-turn-thru and right-angle crashes, related to turning manoeuvres.

The area within the immediate vicinity of the Site, constituting local access roads, has seen very few crashes relative to the roads at a further radius from the Site, predominantly resulting in major and minor property damage only. This is due to the low-speed nature of the driving environment. Further away from the Site, the road network comprises key Distributor roads with higher speed limits, and it is on these roads where the vast majority of crashes occur. The prevalent types of crashes include rear-ends, right-angles and right-turn-thru crashes, largely influenced by excessive speed and delayed reaction times facilitated by the straight nature of the Distributor roads.

Given the low-speed environment and the low number of trips generated, it is considered unlikely that the development will cause any material impact on the traffic safety of the surrounding road network.

9.2 Sight Distance

The sight distance from the Site to Clarke Crescent was checked to ensure it is compliant. The provision of wide verges and setbacks assists in achieving these requirements.

9.3 Green Travel Action Plan

A Green Travel Action Plan has been produced for the Site and is contained in this report in Appendix D. The Travel Plan has been produced consistent with the objectives of the City of Joondalup to encourage more sustainable travel by reducing car use.

The Green Travel Plan incorporates 20 specific actions to increase sustainability and reduce the carbon emissions of the development focussed in the areas of:

- Providing physical infrastructure and end of trip facilities for non-car modes,
- Promoting walking and cycling,
- Providing electric charging systems to support low emissions vehicles,
- Encouraging sharing and non-travel options, and
- Spreading peak arrival and departure times.

10 Summary

This Transport Impact Assessment report outlines the transport aspects of the proposed development focusing on traffic operations, access, and provision of sufficient parking. Included are details relating to pedestrians, cyclists, public transport, road safety, sustainable travel and a number of other important considerations.

This report has been prepared in accordance with the WAPC Transport Assessment Guidelines for Developments: Volume 4 - Individual Developments (2016).

The following points distil the key findings and conclusions of the assessment:

- The proposed development is expected to generate approximately 43 additional vehicle trips in the PM peak hour, and 72 additional vehicle trips in the weekend peak hour.
- The traffic capacity analysis indicates that during the weekday evening and weekend peaks no intersections in the close surrounds of the development will be materially affected, and all will continue to operate at similar levels of service as at present. Furthermore, the two main entries to the Site will continue to enjoy a high Level of Service (LOS A) with delays to all turning traffic of less 5 to 10 seconds in the busiest peak periods.
- The analysis indicates that the traffic generated by the proposed development can be adequately accommodated by the existing road network without creating significant impacts or issues. In all cases the traffic generated by the development can be accommodated within the environmental traffic capacity of the roads the traffic is forecast to use.
- The design has been checked for the safe movement of large service vehicles (up to and including 19 metre articulated trucks) into, out of, and throughout the Site, and all swept paths are appropriately accommodated.
- A total of 186 off-street basement car parking bays are proposed to be provided over two parking levels. In addition, there are 33 on-street public parking spaces adjacent to the development along Clarke Crescent and Onslow Place that are heavily underutilised.
- The parking supply proposed for the development both exceeds the total parking demand calculated for the Site and the City of Joondalup parking policy requirements as defined in the Joondalup Activity Centre Plan.
- The development has excellent access to pedestrian and cycling facilities and high-frequency public transport services that will provide outstanding opportunities for people to travel to/from the Site using public transport and more active modes and to reduce the amount of their car use.
- A Green Travel Plan has been prepared that provides guidance on 20 specific actions to encourage the use of more sustainable travel and to reduce the impact of the development on surrounding streets. Once implemented this will have the added advantage of reducing the traffic generated by the development, particularly in busy peak periods for the road network.
- Given the low-speed environment and the low number of trips generated, it is considered unlikely that the development will cause any material impact on the traffic safety of the surrounding road network.

In conclusion, we are of the view that the level of the expected traffic impact resulting from the redevelopment of the Harvey Norman Joondalup site can be accommodated within the environmental traffic capacity of the road network.

Appendix A: WAPC Checklist

Item	Status
Introduction/Background	
Development location and context	Section 2
Description of proposed development	Section 3
Key issues	Section 2
Background information	Section 2
Existing situation	
Existing site uses	Section 2
Existing parking supply and demand	Section 2
Existing access arrangements	Section 2
Existing land uses	Section 2
Surrounding road network	Section 2
Traffic management of frontage streets	Section 2
Daily traffic volumes	Section 2
Peak traffic volumes	Section 2
Operation of surrounding intersections	Section 2
Existing pedestrian/cyclist networks	Section 2
Crash data	Section 9.1
Development proposal	
Regional context	Section 3
Proposed land uses	Section 3
Proposed access arrangements	Section 3
Proposed parking provision	Section 6
Proposed end of trip facilities	Section 8
Specific issues	Section 9
Proposed road network	Section 3
Proposed intersection layouts and controls	Section 3
Proposed pedestrian/ cycle networks and crossing facilities	Section 8
Public transport services	Section 7
Integration with surrounding area	
Surrounding major attractors/generators	Section 2
Proposed changes to surrounding land uses	Section 2
Travel desire lines	Section 5
Adequacy of existing transport networks	Section 2
Remedial measures to address deficiencies	Sections 5 and 10
Analysis of transport networks	
Time periods	Section 2
Development generated traffic	Section 5
Distribution of generated traffic	Section 5
Parking supply and demand	Section 6
Base with development traffic flows	Section 5
Analysis of development accesses	Section 5
Impact on surrounding roads, intersection and neighbouring areas	Section 5
Road safety	Section 9
Public transport access	Section 7
Pedestrian and cyclist access/amenity	Section 8

Appendix B: Harvey Norman Joondalup Traffic Survey

Figure B1 – HN Entry facing West

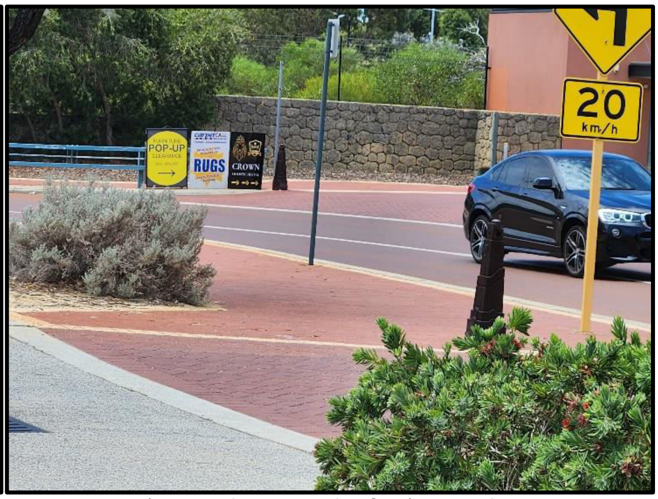

Figure B2 – HN Entry facing East

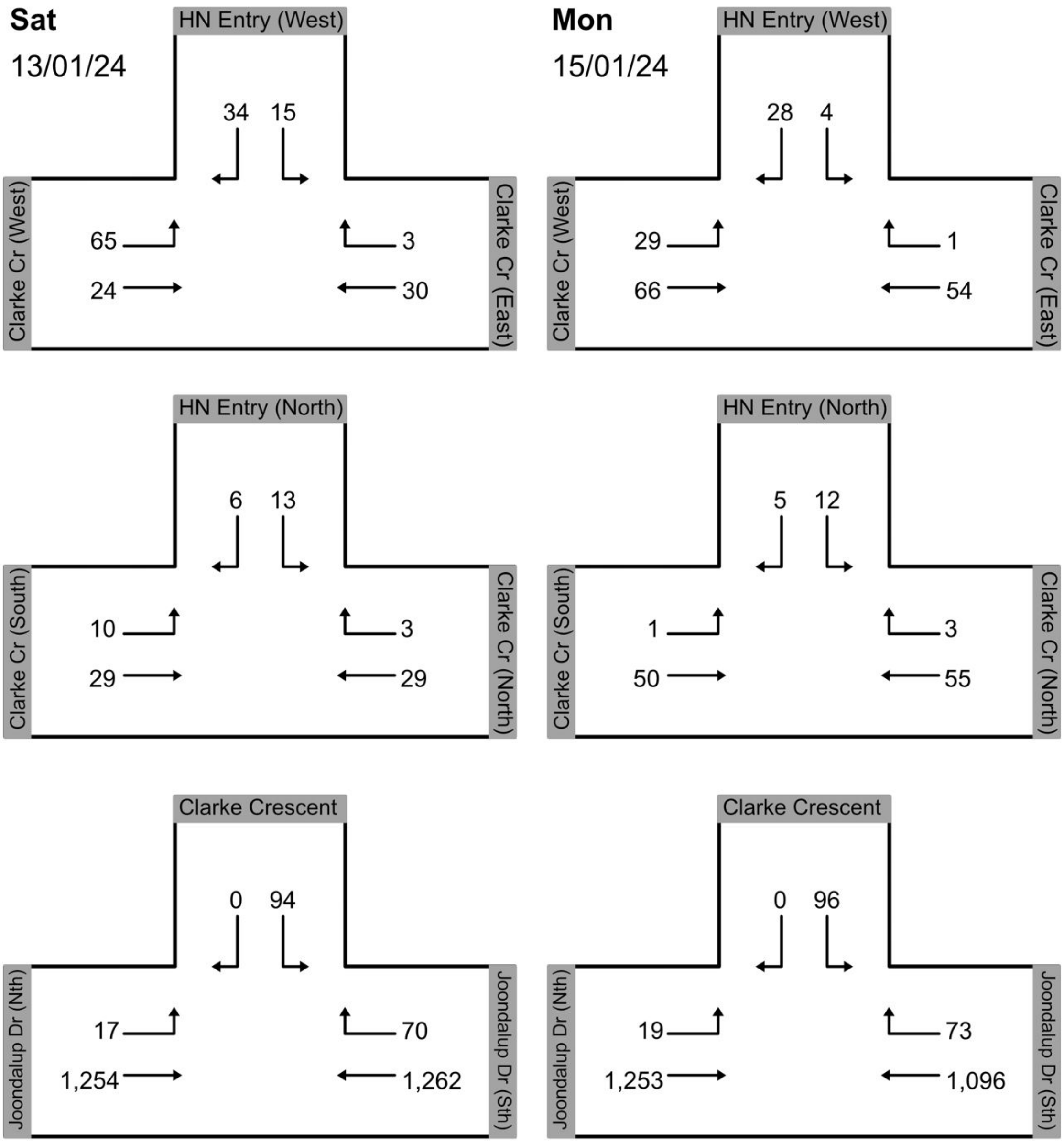

Figure B3 – Clarke Crescent Turning Counts

Appendix C: Joondalup Harvey Norman Store Current Floor Plan and Development Summary

Courtesy of Leffler Simes Architects

Green Building Council Australia Member

Member Australian Institute of Architects

ISSUE	AMENDMENT	DATE	CHK'D
P1	PRE-DA	17.08.23	SJC
A	DEVELOPMENT APPLICATION	17.11.23	SJC
B	AMENDED DEVELOPMENT APPLICATION	30.01.24	SJE

1 **EX. SITE PLAN**
Scale: 1 : 500

2 **LOCATION PLAN**

DA - DRAWING LIST		
SHEET N°	**SHEET NAME**	**SCALE**
DA 01	EXISTING SITE & LOCATION PLAN	1:500
DA 02	EXISTING FLOOR PLAN	1:500
DA 03	OVERALL FLOOR PLAN	1:200
DA 04	FLOOR PLAN SOUTH	1:200
DA 05	END OF TRIP AND OFFICE LAYOUT	1:200
DA 06	ROOF PLAN NORTH	1:200
DA 07	ROOF PLAN SOUTH	1:200
DA 08	ELEVATIONS 1	1:200
DA 09	ELEVATIONS 2	1:200
DA 10	SECTIONS	1:200
DA 11	STEEL FACADE PANEL DETAIL	1:20
DA 12	PERSPECTIVE 1	NTS
DA 13	PERSPECTIVE 2	NTS

NOTE:
SITE BOUNDARIES AND SITE AREAS AND EXISTING BUILDING ARE INDICATIVE ONLY. SUBJECT TO CONFIRMATION BY LICENSED SURVEYOR.

DEVELOPMENT SUMMARY

EXISTING BUILDING	= 7,049 SQM
TOTAL CARPARKING	= 238 SPACES
EXISTING BUILDING	= 7,049 SQM
EXTENSION	= 3,003 SQM
TOTAL AREA	= 10,052 SQM
PARKING PROVIDED	
TOTAL CAR SPACES	= 186 SPACES (1:54)
TOTAL MOTORBIKE	= 13 SPACES
TOTAL BICYCLES	= 24 SPACES

DEVELOPMENT APPLICATION

EXISTING SITE & LOCATION PLAN

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SCALE 1:500 @A1

HARVEY NORMAN ADDITION
Cnr CLARKE CRESCENT JOONDALUP DRIVE. JOONDALUP WA

JOB NO: 5244 DATE: MAY '23 DRAWN: LSA DWG NO. DA 01 REV. B

LEFFLER SIMES ARCHITECTS

Appendix D: Green Travel Plan – Harvey Norman Joondalup

	Green Travel Initiative	Description	Responsibility
1	**Encourage non-peak hour service deliveries**	Build a set of service delivery peak hour exclusions into lease documentation.	Harvey Norman
2	**Offer flexible start and finishing times**	Allow employee to offset start and finish times and to support flexible working arrangements where possible.	Harvey Norman Store Management
3	**Offer some employees part-time work from home arrangements**	Offer office-based support staff some flexibility to work from home.	Harvey Norman Store Management
4	**Provide secure bicycle and scooter parking for employees**	Install secure bicycle and scooter parking within the centre for employees.	Harvey Norman
5	**Provide secure bicycle and scooter parking for customers**	Install secure bicycle and scooter parking within the centre for customers.	Harvey Norman
6	**Provide end of trip facilities / showers for employees**	Building fit out to include staff showers and related end-of-trip facilities.	Harvey Norman
7	**Install posters in employee break areas**	Develop simple posters with clear messaging and circulate to all businesses to place in employee	Harvey Norman Store Management

	Green Travel Initiative	Description	Responsibility
		communal break areas.	
8	**Provide maps of nearby facilities in walking distance to the site, e.g. gyms, day care facilities, bus stops, etc.**	Develop spatial maps and place in employee communal break areas.	Harvey Norman Store Management
9	**Map a 40-minute walking circle from the site**	Develop a spatial map and place in employee communal break areas.	Harvey Norman Store Management
10	**Encourage virtual meetings using MS Teams/Zoom/etc.**	Management to encourage staff to conduct virtual meetings where possible.	Harvey Norman Store Management
11	**Improve pedestrian pathways and connections**	Improve pedestrian connections as part of any redevelopment of the Site including the creation of east-west and north-south pedestrian spines.	Harvey Norman
12	**Provide free charging for e-bikes**	Install one or more charging points for electric bikes throughout the centre.	Harvey Norman
13	**Provide charging points for electric vehicles**	Install one or more charging points for electric vehicles throughout the centre.	Harvey Norman
14	**Consider organising a ride and walk to work / car free day for employees**	Store management to conduct an annual employee car free day. Also offer incentives to customers to ride and walk.	Harvey Norman Store Management
15	**Encourage carpooling**	Store Management to initiate workplace travel challenges to drive	Harvey Norman Store

	Green Travel Initiative	Description	Responsibility
		health, wellbeing and sustainability outcomes.	Management
16	**Encourage use of cargo bikes**	Promote the use of cargo bikes.	Harvey Norman Store Management
17	**Provide on-line shopping and delivery options**	Provide genuine on-line shopping and delivery options.	Harvey Norman
18	**Encourage workplace pedometer challenges**	Centre businesses encouraged by Centre Management to initiate workplace travel challenges to drive health, wellbeing and sustainability outcomes.	Harvey Norman Store Management
19	**Consider a parking cash-out program for employees**	Store Management to consider small cash incentives to employees to use other modes to get to work rather than by car, which requires parking.	Harvey Norman Store Management
20	**Explore a lower parking supply for the Development**	Engage with the City and explore the provision of less parking on Site than prescribed by the Local Planning Policy	Harvey Norman

Appendix E: Swept Path Simulations

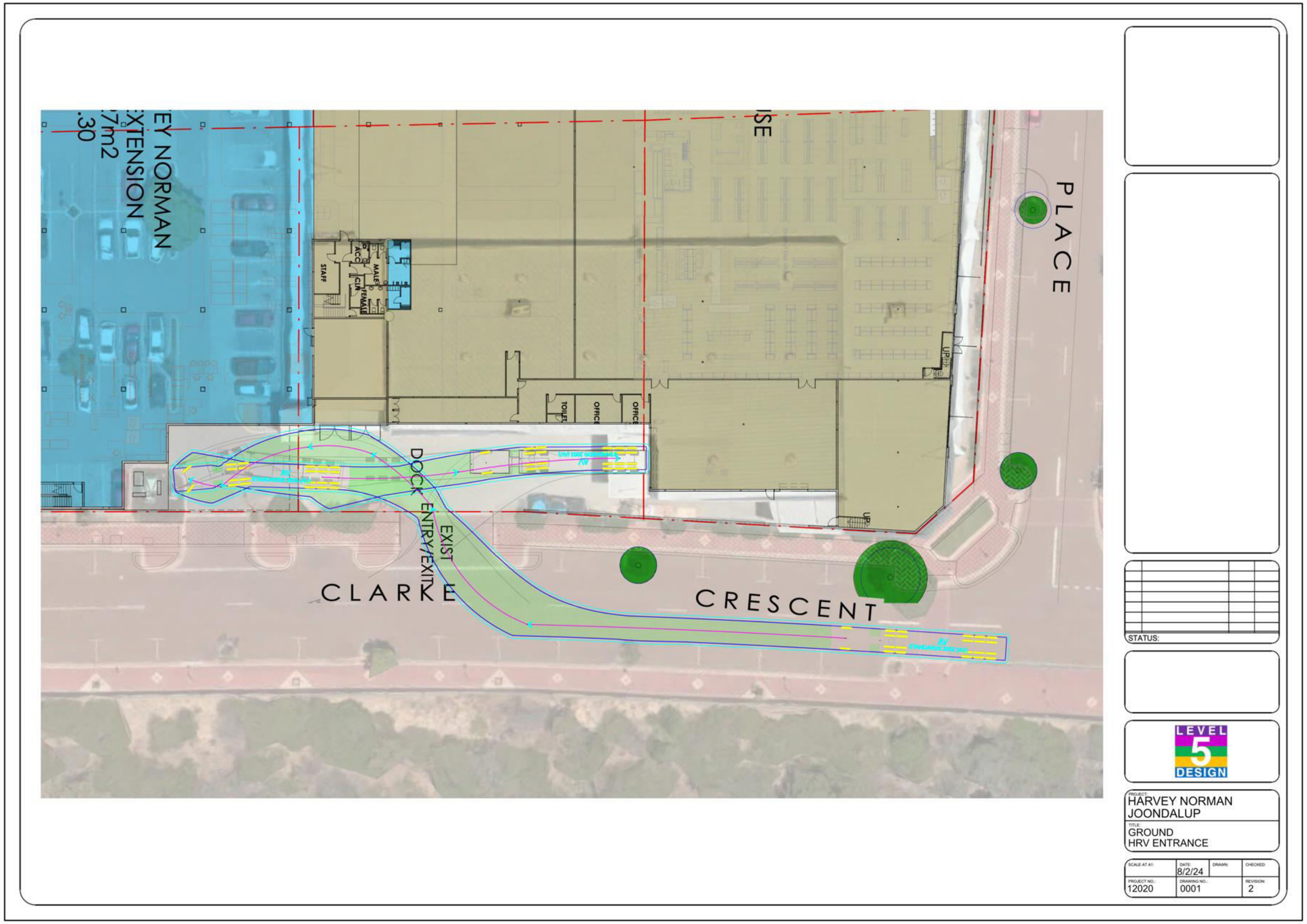

Figure E1 – Swept Path – Ground – HRV Entrance

Figure E2 – Swept Path – Ground – HRV Exit

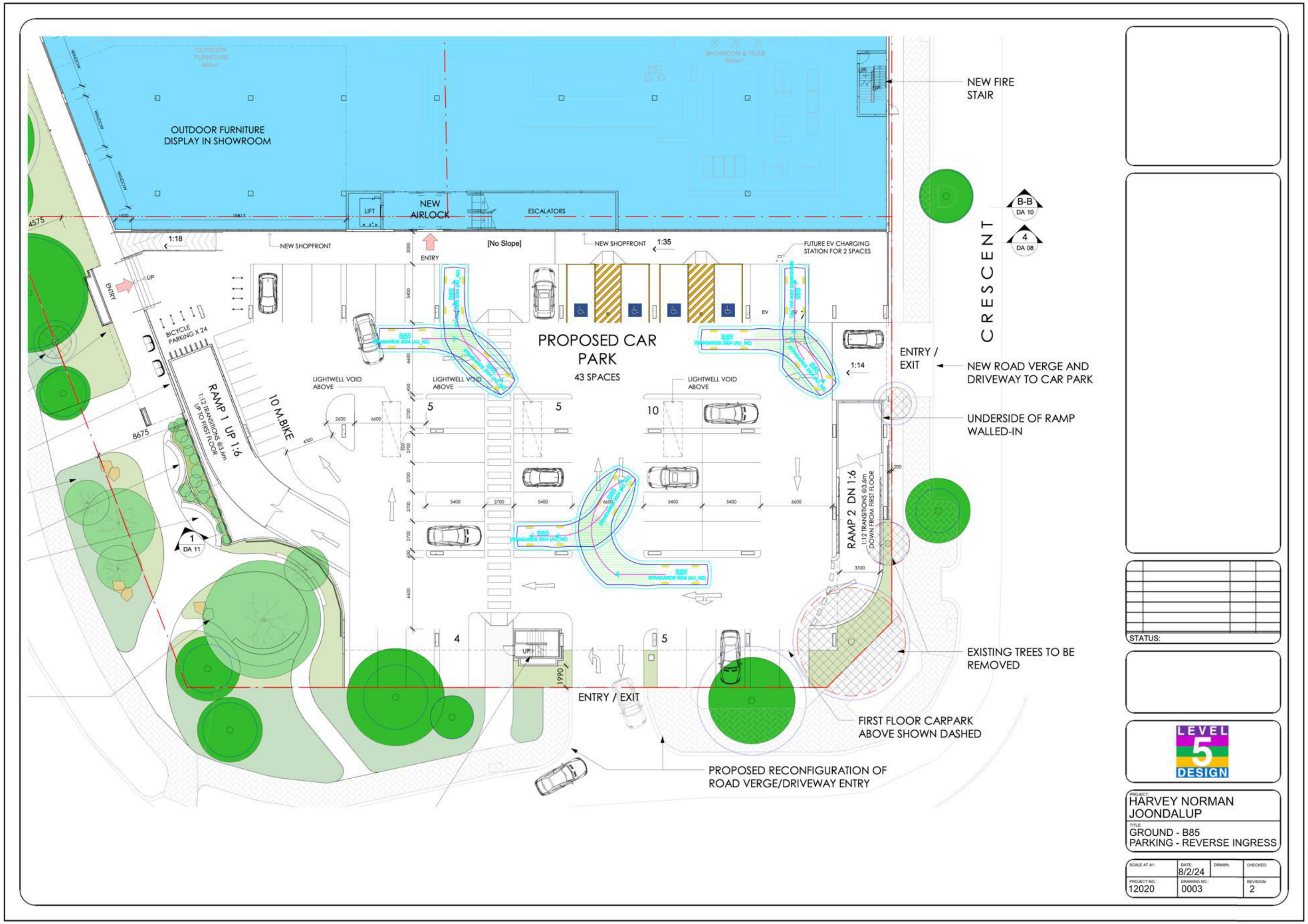

Figure E3 – Swept Path – Ground – B85 Parking – Reverse Ingress

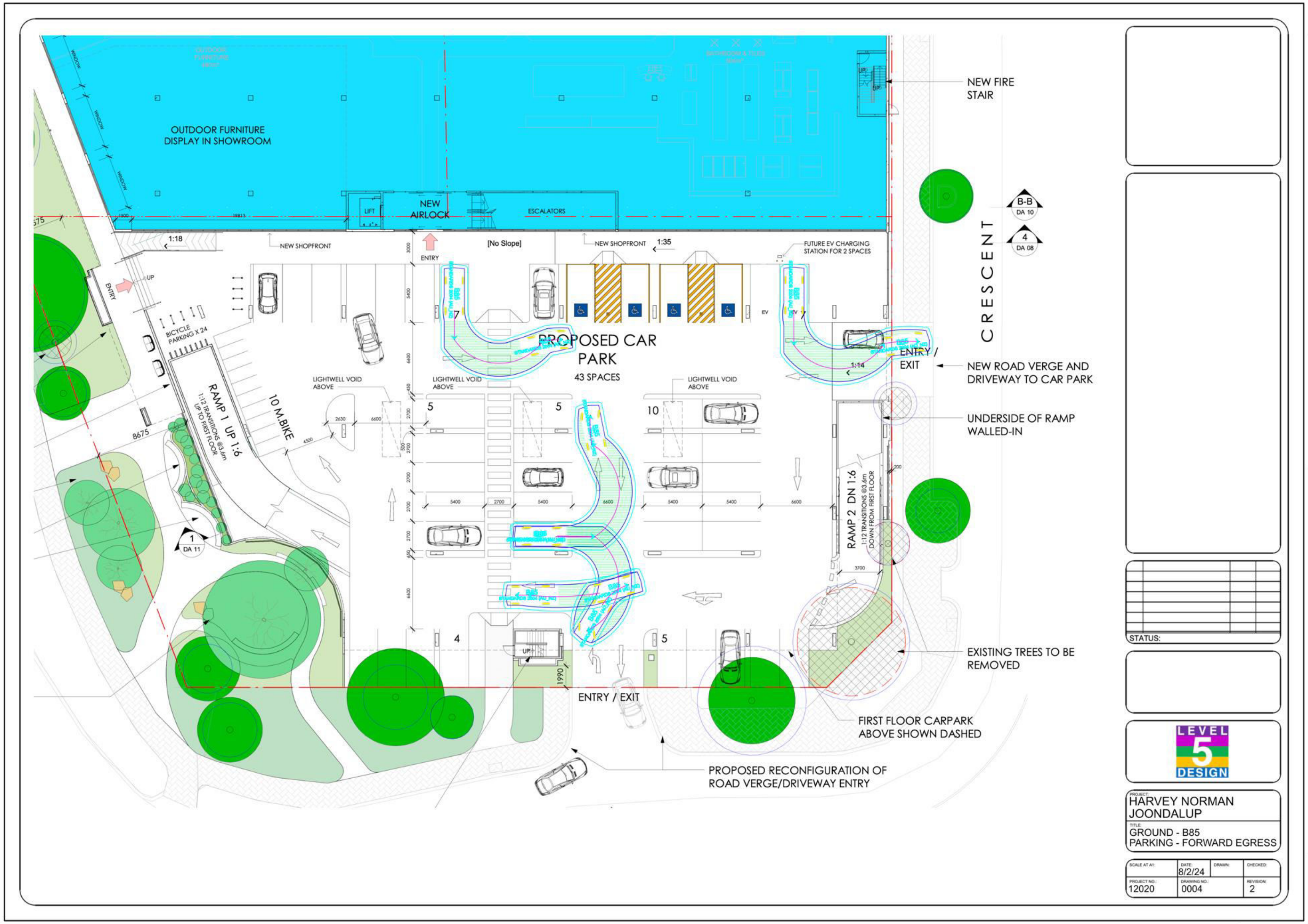

Figure E4 – Swept Path – Ground – B85 Parking – Forward Egress

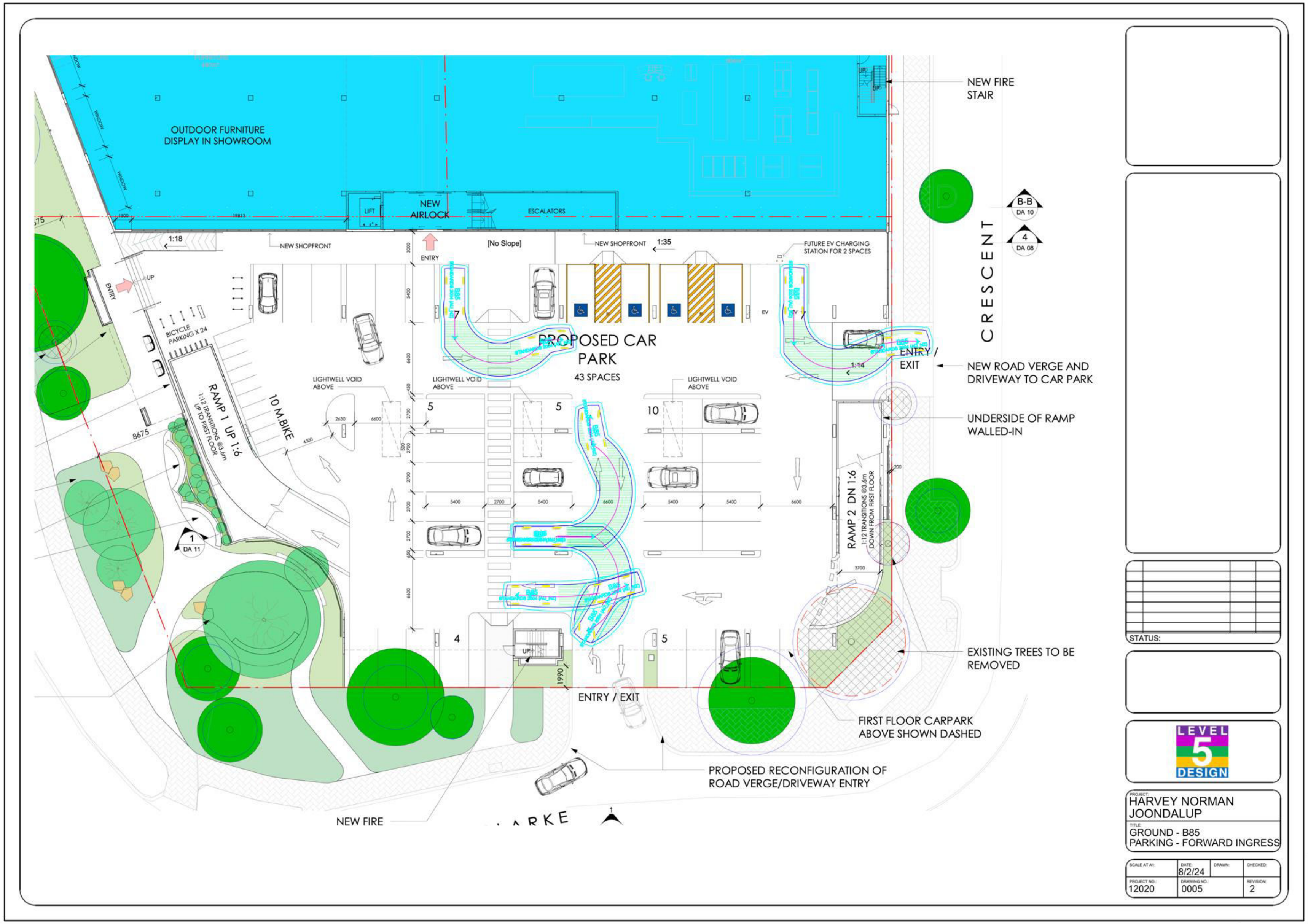

Figure E5 – Swept Path – Ground – B85 Parking – Forward Ingress

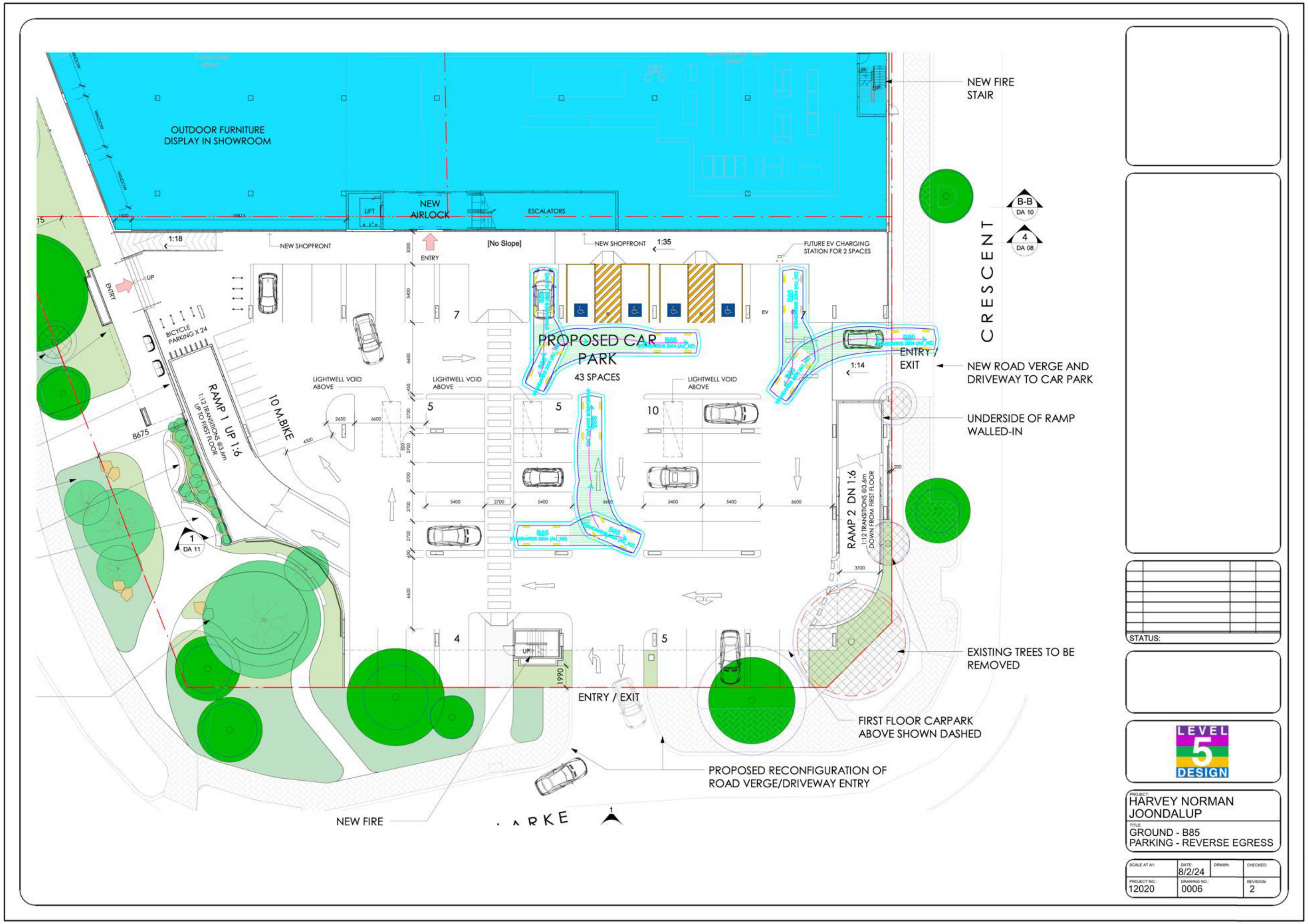

Figure E6 – Swept Path – Ground – B85 Parking – Reverse Egress

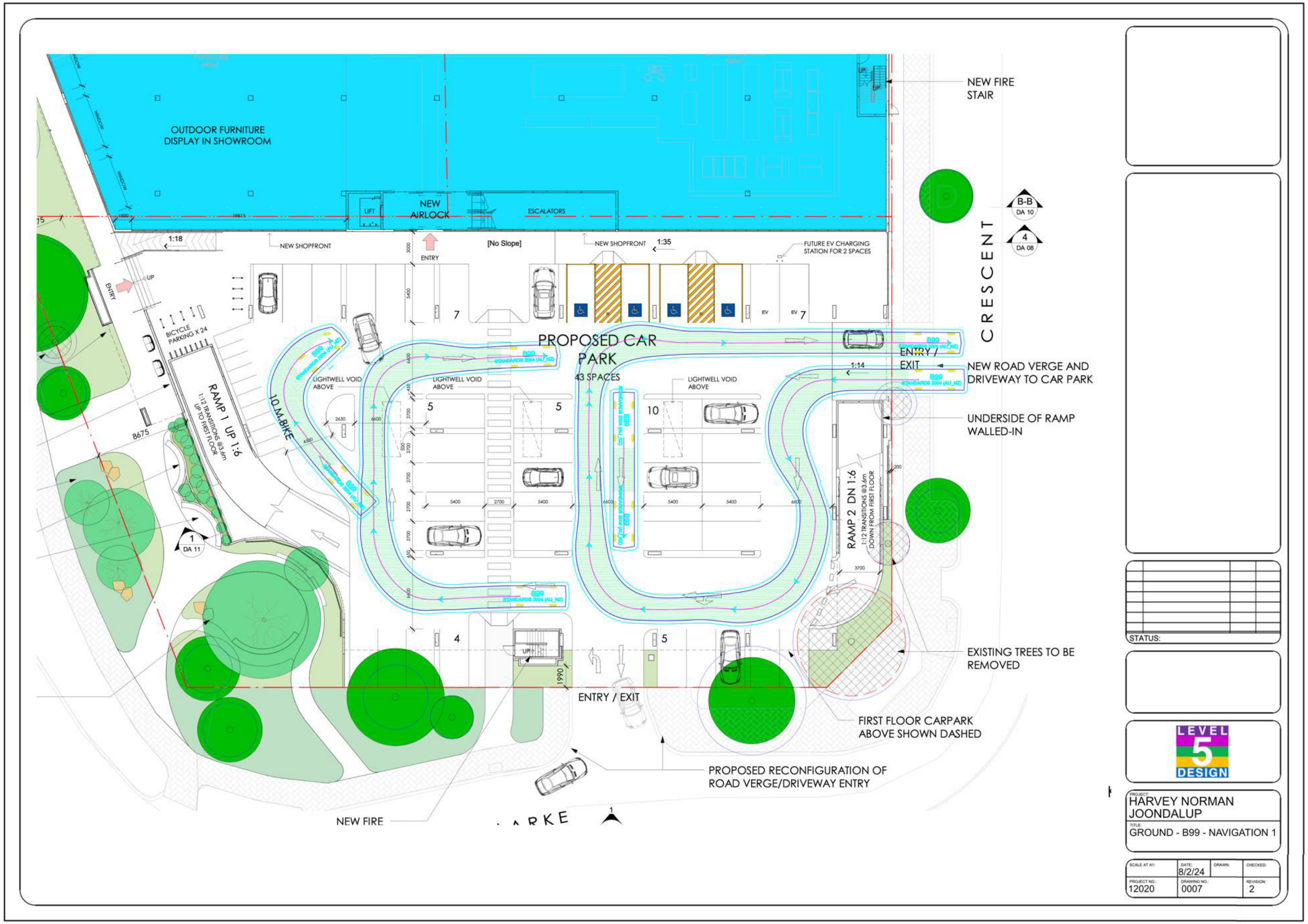

Figure E7 – Swept Path – Ground – B99 – Navigation 1

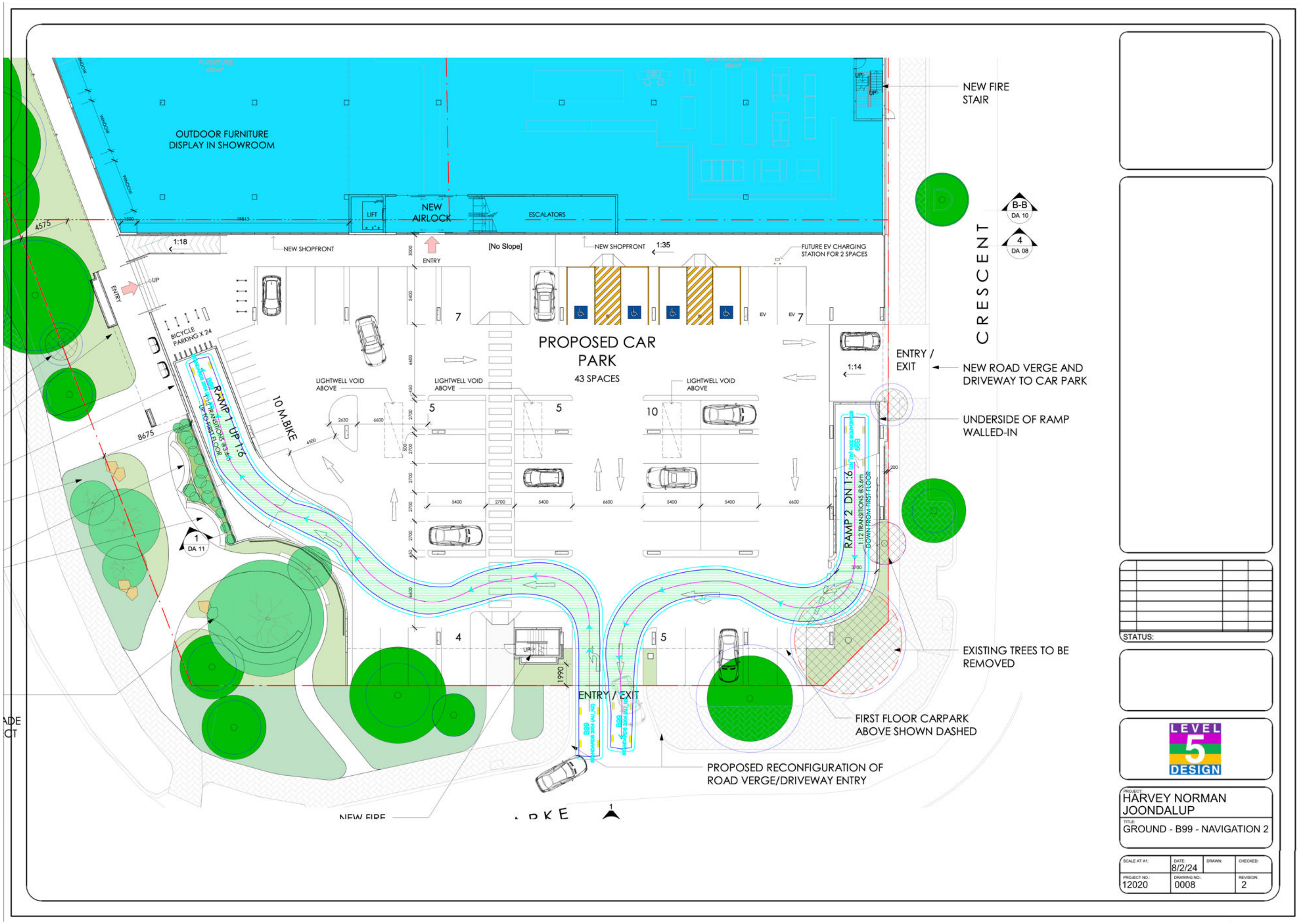

Figure E8 – Swept Path – Ground – B99 – Navigation 2

Figure E9 – Swept Path – Ground – B85 Parking – Reverse Ingress

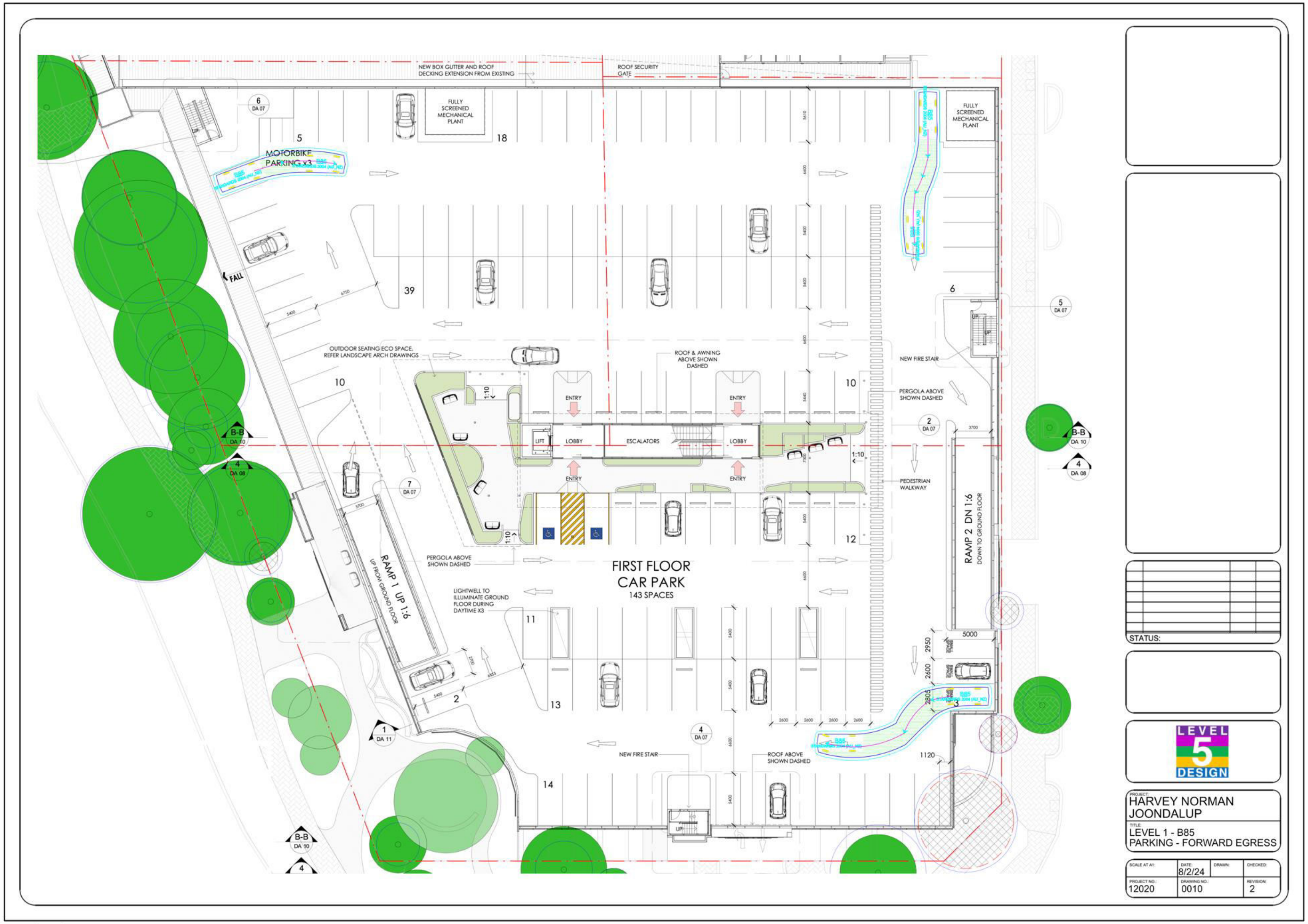

Figure E10 – Swept Path – Ground – B85 Parking – Forward Egress

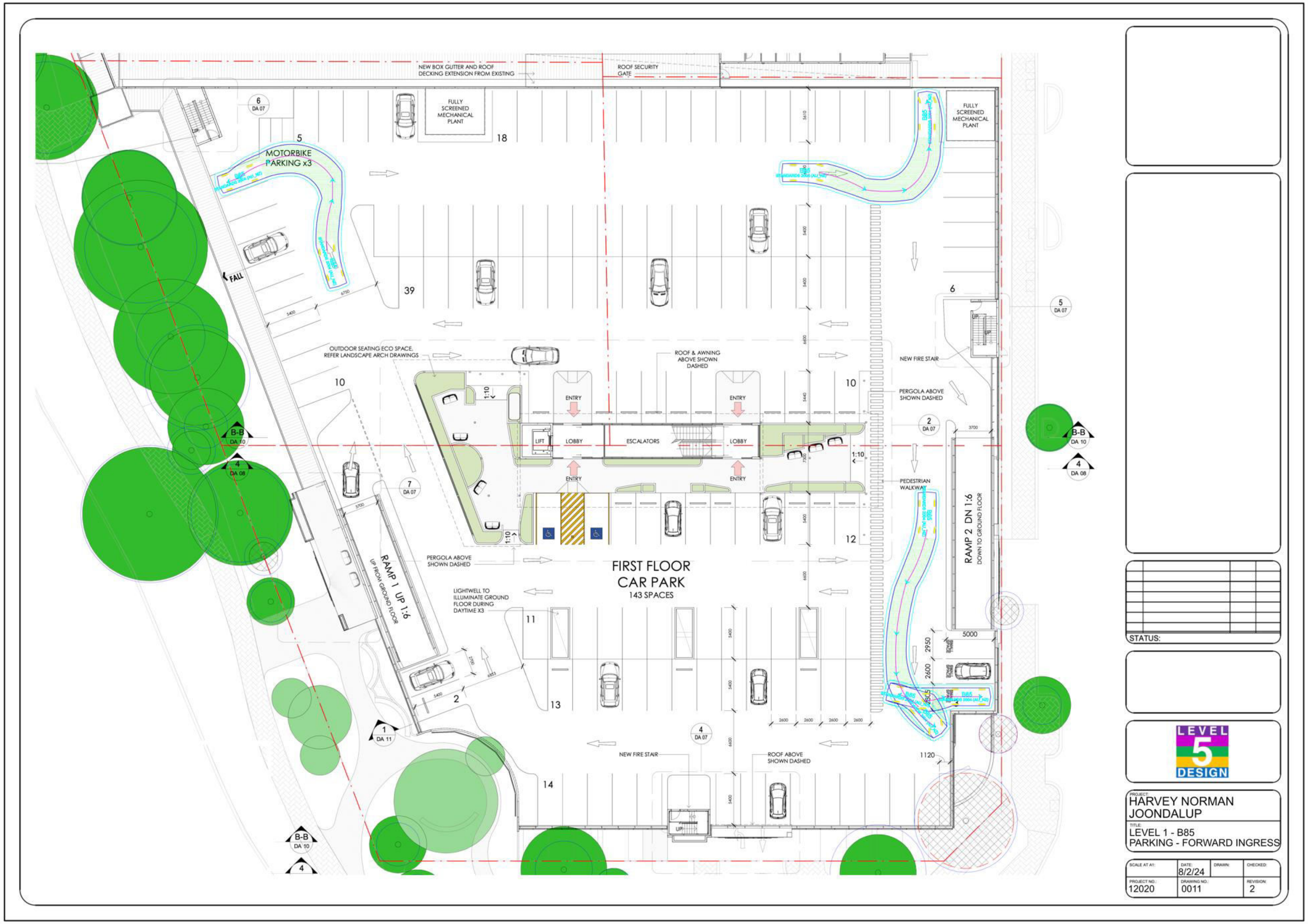

Figure E11 – Swept Path – Ground – B85 Parking – Forward Ingress

Figure E12 – Swept Path – Ground – B85 Parking – Reverse Egress

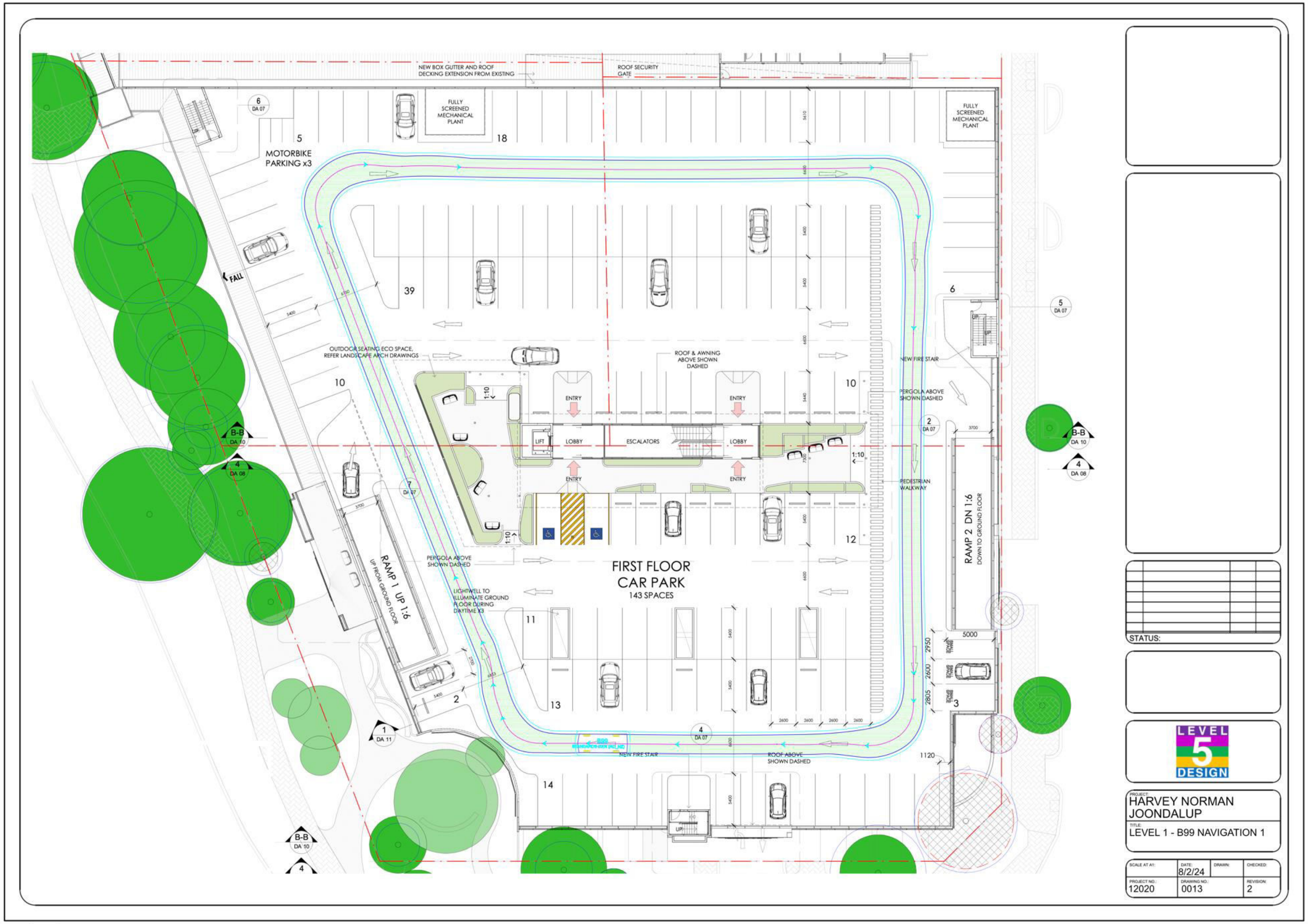

Figure E13 – Swept Path – Ground – B99 – Navigation 1

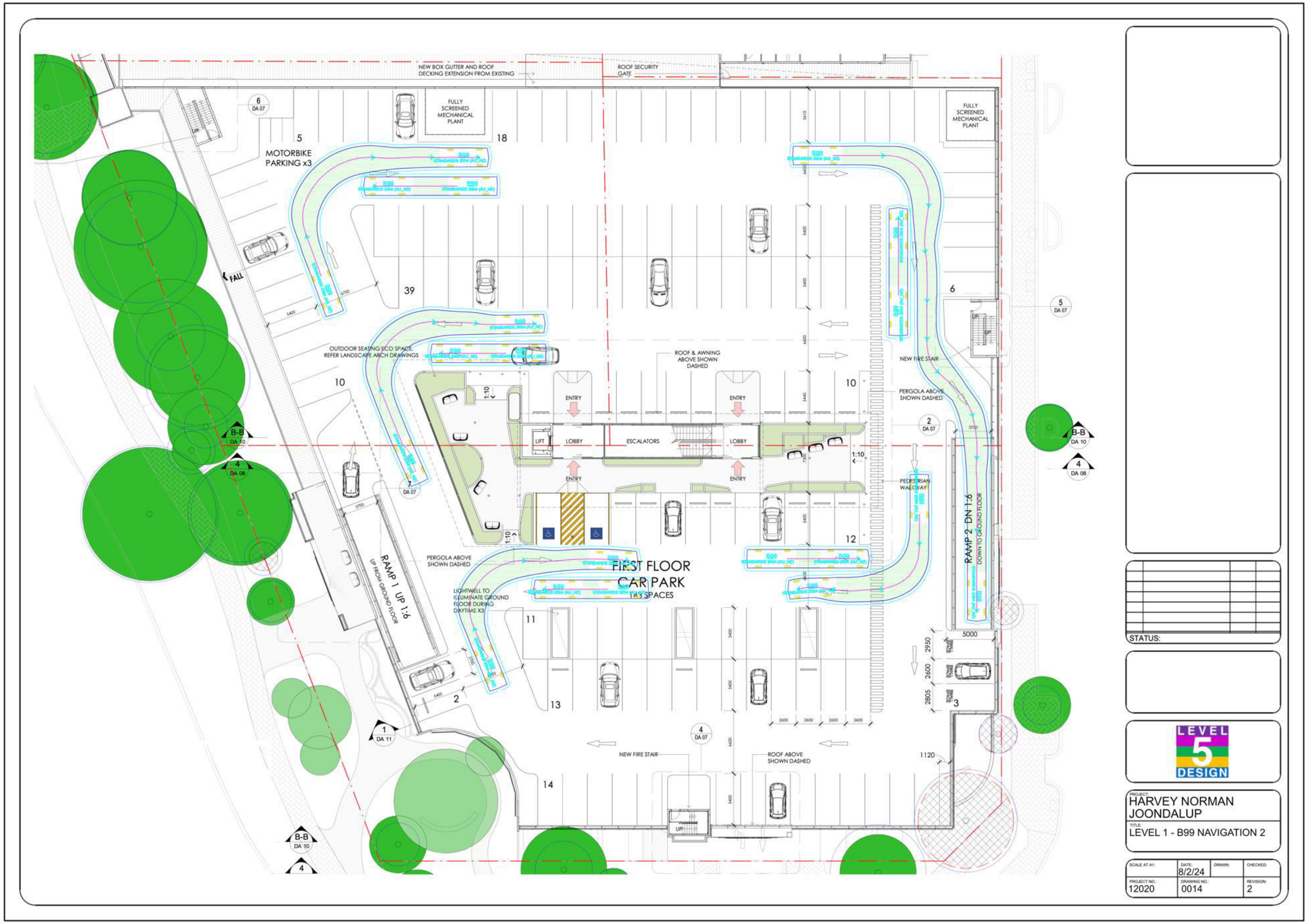

Figure E14 – Swept Path – Ground – B99 – Navigation 2

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