MLA Transport Planning

3 Holdsworth Ave, St Leonards Proposed Residential Development

Traffic and Parking Assessment

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1 Introduction

MLA Transport Planning (MLA) has been commissioned by New Golden St Leonards Pty Ltd to prepare this traffic and parking assessment report for a proposed residential development at 3 Holdsworth Avenue, St Leonards. It accompanies a development application to be submitted to Lane Cove Municipal Council. The development application seeks approval to demolish all existing structures on the site and construct in their place a new 12-storey residential flat building containing 96 apartments and a 4-level basement car park with 110 car parking spaces.

The subject site is located within an urban renewal area known as St Leonards South. Lane Cove Council prepared a planning proposal in 2018 to permit higher density residential development in the area. The planning proposal has been gazetted in November 2020 and Council has prepared and adopted development control plan for the overall St Leonards South precinct. The gazetted planning proposal is expected to deliver 2,000 additional dwellings. Land within the St Leonards South is proposed to be amalgamated into 23 areas to provide larger parcel of land to facilitate "*economic and aesthetic redevelopment while preventing land fragmentation or isolation that detracts from the desired future character of the precinct*". The subject site is the amalgamation of Nos. 10 and 12 Marshall Avenue and Nos. 1 and 3 Holdsworth Avenue to form Area No. 12 permitting buildings of 10 and 12 storeys with open green space along its Marshall Avenue frontage.

The proposed development is consistent with the development anticipated for Area No. 12 (the subject site) as envisaged in the St Leonards South planning proposal.

This report assesses the transport, traffic and parking effects of the proposed development. The remainder of the report is set out as follows:

- Chapter 2 describes the existing conditions including a description of the subject site
- Chapter 3 outlines the planning proposal for the St Leonards South precinct
- Chapter 4 presents a brief description of the proposed development
- Chapter 5 assesses the proposed on-site parking provision and the design of the car parking spaces
- Chapter 6 examines the traffic generation and its effects, and
- Chapter 7 presents the summary and conclusion of the assessment.

This revision of the traffic and parking assessment report reflects changes to the proposed development to address Council's comments.

2 Existing Conditions

2.1 Site Description

The subject site is located at 3 Holdsworth Avenue, St Leonards. It is legally described as Lot 8 in DP1275969. The subject site is located within the local government area of Lane Cove Council. The site is currently occupied by four detached houses.

The subject site is located within the St Leonards South precinct for which a planning proposal to provide additional high density housing has been given approval with the local environmental plan and development control plan finalised.

The location of the subject site and its surrounding environs are shown in Figure 2.1.

Figure 2.1: Site Locality Plan

The subject site is surrounded by low density detached dwellings on all sides. The entire area including the subject is undergoing through an urban renewal process consistent with the St Leonards South planning proposal as noted previously. This development application is part of the renewal process relating to the subject site.

2.2 Road Network

The road network in the vicinity of the subject site includes Pacific Highway, River Road, Berry Road, Marshall Avenue, Holdsworth Avenue and Canberra Avenue. Below is a description of the local road network.

2.2.1 Pacific Highway

Pacific Highway is a declared State Road under the jurisdiction of Transport for New South Wales (TfNSW, formerly Roads and Maritime Services, RMS). It forms part of the arterial major road network linking the North Shore area and beyond to Sydney CBD via Sydney Harbour Bridge and Sydney Harbour Tunnel.

In the vicinity of the site, Pacific Highway is aligned in an east-west direction and is generally configured as a six-lane, divided two-way road except at Albany Road and Westbourne Road where a westbound lane has been dropped to provide an auxiliary right turn lane.

One hour parking is permitted within the kerbside lane on both sides of Pacific Highway outside of the peak periods (except at bus zones and "NO STOPPING" zones). In addition, T3 lane is implemented on the eastbound carriageway during the morning peak period (6:00am to 10:00am) and on the westbound carriageway during the evening peak period (3:00pm to 7:00pm).

Pacific Highway has a sign posted speed limit of 60km/hr.

2.2.2 River Road

River Road is a regional road is maintained by Lane Cove Council with funding from TfNSW. It is generally aligned in an east-west direction. It connects to Pacific Highway to the east (via Shirley Road) and to Burns Bay Road to the west (via Northwood Road and River Road West). It is generally configured with one traffic lane and one parking lane in each direction, however at its intersection with Canberra Avenue the carriageway is reduced to one traffic lane in each direction separated by a raised median strip. Traffic movements to and from Canberra Avenue is restricted to left in and left out traffic movements. River Road has sign posted speed limit of 50km/hr.

2.2.3 Canberra Avenue

Canberra Avenue is a local street under the jurisdiction of Lane Cove Council. It provides access to properties fronting on to it. It is configured as a 2-lane undivided road with a generally north-south alignment. It terminates at the northern end to form a cul-de-sac near Pacific Highway. Time restricted kerbside parking (2P) is available on both sides of the road north of Duntroon Avenue, while south of Duntroon Avenue unrestricted kerbside parking is available on the western side of Canberra Avenue and

"NO PARKING" parking restriction is enforced on the eastern side. Canberra Avenue is located within a 50km/hr speed limit area.

2.2.4 Berry Road

Berry Road is a local road providing access to abutting properties under the administration of Lane Cove Council. It is aligned in a north-south direction. It connects to Pacific Highway to the north via a signalised intersection. Berry Road terminates at its southern end to provide a cul-de-sac with pedestrian access permitted to River Road.

It is generally configured as a 2-lane undivided road with kerbside parking on both sides of the road. Kerbside parking is restricted to 1P and 2P parking in the vicinity of its intersection with Holdsworth Avenue. It is located within a 50km/hr speed limit area.

2.2.5 Marshall Avenue

Marshall Avenue is a local road providing access to abutting properties and is administrated by Lane Cove Council. The road is generally aligned in an east-west direction. It is configured as a 2-lane undivided road with kerbside restricted parking (1P) permitted. It is located within a 50km/hr speed limit area.

2.2.6 Holdsworth Avenue

Holdsworth Avenue is another local road under the administration of Lane Cove Council. It is aligned in a north-south direction as a 2-lane undivided road with unrestricted kerbside parking permitted on both sides of the road. Holdsworth Avenue also terminates at the southern end to form a cul-de-sac. It is located within a 50km/hr speed limit area.

2.3 Public Transport

The subject site is located within 400m to St Leonards Railway Station with the nearest bus stop located within 200m of the site.

The site can be accessed using train services operated by Sydney Trains and NSW TrainLink as well as regular scheduled bus services operated by State Transit Authority, Transit Systems, Hillsbus and Keolis Downer Northern Beaches. As such, the subject site is well located in terms of accessibility to public transport services.

The available public transport services in the vicinity of the site are summarised in Table 2.1 for train services and Table 2.2 for bus services.

Table 2.1: Available Train Services at St Leonards Railway Station

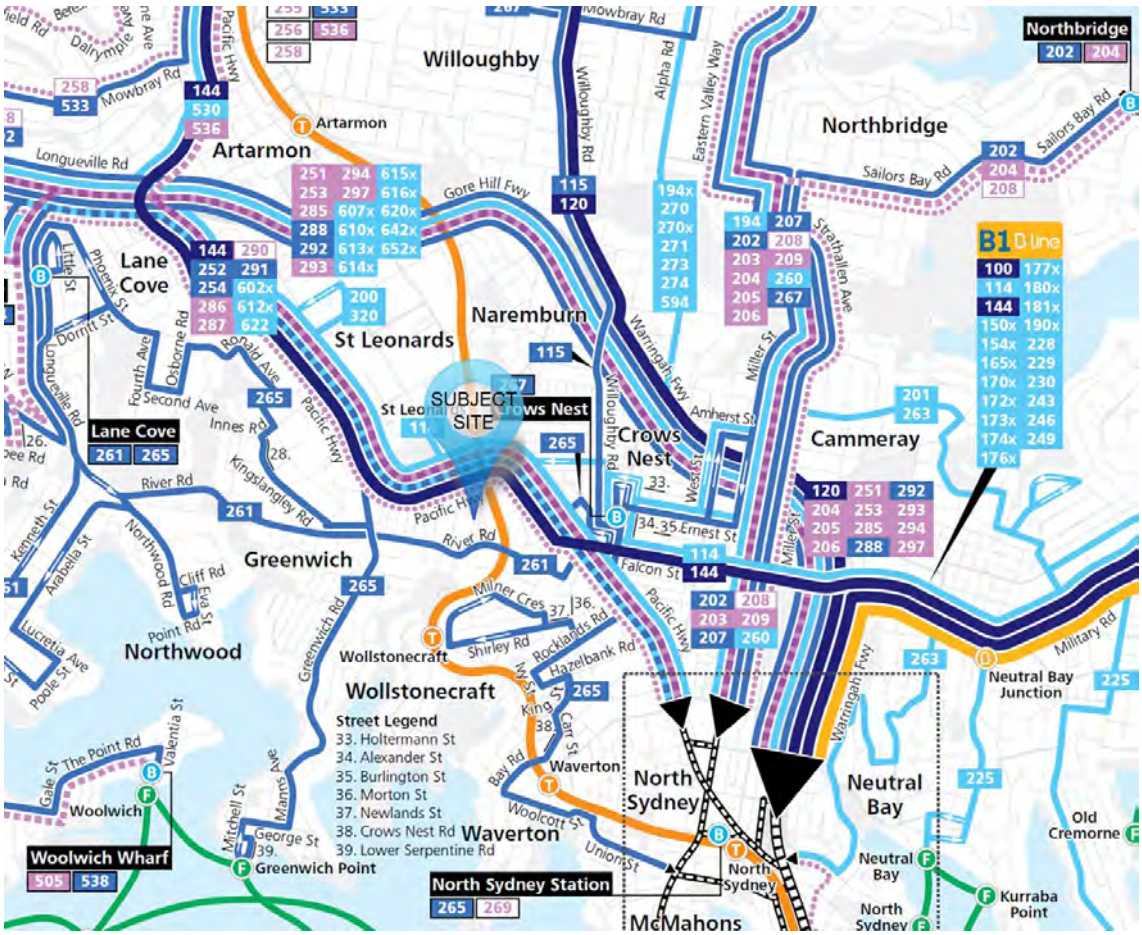
Line	Line Description	Weekday Peak Period Frequency
T1 Western Line	Emu Plains/Richmond to City	3-10 minutes
T1 North Shore Line	Berowra to City via Gordon	3-5 minutes
T9 Northern Line	Hornsby to North Shore via City	15 minutes
Central Coast & Newcastle Line	Newcastle to Central via Strathfield or Gordon	15 minutes

Table 2.2: Available Bus Services

Route No.	Route Description	Weekday Peak Period Frequency
114	Balmoral to Royal North Shore Hospital	20-25 minutes
144	Manly to Chatswood via St Leonards	10 minutes
200	Bondi Junction to Gore Hill	15-20 minutes
252	Gladesville to City King Street Wharf via North Sydney	20-45 minutes
254	McMahons Point to Riverview	15-20 minutes
265	North Sydney to Lane Cove via Greenwich	30 minutes
286	Denistone East to Milsons Point via St Leonards & North Sydney	30 minutes
287	Milsons Point to Ryde via North Sydney & St Leonards	30 minutes
290	Epping to City Erskine St via Macquarie University & North Sydney	No Service
291	McMahons Pt to Epping	20 minutes
320	Mascot to Gore Hill	10-15 minutes
602X	Bella Vista Station to North Sydney (Express Service)	10-15 minutes
612X	Castle Hill to North Sydney (Express Service)	10 minutes
622	Dural to Milsons Point via Cherrybrook	30 minutes

Figure 2.2 shows a map of the existing available bus services in the vicinity of the subject site.

Figure 2.2: Bus Network



Source: TfNSW

It is also noted that the subject site is located within walking distance to the future Crows Nest Metro Station which is currently under construction. The new station is located on the eastern side of Pacific Highway at Oxley Street which is within 700m walking distance to the subject site. The station is expected to open in 2024 and would operate with a "just turn up and go" timetable where a train would arrive at every four minutes during the peak periods and every 10 minutes at other times. The Crows Nest Metro Station will increase public transport capacity in the area significantly in the future.

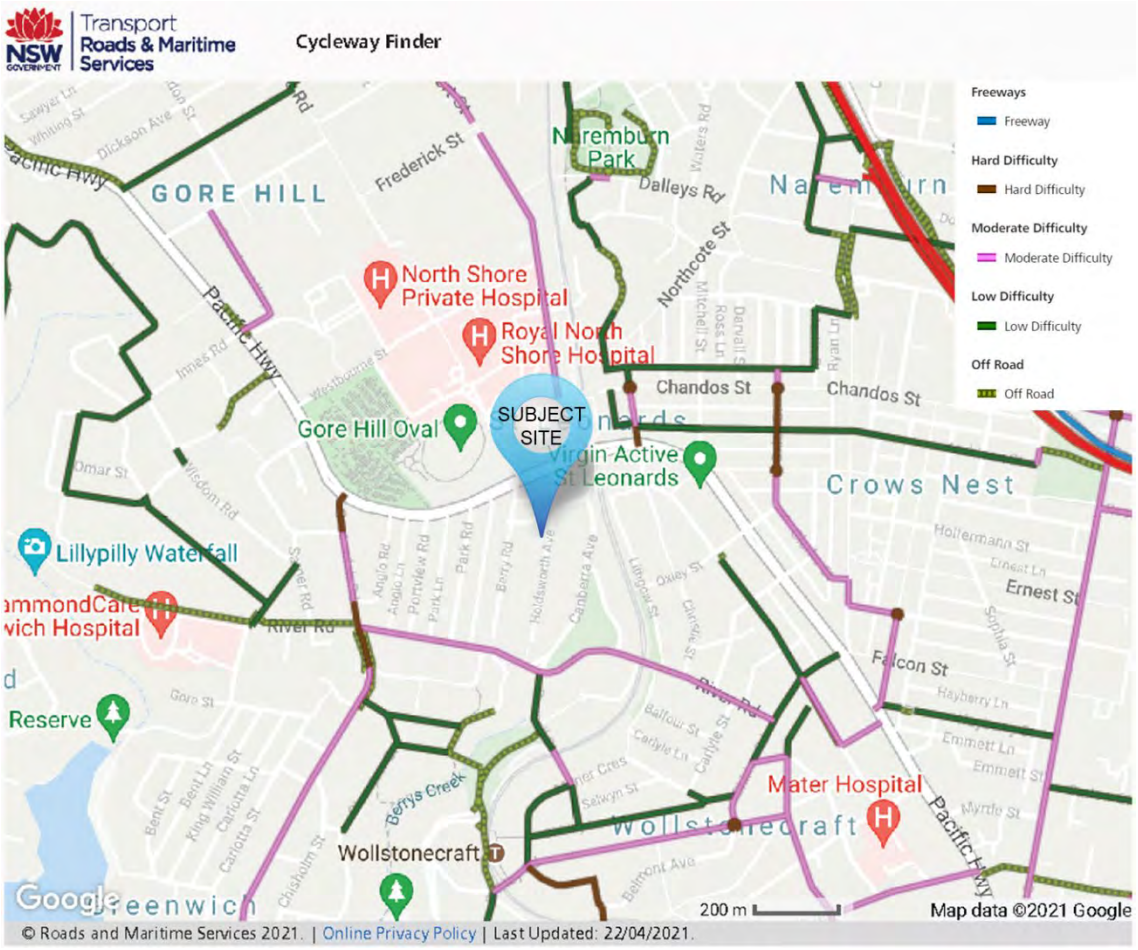
2.4 Pedestrian and Cycle Network

Within the immediate vicinity of the site, well established pedestrian and cycle infrastructures are available.

Fully formed pedestrian paths are provided on all existing roads in the vicinity of the site.

In relation to bicycle pathways in the vicinity of the site, the map in Figure 2.3 shows the existing bicycle paths in the area.

Figure 2.3: Cycle Network Map



Source: https://www.rms.nsw.gov.au/maps/cycleway_finder

It is noted that in the future the St Leonards South precinct will include a number of pedestrian links and bicycle paths. These are depicted in Figure 2.4 which has been extracted from Lane Cove Development Control Plan 2010.

Figure 2.4: Future Access Network in St Leonards South Precinct

3 Planning Proposal

3.1 Background

The subject site is part of the St Leonards South precinct. The St Leonards South was the subject matter of a planning proposal prepared by Lane Cove Council. The planning proposal process commenced in July 2015 when Lane Cove Council resolved to undertake a master planning exercise for the precinct.

Lane Cove Council exhibited the planning proposal in 2018. The planning proposal was reviewed by the Independent Planning Commission of NSW. A design charrette was organised and attended by representatives from Lane Cove Council, Government Architect NSW (GANSW), Greater Sydney Commission (GSC) and three independent State Design Review Panel (SDRP) members. The planning proposal was finalised by the Department of Planning, Industry and Environment in September 2020 and gazetted in November 2020. The development control plan was adopted by Council in its October 2020 meeting and come into effect on the same date.

The gazetted planning proposal permitted an additional 2,000 new dwellings delivered through the following changes to the relevant controls and provisions in Lane Cove Council Local Environmental Plan (LEP):

- land use zone control – from R2 Low Density Residential to R4 High Density Residential
- maximum building height control – from 9.5m to up to 65m (or equivalent to 19 storeys), and
- maximum floor space ratio control – from 0.5-0.6:1 up to 3.85:1.

The subject site which has been designated as Area 12 in the planning proposal is permitted to have the following controls in the gazetted planning proposal:

- a R4 High Density Residential zoning
- a maximum building height of 2.5m and 44m, and
- a maximum floor space ratio of 3.45:1.

3.2 Traffic Assessment

The planning proposal was supported by a cumulative traffic assessment report[1] prepared on behalf of Lane Cove Council. The cumulative traffic assessment included the development of a Aimsun traffic model which takes into account the cumulative traffic impacts arising from all known developments at the time in the St Leonards area within the local government area of Lane Cove Council. It includes development traffic generated by the St Leonards South precinct which was anticipated to provide an additional 2,400 dwellings (this was reduced to 2,000 dwellings in the gazetted planning proposal).

The Aimsun traffic model has been developed by building upon the previous microsimulation traffic models developed on the Paramics platform.

The Aimsun traffic model adopted the following traffic generation rates:

- morning peak period – 0.14 trips per peak hour per dwelling, and
- evening peak period – 0.07 trips per peak hour per dwelling.

The above traffic generation rates have been extracted from Technical Direction TDT 2013/04a, TfNSW's updated traffic generation guidelines and are based on the St Leonards high density residential site. These rates have also been agreed with the then Roads and Maritime Services (now Transport for NSW, TfNSW).

The Aimsun traffic model includes assessment of the following traffic scenarios:

- Base Model 2013 – existing traffic conditions at the time
- Base Model 2021 – future case with additional development traffic including those from LEP 2009 growth, St Leonards South and the Loftex sites on Marshall Avenue (Site L)
- Model 2021 + A – Base Model 2021 plus development traffic from Site A (Winten sites) which is currently under construction and is generally referred to as 88 Christie Street
- Model 2021 + AB – Model 2021 + A plus development traffic from Site B (Mirvac site) which has been completed and occupied, and
- Model 2021 + ABC –Model 2021 + AB plus development traffic from Site C (New Hope/VIMG site) which is currently under construction.

The cumulative traffic assessment recommended a number of traffic measures in order to achieve satisfactory performance in the Base Model 2021 scenario. These are

[1] St Leonards South, A Report on Traffic Impacts of Large-Scale Developments on Pacific Highway prepared by TEF Consulting for Lane Cove Council (Ref: 17020 Rep 02a 170424)

required "*as a result of the general growth of network traffic, LEP 2009 developments and the proposed St Leonards South Master Plan development*". These measures include:

- parking bans on streets approaching certain intersections
- adjustment to traffic signal timing and phasing at select intersections
- right turn bans at select intersections, and
- new road connection (between Park Road and Berry Road).

The cumulative traffic assessment found that:

> *"The results of modelling for all development options, with consideration of subsequent cumulative impacts of each large development analysed in this study, are generally consistent with findings of the traffic impact assessment reports submitted for the respective development applications.*
>
> *Primarily due to the fact that the proposed developments replace existing substantial buildings, traffic increases as a result were very moderate for each of the developments L, A, B and C and in some cases a reduction of trip generation resulted from the land use change.*
>
> *Accordingly, although total traffic delays for the whole network generally increased with each additional development, some intersections even experienced slight improvements (due to traffic redistribution), whilst increased delays at other intersections were minor to moderate. Levels of Service remained essentially the same for all models."*

4 Development Description

4.1 Development Description

The proposed development involves the demolition of all existing buildings on the site and construct in their place a 12-storey residential flat building.

The proposed building will accommodate 96 residential apartments with the following apartment mix:

- 1-bedroom units – 29
- 2-bedroom units – 45
- 3-bedroom units – 18, and
- 4-bedrooom unit – 4.

The proposed development includes a 4-basement level car park plus a ground floor level containing a loading bay plus some visitor parking spaces. Overall, the proposed development will have 110 car parking spaces including 20 visitor parking spaces.

The revised architectural car park plans are contained in Appendix A.

4.2 Proposed Access Arrangement

Vehicular access to the basement car park and loading area is proposed to be provided off Holdsworth Avenue. The proposed access is proposed to be configured as a combined entry and exit driveway to be shared between general traffic and service vehicles.

All redundant vehicle crossovers will be removed with kerb and gutter re-instated to Council's requirements and in accordance with relevant design guidelines.

4.3 Loading Facility

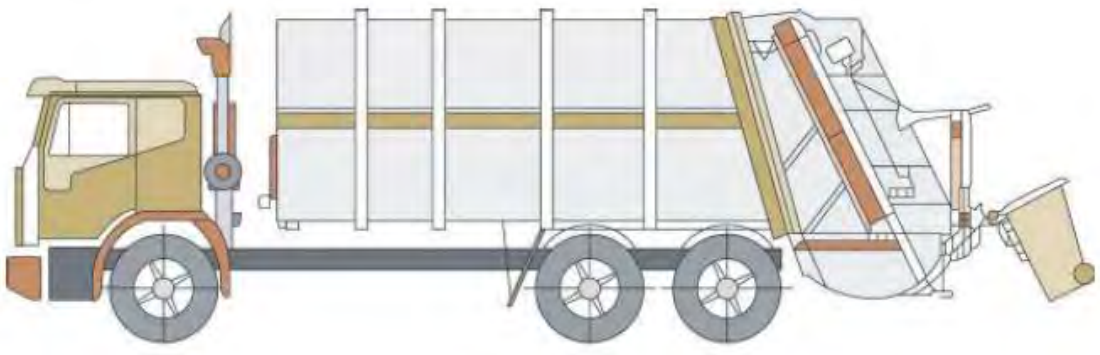
The proposed development includes an on-site loading bay on the ground floor. It has dimensions of 3.5m by 8.8m long with an additional clearance area at the rear measuring 3.5m by 2.7m. The proposed loading bay has been designed to accommodate service vehicles up to an Australian Standard 8.8m long medium rigid vehicle (MRV).

It is noted that in the pre-DA meeting, Council requested for waste collection be conducted in compliance with Part Q of the Lane Cove Development Control Plan 2010 (LCDCP 2010). LCDCP 2010 states that residential developments are to be designed to accommodate waste collection vehicles in Appendix E of LCDCP 2010. The largest waste collection vehicle in Appendix E of LCDCP 2010 is a 9.64m long vehicle which is a side loading vehicle. The largest rear loading waste vehicle is an 8.0m long waste vehicle – see Figure 4.1. Side loading waste collection vehicles are typically used for kerbside collection, while rear loading waste collection vehicles are typically used for onsite waste collection. It is also noted that Council's Waste Contract Coordinator has agreed to the use of an 8.0m long waste vehicle for the subject proposed development.

Figure 4.1: Council's Waste Collection Vehicle

- **Typical Council Garbage Truck used for Domestic Waste Collection – Rear Load**

Length overall	8.0 metres
Width overall	2.5 metres
Operational height	4.3 metres
Travel height	4.3 metres
Weight (vehicle and load)	22.5 tonnes
Weight (vehicle only)	13 tonnes
Turning Circle	25.0 metres



rearloader garbage truck

As noted above, the proposed development has been designed to accommodate an 8.8m long MRV which exceeds the dimensions of an 8.0m long rear loading waste collection vehicle in LCDCP 2010.

In relation to the required headroom for waste collections vehicles, the LCDCP2010 (refer to Figure 4.1 above) requires a travel and operational height of 4.3m to be provided. In addition, in the pre-DA meeting Council also requested for the 4.3m to be shown in the traffic report. MLA's review of the architectural plans indicates the part of the ground floor that would be accessed by service vehicles has double height with a floor to floor of 7.6m. As such, the required 4.3m headroom for the waste collection vehicles can be accommodated.

In addition, it is noted that an 8.8m long service vehicle bay can also accommodate typical removalist trucks.

Following the above, the proposed loading bay on the ground floor is proposed to operate as a shared loading facility for the proposed development i.e. it will accommodate service vehicles for waste collection, removalist trucks and large bulky items deliveries (refrigerators, televisions, washing machines) etc.

It is also proposed for service vehicles to share the same access as the general traffic accessing the car park.

4.4 Electric Vehicle Infrastructure

Part C of the LCDCP 2010 requires the proposed development to provide infrastructure for potential to provide electric charging points to every car space within the internal parking basements for hybrid and electric vehicles.

The proposed development proposes to comply with the above requirement as follows.

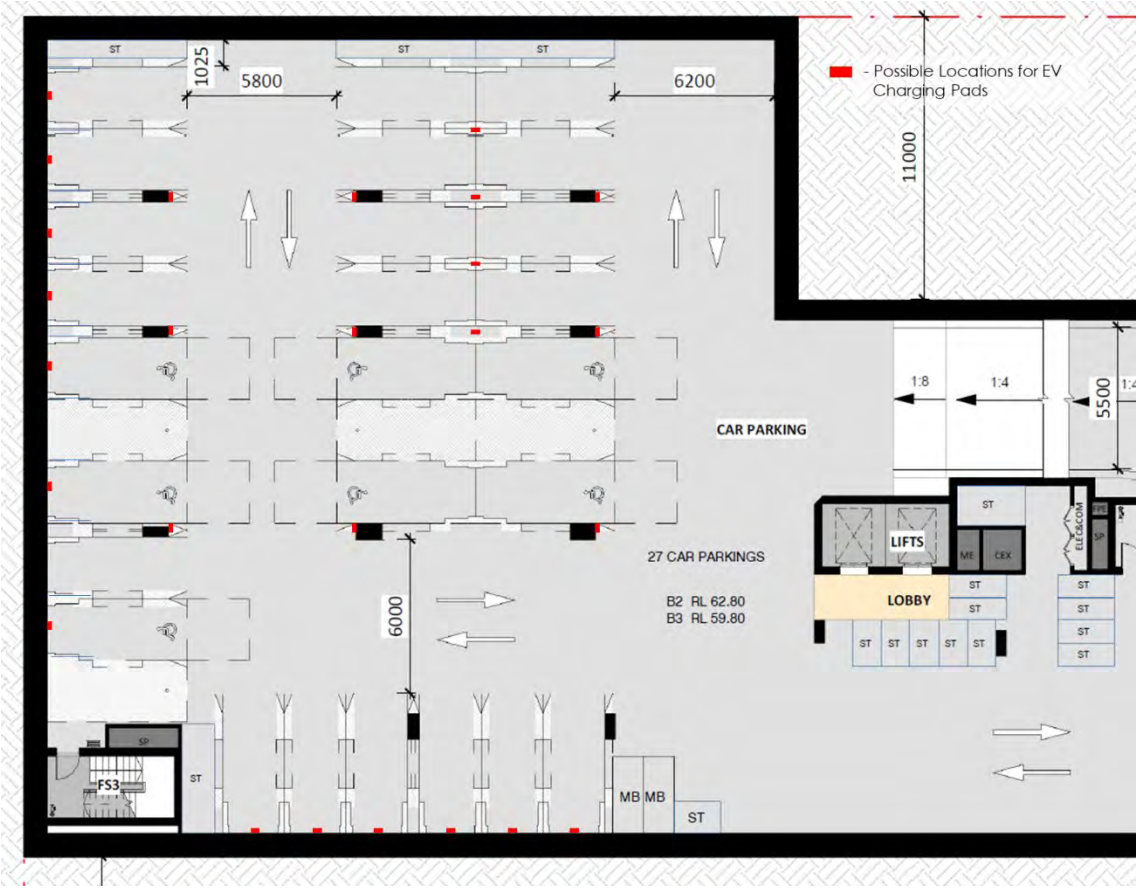
All proposed car parking spaces for residents will be provided with surface mounted conduits and cabling reticulated back to the sub-station for the proposed development. The mounting of conduits and cabling (with a maximum nominal size of 150mm, but typically 25mm) will not affect the car park's ability to comply with the Australian Standard headroom requirement. A headroom of 2.2m (or 2.5m above accessible car parking spaces) will be maintained noting that the basement is proposed with a floor to floor height of 3.0m.

In addition, the charging pad or wallbox responsible for the charging of the vehicles has typical dimensions (H x W x D) of 320mm x 195mm x 110mm (see Appendix B for specifications). It is noted that the width of the charging pad will not be wider than a typical column width (400mm typical). The charging pad will be accommodated by having it mounted on a wall and/or column adjacent to the car space. Where this is not possible, it will be mounted on a pedestal which will be fixed to the ground

adjacent to the car space. In all cases, the charging pad will be located outside of the Australian Standard car space design envelope (Figure 5.2 of the Australian Standard AS2890.1:2004). As such, the charging pad including the pedestal (where required) will not compromise the car park's ability to comply with the design requirement set out in the Australian Standard.

The possible locations for a charging pad to each car space on a typical basement level are shown in Figure 4.2.

Figure 4.2: Possible Locations for Electric Vehicle Charging Pad



As such, the above will provide adequate infrastructure to future proof the development so to encourage the uptake of electric vehicles and thus complies with the Sustainable Transport control in Part C of LCDCP 2010.

5 Parking Assessment

5.1 Car Parking Requirements

Parking requirements for the proposed development have been assessed against Lane Cove Council's Lane Cove Development Control Plan 2010, specifically Table 2 in Part R Traffic, Transport and Parking (DCP 2010).

The parking assessment based on DCP 2010 requirements for the proposed development is presented in Table 5.1.

Table 5.1: Car Parking Assessment

Proposed Land Use	No. of Dwellings	DCP Parking Rates	Car Parking Requirement
1-Bedroom Dwellings	29 Apts	0.5 spaces per dwelling	15
2-Bedroom Dwellings	45 Apts	0.9 spaces per dwelling	41
3-Bedroom Dwellings	18 Apts	1.4 spaces per dwelling	26
4-Bedroom Dwellings	4 Apt	2.0 spaces per dwelling	8
Visitors	-	1.0 space per 5 dwellings	20
Total	**96**	**-**	**110**

Based on the DCP parking requirements presented in Table 5.1, the proposed development is required to provide a total of 110 car parking spaces comprising 90 resident car parking spaces and 20 visitor car parking spaces.

5.2 Adequacy of Car Parking Spaces

The proposed development includes a 4-level basement car park with additional parking on the ground floor. A total of 110 car parking spaces comprising 90 car parking spaces for residents and 20 visitor car parking spaces is proposed to serve the proposed development.

The proposed parking provision of 110 car parking spaces is consistent with the DCP 2010 parking requirement.

5.3 Accessible Parking

DCP 2010 requires accessible parking for residents to be provided at a rate of one accessible car space per one adaptable housing unit. DCP 2010 also requires one accessible car space per 10 visitor car parking spaces provided (with a minimum of one accessible space).

The proposed development includes 20 adaptable apartments. As such, based on DCP 2010 requirement, the proposed development is required to provide 20 accessible parking for residents. Similarly, the proposed development proposes to provide 20 visitor car parking spaces. As such, the proposed development is required to provide two visitor accessible car parking spaces.

The architectural car park plans indicate a total of 22 accessible car parking spaces for residents and two accessible visitor car parking spaces. Therefore, the proposed accessible parking provision for the proposed development is satisfactory.

Separately, the accessible car parking spaces are proposed to be distributed to all parking levels.

5.4 Bicycle Parking

DCP 2010 requires bicycle parking for residential developments to be provided at a rate of one bicycle parking space per four dwellings for residents and one bicycle space plus one bicycle space per 10 dwellings.

Therefore, the proposed development is required to provide 24 bicycle parking spaces residents and 11 bicycle parking spaces for visitors.

The proposed development includes 26 bicycle parking spaces for residents and 11 bicycle parking spaces for visitors. As such, the proposed bicycle parking provision complies with DCP 2010 requirement and is therefore satisfactory.

5.5 Motorcycle Parking

DCP 2010 requires motorcycle parking to be provided at a rate of one motorcycle parking space per 15 car parking spaces for all types of development.

The proposed development is required to provide 110 car parking spaces. Therefore, it is required to provide seven motorcycle parking spaces.

The proposed development includes eight motorcycle parking spaces. Therefore, the proposed motorcycle parking provision is also satisfactory.

5.6 Service and Delivery Vehicle Parking

In relation to service vehicle requirements, DCP 2010 requires any proposed residential developments to provide service vehicle bays at a rate of one removalist truck space per 100 residential units.

As such, the proposed development with 96 dwellings is required to provide one truck bay. In this regard, it is noted that the proposed development includes a loading bay on the ground floor which has been designed to accommodate service vehicles up to an Australian Standard 8.8m long medium rigid vehicle.

Therefore, the proposed provision of service vehicle bay is satisfactory.

5.7 Car Park Layout Design

The car park is proposed as a 4-level basement car park from Levels B1 to B4 with additional parking provided on the ground floor and is located directly beneath the proposed development. It can be accessed via a combined entry and exit driveway located off Holdsworth Avenue.

Each basement level has an L shape with the floor-to-floor internal ramp being located on the northern half of the basement while the car parking spaces are located on the southern half.

A straight two-lane, two-way ramp is located off the eastern wall within the northern half of the site to provide access between basement levels as well as connecting to the ground floor.

On Basement B2 to B4, 90 degrees car parking spaces are proposed to be located along the southern and eastern periphery walls of the basement with an additional module of car parking spaces located opposite the car parking spaces off the southern wall. This layout is replicated on B1, but plant rooms on the eastern wall have displaced the car parking spaces. On the ground floor, 90 degrees parking spaces are proposed on the southern and northern periphery walls of the southern half of the site.

In relation to the design of the parking spaces, it is noted that the car parking spaces have minimum dimensions of 2.4m wide by 5.4m long with aisle width of 5.8m. The proposed dimensions of the car parking spaces comply with the Australian Standard AS2890.1:2004 as Class 1A car parking facility. The Australian Standard notes that a Class 1Acar park facility is suitable for a residential car park.

The proposed accessible car spaces and associated shared areas have dimensions 2.4m wide by 5.4m long with 5.8m wide aisles. The proposed dimensions comply with AS2890.6:2009.

In addition, MLA's car parking spaces design review also assessed the following (but not limited to) design elements relating to car parking spaces:

- the first 6m of the access driveway behind the property boundary has a maximum grade of 1:20 has been provided
- an additional width of 0.3m has been provided for car spaces adjacent to a wall
- all columns have been located outside of the parking space design envelope
- blind aisles have been provided with an extension of 1.0m beyond the last car parking space
- single sided aisles (where one side is confined by a vertical obstruction higher than 0.15m) have been provided with an additional 0.3m in width
- minimum clear head heights of 2.2m for general car parking spaces and 2.5m for accessible parking spaces have been provided within the basement car park as required by AS2890.1 and AS2890.6
- maximum vertical grade of 1:4 with appropriate length transitions at 1:8 have been provided along ramps used by passenger vehicles in accordance with AS2890.1
- bicycle parking spaces have dimensions of 0.5m by 1.8m with an aisle width of 1.5m
- motorcycle parking spaces have dimensions of 3.0m by 1.2m as required by LCDCP 2010, and
- the proposed loading area has been designed to accommodate service vehicles up to an Australian Standard 8.8m long medium rigid vehicle, it can enter and exit the site in a forward direction, and
- loading area including along access paths to and from the loading area have a minimum headroom of 4.5m.

Our review indicates that the proposed the design of the car parking spaces and aisles generally complies with the design requirements set out in the Australian Standard for car parking facilities in AS2890.1, AS2890.3 and AS2890.6. Therefore, the design of the proposed car parking spaces is satisfactory. The design of the loading dock also complies with AS2890.2.

Finally, it is noted swept path analysis has been conducted at the driveway and along the internal ramps using an Australian Standard 5.2m long B99 vehicle as the design vehicle. The analysis indicates that a B99 vehicle can access and circulate within the car park satisfactorily and have sufficient clearance to pass one another where required.

Swept path analysis has also been conducted for an MRV accessing the loading dock. These were also found to be satisfactory.

The swept path diagrams are contained in Appendix C.

6 Traffic Assessment

6.1 Previous Traffic Assessment

As noted previously, the planning proposal was supported by a cumulative traffic assessment which included the development of a Aimsun traffic model – see Section 3.2 of this report.

The Aimsum traffic model assessed the traffic effects of additional development traffic arising from all known developments within Lane Cove Council's St Leonards area which included the expected 2,400 additional dwellings within the St Leonards South precinct.

With agreement from the then RMS, the traffic assessment adopted traffic generation rates of 0.14 and 0.07 vehicle trips per peak hour per dwelling during the morning and evening peak periods respectively.

The Aimsun model assessed several traffic scenarios including Model 2021 + ABC. This scenario includes all known developments including the St Leonards South precinct.

The modelling results extracted from the cumulative traffic assessment for the traffic scenario Model 2021 + ABC are presented in Figure 6.1 and Figure 6.2 for the morning and evening peak periods respectively.

Figure 6.1: Intersection Operation Results – Morning Peak

Base Model 2021 +ABC	SB			EB			NB			WB			AVD	LOS
	Flow (veh)	Delay time Sec	Queue max (veh)	Flow (veh)	Delay time Sec	Queue max (veh)	Flow (veh)	Delay time Sec	Queue max (veh)	Flow (veh)	Delay time Sec	Queue max (veh)		
Pacific Hwy / Alexander St	1588	18.8	11.0				1248	21.6	9.0	392	30.1	10.2	21.2	B
Pacific Hwy / Shirley Rd/Falcon St	1710	51.7	25.6	601	39.7	6.4	958	24.3	7.4	945	29.1	11.0	38.7	C
Pacific Hwy / Hume St	1698	21.4	13.4	243	66.1	9.6	1372	21.5	12.4	187	119.4	6.6	29.8	C
Pacific Hwy / Oxley St	1654	7.6	7.2	377	56.3	6.4	1512	5.4	5.8	101	54.0	3.2	13.0	A
Pacific Hwy / Albany St	2047	15.1	10.6				1515	16.2	6.0	581	68.8	13.2	23.0	B
Pacific Hwy / Christie St	654	56.8	10.2	2737	19.9	15.6	152	0.6	0.2	1875	17.3	13.4	22.9	B
Pacific Hwy / Herbert St	702	69.6	21.2	2476	25.7	12.6				2282	16.2	5.6	27.4	B
Pacific Hwy / Reserve Rd/Berry Rd	166	48.1	6.8	2176	34.2	16.8	474	63.6	9.0	2004	13.8	8.8	29.1	C
Pacific Hwy / Greenwich Rd				1805	10.7	7.6	675	55.9	10.0	1939	19.1	11.0	21.3	B
Shirley Rd / River Rd	569	36.2	12.0	1244	17.6	8.6	199	31.3	4.2				24.2	B
River Rd / Greenwich Rd	452	56.0	7.4	1587	48.2	31.8	307	78.9	9.0	648	49.1	8.2	52.8	D

Source: Cumulative Traffic Assessment prepared by TEF on behlaf of Lane Cove Council

Figure 6.2: Intersection Operation Results – Evening Peak

Base Model 2021 + ABC	SB			EB			NB			WB			AVD	LOS
	Flow (veh)	Delay time Sec	Queue max (veh)	Flow (veh)	Delay time Sec	Queue max (veh)	Flow (veh)	Delay time Sec	Queue max (veh)	Flow (veh)	Delay time Sec	Queue max (veh)		
Pacific Hwy / Alexander St	1091	12.4	6.6				1430	20.5	11.0	290	22.3	7.4	17.6	B
Pacific Hwy / Shirley Rd/Falcon St	1254	41.8	21.0	690	38.2	6.8	1114	28.9	9.0	1017	23.3	11.2	33.0	C
Pacific Hwy / Hume St	1208	13.0	7.6	226	77.4	9.6	1261	20.3	11.6	152	81.4	5.0	25.0	B
Pacific Hwy / Oxley St	1233	6.0	3.4	203	61.1	4.2	1340	6.0	5.2	172	60.9	5.6	13.0	A
Pacific Hwy / Albany St	1500	9.0	8.0				1315	12.0	4.6	536	61.6	12.6	18.6	B
Pacific Hwy / Christie St	453	47.1	9.4	2029	10.4	9.6	187	0.7	0.0	1711	12.6	10.4	14.7	B
Pacific Hwy / Herbert St	859	65.1	21.4	1617	18.0	7.4				1933	17.1	5.2	26.8	B
Pacific Hwy / Reserve Rd/Berry Rd	246	40.8	7.6	1554	22.6	10.8	121	52.5	3.4	1849	7.9	5.4	17.6	B
Pacific Hwy / Greenwich Rd				1476	7.6	5.6	359	61.2	9.2	1711	17.9	10.4	18.0	B
Shirley Rd / River Rd	869	28.5	15.4	809	17.9	7.6	387	40.3	8.0				26.5	B
River Rd / Greenwich Rd	420	65.9	7.2	971	21.0	14.8	240	73.6	7.6	1095	26.9	8.0	34.9	C

Source: Cumulative Traffic Assessment prepared by TEF on behlaf of Lane Cove Council

6.2 Traffic Assessment Methodology

6.2.1 Preliminary

In the pre-DA meeting, Council requested for the traffic impact of the proposed development be assessed using the Aimsun traffic model created as part of the cumulative traffic assessment conducted on behalf of Lane Cove Council.

The following traffic assessment methodology has been agreed with Council's Coordinator Traffic & Transport:

- estimate development traffic using traffic generation rates from TfNSW's Technical Direction TDT 2013/04a for the site in St Leonards
- obtain 2021 to future year 2031 background traffic growth factors from TfNSW Sydney STFM model
- apply 2031 growth factors to the Aimsun future year model, namely "Base Model 2021 + ABC", and
- add development traffic and background growth to the Aimsun future year model "Base Model 2021 + ABC" to create a future 2031 traffic model with background traffic growth and development traffic (one scenario only).

Following the above agreed traffic assessment methodology, the traffic assessment for the proposed development has been carried as described below.

6.2.2 Traffic Generation Estimates for the Subject Proposed Development

This development application seeks approval for a residential development with 96 dwellings.

Using the agreed traffic generation rates from the cumulative traffic assessment which has been extracted from TDT 2013/04a, the potential traffic generation for the proposed development is as follows:

- morning – 96 dwellings @ 0.14 vehicle trips per hour per dwelling = 13 vph
- evening – 96 dwellings @ 0.07 vehicle trips per hour per dwelling = 7 vph

It is noted that the previous scheme was estimated to generate 15 vph and 7 vph during the morning and evening peak periods respectively. Given that the revised scheme is expected to generate less development traffic than the previous scheme, traffic modelling for the previous scheme has been retained with the modelling results discussed below.

6.2.3 Background Traffic Growth

Traffic modelling growth plots for the years between 2019 and 2031 have been sourced from TfNSW using their Sydney Strategic Traffic Forecasting Model (STFM).

The 2019 and 2031 STFM growth plots provide growth rates (per cent per annum growth) from the year 2019 to 2031. This enables the per cent per annum to be derived so to project traffic out to a 10-year planning horizon. The growth plots take into consideration the known population and employments growth in the area.

The growth plots from TfNSW show the 2019 to 2031 growth rates ranging from negative 0.1 per cent per annum to positive 5.2 per cent per annum. The growth factors are presented in Figure 6.3 and Figure 6.4 for the morning and evening peak periods respecitively.

Figure 6.3: 2019-2031 Growth Factors – Morning Peak Hour

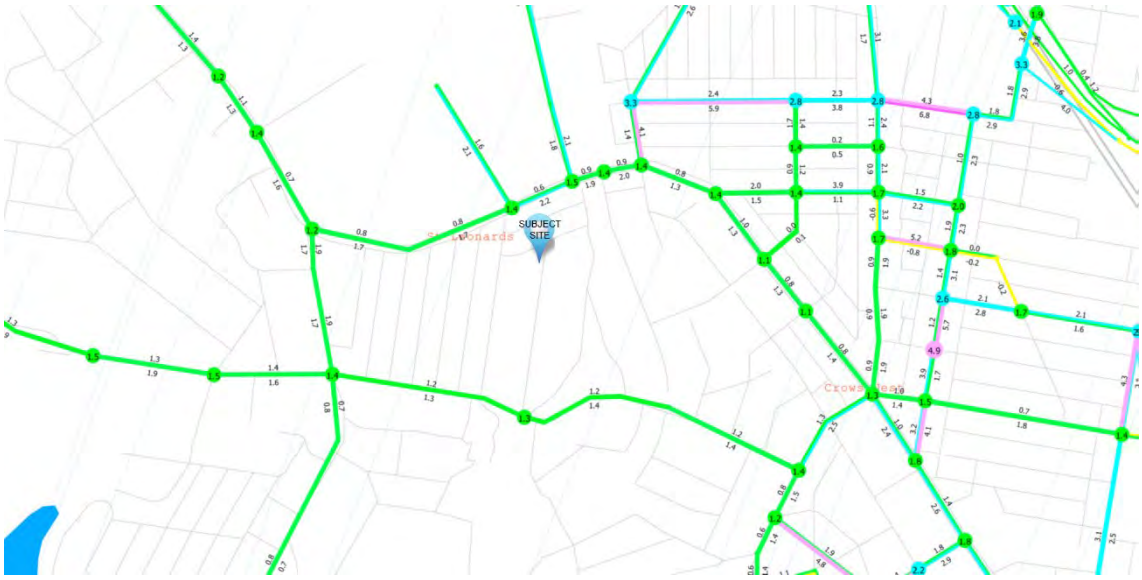
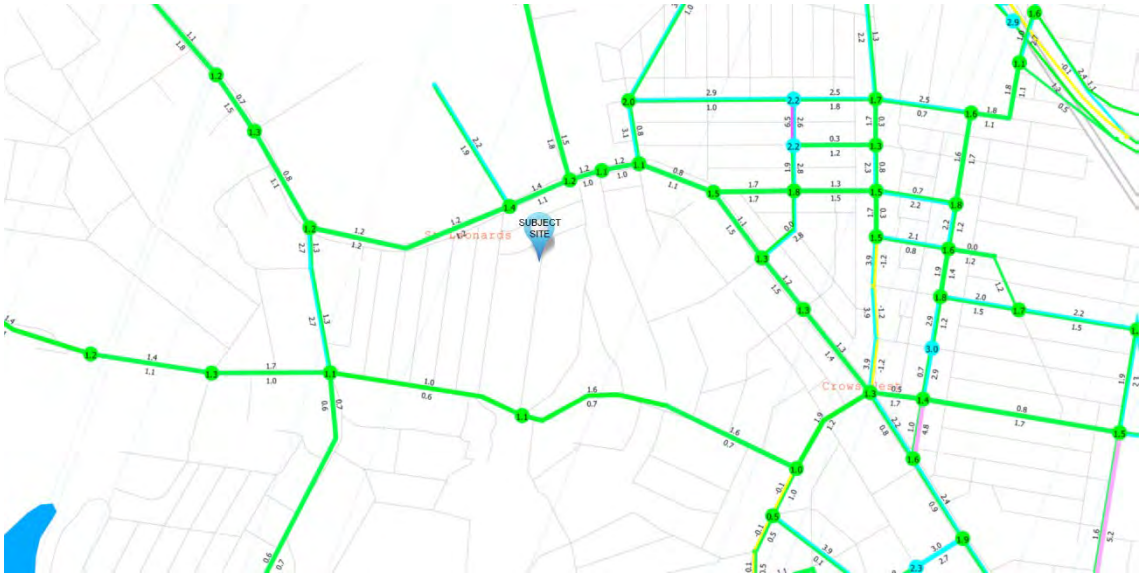


Figure 6.4: 2019-2031 Growth Factors – Morning Peak Hour



These traffic growth factors have been input into the 2021 Base Model + ABC to provide a 2031 Base Model + ABC.

Development traffic arising from the subject proposed development as estimated in Section 6.2.2 above has been added to the above 2031 Base Model + ABC to create a 2031 Future Model + ABC + MH (MH being the subject proposed development on Marshall Avenue and Holdsworth Avenue).

The 2031 Future Model + ABC + MH is then assessed in the Aimsun traffic model with results as discussed below.

6.2.4 Intersection Performance Criteria

Aimsun calculates intersection performance parameters such as vehicle delays and level of service to assist with the traffic assessment.

Level of Service (LoS) is a key performance parameter used by TfNSW to describe the operation of an intersection. It ranges from LoS A (good operation) to LoS F (over-saturated conditions), as presented in Table 6.1. At signalised intersections, the LoS criteria relate to the overall average intersection delay, whilst at sign-controlled intersections and roundabouts, LoS is determined by the worst movement delay.

Table 6.1: Level of Service Criteria for Intersections

Level of Service	Average Delay (Seconds per Vehicle)	Traffic Signals, Roundabout	Give Way and Stop Signs
A	Less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity and accident study required
E	57 to 70	At capacity. At signals, incidents will cause excessive delays Roundabouts require other control mode	At capacity, requires other control mode
F	Greater 70	Unsatisfactory with excessive queueing	Unsatisfactory with excessive queueing; requires other control mode

Source: TfNSW Guide to Traffic Generating Developments, 2002

6.2.5 Modelling Result Comparisons

The analysis results for the 2031 Future Model + ABC + MH traffic scenario are presented in Table 6.2.

Table 6.2: Aimsun Modelling Results – 2031 Future Model + ABC + MH

Morning Peak

Intersection	SB			EB			NB			WB			Avg Delay	LOS
	Flow (veh)	Delay Time (sec)	Queue max (veh)	Flow (veh)	Delay Time (sec)	Queue max (veh)	Flow (veh)	Delay Time (sec)	Queue max (veh)	Flow (veh)	Delay Time (sec)	Queue max (veh)		
Pacific Hwy / Alexander St	1601	19	10	N/A	N/A	N/A	1470	24	12	422	36	9	23	B
Pacific Hwy / Shirley Rd/Falcon St	1755	44	22	592	41	7	1142	27	9	944	30	11	36	C
Pacific Hwy / Hume St	1726	24	15	264	51	4	1485	24	13	186	116	7	30	C
Pacific Hwy / Oxley St	1682	7	5	373	58	6	1615	12	13	101	55	3	15	B
Pacific Hwy / Albany St	2048	15	11	N/A	N/A	N/A	1623	22	10	565	85	13	27	C
Pacific Hwy / Christie St	704	60	11	2734	19	15	148	1	1	1959	28	17	27	B
Pacific Hwy / Herbert St	734	146	29	2411	31	13	N/A	N/A	N/A	2403	21	7	42	C
Pacific Hwy / Reserve Rd/Berry Rd	169	95	11	2241	59	18	340	55	4	2037	30	14	48	D
Pacific Hwy / Greenwich Rd	N/A	N/A	N/A	1867	17	12	749	60	10	1895	24	12	27	B
Shirley Rd / River Rd	604	40	14	1229	18	9	205	31	5	N/A	N/A	N/A	26	B
River Rd / Greenwich Rd	368	92	7	1665	61	34	339	82	9	770	44	8	62	E

Evening Peak

Intersection	SB			EB			NB			WB			Avg Delay	LOS
	Flow (veh)	Delay Time (sec)	Queue max (veh)	Flow (veh)	Delay Time (sec)	Queue max (veh)	Flow (veh)	Delay Time (sec)	Queue max (veh)	Flow (veh)	Delay Time (sec)	Queue max (veh)		
Pacific Hwy / Alexander St	1166	14	7	N/A	N/A	N/A	1524	23	15	340	34	9	21	B
Pacific Hwy / Shirley Rd/Falcon St	1310	30	14	775	37	7	1272	32	12	985	26	10	31	C
Pacific Hwy / Hume St	1308	13	7	201	60	4	1351	22	12	150	85	5	23	B
Pacific Hwy / Oxley St	1324	6	4	208	60	4	1432	7	5	193	60	6	14	A
Pacific Hwy / Albany St	1602	10	9	N/A	N/A	N/A	1413	13	5	535	62	13	19	B
Pacific Hwy / Christie St	475	48	9	2168	11	11	187	1	1	1808	13	11	15	B
Pacific Hwy / Herbert St	917	101	28	1745	19	9	N/A	N/A	N/A	2047	17	6	34	C
Pacific Hwy / Reserve Rd/Berry Rd	291	46	8	1663	24	12	141	49	3	1962	9	6	19	B
Pacific Hwy / Greenwich Rd	N/A	N/A	N/A	1550	8	5	396	63	10	1828	19	11	19	B
Shirley Rd / River Rd	893	28	15	888	18	8	386	36	8	N/A	N/A	N/A	25	B
River Rd / Greenwich Rd	426	65	7	1133	23	17	247	77	9	1170	27	8	35	C

Comparing the results from the 2031 Future Model + ABC + MH with those from the cumulative traffic assessment for the 2021 Base Model + ABC, it is noted that the results are generally consistent. Apart from the Greenwich Street intersection with River Road during the morning peak period, only minor increases to the delays and queues are observable at most intersections.

In relation to the model results from the 2031 Future Model + ABC + MH, the results indicate that the majority of the assessed intersections would continue to operate with acceptable level of service (i.e. LoS D or better) during both peak periods with the exception of the Greenwich Road intersection with River Road which is expected to operate with LoS E during the morning peak period.

The deterioration of the intersection performance at the Greenwich Street intersection is due to growth in the background traffic as it is not conceivable that development traffic from the subject site would result in this level of intersection performance change. In this regard, it is noted that the approaches to this intersection during the morning peak period are expected to have background traffic increases in the order of 8 to 19 per cent over the 10-year period which translates to approximately some 400 vph. However, the proposed development is only expected to generate 13 vph during the morning peak period.

It is further noted that changes to traffic flows on the road network by 13 vph by itself are not expected to register any intersection performance changes especially when input into a computer modelling tool such as Aimsun and SIDRA. Fluctuation in day-to-day traffic flows would occasionally exceed 13 vph.

In summary, given the proposed development is expected to generate only 13 vph during the busiest peak period, the proposed development is not expected to create any material change to the operation of the road network for the reasons stated above.

7 Summary and Conclusion

This report examines the traffic and parking implications of a proposed residential development at 3 Holdsworth Avenue, St Leonards. The salient findings of this assessment are presented below.

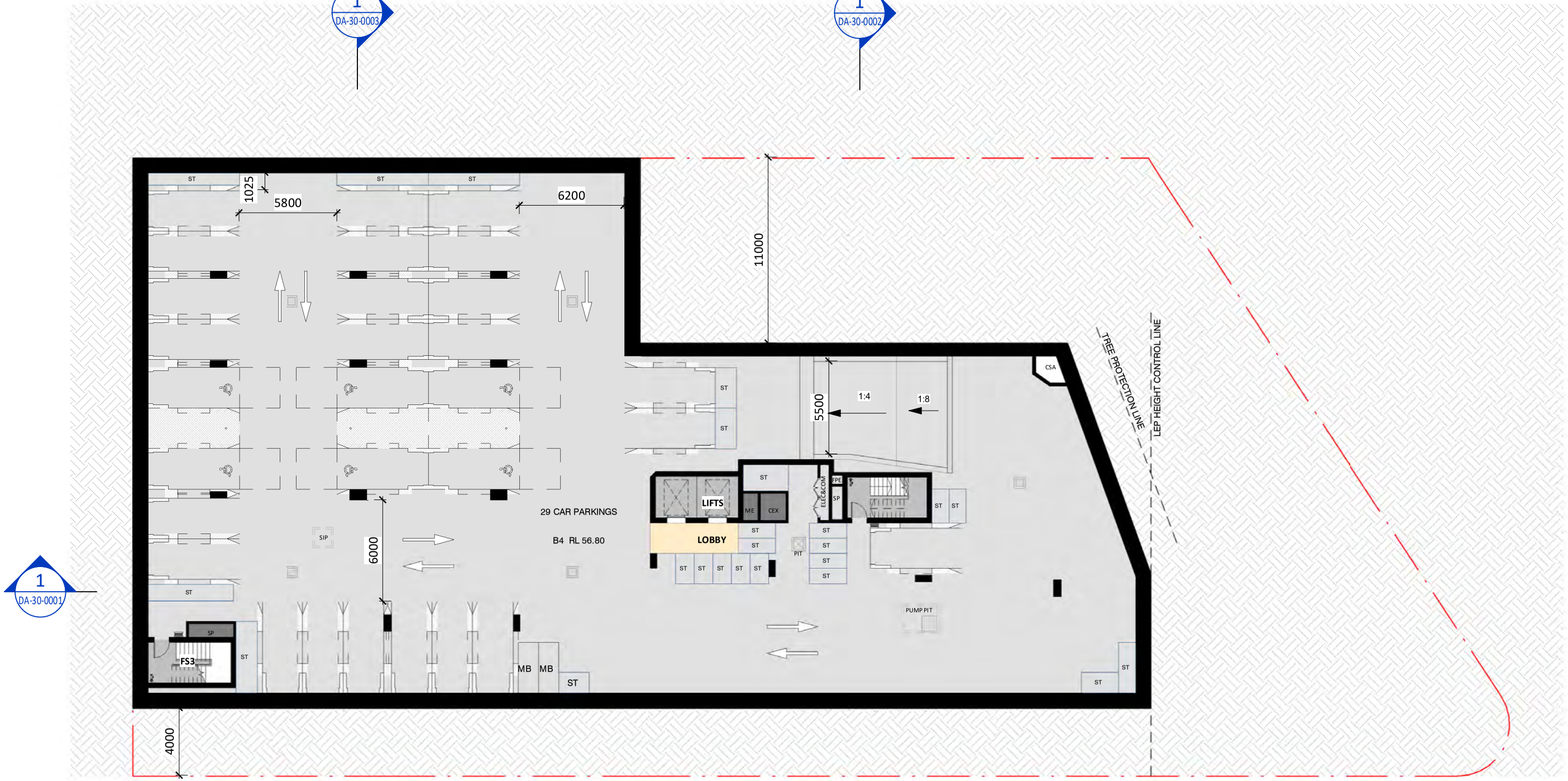
- The proposed development involves the redevelopment of the subject site, which is currently occupied by four detached dwellings, into a 12-storey building to accommodate 96 residential apartments.
- The subject site is part of the St Leonards South precinct for which a planning proposal has been gazetted to provide an additional 2,000 dwellings.
- The planning proposal was supported by a cumulative traffic assessment including the development of a Aimsum traffic model.
- Vehicular access to the proposed development is proposed to be provided off Holdsworth Road to be served between general traffic and service vehicles.
- Based on requirements stipulated in Council's development control plan, the proposed development is required to provide a 110 car parking spaces including 20 visitor car parking spaces.
- The proposed car parking spaces have been designed to comply with the Australian Standard as Class 1A car parking spaces and are considered to be satisfactory.
- Bicycle and motorcycle parking spaces are proposed to be provided in full compliance with the requirements stipulated in the development control plan.
- The proposed development includes a service vehicle bay on the ground floor which has been designed to accommodate service vehicles up to an Australian Standard 8.8m medium rigid vehicle. The proposed loading facility is proposed to be shared between waste collection vehicles, removalist trucks and other delivery vehicles.
- The car park and loading area have been designed to comply with the design requirements set out in the Australian Standard, namely AS2890.1:2004, AS2890.2:2018. AS2890.3:2015 and AS2890.6:2009.
- The proposed development has been estimated to generate a total of 13 vph during the busiest peak period. By itself, the proposed development is not expected to create any material change to the operation of the road network.
- Notwithstanding, at the request of Council the Aimsum traffic model has been updated to include background traffic growth to 2031 traffic conditions with development traffic arising from the proposed development also added – 2031 Future Model + ABC + MH.

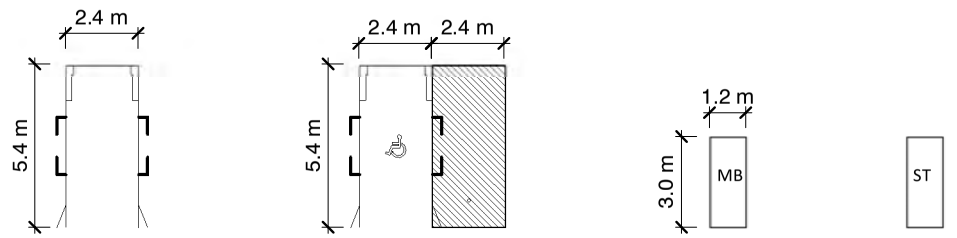
- Aimsun modelling results for the 2031 Future Model + ABC + MH are generally consistent with that from the 2021 Base Model + ABC developed as part of the cumulative traffic assessment for the St Leonards South precinct with the exception of the Greenwich Road intersection with River Road.
- The analysis also found that under 2031 traffic conditions the majority of the assessed intersections would continue to operate with acceptable level of service with the exception of the Greenwich Road intersection with River Road.
- The deterioration in the intersection performance of the Greenwich Road could be attributable to the growth of the background traffic at this intersection which has estimated to increase by 400 vph. This contrasts with some 13 vph generated by the proposed development
- The surrounding road network would continue to operate as originally planned following the completion of the proposed development.

Overall, from a traffic and parking perspective the proposed development is considered to be satisfactory.

Appendix A

Architectural Car Park Layout Plans





RESIDENTIAL PARKING

V - VISITOR

ACCESSIBLE PARKING

MOTORBIKE PARKING

STORAGE CAGE

Key Plan:

N

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Rev	Amendment	By	Chk*	Date
B	REVISED DA SUBMISSION	CN	MGS	2022.06.08
A	DA SUBMISSION	YY	MGS	2021.12.09

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Project PA030370
3 Holdsworth Avenue, St Leonards

Status
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Title
10-GENERAL ARRANGEMENT PLANS
LEVEL B4 PLAN

Drawing Number DA-09-0010 **Revision** B

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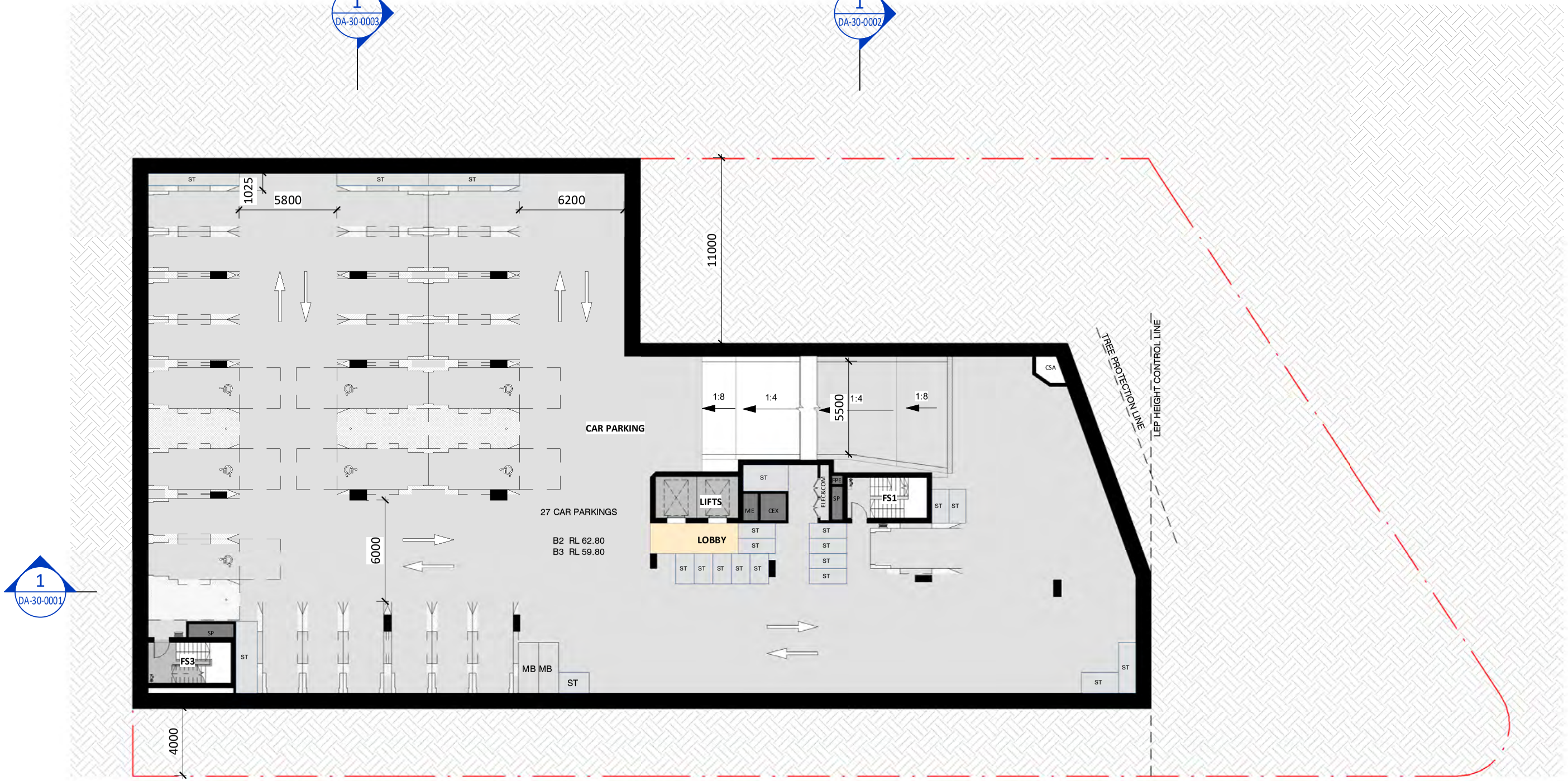

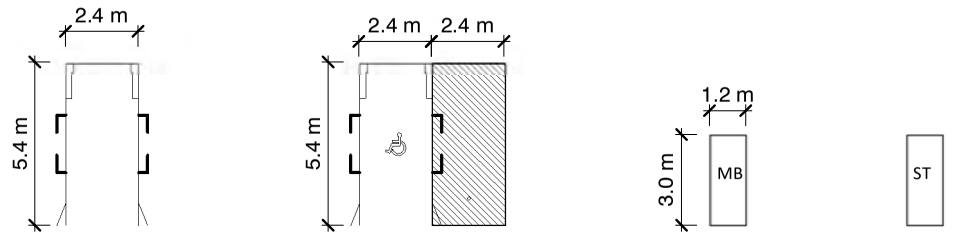

RESIDENTIAL PARKING

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ACCESSIBLE PARKING

MOTORBIKE PARKING

STORAGE CAGE

Key Plan:

N

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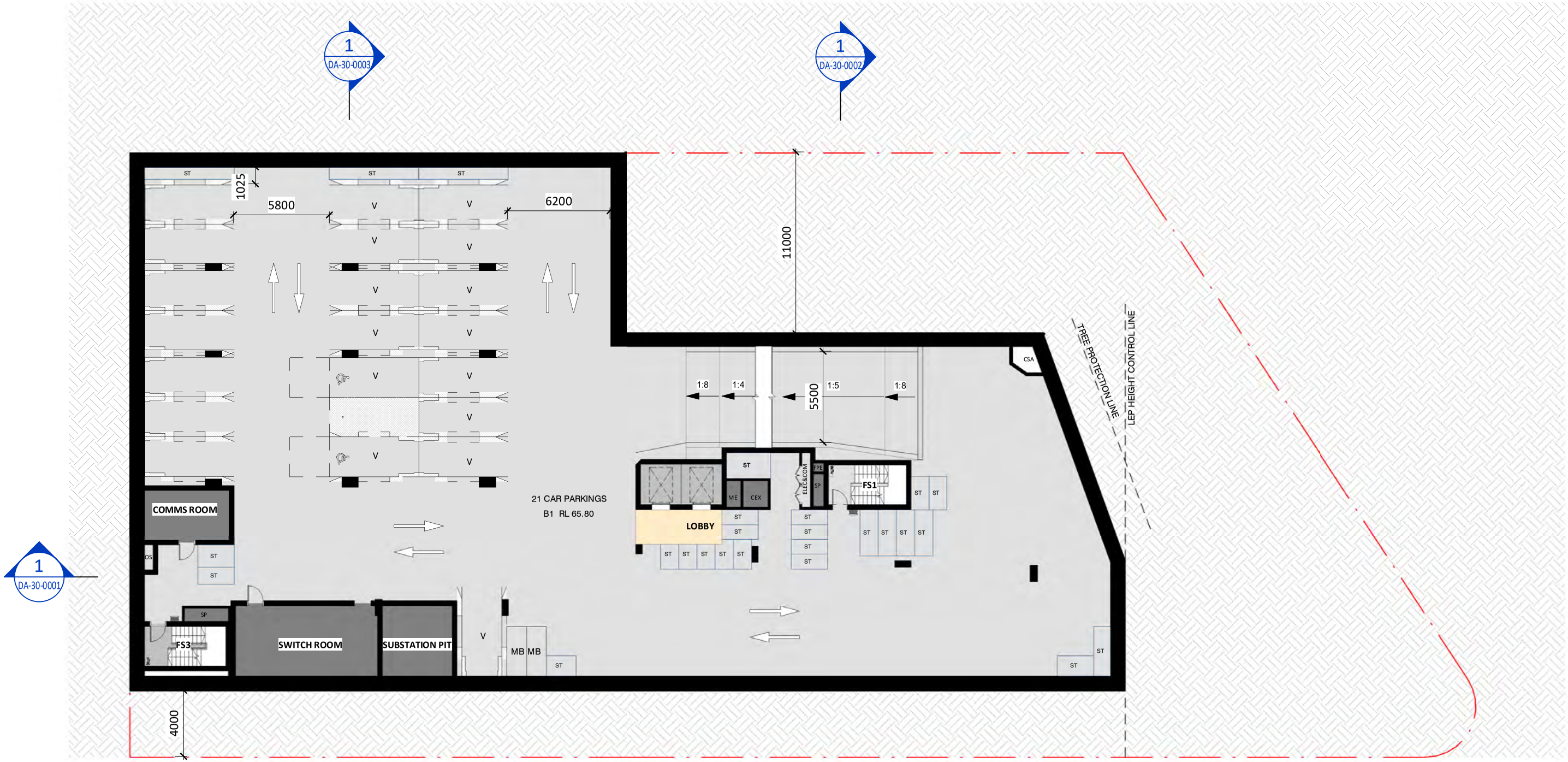

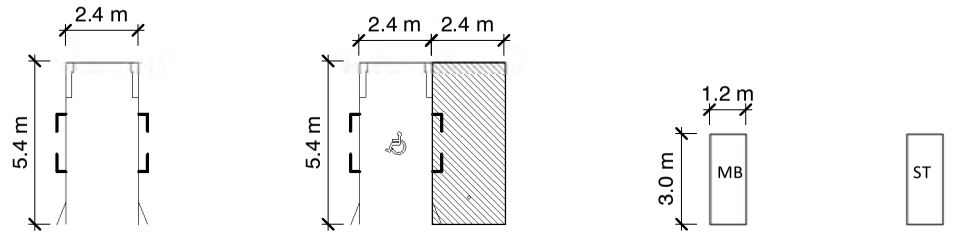

RESIDENTIAL PARKING

V - VISITOR

ACCESSIBLE PARKING

MOTORBIKE PARKING

STORAGE CAGE

Key Plan:

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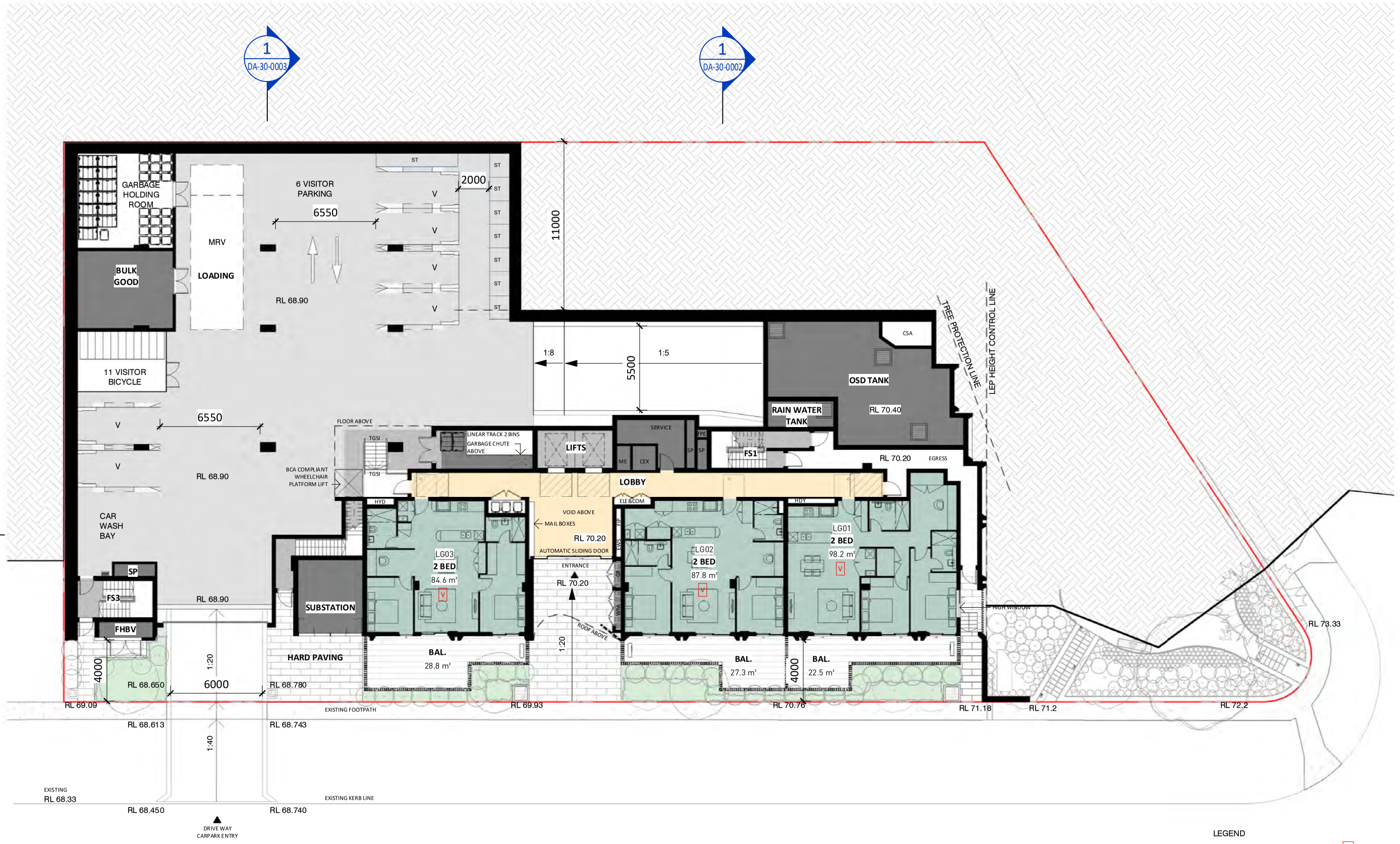

LEGEND

- 1 BEDROOM
- 2 BEDROOMS
- 3 BEDROOMS
- 4 BEDROOMS

- A ADAPTABLE UNITS
- S SILVER LIVABLE UNITS
- V VISITABLE UNITS
- ACCESSIBLE TURNING SPACE (1540 × 2070)

Key Plan:

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D	REVISED DA SUBMISSION	CN	MGS	2022.06.08
C	DA SUBMISSION	YY	MGS	2021.12.09
B	ISSUE FOR DEP	YY	MGS	2021.06.09
A	ISSUE FOR PRE DA	YY	MGS	2021.03.26

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Project PA030370
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LOWER GROUND PLAN

Drawing Number DA-10-0001
Revision D

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Appendix B

Electric Vehicle Charging Pad Details

SMART MOBILITY

The home of charging

Terra AC wallbox

- High-value quality
- Futureproof flexibility
- Safety and protection

At ABB, we have 130 years of heritage in accessible technology leadership and a world-leading AC and DC charging portfolio – for safe, smart and sustainable mobility.

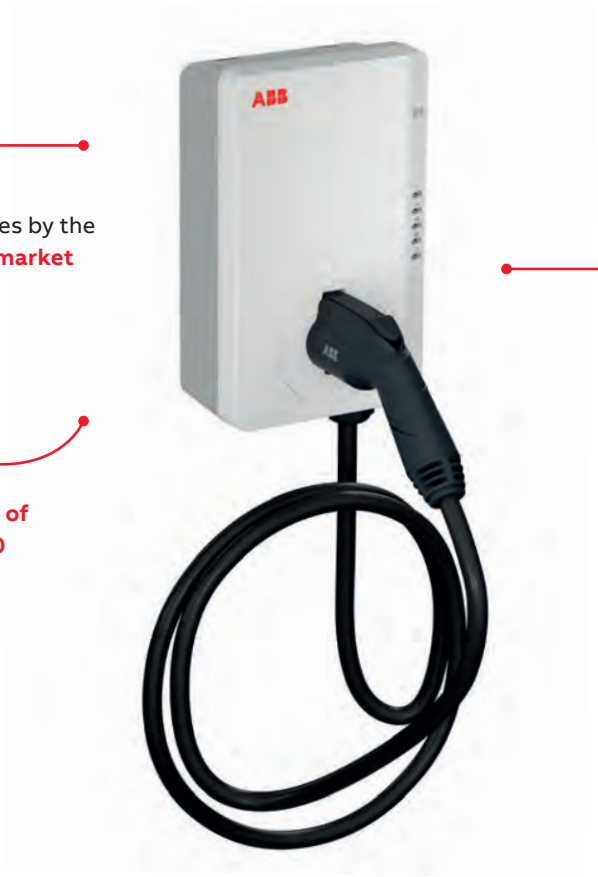
That’s why some of the world’s biggest brands trust us to provide market-leading e-mobility solutions from highway to home.

ABB: The home of charging

Terra AC wallbox
To serve a growing market

Reducing cost of EVs

EVs will be cheaper than internal combustion engine (ICE) alternatives by the mid-to-late 2020s **in almost every market**



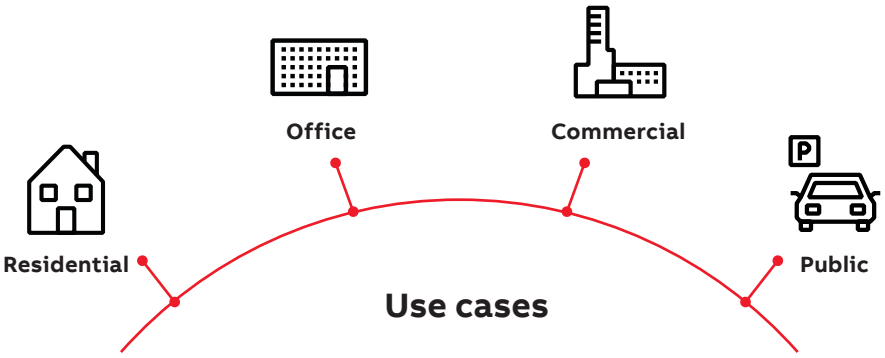
Passenger EV sales

Passenger EV sales will rise to **28 million** in **2030** and **56 million** by **2040**

Global EV sales

Electric vehicles will represent **57% of global** passenger **car sales by 2040**

Terra AC wallbox provides tailored, intelligent and networked charging solutions for any business, home or location.



At home

From private homes to multi-tenant homes and residential communities

At work

From small offices to large offices, business parks and complexes

Commercial locations

From hotels to sports institutions and shopping centres

While parking

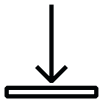
While on the street or in a car park

source: https://about.bnef.com/electric-vehicle-outlook/#toc-viewreport

Terra AC wallbox benefits

High-value quality

The **best value AC charger** on the market, providing the exceptional quality expected of the world leader in EV charging.



Enabled for **remote software updates** to ensure optimal performance while minimizing the need for onsite intervention.

Broad range of connectivity options including Wifi, Bluetooth and Ethernet for easy control and integration with existing infrastructure.

Futureproof flexibility

Smart functionality means the wallbox can adapt its power usage and provide optimal charging, today and into the future.

Set up for **energy meter integration** to provide dynamic load management, reducing energy costs and preventing nuisance tripping of distribution protective devices.

Dedicated ChargerSync™ app provides easy authentication and control of the AC charger, along with and insight.

Safety and protection

Evaluated and tested to the highest standards by independent, third party safety certification organizations.

Current limiting protection allows maximum charging power without nuisance tripping, aligned with the design of a given building's electrical distribution system.

Integrated protections including DC ground fault and over voltage protect both user and car.

Smarter charging

IEC portfolio
AC charger for electric vehicles, type 2
Power supply network: 220 … 240 V single phase and 380 … 415 V three phase, 50 / 60 Hz


Terra AC W7-T-0


Terra AC W11-G5-R-0


Terra AC W22-T-RD-M-0

Rated power (kW)	Max. current (A)	Socket outlet or connector type	Other features	Type	Order code	Weight Pkg (1pce) (kg)
Single phase						
3.7	16	Socket with shutter, type 2	-	Terra AC W4-S-0	ABB6AGC082587	3
		Socket with shutter, type 2	RFID	Terra AC W4-S-R-0	ABB6AGC085384	3
7.4	32	Socket, type 2	-	Terra AC W7-T-0	ABB6AGC081278	3
		Socket, type 2	RFID	Terra AC W7-T-R-0	ABB6AGC085382	3
		Socket, type 2	RFID, 4G	Terra AC W7-T-R-C-0	ABB6AGC085383	3
		Cable 5 m, type 2	RFID	Terra AC W7-G5-R-0	ABB6AGC082155	5
		Cable 5 m, type 2	RFID, 4G	Terra AC W7-G5-R-C-0	ABB6AGC085385	6.5
Single phase with display and MID certification						
7.4	32	Socket, type 2	RFID, 4G, daisy-chain ethernet	Terra AC W7-T-RD-MC-0	ABB6AGC082174	3
		Cable 5m, type 2	RFID, 4G, daisy-chain ethernet	Terra AC W7-G5-RD-MC-0	ABB6AGC085386	6.5
Three phase						
11	16	Cable 5 m, type 2	RFID	Terra AC W11-G5-R-0	ABB6AGC082156	6
22	32	Socket, type 2	-	Terra AC W22-T-0	ABB6AGC081279	3
		Socket, type 2	RFID	Terra AC W22-T-R-0	ABB6AGC082152	3
		Socket, type 2	RFID, 4G	Terra AC W22-T-R-C-0	ABB6AGC082153	3
		Socket with shutter, type 2	RFID	Terra AC W22-S-R-0	ABB6AGC082589	3
		Socket with shutter, type 2	RFID, 4G	Terra AC W22-S-R-C-0	ABB6AGC082154	3
		Cable 5 m, type 2	RFID, 4G	Terra AC W22-G5-R-C-0	ABB6AGC082157	6.5
Three phase with display and MID certification						
22	32	Socket, type 2	RFID, daisy-chain ethernet	Terra AC W22-T-RD-M-0	ABB6AGC081280	3
		Socket, type 2	RFID, 4G, daisy-chain ethernet	Terra AC W22-T-RD-MC-0	ABB6AGC081281	3
		Socket with shutter, type 2	RFID, 4G, daisy-chain ethernet	Terra AC W22-S-RD-MC-0	ABB6AGC081282	3
		Cable 5 m, type 2	RFID, 4G, daisy-chain ethernet	Terra AC W22-G5-RD-MC-0	ABB6AGC081285	6.5

UL portfolio
AC charger for electric vehicle, type 1
Power supply network: 110 … 240 V single phase, 50 / 60 Hz


Terra AC W7-P8-R-C-0


Terra AC W7-P8-RD-MD-0

Rated power (kW)	Max. current (A)	Socket outlet or connector type	Other features	Type	Order code	Weight Pkg (1pce) (kg)
Single phase without display						
7.7	32	Cable 25 ft (7.6 m), type 1	RFID, daisy-chain ethernet	Terra AC W7-P8-R-D-0	ABB6AGC081287	7
		Cable 25 ft (7.6 m), type 1	RFID, daisy-chain ethernet	Terra AC W7-P8-R-CD-0	ABB6AGC081288	7
Single phase with display						
7.7	32	Cable 25 ft (7.6 m), type 1	RFID, daisy-chain ethernet	Terra AC W7-P8-RD-MD-0	ABB6AGC081289	7
		Cable 25 ft (7.6 m), type 1	RFID, 4G, daisy-chain ethernet	Terra AC W7-P8-RD-MCD-0	ABB6AGC081290	7

Terra AC wallbox accessories

Description	Current (A)	Type	Order code	Weight Pkg (1pce) (kg)
Pedestal For floor standing installation				
Metal pedestal for 1 charger, free-standing	-	TAC pedestal single	ABB6AGC085345	9.12
RFID card (MIFARE)				
RFID cards with ABB logo, pack of 5	-	SER-abbRFIDtags	ABB6AGC082175	0.07
RFID cards, blank, pack of 5	-	SER-blankRFIDtags	ABB6AGC082176	0.07
Charge cables Length: 7 m Cables with 2 connectors of same or different types				
Single phase				
Type 2 to type 1	16	TAC-cable T2-T1 7m1P16A	ABB6AGC082538	2.56
Type 2 to type 2	32	TAC-cable T2-T2 7m1P32A	ABB6AGC082535	2.95
Type 2 to type 1	32	TAC-cable T2-T1 7m1P32A	ABB6AGC082539	3.77
Three phase				
Type 2 to type 2	16	TAC-cable T2-T2 7m3P16A	ABB6AGC082536	2.15
Type 2 to type 2	32	TAC-cable T2-T2 7m3P32A	ABB6AGC082537	4.18
Spare parts				
Water and dust proofing set for cable entries including 1 * 32 mm and 2 * 25 mm grommets	-	SER-Grommet	ABB6AGC085387	0.04
Front cover (non-display), 2 screws included	-	SER-Front cover (non-display)	ABB6AGC085388	1.50
Maintenance cover, internal (non-display), 6 screws included	-	SER-Maintenance cover (non-display)	ABB6AGC085389	1.50
Spare cables Length: 5 m For cable replacement of existing cable version charger				
Type 2, three phase	16	SER-TAC-cable T2 5m3P16A	ABB6AGC082555	1.41
Type 2, single phase	32	SER-TAC-cable T2 5m1P32A	ABB6AGC082554	2.05
Type 2, three phase	32	SER-TAC-cable T2 5m3P32A	ABB6AGC082556	2.95
Type 1, single phase	40	SER-TAC-cable T1 5m1P40A		-
Type 1, single phase	80	SER-TAC-cable T1 5m1P80A		-
Warranty				
Total warranty time of 3 years (standard warranty 2 years + 1 year)		TAC extended warranty 3 yr	ABB6AGC084053	-
Total warranty time of 4 years (standard warranty 2 years + 2 years)		TAC extended warranty 4 yr	ABB6AGC084054	-
Total warranty time of 5 years (standard warranty 2 years + 3 years)		TAC extended warranty 5 yr	ABB6AGC084055	-

Technical specification

Product information		
Charging type		Mode 3 charging, level 2
Input/output power rating and current		IEC ratings: Single phase up to 7.4 kW / 32 A Three phase up to 22 kW / 32 A UL ratings up to 7.7 kW / 32 A
Input/ouput voltage		Single phase: 110 … 240 V Three phase: 380 … 415 V, 50 / 60 Hz
Network type		TT, TN
Socket outlet or connector type		Type 2 socket with or without shutter Type 1 or type 2 cable. Cable can be wrapped around the charger
Protection		Overcurrent, overvoltage, undervoltage, ground fault including DC residual current protection, integrated surge protection
Overvoltage category		III
Energy metering		Revenue grade energy meter Class B (+/- 1%) , MID certification on display variants only
Mobile communication with nano SIM socket		EU: GSM, 4G, LTE, WCDMA US: 4G, LTE, WCDMA
Available configurable contacts		1 input, 1 output
User Interface		
Connectivity		Wifi, Ethernet (RJ45), Bluetooth, RS485, 4G / 3G
User authentification		ABB RFID card (1 included) or ChargerSync™ app and portal
User interface		TerraConfig app or portal for setup, ChargerSync™ app or portal for use
Communication protocols		OCPP 1.6 and RS485 for energy meter connection
Status indication		5 LED's
Configuration		
Software update		OCPP 1.6, ABB web portal or App
Control and configuration		ABB web portal or App
General characteristics		
IP and IK rating		IP54, IK10 (IK8+ for operating temperature from -35 to -30 °C)
NEMA enclosure type		NEMA 3
Operating altitude		2000 m
Operating temperature range		-35...+50 °C (derating may apply)
Storage temperature range		-40...+80 °C
Mounting		Wall or floor using a pedestal
Dimensions	H x W x D	320 x 195 x 110 mm
	H x W x D	12.60 x 7.68 x 4.33 inches
Certification and standards		
Safety standards		IEC/EN 61851-1, EN 62311, EN 62479, IEC/EN 62955
		TuV listed conforming to UL 2594, UL 2231-1, UL 2231-2, UL 1998, CSA C22.2. NO.280
Codes and standards		IEC 61851-21-2, EN 61000-6-1, EN 61000-6-2, EN 61000-6-3, EN 61000-6-4, EN 61000-3-2, EN 61000-3-3, EN 61000-3-11, EN 61000-3-12 CE RED- WLAN / RFID / E-UTRA: EN 300 328 V2.1.1, EN 300 330 V2.1.1, EN 301 908-1 V11.1.2, EN 301 908-13 EN 50470-1, EN 50470-3
		FCC Part 15 Class B ENERGY STAR
Certification		CE, CB, MID, UL
Warranty		24 months

Smarter by design

- The App allows streamlined charger configuration
- Ready for integration with advanced smart building energy system
- Simple software updates via the App makes the charger future-ready

With the user in mind

- Enables users to authenticate their charger via the App or RFID card. Configuration is easily done via the App or ABB web portal
- Sends charging status via the App
- Provides information about the status of chargers (availability, number of sessions, energy delivery)

ABB
Heertjeslaan 6, 2629 JG
Delft, Netherlands

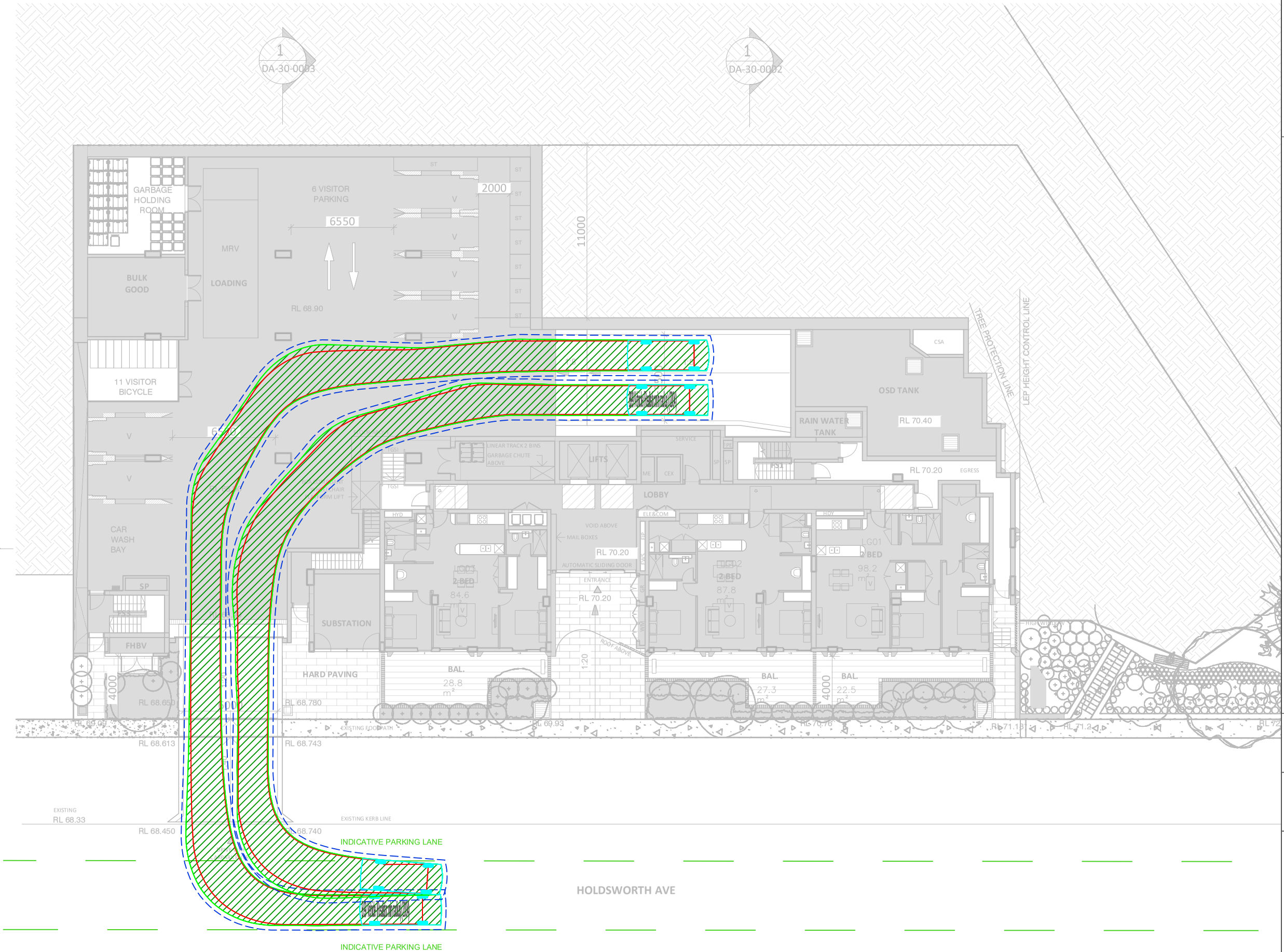
solutions.abb/terraacwallbox

Additional information
We reserve the right to make technical changes or modify the contents of this document without prior notice. With regard to purchase orders, the agreed particulars shall prevail. ABB AG does not accept any responsibility whatsoever for potential errors or possible lack of information in this document.

9AKK107680A2257- Rev. F- (03/2021)

Appendix C

Swept Path Diagrams



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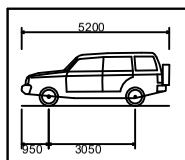
Clearance (300mm)		



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

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16 JUNE 2022	1:250@A3

DRAWING NO.:	REV:
20080CAD006A-001	A

DRAWING TITLE:

SWEPT PATH ANALYSIS - AS2890.1 5.2M B99 VEHICLE - GROUND FLOOR

PROJECT:

10-12 MARSHALL AVE, ST LEONARDS PROPOSED RESIDENTIAL DEVELOPMENT

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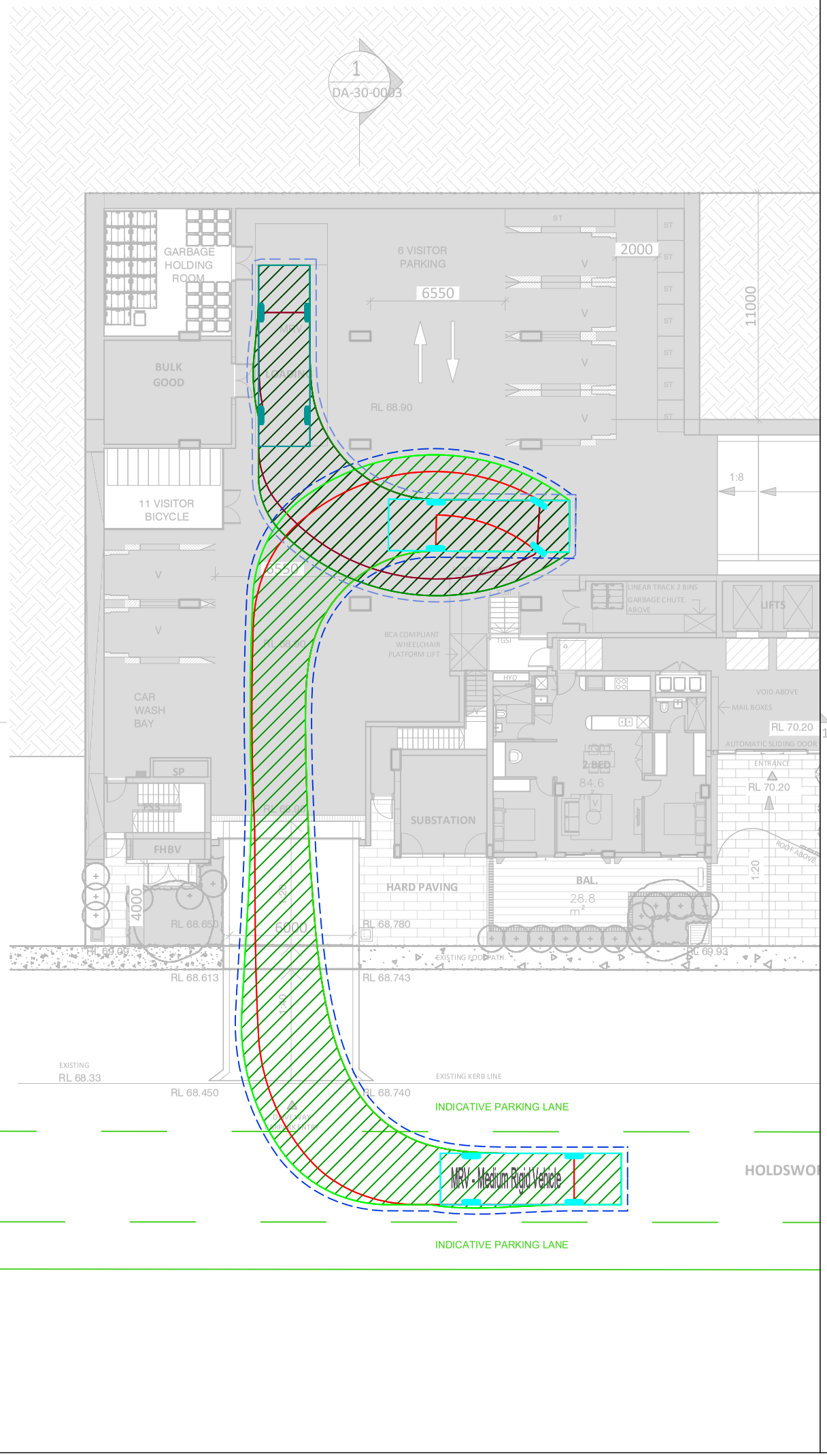

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Wheel Path		
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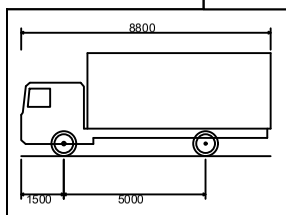
Clearance (300mm)		



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

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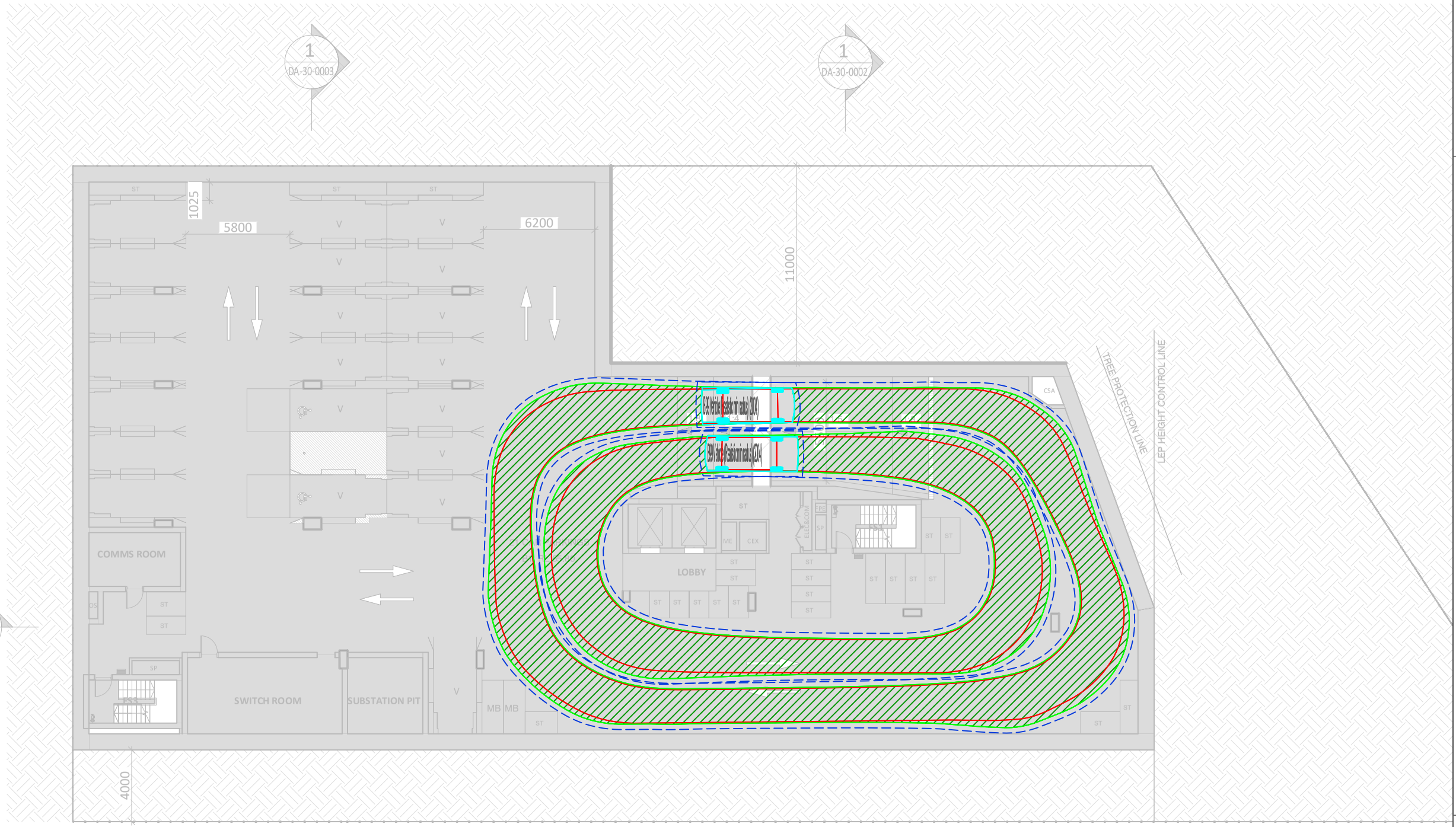
DRAWING NO.:	REV:
20080CAD006A-002	A

DRAWING TITLE:

SWEPT PATH ANALYSIS - AS2890.2 8.8M MRV - GROUND FLOOR

PROJECT:

10-12 MARSHALL AVE, ST LEONARDS PROPOSED RESIDENTIAL DEVELOPMENT



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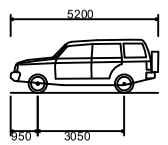
Wheel Path		
Body Envelope		
Clearance (300mm)		



B99 Vehicle (Realistic min radius) (2004)	
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Overall Body Height	1878mm
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Track Width	1840mm
Lock-to-lock time	4.00s
Curb to Curb Turning Radius	6250mm

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SWEPT PATH ANALYSIS - AS2890.1 5.2M B99 VEHICLE BASEMENT LEVEL B1

PROJECT:
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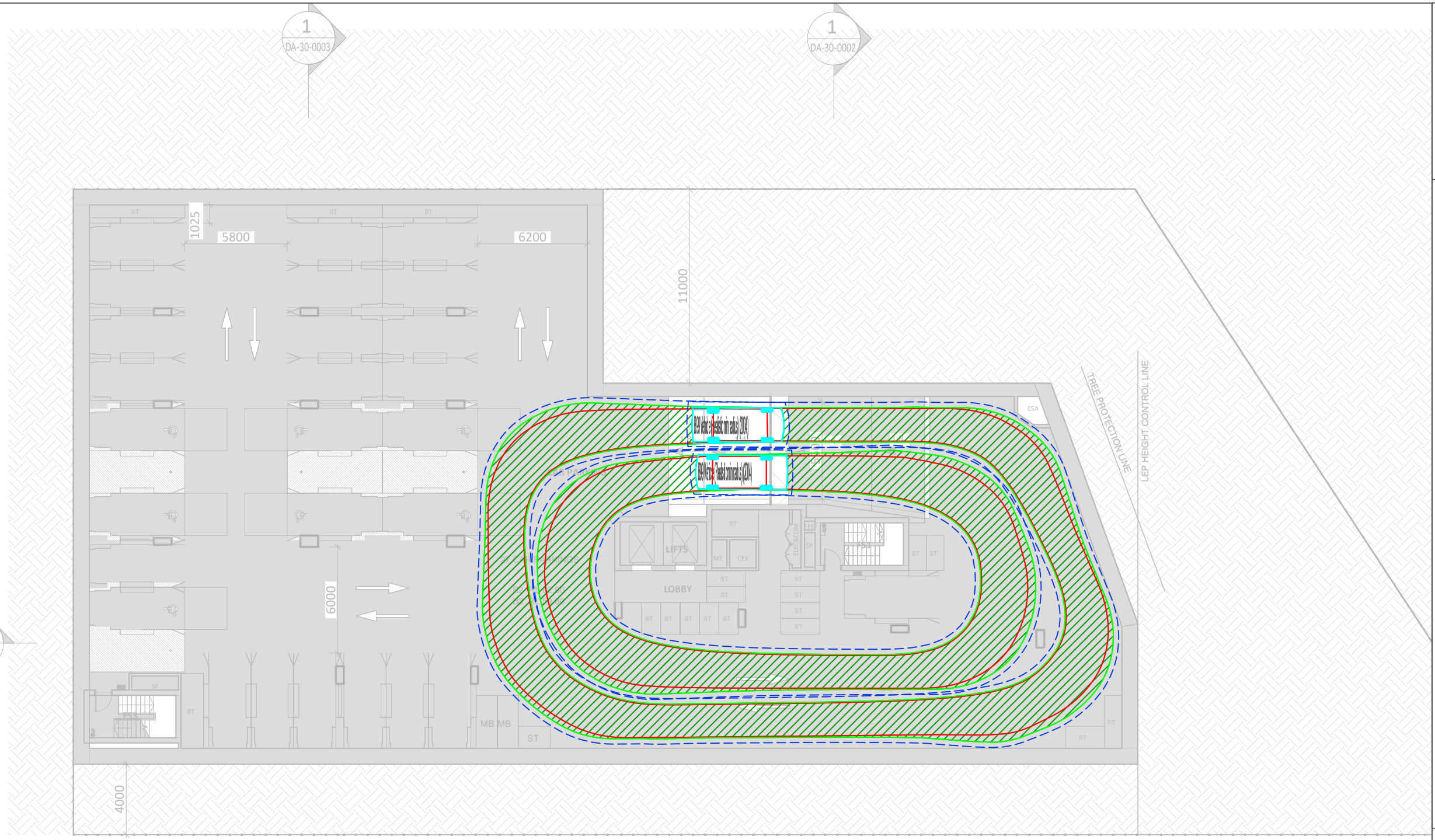

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KEY:

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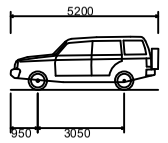
Body Envelope		
Clearance (300mm)		



B99 Vehicle (Realistic min radius) (2004)

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

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SWEPT PATH ANALYSIS - AS2890.1 5.2M B99 VEHICLE BASEMENT LEVELS B2 & B3

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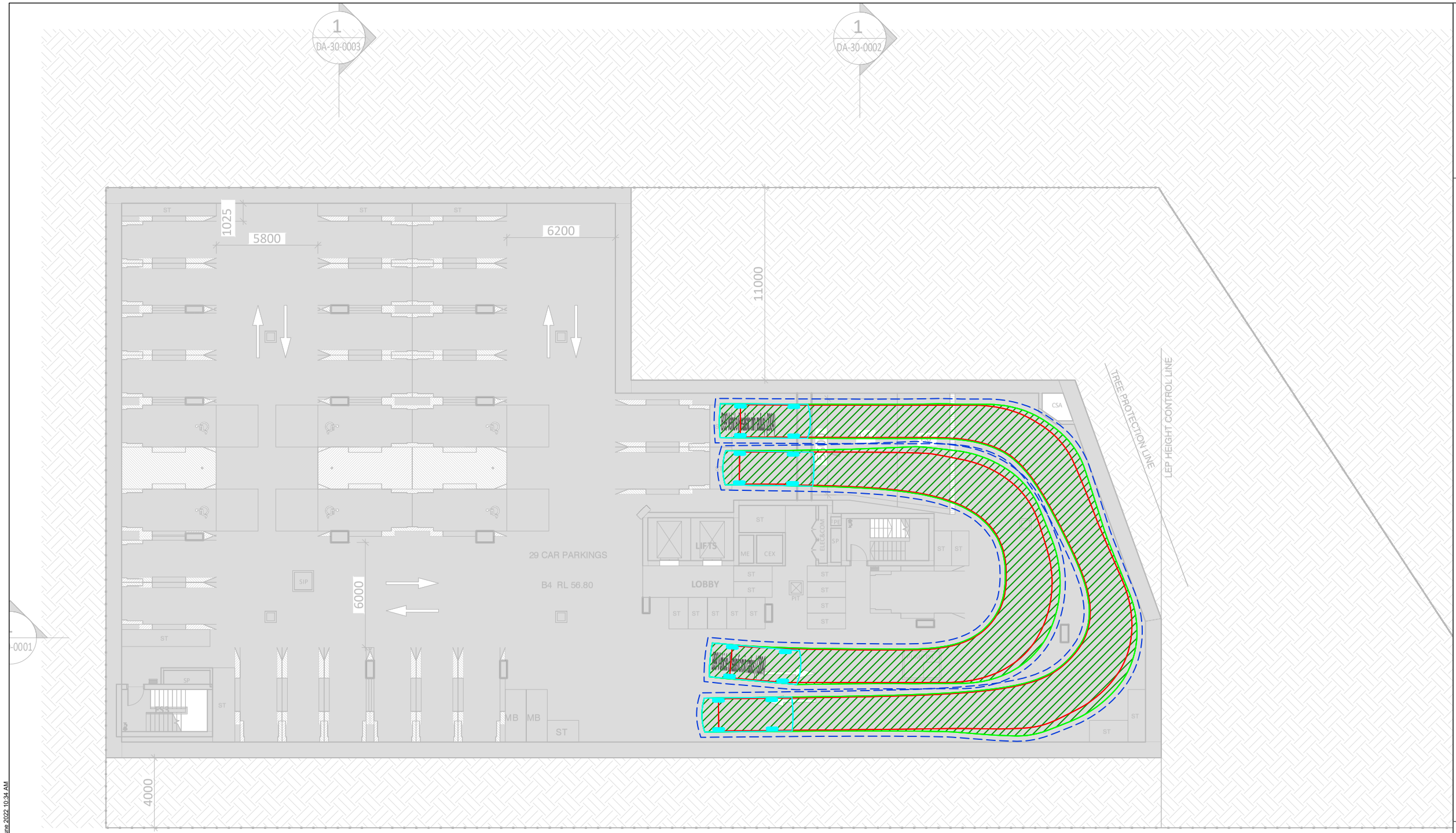

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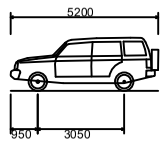
KEY:

	Forward	Reverse
Wheel Path		
Body Envelope		
Clearance (300mm)		



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PROJECT:
10-12 MARSHALL AVE, ST LEONARDS PROPOSED RESIDENTIAL DEVELOPMENT

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