STANBURY
TRAFFIC PLANNING
TRAFFIC, PARKING & TRANSPORT CONSULTANTS

PARKING AND TRAFFIC IMPACT ASSESSMENT

PROPOSED RESIDENTIAL FLAT BUILDING
67 PACIFIC PARADE
DEE WHY

PREPARED FOR BL 2093 PTY. LTD.
OUR REF: 23-179-rep-1

24 JULY 2024

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APPENDICES

1. INTRODUCTION

1.1 Scope of Assessment

Stanbury Traffic Planning has been commissioned by BL 2093 Pty. Ltd. to prepare a Parking & Traffic Impact Assessment to accompany a Development Application to be lodged with Northern Beaches Council. The Development Application seeks consent for the construction of a new residential flat building at 67 Pacific Parade, Dee Why (hereafter referred to as the 'subject site').

The aim of this assessment is to investigate and report upon the potential traffic and parking consequences of the development application and to recommend appropriate ameliorative measures where required. This report provides the following scope of assessment:

- Section 1 provides a summary of the site location, details, existing and surrounding land-uses;

- Section 2 describes the proposed development;

- Section 3 assess the adequacy of the proposed site access arrangements, parking provision, internal circulation and servicing arrangements with reference to relevant Council, Transport for NSW (TfNSW) and Australian Standard specifications;

- Section 4 assesses the existing traffic, parking and transport conditions surrounding and servicing the subject development site including a description of the surrounding road network, traffic demands, operational performance and available public transport infrastructure; and

- Section 5 estimates the projected traffic generating ability of the proposed development and assesses the ability or otherwise of the surrounding road network to be capable of accommodating the altered demand in a safe and efficient manner.

The report has been prepared pursuant to State Environmental Planning Policy (Transport & Infrastructure) 2021.

1.2 Reference Documents

Reference is made to the following documents throughout this report:

- TfNSW's *Guide to Traffic Generating Developments*;
- Northern Beaches Council's *Warringah Development Control Plan 2011 (WDCP 2011)*;
- Australian Standard for *Parking Facilities Part 1: Off-Street Car Parking* (AS2890.1:2004);
- Australian Standard for *Parking Facilities Part 3: Bicycle Parking Facilities* (AS2890.3:2015); and
- Australian Standard for *Parking Facilities Part 6: Off-Street Parking for People with Disabilities* (AS2890.6:2022).

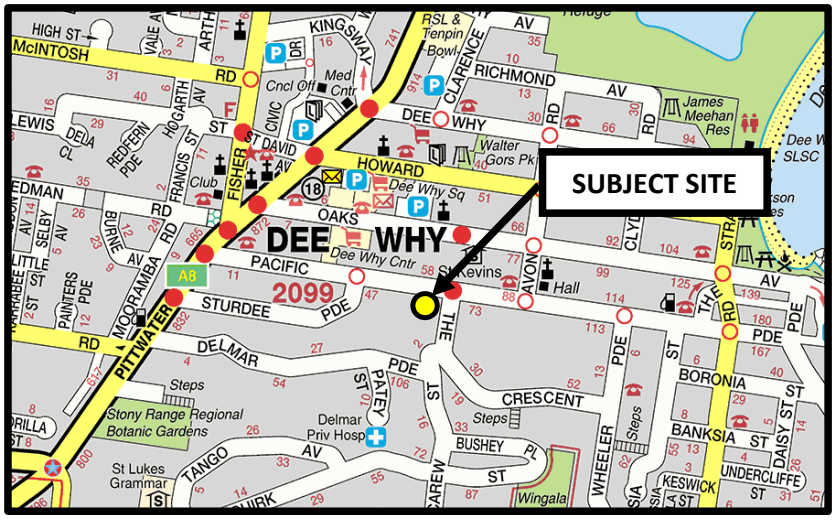
Architectural plans have been prepared by DKO Architecture Pty. Ltd. and should be read in conjunction with this report, reduced copies of a selection of which are included as **Appendix 1** for reference.

1.3 Site Details

1.3.1 Site Location

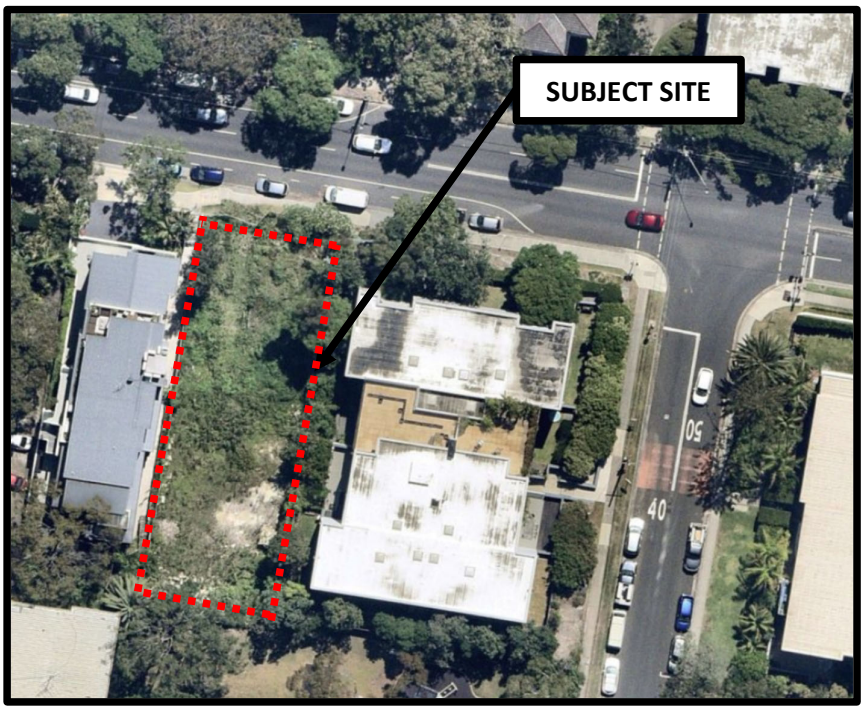
The subject site is situated on the southern side of Pacific Parade, approximately 40m west of The Crescent, Dee Why. The site location is illustrated overleaf within a local and aerial context by **Figure 1** and **Figure 2**, respectively.

FIGURE 1
SITE LOCATION WITHIN A LOCAL CONTEXT



Source: UBD's Australian City Streets – Version 8

FIGURE 2
SITE LOCATION WITHIN AN AERIAL CONTEXT



Source: Nearmap (image date: 12/03/2024)

1.3.2 Site Description

The subject site provides a real property address of Lot 25 within DP 7002 and a street address of 67 Pacific Parade, Dee Why.

The allotment provides a rectangular shaped parcel of land with an approximate frontage of 15m to Pacific Parade, extending to the south approximately 46m, resulting in a site area in the order of 700m^2.

1.3.3 Existing Site Use

The subject site is currently vacant.

1.3.4 Approved Development

Development consent (DA 2020/1597) was issued by Land & Environment Court on 8 February 2022 for a boarding house development comprising 25 accommodation rooms, a manager's residence and a common room.

The development was approved to be contained within a part four / part five storey building, situated approximately central to the site.

The development was approved to be serviced by a total of nine car parking spaces, six of which are to be provided within a mechanical stacker parking system, in conjunction with five motorcycle spaces and 11 bicycle spaces.

Vehicular access to the on-site parking area is via a 7m single combined ingress / egress driveway linking to connect with Pacific Parade in the north-western corner of the site.

The abovementioned development application was supported by a Traffic & Parking Impact Assessment prepared by this Practice dated April 2021, which projected that the boarding house development would generate in the order of 10 peak hour vehicle trips to and from the site and that the surrounding road network was capable of accommodating such an extent of traffic without unreasonable impacts on safety and efficiency.

1.3.5 Existing Site Use

The subject site is adjoined in all directions by medium to high density residential developments.

2. PROPOSED DEVELOPMENT

2.1 Built Form

The subject application seeks approval for the construction of a residential flat building within 67 Pacific Parade, Dee Why. The development is proposed to comprise the provision of a total of nine dwellings, comprising:

- Two x 2-bedroom dwellings; and
- Seven x 3-bedroom dwellings.

The development is to be serviced by three levels of parking, containing a total of 15 off-street spaces comprising:

- 13 resident spaces (including one disabled space); and
- Two visitor spaces.

The development is also proposed to provide a total of 10 bicycle parking spaces.

Vehicular access to the basement level car parking area is proposed via a combined ingress / egress driveway connecting with Pacific Parade in the north-western corner of the site. Connectivity between the basement level parking area and the ground and level 1 parking areas is via a mechanical lift system situated approximately central to the western site boundary.

Pedestrian access is proposed via a pedestrian walkway connecting with the southern Pacific Parade footpath situated to the east and separate to the abovementioned vehicular driveway, providing access to the building lift / staircase lobbies. Further, a pedestrian lift provides connectivity between all building levels, including the parking areas.

3. SITE ACCESS & INTERNAL CIRCULATION

3.1 Passenger Vehicle Access

Vehicular access between the development site and Pacific Parade is proposed to be provided via a 6.3m wide combined ingress / egress driveway located within the north-western corner of the site. The driveway is proposed to provide connectivity to internal roadway extending into the site, widening to provide 3m wide ingress and egress travel lanes separated by a 0.6m wide intercom island. This internal roadway ramps down to provide connectivity to the basement parking area.

AS2890.1:2004 provides driveway design specifications based on the proposed primary land use, the functional order of the access road and the number of spaces the driveway is to serve. Tables 3.1 and 3.2 of AS2890.1:2004 specify that, at minimum, a Category 1 type driveway is required, providing a combined ingress / egress driveway width of between 3m and 5.5m based on the local (non-arterial) functional order of Pacific Parade, the residential land-use and the total passenger vehicle parking provision of less than 25 spaces. The proposed combined ingress / egress driveway width of 6.3m therefore complies with the minimum AS2890.1:2004 specifications and accordingly, is considered to be satisfactory.

Swept path plans have been prepared in order to demonstrate the ability of passenger vehicles to enter and exit the site in combination, copies of which are included as **Appendix 2**.

The safety and efficiency of access / egress movements are also proposed to be assisted by the following:

- The provision of a relatively level (maximum of 1:20) grade within the first 6m of the egress driveway inside the property boundary;

- No obstructions to visibility adjacent to the egress (western) side of the driveway facilitating appropriate sight distance between exiting motorists and potential pedestrians travelling along the southern Pacific Parade footpath; and

- The reasonably consistent horizontal and vertical alignment of Pacific Parade in the immediate vicinity of the subject site resulting in satisfactory sight distance between the frontage road and the proposed site access driveway, based on the prevailing 40km/h speed limit.

3.2 Pedestrian Access

Pedestrian connectivity is proposed to be provided via a walkway to the east of and separate from the vehicular access driveway, connecting with the southern Pacific Parade footpath. The walkway leads to a forecourt that is situated at the main door to the lobby.

3.3 Passenger Vehicle Parking Provision

3.3.1 Proposed Vehicular Parking Provision

The development is serviced by a total of 15 off-street passenger vehicle parking spaces provided as follows:

Resident spaces	13 (including one disabled space)
Visitor spaces	2
Total	15 spaces

3.3.2 Council's Vehicular Parking Requirements

Northern Beaches Council has adopted the following off-street parking rates presented within **Table 1** below for residential flat buildings, as outlined in WDCP 2011, being relevant to the existing and proposed development.

TABLE 1
OFF-STREET PARKING RATES
WARRINGAH DEVELOPMENT CONTROL PLAN 2011

Use	Measure	Parking Requirement
Residential flat buildings	2-bedrooms	1.2 space per dwelling
	3-bedrooms	1.5 spaces per dwelling
	Visitors	1 space per 5 dwellings

Table 2 below identifies the off-street parking required to satisfy WDCP 2011.

TABLE 2
OFF-STREET PARKING REQUIREMENTS
WARRINGAH DEVELOPMENT CONTROL PLAN 2011

Measure	No. Dwellings	Parking Requirement
2-bedrooms	2	12.9 (adopt 13)
3-bedrooms	7	
Visitors	9	1.8 (adopt 2)
Total		**15**

Table 2 indicates that WDCP 2011 requires the development provide a total of 15 passenger vehicle parking spaces, comprising 13 resident and 2 visitor spaces.

According to the above, the proposed passenger vehicle parking provision of 13 resident and 2 visitor spaces complies with Council's minimum requirements and is therefore considered satisfactory.

3.4 Bicycle Parking Provision

The subject development is proposed to provide a total of 10 bicycle parking spaces comprising of nine resident bicycle parking spaces and one visitor bicycle parking space.

Table 3 below provides a summary of the bicycle parking rates applicable to the proposed development as specified within WDCP 2011.

TABLE 3 BICYCLE PARKING RATES AND REQUIREMENTS – PROPOSED DEVELOPMENT WARRINGAH DEVELOPMENT CONTROL PLAN 2011				
Use	**Measure**	**No. Dwellings**	**Rate**	**Minimum Spaces Required**
Residential Flat Buildings	Residents	9	1 space per dwelling	9
	Visitors	9	1 space per 12 dwellings	0.75 (adopt 1)
			Total	**10**

Table 3 indicates the proposed development therefore has a minimum requirement of 10 bicycle parking spaces, comprising nine resident and one visitor parking space. Compliance with Council's bicycle parking requirement is therefore achieved.

3.5 Internal Circulation and Manoeuvrability

3.5.1 Parking Design

Upon entry to the site via the access driveway connecting with Pacific Parade, vehicles are to proceed in a forward direction to the basement parking area, whereby the internal access roadway continues to form a north-south aligned parking aisle servicing three 90-degree angled (east-west aligned) parking spaces comprising two visitor spaces and one accessible resident space.

Connectivity between the basement parking area and the ground / Level 1 parking areas is proposed via a north-south alignment mechanical vehicle lift situated in the south-western corner of the basement parking area (approximately 22m to the south of the development access driveway).

The ground and level 1 parking areas provide two rows of north-south aligned 90-degree angled parking spaces situated along the northern and southern periphery walls, being serviced by a central east-west aligned parking circulation aisle.

The parking areas have been designed with the following minimum dimensions in accordance with AS2890.1:2004 and AS2890.6:2022:

- Standard 90-degree angled parking space width = 2.4m;
- Disabled parking space width = 2.4 (plus adjacent 2.4m wide shared area);
- Additional vehicular space width where parking spaces adjoins an obstruction = 0.3m;
- Minimum parking circulation aisle = 5.8m;

- Standard 90-degree parking space length = 5.4m;

- Minimum clearance throughout off-street parking area and access thereto = 2.2m; and

- Minimum clearance above disabled parking spaces = 2.5m.

In order to further demonstrate the suitability of the abovementioned arrangement and internal passenger vehicle manoeuvrability throughout the internal circulation areas, this Practice has prepared a number of swept path plans which are included as **Appendix 2**. The turning paths provided on the plans have been generated using Autoturn software and derived from B85 vehicle specifications provided within AS2890.1:2004.

The swept path plans illustrate that passenger vehicles can generally manoeuvre throughout the parking area with a reasonable level of safety and efficiency. In this regard, whilst it is acknowledged that a minor level of additional manoeuvring is required in order to access the eastern-most parking spaces within the ground and level parking areas, this is a common scenario within small developments with constrained parking areas. Such an arrangement is further considered acceptable as these parking spaces are to be allocated to residents of the development, therefore being considered everyday users that will be aware of the additional level of manoeuvring required.

Further, it should be acknowledged that Section B4.4 of AS2890.1:2004 states the following with regard to the use of templates to assess vehicle manoeuvring:

'Constant radius swept turning paths, based on the design vehicle's minimum turning circle are not suitable for determining the aisle width needed for manoeuvring into and out of parking spaces. Drivers can manoeuvre vehicles within smaller spaces than swept turning paths would suggest.'

It would therefore appear that whilst the turning paths provided within AS2890.1:2004 can be utilised to provide a 'general indication' of the suitability or otherwise of internal parking and manoeuvring areas, vehicles can generally manoeuvre more efficiently than the paths indicate. In consideration of this and the above discussion, the proposed internal passenger vehicle circulation arrangements are considered to be satisfactory.

It is recommended that the basement visitor car parking spaces be supplemented with a visitor parking space occupation sensor system. In the event that all on-site parking spaces are occupied, the sensors will trigger the illumination of an electronic "car park full" sign situated adjacent to the site access driveway facing the street. Incorporating such a system, entering visitors will therefore be appropriately advised in the unlikely event that all on-site visitor car parking spaces are occupied and accordingly, undesirable internal turnaround movements are not expected to occur. It is considered that the above car park management measure could be incorporated with the Operational Management Plan, the requirement for which could reasonably be imposed by Council as a Condition of Consent.

In consideration of the above discussion, the proposed parking area layout as it relates to passenger vehicle manoeuvrability is considered to be satisfactory.

3.5.2 Vehicle Lift

The following sub-section provides a general description of the usage procedure and specifications of the vehicle lift.

3.5.2.1 Vehicle Lift Specifications

The mechanical vehicle lift system is proposed to be provided by Liftronic, an appropriately experienced and qualified manufacturer. The following provides a summary of the relevant minimum required vehicle lift specifications, whilst indicative specifications are provided within **Appendix 3**:

- The lift is to provide internal dimensions of 3.2m x 5.9m, being compliant with AS2890.1:2004 for a single vehicle garage;
- The lift is to provide a door opening width of 3.0m;
- The lift is to provide a load capacity of 3 tonnes;
- The lift is to provide an internal clearance of 2.2m, being compliant with the AS2890.1:2004 requirements for off-street parking; and
- The lift provides an ascent / descent speed of 0.5 metres per second.

Vehicular access to / from the lift is proposed to be governed by an internal traffic signal system. The traffic lanterns and the traffic lantern controllers are to be provided by AGD Systems Pty Ltd. The following provides a summary of the relevant lantern and lantern controller specifications, whilst a full data sheet provided by the manufacturer is provided within **Appendix 4**:

- Two 100mm Two Aspect 12/24Vdc – AGD13 traffic lanterns (red and green coloured lanterns) are to be provided; and
- Each lantern is to provide the dimensions of 150mm and 300mm.

Additional infrastructure associated with the traffic signal system includes the following:

- One push button positioned near the lifts within the ground and level 1 parking areas; and
- Signage positioned within the ground and level 1 parking areas specifying that vehicles are to remain within their parking spaces until a green lantern is displayed.

3.5.2.2 Vehicle Lift Site Entry Procedure

The vehicle lift is to be located at basement level with the door open in passive / default mode. A traffic signal is to be situated at the basement level, ground level and Level 1 parking areas near the lift bay. The traffic signal system will display a green lantern at basement level and red lanterns within the ground level and Level 1 in passive / default mode advising entering motorists that the lift can be accessed and that vehicles within the ground level and Level 1 are to wait within their parking spaces until a green lantern is displayed.

In the event that the lift is located at basement level (default mode), entering vehicles from development access driveway / roadway level will travel in a forward direction into the site in an unimpeded fashion to access the vehicle lift. Once positioned within the vehicle lift bay, drivers will thence control the lift by in-vehicle remotes or an intercom system within the lift. Upon arrival to ground floor parking area or Level 1 parking area, the lift door will open, and vehicles will directly access the ground floor or Level 1 parking area from the lift in a forward direction.

In the event that the lift is not located at basement level, an entering vehicle will occupy the designated waiting bay situated to the north of the lift, until such time as the lift returns to default mode, thereby allowing the vehicle to access the lift as described above.

3.5.2.3 Vehicle Lift Site Exit Procedure

The vehicle lift access door within the ground floor parking area and Level 1 parking area is proposed to be governed by traffic signals. As previously presented, these signals will display a red lantern under default arrangement to the ground floor parking level and Level 1 parking level and a green lantern to the basement parking level.

Motorists wishing to exit the ground floor parking level or Level 1 parking level will call for the lift and the opening of the lift door through an in-vehicle remote or push buttons situated within the ground floor parking area or Level 1 parking area. Motorists will be directed through signage that vehicles are to remain within their parking spaces until the red lantern becomes green. Once the lift has reached the ground floor parking level or Level 1 parking level, the lift door will open, a vehicle will exit the lift (as required) and the traffic signal lantern within the parking level will change from red to green. Motorists will thence manoeuvre their vehicle from their respective parking space as required in order to enter the vehicle lift in a forward direction.

The exiting motorist will thence control the lift by an in-vehicle remote or the intercom system within the lift. Upon arrival of the lift to the basement parking level, the lift door will open, and vehicles will exit the lift to the basement parking area in a forward direction.

3.5.2.4 Queueing Analysis

The setting back of the vehicle lift within the site approximately 22m allows for up to three passenger vehicles to queue on approach to the lift, without such a queue extending into the adjacent public roadway. On the basis of an additional vehicle being situated within lift, the proposed lift system provides an internal queuing capacity of four vehicles. In order to assess the suitability of such a queuing capacity, the below queuing analysis has been undertaken.

The mechanical vehicle lift will be required to travel a vertical span of up to 6.3m from the default position at basement level to the Level 1 parking level. On the basis of a total cycle lift travel distance of 12.6m (6.3m x 2) and the previously presented lift travel speed of 0.5 m/s, the total lift travel time is calculated to be 25.2 seconds (12.6m / 0.5 m/s).

In addition to the lift travel time, a single lift cycle time is also required to include time taken for lift doors to close and lock, vehicles to enter and exit the lift, dwell time following a vehicle exiting a lift and the door closing, lift speed to slow on approach to a stop the lift door to open when back at basement level. To account for this activity, an additional 50 seconds has been applied to the total lift travel time, based on advice from the lift manufacturer, resulting in a total lift cycle time of 75.2 seconds.

Based on the above mechanical lift operation and characteristics, the potential for queueing with the implementation of the lift has been investigated in order to assess the suitability or otherwise of the on-site parking arrangements to generate and accommodate a potential queue, as required by Clause 3.5 of AS2890.1:2004.

The queueing analysis incorporates the following critical operational characteristics of the parking system and the proposed development:

- The on-site parking area is projected to generate up to six vehicle movements during weekday commuter peak periods;

- The service rate is calculated based on the mechanical vehicle lift system's ability to accommodate 47.87 vehicle dispatch / retrieval movements per hour (3,600/75.2).

On the basis of the above critical system characteristics, the following queueing analysis is provided in accordance with standard (M/M/1) procedures, a first-in-first-out basis (FIFO) and a Poisson process for the arrival and service rates:

$$a = arrival\ rate$$

$$s = service\ rate$$

$$p = utilisation\ rate\ (\frac{a}{s})$$

$$E(m) = Mean\ number\ of\ vehicles\ in\ queue\ \left(\frac{p}{1-p}\right) - p$$

$$P(n) = \ Discrete\ probability\ of\ n\ vehicles\ within\ the\ system\ (1-p)p^n$$

On this basis, the following analysis is provided:

- The arrival rate is 6 vehicles every hour;
- The service rate is 47.87 vehicles per hour;
- The utilisation rate is the arrival rate divided by the service rate is (6/47.87) or p = 0.125;
- The average number of vehicles in the queue is 0.02 vehicles [$E(m) = \frac{\mathrm{p}}{(1-\mathrm{p})} - p$];
- The probability of zero vehicles in the system: $(1-p)p^0$ = 0.875 (87.5%);
- The probability of one vehicle in the system: $(1-p)p^1$ = 0.109 (10.9%);
- The probability of two vehicles in the system: $(1-p)p^2$ = 0.014 (1.4%);
- The probability of three vehicles in the system: $(1-p)p^3$ = 0.002 (0.2%);
- The probability of four vehicles in the system: $(1-p)p^4$ = 0.0002 (0.02%);
- The probability of five vehicles in the system: $(1-p)p^5$ = 0.00003 (0.003%);
-

Application of the abovementioned calculations results in the following:

- The probability of one or more vehicles in the system
  - 1 – 0.875 = 0.125 (12.5%);
- The probability of two or more vehicles in the system
  - 1 – 0.875 - 0.109 = 0.016 (1.6%);
- The probability of three or more vehicles in the system
  - 1 – 0.875 - 0.109 – 0.014 = 0.002 (0.2%);
- The probability of four or more vehicles in the system
  - 1 – 0.875 - 0.109 – 0.014 – 0.0002 = 0.00018 (0.18%); and
- The probability of five or more vehicles in the system
  - 1 – 0.875 - 0.109 – 0.014 – 0.0002 – 0.00003 = 0.00015 (0.015%).

Full details with respect to the above queue calculations are contained within **Appendix 5**.

According to the above, the scenarios whereby a five or more vehicles are within the system, which would result in a queue extending into the adjacent public road, has been calculated to occur 0.00015% of the time. This means that the proposed operation of the on-site parking area access arrangements is therefore capable of accommodating well in excess of the 98th percentile queue, thereby complying with the requirements of Clause 3.5 of AS2890.1:2004.

3.5.2.5 Lift Servicing / Emergency Procedures

Mechanical vehicle lifts and traffic signal systems such as that described above are typically fitted with a battery powered back up system to ensure that they continue to operate during power black outs. It is further understood that the mechanisms such as that proposed tend to be very reliable and rarely malfunction. However, in the event of a malfunction occurring, the manufacturer provides a maintenance crew which is on call 24 hours per day seven days a week, which will be dispatched to the site immediately and arrive at most within 90 minutes. Further, the system incorporates a computer which in most cases can self-diagnose a problem and inform service personnel who can often fix the issue remotely via the internet.

Advice from vehicle lift manufacturers has also indicated that regular bi-monthly servicing of the vehicle lift is recommended and generally adopted in order to keep the vehicle lift systems and mechanisms in satisfactory working order and to identify and diagnose potential issues early.

The indicative location of the lanterns and push buttons associated with the vehicle lift and traffic signal system are illustrated on the architectural plans. Notwithstanding this, the specific details of the internal traffic signal system are typically specified by traffic signal contractors at construction certificate stage, complete with a management plan, including measures to be implemented during malfunctions or blackouts.

3.5.3 Bicycle Parking Design

A series of horizontal bicycle parking rails are proposed to be provided within the basement parking area. These bicycle parking spaces have been designed with the following minimum characteristics complying with AS2890.3:2015:

- Bicycle parking space width = 0.5m;
- Bicycle parking space length = 1.8m;
- Minimum bicycle parking aisle / access path width = 1.5m.

3.6 Site Servicing

The subject development is anticipated to generate the requirement for regular waste collection vehicle servicing. Garbage bins are proposed to be contained within a waste storage area situated in the north-eastern corner of the basement level. The location of this bin room allows efficient kerb side collection by

Council's waste service from Pacific Parade, in a similar manner to other properties in the subject vicinity.

4. EXISTING TRAFFIC CONDITIONS

4.1 Surrounding Road Network

The following provides a description of the local road network surrounding the subject site:

- **Pacific Parade** performs a minor collector road function under the care and control of Northern Beaches Council, providing an east-west connection between Dee Why Beach in the east and Pittwater Road in the west.

  Pacific Parade provides an approximate pavement width of 13m, providing one through lane of vehicular traffic, plus a designated bicycle lane in each direction, in conjunction with unrestricted parallel parking along both kerb alignments. Traffic flow is governed by a local area speed limit of 40km/h.

  To the west of the site, Pacific Parade intersects with Sturdee Parade under a single lane circulating roundabout control. Further to the west, Pacific Parade forms a junction with Pittwater Road, operating under traffic signal control.

  To the east of the subject site, Pacific Parade intersects with The Crescent under traffic signal control. Further to the east, Pacific Parade intersects with Avon Road and Griffin Road, each junction being governed by single lane circulating roundabout control.

- **The Crescent** performs a local access function under the care and control of Northern Beaches Council providing a connection between Pacific Parade in the north and Wheeler Parade in the east.

  The Crescent provides a 9.5m wide pavement with one lane of traffic in each direction, in conjunction with parallel parking along both kerb alignments. The Crescent is governed by a local area speed limit of 50km/hour.

  The Crescent extends to the south approximately 75m from Pacific Parade, prior to forming a T-junction with Carew Street, under 'Give Way' control. This T-junction operates in a somewhat non-standard arrangement whereby turning movements between the northern approach of The Crescent and Carew Street are provided with priority. A short raised concrete central median is provided within Carew Street to the west of this junction to provide appropriate junction channelisation and reinforce the abovementioned non-standard priority arrangement.

  The Crescent continues to the south-east to link with Wheeler Parade, with which it intersects under major / minor priority control with Sheeler Parade forming the priority route.

- **Sturdee Parade** performs a minor collector road function under the care and control of Northern Beaches Council, providing a connection between Pacific Parade in the north-east and Pittwater Road in the south-west, with which it intersects under traffic signal control.

Sturdee Parade provides a variable pavement width between 9.5m and 12.8m providing one through lane of traffic in each direction in conjunction with parallel parking on one or both kerb alignments. Traffic flow is governed by a sign posted speed limit of 40km/h.

- **Pittwater Road** performs an arterial road function under the care and control of TfNSW. Pittwater Road provides a connection between North Manly at its southern end, and Church Point in the north. Pittwater Road performs the main road function along the coast of the northern beaches suburbs, connecting the suburbs of Manly, Brookvale, Dee Why, Collaroy, Narrabeen, Mona Vale and Church Point.

  In the vicinity of Dee Why, Pittwater Road provides a 25m wide carriageway with three lanes of traffic in each direction separated by a raised central median. Traffic is governed by a sign posted speed limit of 60km/hour. In the vicinity of the junction with Pacific Parade, the western kerbside lane of Pittwater Road provides sign-posted bus lane / clear way conditions during Monday to Friday, 3pm to 7pm. 1 hour time limited parking is permitted in sign-posted sections between Monday to Friday 8:30am – 3pm and 8:30am – 12:30pm Saturdays. Unrestricted kerbside parking is permitted at other times. In a similar manner to that described above, the eastern kerbside lane of Pittwater Road provides sign-posted bus lane / clear way conditions during Monday to Friday, 6am – 10am.

  Pittwater Road intersects with Pacific Parade under traffic signal control, with all movements permitted, with the exception of right turn movements from Pittwater Road. Right turn access to the Dee Why precinct form the northbound Pittwater Road carriageway is facilitated at the signalised junction of Pittwater Road and Sturdee Parade, to the south.

4.2 Existing Traffic Volumes

4.2.1 Junction of Pacific Parade and The Crescent

Traffic demand surveys have been commissioned at the junction of Pacific Parade and The Crescent in order to accurately ascertain existing traffic demands within the immediate precinct.

Surveys were undertaken between 7:00am – 9:00am and 4:00pm – 6:00pm on Wednesday 29th of May 2024.

Figure 3 overleaf provides a summary of the surveyed peak hour intervals of traffic flows at the subject intersection including a morning peak hour which has been identified as 7:45am — 8:45am (AM Peak) and 4:30pm – 5:30pm (PM Peak), whilst full details are contained within **Appendix 6**.

FIGURE 3
EXISTING WEEKDAY COMMUTER PEAK HOUR TRAFFIC VOLUMES
JUNCTION OF PACIFIC PARADE AND THE CRESCENT

Legend: AM Peak / PM Peak

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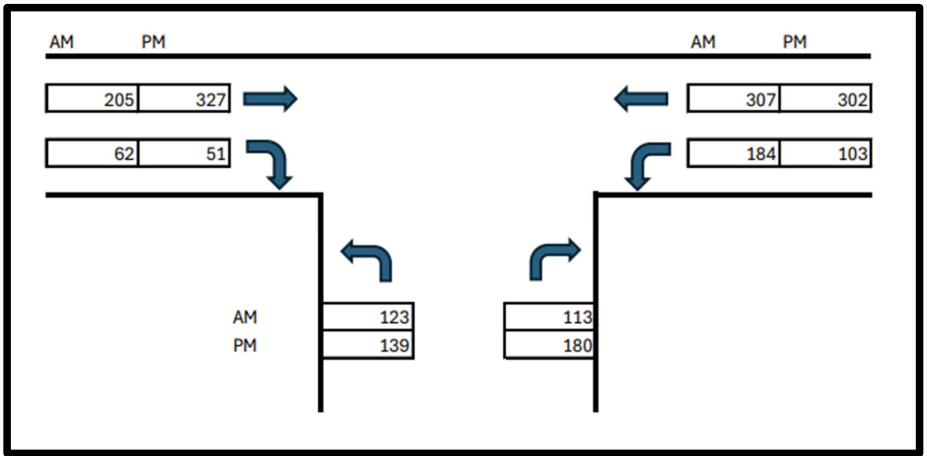

Figure 3 indicates the following:

- Pacific Parade accommodates directional traffic demands approximately between 250 – 500 vehicles per hour during weekday commuter peak hours; and

- The Crescent accommodates directional traffic demands between 150 – 350 vehicles per hour during weekday commuter peak hours.

4.3 Existing Road Network Operation

4.3.1 Intersection Performance

The junction of Pacific Parade and The Crescent has been analysed utilising the SIDRA computer intersection analysis program in order to objectively assess the operation of the nearby public road network.

SIDRA is a computerised traffic arrangement program which, when volume and geometrical configurations of an intersection are imputed, provides an objective assessment of the operation efficiency under varying types of control (i.e. signs, signal and roundabouts). Key indicators of SIDRA include level of service where results are placed on a continuum from A to F, with A providing the greatest intersection efficiency and therefore being the most desirable by the TfNSW.

SIDRA uses detailed analytical traffic models coupled with an iterative approximation method to provide estimates of the abovementioned key indicators of capacity and performance statistics. Other key indicators provided by SIDRA are average vehicle delay, the number of stops per hour and the degree

of saturation. Degree of saturation is the ratio of the arrival rate of vehicles to the capacity of the approach. Degree of saturation is a useful and professionally accepted measure of intersection performance.

SIDRA provides analysis of the operating conditions that can be compared to the performance criteria set out in **Table 4** below (being the TfNSW NSW method of calculation of Level of Service).

TABLE 4 LEVEL OF SERVICE CRITERIA FOR SIGNAL CONTROLLED INTERSECTIONS		
Level of Service	**Average Delay per Vehicle (secs/veh)**	**Expected Delay**
A	Less than 14	Good operation
B	15 to 28	Acceptable delays and spare capacity
C	29 to 42	Satisfactory, but accident study required
D	43 to 56	Near capacity and accident study required
E	57 to 70	At capacity and requires other control mode
F	> 70	Unsatisfactory and requires other control mode

The existing conditions have been modelled utilising the peak hour traffic volumes presented within **Figure 3.**

Table 5 below provides a summary of the SIDRA output data whilst more detailed summaries are included as **Appendix 7**.

TABLE 5 SIDRA OUTPUT – EXISTING WEEKDAY PEAK HOUR PERFORMANCE JUNCTION OF PACIFIC PARADE AND THE CRESCENT		
	AM PEAK (7:45AM-8:45AM)	**PM PEAK (4:30PM-5:30PM)**
Pacific Parade East Approach		
Delay (seconds / vehicle)	19.8	23.0
Degree of Saturation	0.50	0.62
Level of Service	B	B
The Crescent Approach		
Delay (seconds / vehicle)	10.4	16.0
Degree of Saturation	0.40	0.39
Level of Service	A	A
Pacific Parade West Approach		
Delay (seconds / vehicle)	9.0	10.5
Degree of Saturation	0.34	0.43
Level of Service	A	A
Total Intersection		
Delay (seconds / vehicle)	12.3	15.0
Degree of Saturation	0.50	0.62
Level of Service	A	B

Table 5 indicates that the junction of Pacific Parade and The Crescent currently provides an overall intersection level of service between 'A' during the morning peak period and 'B' during the evening peak period, representing good operation.

4.4 Sustainable Transport

4.4.1 Bus

State Transit provides the following bus services immediately adjacent to the subject site within Pacific Parade:

- Route 177 – Dee Why to Warringah Mall; and
- Route 177X – Dee Why to the City Wynyard via Wingala (Express Service)

Both routes are serviced by stops situated on both sides of Pacific Parade, within 100m walking distance of the site.

Route 177 provides an hourly service frequency during weekdays, weekends and public holidays.

Route 177X provides a service frequency between 10 – 20 minutes during weekday peak hour periods.

In addition, a large number of bus services operate along Pittwater Road, with the closest stop being located approximately 500m west of the subject site. Services include but are not limited to:

- Route 178 – Warringah Mall to Cromer Heights;
- Route 179 – Warringah Mall to Wheeler Heights;
- Route 180 – Warringah Mall Wynyard to Collaroy Plateau;
- Route 199 – Palm Beach to Manly via Mona vale & Dee Why; and
- Route 160X – Chatswood to Dee Why via Frenches Forest (Express Service).

These services combine to provide an approximate frequency of 5 minutes during most periods of the week.

4.4.2 Pedestrians

Pedestrians are provided with the following access and mobility infrastructure within the immediate vicinity of the subject site:

- Footpaths are provided along both sides of all immediately surrounding local streets, including Pacific Parade, The Crescent, Sturdee Parade, Avon Road and Oaks Avenue;
- Signalised pedestrian crossings are provided over Pacific Parade, east and west of the junction of Pacific Parade and The Crescent;
- Pedestrian refuges are provided over the eastern and southern approaches of the junction of Pacific Parade and Sturdee Parade;

- A marked pedestrian crossing is provided over Pacific Parade, approximately 35m west of its intersection with Sturdee Parade;

- Signalised pedestrian crossings are provided over the eastern and southern approaches at the junction of Pacific Parade and Pittwater Road; and

- Pedestrian refuges are provided over the northern, eastern and western approaches at the junction of Pacific Parade and Avon Road.

4.4.3 Cyclists

Cyclists are provided with the following infrastructure in the vicinity of the site.

- Marked on-road bicycle lanes are provided adjacent to the northern and southern kerb side parking lanes along Pacific Parade from Sturdee Parade to Griffin Road;

- Sturdee Parade is a marked on-road bicycle route between Pacific Parade and Pittwater Road, with dedicated lanes being provided where the pavement width allows;

- An off-road shared path is provided along the eastern side of Pittwater Road between Delmar Parade and Harbord Road; and

- An off-road shared path is provided along the eastern side of Harbord Road from Pittwater Road to Miles Street.

The above cycle routes form part of a regional connection between Dee Why and Manly.

5. PROJECTED TRAFFIC CONDITIONS

5.1 Traffic Generation

Section 2.1 of this report presents that the subject development is proposed to accommodate two two-bedroom apartments and seven three-bedroom apartments.

Traffic generation rates for various land-uses have been established through extensive surveys undertaken throughout NSW and published within TfNSW's *Guide to Traffic Generating Developments* in 1993. The following sub-sections provide a summary of the traffic generating potential of the existing and proposed site uses.

Medium Density Residential Flat Dwellings:
Smaller Units (up to two bedrooms):
0.4 – 0.5 per dwelling

Larger Units (three or more bedrooms):
0.5 – 0.65 per dwelling

Application of the above discussed traffic generation rates to the proposed development yield results in the following peak hour traffic generation:

Medium Density Residential Flat Buildings:
(0.5 x 2) + (7 x 0.65) = 5.55 (adopt 6) trips

The proposed development yield is projected to provide a traffic generating capacity of six peak hour vehicle trips in the morning and afternoon peak hours.

5.2 Trip Distribution

The residential nature of the development is such that a proportion of vehicle movements are expected to comprise egress trips during the morning period and ingress trips during the evening period, associated with standard journeys to and from work. On the basis of the above, the development is projected, for the purposes of this assessment, to generate:

- Five egress movements and one ingress movement during the morning peak hour; and

- Five ingress movements and one egress movement during the evening peak hour.

5.3 Traffic Impacts

The proposed development has been projected to generate up to six peak hour trips to and from the site. Such an extent of additional traffic, representing one vehicle movement every 10 minutes during weekday commuter peak periods, is less than that previously assessed with respect to the approved boarding house

development within the subject site. The proposed development is accordingly not expected to result in any impacts over and above that previously assessed and approved.

The development is accordingly not projected to, in itself, result in any unreasonable impacts on the existing operational performance of the surrounding local road network. The previous assessment contained within this report has revealed that traffic demands within the surrounding local road network are notable and accordingly motorists are provided with a stable level of service with spare capacity.

In consideration of the above, the impact of the development is most likely to be a result of the safety and efficiency with which motorists are capable of entering and exiting the development. The good sight distance provisions between the frontage road and the driveway location and the proliferation of driveways servicing abutting development sites in the immediate vicinity result in trailing through traffic movements within Pacific Parade being aware of the potential for vehicles to decelerate to access private properties is such that it is envisaged that motorists will be capable of entering and exiting the site in a safe and efficient manner.

5.4 Transport Impacts

The subject site is located approximately within reasonably close walking distance to a number of bus services operating along Pacific Parade. It is accordingly expected that a portion of the future residents within the subject development will utilise the surrounding public transport infrastructure to access destinations throughout the Sydney metropolitan area. The capacity of the existing public transport system is however not envisaged to be measurably affected by any additional demand associated with the development, given its limited scale.

6. CONCLUSION

This report assesses the potential traffic and parking implications associated with a residential development containing nine dwellings at 67 Pacific Parade, Dee Why. Based on this assessment, the following conclusions are now made:

- The proposed off-street vehicular parking provision complies with the relevant requirements of WDCP 2011 for resident and the visitor parking requirements;

- The proposed off-street bicycle parking provision complies with the relevant requirements of WDCP 2011;

- The proposed site access arrangements are projected to result in motorists being capable of entering and exiting the subject site in a safe and efficient manner;

- The implementation of the proposed internal traffic signal and vehicle lift management system to govern the internal circulation arrangements and the mechanical vehicle lift is expected to effectively facilitate safe and efficient internal passenger vehicle circulation arrangements, compliant with the relevant requirements of AS2890.1:2004;

- The surrounding road network operates with a good level of service during peak periods;

- The subject development has been projected to generate up to six peak hour vehicle trips to and from the subject site, being less than that previously assessed with respect to the approved boarding house use of the site; and

- It is considered that the adjoining road network is capable of accommodating the traffic projected to be generated by the subject development.

It is considered, based on the contents of this report and the conclusions contained herein, there are no traffic or parking related issues that should prevent approval of the subject application. This action is therefore recommended to Council.

APPENDIX 1

Rev	Date	By	Chk	Description
A	17/07/2024	OD	MW XD	DA ISSUE

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Koos de Keijzer 5767
David Randerson 8542

Project Name	67 Pacific Parade, Dee Why	Project Number	00013395
Project Address	67 Pacific Parade, Dee Why, NSW 2099	Drawing Name	Site Analysis
		Scale	2:16@A3
		Date	17/07/2024
Client	Adjani	Drawing Number	DA100
		Revision	A

Adjacent Site
No. 65
Pacific Parade

8°18'50"

45.73

6.5 m Setback

SETBACK 1.66

4.5 m Setback

8,396

2,400

15 m²

278°19'20"
15.24

37.97
38.18

39.01
TIMBER
PERGOLA

12 m²

1.960

+31.55

2,400

2,846

22 m²

AWNING ABOVE

15 m²

1:20

98°17'30"
15.24

+51.55

+31.55

1:14

1:200

+31.19

45.735
188°18'50"

PACIFIC PARADE

BENCH MARK
CUT IN KERB
RL 29.49 AHD

SETBACK 4.5

SETBACK 4.47

SETBACK 4.48

SETBACK 4.5

SETBACK 4.5

Adjacent Site
No. 1
The Crescent

SILL 43.88
HEAD 45.99
SILL 46.90
HEAD 49.01

LEVEL 2 BALCONY RL 43.56
LEVEL 3 BALCONY RL 46.60
LEVEL 1 SOFFIT RL 43.27
LEVEL 2 SOFFIT RL 46.27
LEVEL 3 SOFFIT RL 49.40

SILL 40.64
HEAD 42.97
SILL 43.59
HEAD 45.92
SILL 46.64
HEAD 48.96

SILL 40.22
HEAD 42.30
SILL 43.36
HEAD 45.46
SILL 46.51
HEAD 48.61

LEVEL 1 TERRACE RL 39.94
LEVEL 2 BALCONY RL 43.01
LEVEL 3 BALCONY RL 46.10
LEVEL 3 SOFFIT RL 49.01

SILL 40.02
HEAD 42.35
SILL 43.13
HEAD 45.46
SILL 46.24
HEAD 48.57

TERRACE GROUND RL 36.98
LEVEL 1 BALCONY RL 40.04
LEVEL 2 BALCONY RL 43.00
TERRACE GROUND SOFFIT RL 39.74
LEVEL 1 SOFFIT RL 42.70
LEVEL 2 SOFFIT RL 45.86

SILL 40.07
HEAD 42.34
SILL 43.02
HEAD 45.29

SILL 40.27
HEAD 42.34
SILL 43.38
HEAD 45.46

SILL 39.64
HEAD 41.80
SILL 42.74
HEAD 44.84

LEVEL 1 BALCONY RL 39.36
LEVEL 2 BALCONY RL 42.37
GROUND SOFFIT RL 39.08
LEVEL 1 SOFFIT RL 42.08
LEVEL 2 SOFFIT RL 45.25

SILL 39.36
HEAD 41.68
SILL 42.50
HEAD 44.82

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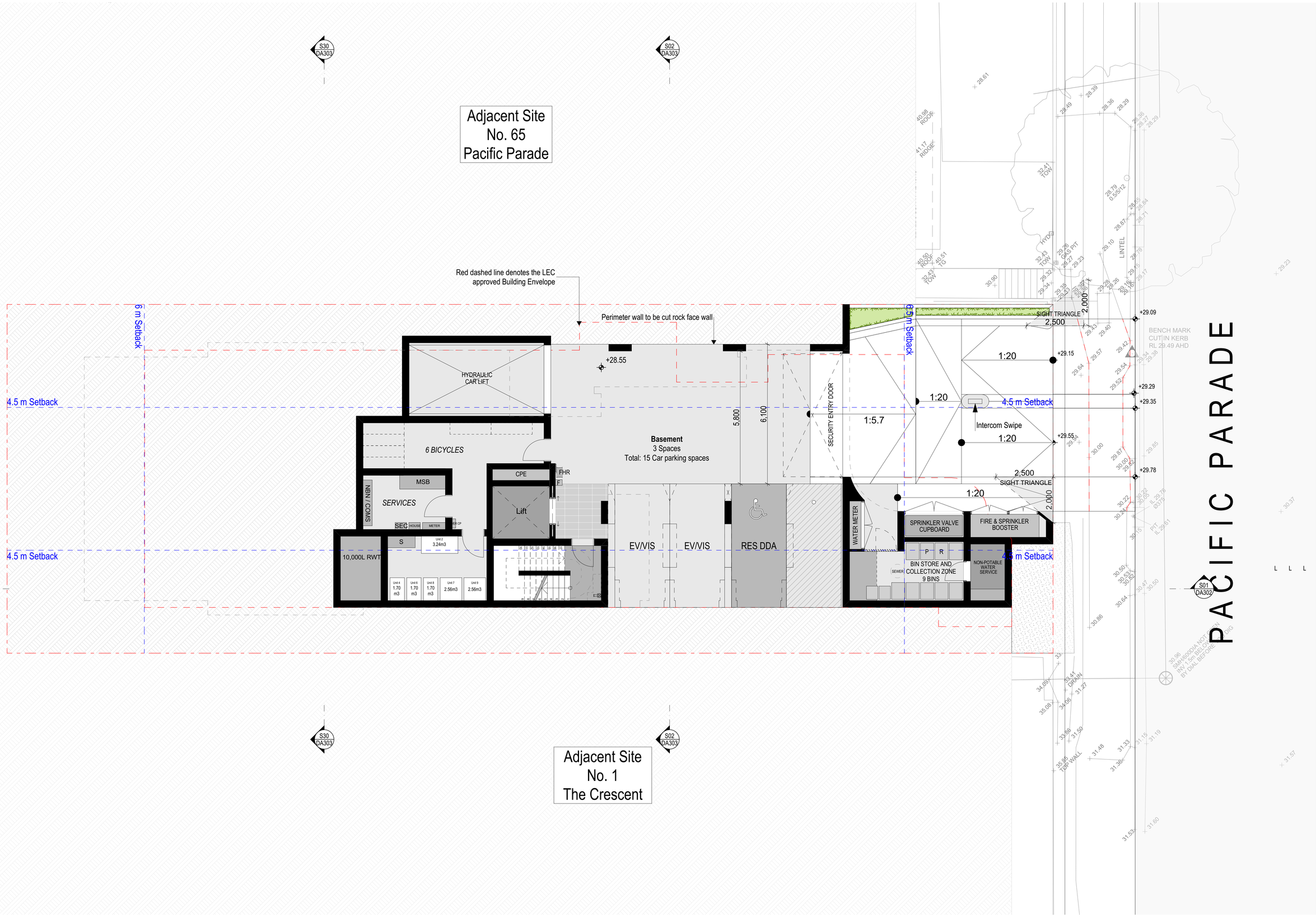
Project Name	67 Pacific Parade, Dee Why
Project Address	67 Pacific Parade, Dee Why, NSW 2099
Client	Adjani
Project Number	00013395
Drawing Name	Site Plan
Scale	1:75@A3
Date	17/07/2024
Drawing Number	DA101
Revision	A



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Project Name	67 Pacific Parade, Dee Why	Project Number	00013395
Project Address	67 Pacific Parade, Dee Why, NSW 2099	Drawing Name	Basement Level
		Scale	1:75@A3
		Date	17/07/2024
Client	Adjani	Drawing Number	DA200
		Revision	A

Adjacent Site
No. 65
Pacific Parade

Adjacent Site
No. 1
The Crescent

S30 DA303
S02 DA303
S01 DA302

6 m Setback
4.5 m Setback
Red dashed line denotes the LEC approved Building Envelope
Perimeter wall to be cut rock face wall
1,000
1,377
1,960
6,800

RES
EV/RES
Ground
6 Spaces
Total: 15 Car spaces
HYDRAULIC CAR LIFT
PLANTER BOX
EXISTING NATURAL LEVELS TO BE RETAINED
12 m²
COURTYARD
+31.55
1 BICYCLE
3 BICYCLES
FHR
HYD
CPE
ELEC
Lift
LOBBY
Unit 1
2 BED
A: 99 m²
2.40m3
2.04m3
2.76m3
0.80m3
1:20
1:14
1,200
+31.19
+30.83
FIRE EGRESS & DDA PATH
FIP
MAILBOXES
4.5 m Setback

PACIFIC PARADE
BENCH MARK
CUT|N KERB
RL 29.49 AHD
LINTEL
HYDT
PIT
IL 29.61
DRAIN
SETBACK 4.5
ROOF
ROOF LINE
TOP WALL
1100dia NOT OPEN
INV 1.5m BELOW
BY DIAL BEFORE YOU DIG

Rev	Date	By	Chk	Description
A	17/07/2024	OD	MW XD	DA ISSUE

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Project Name	67 Pacific Parade, Dee Why	Project Number	00013395
Project Address	67 Pacific Parade, Dee Why, NSW 2099	Drawing Name	Ground Floor Plan
		Scale	1:75@A3
		Date	17/07/2024
Client	Adjani	Drawing Number	DA201
		Revision	A

Adjacent Site
No. 65
Pacific Parade

Adjacent Site
No. 1
The Crescent

Red dashed line denotes the LEC approved Building Envelope

Level 1
6 Spaces
Total: 15 Car spaces

RES
RES
RES
RES
EV/RES
RES

HYDRAULIC CAR LIFT
Lift
FS
FHR
CPE
ELEC
CPE
HYD

Unit 2
3 BED
A: 106 m²
15 m²
0.44m3
2.94m3
1.68m3
1.09 m3
HWU
1.63 m3

6 m Setback
6.5 m Setback
4.5 m Setback
4.5 m Setback
4.5 m Setback
4.5 m Setback

8°18'50"
1,377
3,075
1,000
6,800
1,000
2,000
45.735
188°18'50"
98°17'30"
15.24

+34.65
+34.65

SETBACK 4.5
SETBACK 4.47
SETBACK 4.48
SETBACK 4.5
SETBACK 4.5

S30 DA303
S02 DA303
S01 DA302
S30 DA303
S02 DA303
S01 DA302

SILL 41.58
HEAD 42.88
SILL 41.61
HEAD 42.88
SILL 38.52
HEAD 40.00
SILL 41.71
HEAD 42.90
SILL 41.71
HEAD 42.90
SILL 35.63
HEAD 36.43
SILL 35.61
HEAD 36.43
SILL 38.54
HEAD 39.98
SILL 34.94
HEAD 40.13
SILL 34.75
HEAD 40.14
SILL 40.98
HEAD 42.90
HEAD 33.10
SILL 35.58
HEAD 36.07
SILL 38.50
HEAD 38.97

LEVEL 1 BALC TILE RL 31.69
LEVEL 2 BALC TILE RL 34.63/HOB RL 34.66
LEVEL 3 BALC HOB RL 37.56
LEVEL 1 SOFFIT RL 34.28
LEVEL 2 SOFFIT RL 37.26
LEVEL 3 SOFFIT RL 40.16

SILL 43.88
HEAD 45.99
SILL 46.90
HEAD 49.01
LEVEL 2 BALCONY RL 43.56
LEVEL 3 BALCONY RL 46.60
LEVEL 1 SOFFIT RL 43.27
LEVEL 2 SOFFIT RL 46.27
LEVEL 3 SOFFIT RL 49.40
SILL 40.64
HEAD 42.97
SILL 43.59
HEAD 45.92
SILL 46.64
HEAD 48.96
SILL 40.22
HEAD 42.30
SILL 43.36
HEAD 45.46
SILL 46.51
HEAD 48.61
LEVEL 1 TERRACE RL 39.94
LEVEL 2 BALCONY RL 43.01
LEVEL 3 BALCONY RL 46.10
LEVEL 3 SOFFIT RL 49.01
SILL 40.02
HEAD 42.35
SILL 43.13
HEAD 45.46
SILL 46.24
HEAD 48.57
TERRACE GROUND RL 36.98
LEVEL 1 BALCONY RL 40.04
LEVEL 2 BALCONY RL 43.00
TERRACE GROUND SOFFIT RL 39.74
LEVEL 1 SOFFIT RL 42.70
LEVEL 2 SOFFIT RL 45.86
SILL 40.07
HEAD 42.34
SILL 43.02
HEAD 45.29
SILL 40.27
HEAD 42.34
SILL 43.38
HEAD 45.46
SILL 39.64
HEAD 41.80
SILL 42.74
HEAD 44.84
LEVEL 1 BALCONY RL 39.36
LEVEL 2 BALCONY RL 42.37
GROUND SOFFIT RL 39.08
LEVEL 1 SOFFIT RL 42.08
LEVEL 2 SOFFIT RL 45.25
SILL 39.36
HEAD 41.68
SILL 42.50
HEAD 44.82

BENCH MARK
CUT IN KERB
RL 29.49 AHD

PACIFIC PARADE

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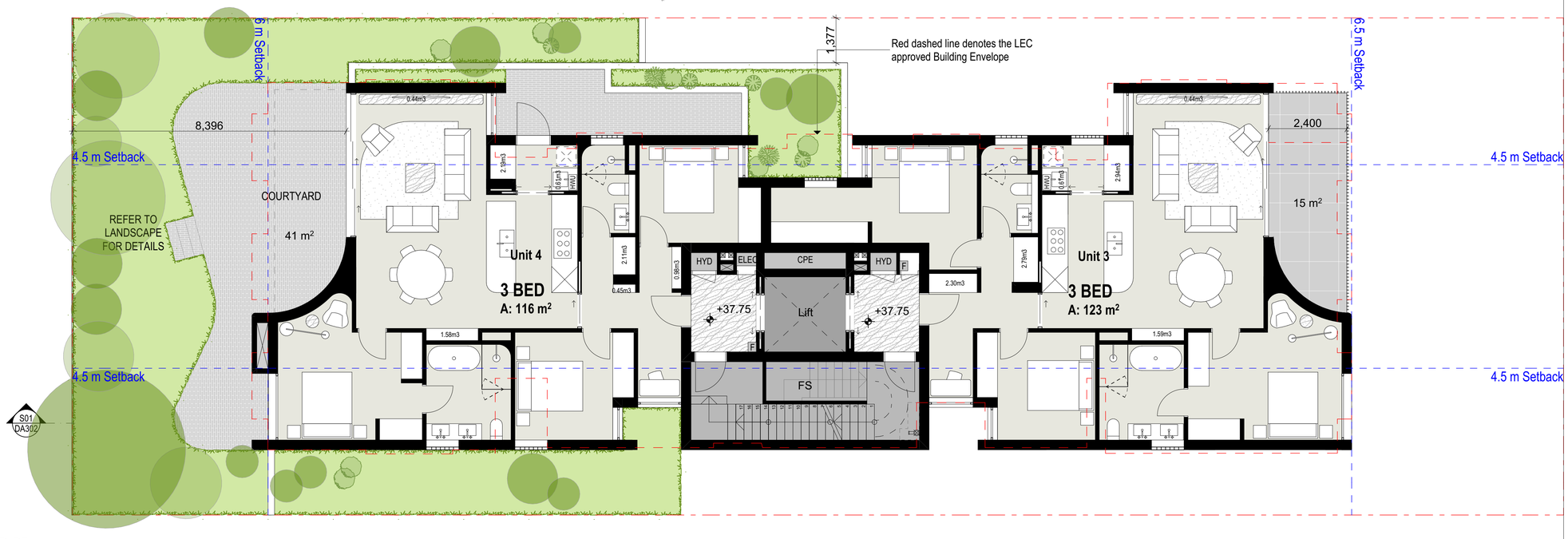
Project Name	67 Pacific Parade, Dee Why
Project Address	67 Pacific Parade, Dee Why, NSW 2099
Client	Adjani
Project Number	00013395
Drawing Name	Level 1 Plan
Scale	1:75@A3
Date	17/07/2024
Drawing Number	DA202
Revision	A

S30 DA303

S02 DA303

Adjacent Site
No. 65
Pacific Parade



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S30 DA303

S02 DA303

Adjacent Site
No. 1
The Crescent

PACIFIC PARADE

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Project Name	67 Pacific Parade, Dee Why
Project Address	67 Pacific Parade, Dee Why, NSW 2099
Client	Adjani
Project Number	00013395
Drawing Name	Level 2 Plan
Scale	1:75@A3
Date	17/07/2024
Drawing Number	DA203
Revision	A

S30
DA303

S02
DA303

Adjacent Site
No. 65
Pacific Parade

6 m Setback

6.5 m Setback

4.5 m Setback

4.5 m Setback

Red dashed line denotes the LEC approved Building Envelope

2,400

15 m²

0.44m3

2.09m3

0.61m3

HWU

Unit 6

3 BED

A: 116 m²

2.11m3

0.45m3

0.98m3

HYD

ELEC

CPE

HYD

F

+40.85

Lift

+40.85

F

FS

2.30m3

2.79m3

Unit 5

3 BED

A: 123 m²

2.94m3

0.61m3

HWU

0.44m3

2,400

15 m²

AWNING OVE

1.58m3

1.59m3

4.5 m Setback

4.5 m Setback

S01
DA302

S01
DA302

S30
DA303

S02
DA303

Adjacent Site
No. 1
The Crescent

PACIFIC PARADE

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Project Name	67 Pacific Parade, Dee Why	Project Number	00013395
Project Address	67 Pacific Parade, Dee Why, NSW 2099	Drawing Name	Level 3 Plan
		Scale	1:75@A3
		Date	17/07/2024
Client	Adjani	Drawing Number	DA204
		Revision	A

Adjacent Site
No. 65
Pacific Parade

Adjacent Site
No. 1
The Crescent

PACIFIC PARADE

Unit 8
3 BED
A: 116 m²

Unit 7
2 BED
A: 91 m²

15 m²
22 m²
FS
Lift
HYD
ELEC
CPE

4.5 m Setback
6.5 m Setback
SETBACK 1.66
SETBACK 4.5
SETBACK 4.47
SETBACK 4.48

45.73
45.735
278°19'20"
15.24
8°18'50"
188°18'50"
98°17'30"
15.24

S30 DA303
S02 DA303
S01 DA302

#toPZvalue

BENCH MARK
CUT IN KERB
RL 29.49 AHD

DIAL BEFORE YOU DIG
SYMBIOSIA NOT OPEN
ANY TIPS BELOW
BY DIAL BEFORE YOU DIG

Rev	Date	By	Chk	Description
A	17/07/2024	OD	MW XD	DA ISSUE

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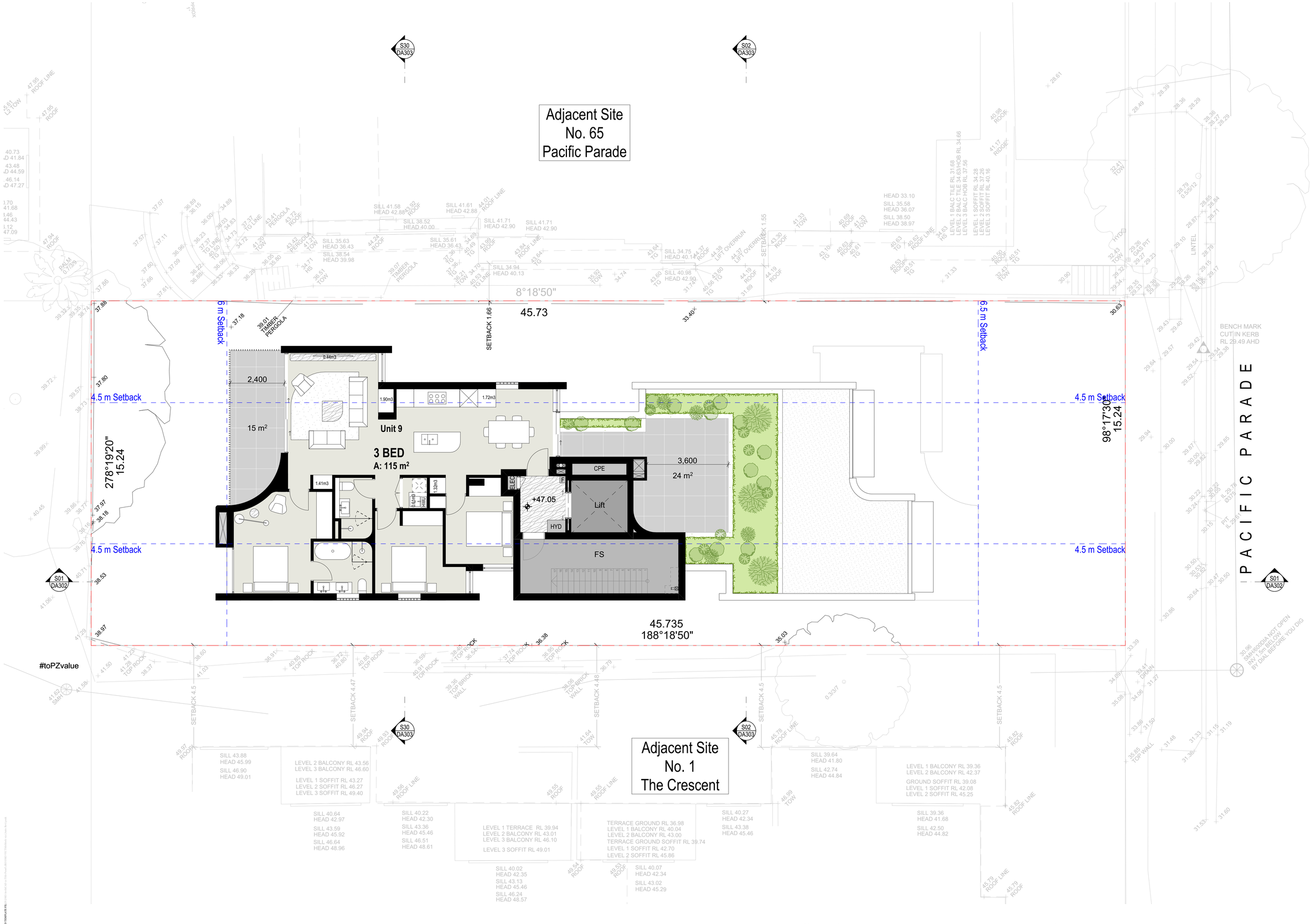
Project Name	67 Pacific Parade, Dee Why	Project Number	00013395
Project Address	67 Pacific Parade, Dee Why, NSW 2099	Drawing Name	Level 4 Plan
		Scale	1:75@A3
		Date	17/07/2024
Client	Adjani	Drawing Number	DA205
		Revision	A



Rev	Date	By	Chk	Description
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Project Name	67 Pacific Parade, Dee Why	Project Number	00013395
Project Address	67 Pacific Parade, Dee Why, NSW 2099	Drawing Name	Level 5 Plan
		Scale	1:75@A3
		Date	17/07/2024
Client	Adjani	Drawing Number	DA206
		Revision	A

Adjacent Site
No. 65
Pacific Parade

Adjacent Site
No. 1
The Crescent

PACIFIC PARADE

8°18'50"
45.73

45.735
188°18'50"

278°19'20"
15.24

98°17'30"
15.24

SETBACK 1.66

SETBACK 1.55

SETBACK 4.5

SETBACK 4.47

SETBACK 4.48

Provision of PV Panels asper Basix's Requirements

A/C PLANT

Access Hatch

+51.55

S30 DA303

S02 DA303

S01 DA302

BENCH MARK
CUT IN KERB
RL 29.49 AHD

DIAL BEFORE YOU DIG

Rev	Date	By	Chk	Description
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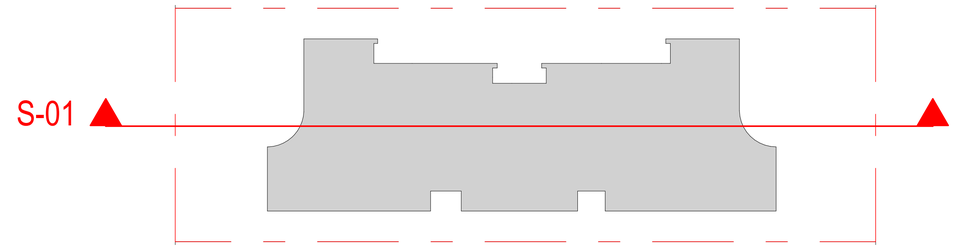
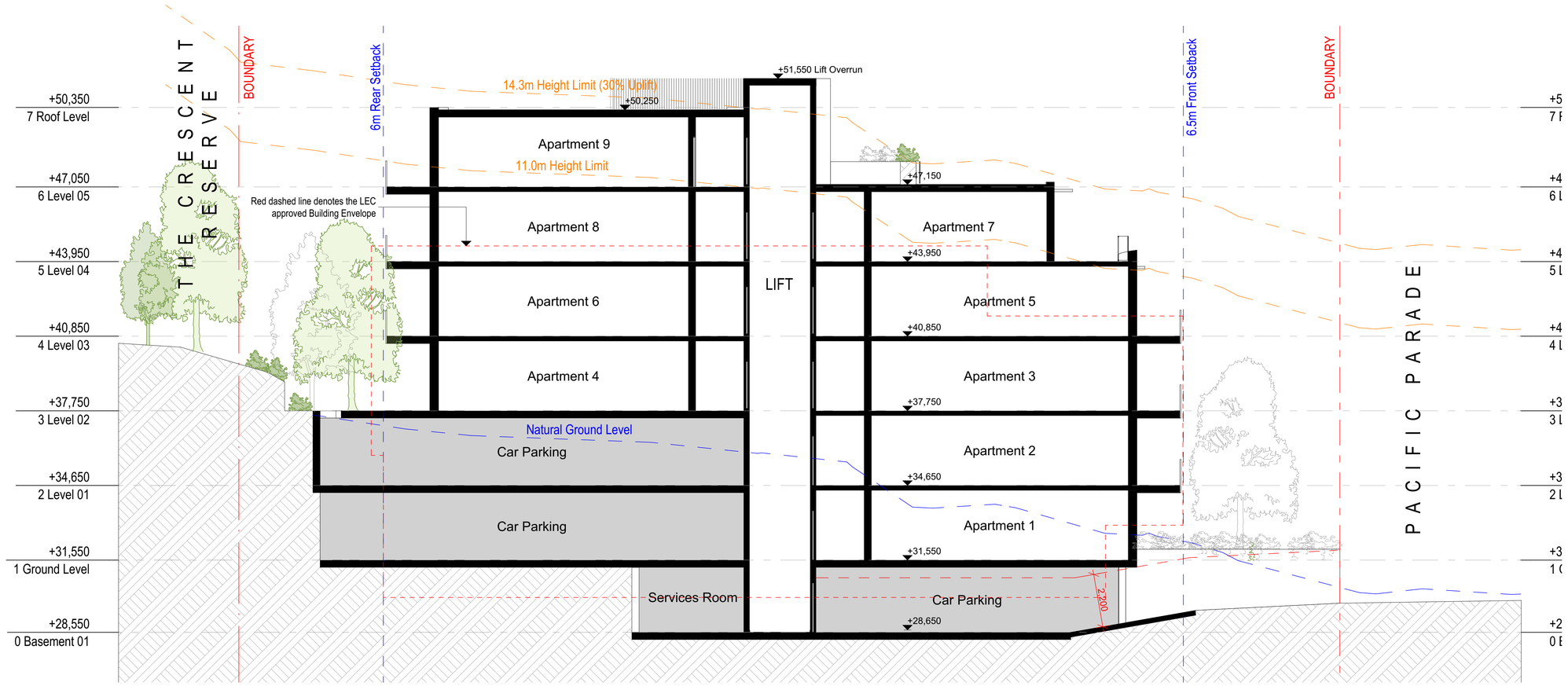
Project Name	67 Pacific Parade, Dee Why
Project Address	67 Pacific Parade, Dee Why, NSW 2099
Client	Adjani
Project Number	00013395
Drawing Name	Roof Plan
Scale	1:75@A3
Date	17/07/2024
Drawing Number	DA207
Revision	A

Key Plan





S01 SECTION 01 1:100

Rev	Date	By	Chk	Description
A	17/07/2024	OD	MW XD	DA ISSUE

DKO Architecture (NSW) Pty Ltd
42 Davies Street
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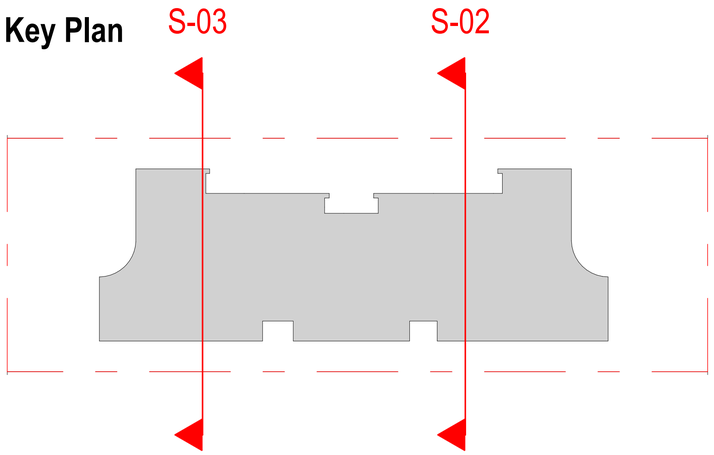
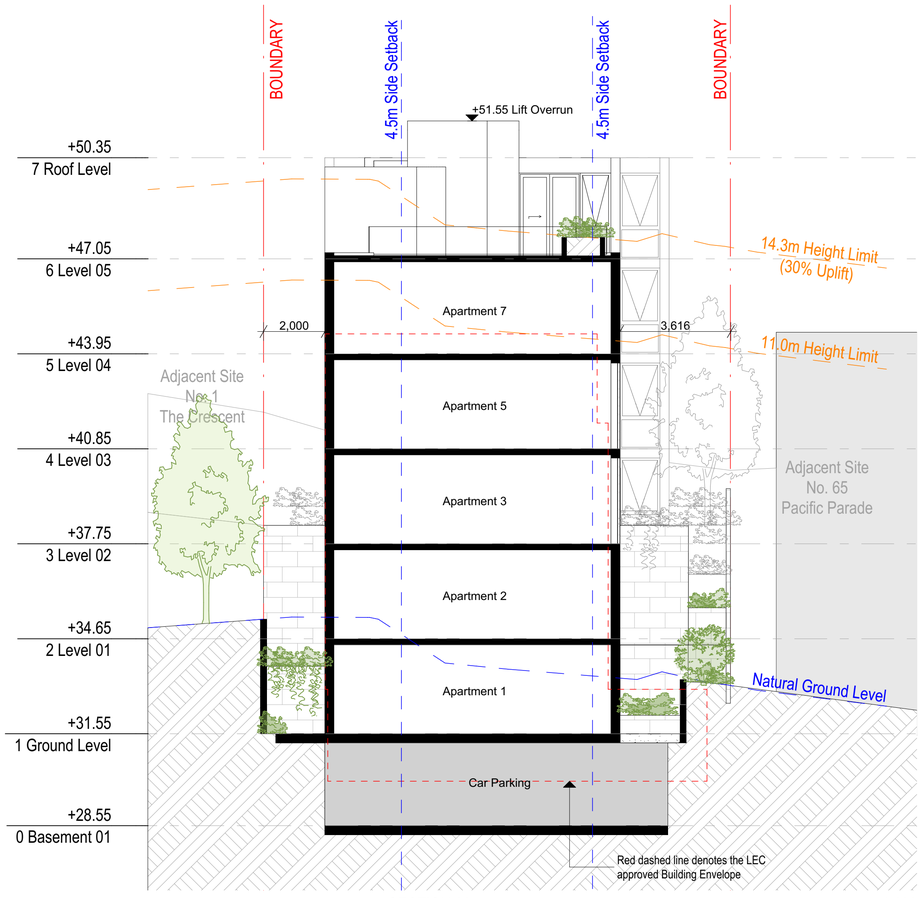
T +61 2 8346 4500
info@DKO.com.au
www.DKO.com.au
ABN: 81956706590
NSW: Nominated Architects
Koos de Keijzer 5767
David Randerson 8542

DKO

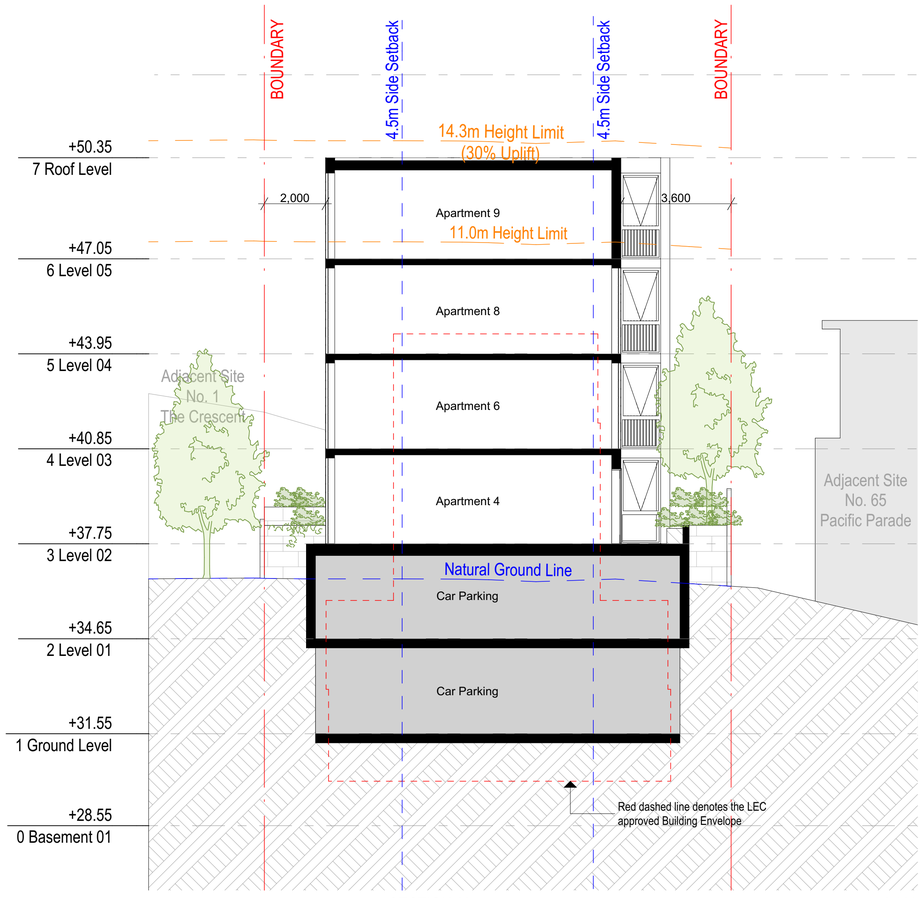
Project Name	67 Pacific Parade, Dee Why	Project Number	00013395
Project Address	67 Pacific Parade, Dee Why, NSW 2099	Drawing Name	Section North-South
		Scale	1:100, 1:200@A3
		Date	17/07/2024
Client	Adjani	Drawing Number	DA302
		Revision	A

Key Plan





S02 SECTION 02 1:100



S03 SECTION 03 1:100

Rev	Date	By	Chk	Description
A	17/07/2024	OD	MW XD	DA ISSUE

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David Randerson 8542

DKO

Project Name	67 Pacific Parade, Dee Why	Project Number	00013395
Project Address	67 Pacific Parade, Dee Why, NSW 2099	Drawing Name	Section East-West
		Scale	1:100, 1:200@A3
		Date	17/07/2024
Client	Adjani	Drawing Number	DA303
		Revision	A

APPENDIX 2

NOTES:

1. THIS PLAN IS BASED ON THE ARCHITECTURAL PLANS PREPARED BY DKO ARCHITECTURE AND AERIAL IMAGERY SOURCED FROM NEARMAP (IMAGE DATE 07/12/2023)
2. THE SWEPT PATHS PROVIDED ON THIS PLAN HAVE BEEN GENERATED UTILISING AUTOTURN PRO VERSION 11 IN CONJUNCTION WITH VEHICLE MANOEUVRING SPECIFICATIONS IN ACCORDANCE WITH THE AUSTRALIAN STANDARD AS2890.1:2004

LEGEND:

INDICATIVE ON–STREET PARKING

PROPOSED DRIVEWAY AS SHOWN

PROVIDE 2.5m x 2m CLEAR SIGHT LINES AT THE FOOTPATH TO ENSURE ADEQUATE VISIBILITY TO PEDESTRIANS FOR EXITING VEHICLES

Adjacent Site No. 65 Pacific Parade

Adjacent Site No. 1 The Crescent

PACIFIC PARADE

Red dashed line denotes the LEC approved Building Envelope

Perimeter wall to be cut rock face wall

Basement 3 Spaces Total: 15 Car parking spaces

6 BICYCLES

RES DDA

SERVICES

10,000L RWT

BIN STORE AND COLLECTION ZONE 9 BINS

Intercom Swipe

8°18'50"

278°19'20" 15.24

98°17'30" 15.24

45.735 188°18'50"

BENCH MARK CUT/IN KERB RL 29.49 AHD

STANBURY TRAFFIC PLANNING TRAFFIC, PARKING & TRANSPORT CONSULTANTS	ADDRESS: 401/380 HARRIS ST, PYRMONT PH: (02) 8971 8314 EMAIL: info@stanburytraffic.com.au WEBSITE: www.stanburytraffic.com.au	STANBURY TRAFFIC PLANNING 67 PACIFIC PARADE, DEE WHY – OPTION 2 CAR PARK COMPLIANCE REVIEW CONCEPT LAYOUT GROUND	SCALE 0 2.0 4.0 1:200@A3 DRAWING NO. 23–179–04–V3 DATE 19 July 2024	CREATED BY Y.H APPROVED BY M.S SHEET 01 / 11

NOTES:

1. THIS PLAN IS BASED ON THE ARCHITECTURAL PLANS PREPARED BY DKO ARCHITECTURE AND AERIAL IMAGERY SOURCED FROM NEARMAP (IMAGE DATE 07/12/2023)
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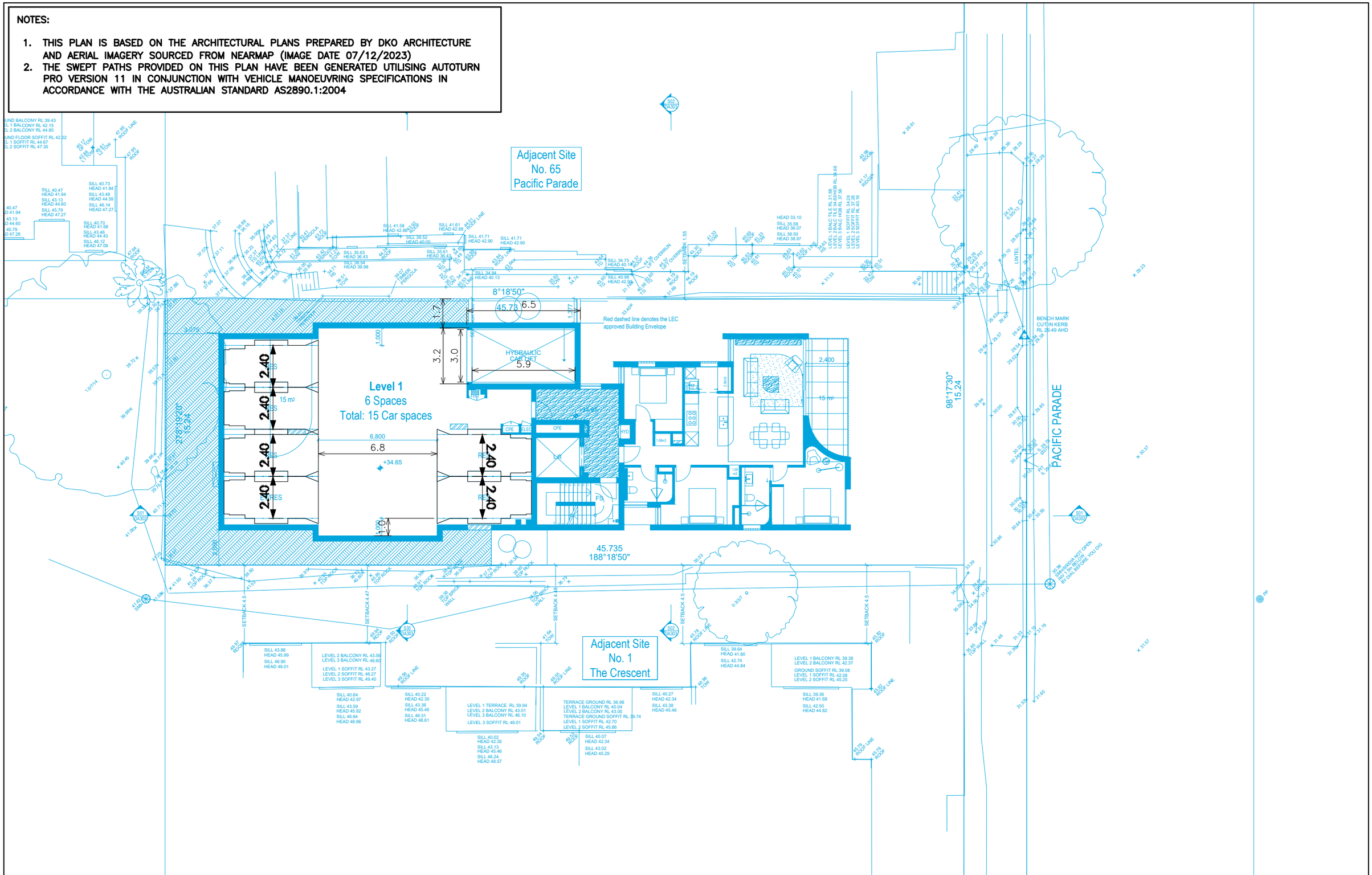

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NOTES:

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LEGEND:

INDICATIVE ON-STREET PARKING

Adjacent Site
No. 65
Pacific Parade

Adjacent Site
No. 1
The Crescent

PACIFIC PARADE

Red dashed line denotes the LEC approved Building Envelope

Perimeter wall to be cut rock face wall

Basement
Total: 15 Car parking spaces

6 BICYCLES

RES DDA

10,000L RWT

SERVICES

B99 STANDARDS 2004 (AU_NZ)

8°18'50"
45.73

278°19'20"
15.24

45.735
188°18'50"

98°31'30"
15.24

SETBACK 4.5

SETBACK 4.47

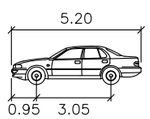
SETBACK 4.18

SETBACK 4.5

SETBACK 4.5

SWEPT PATH KEY:

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 300mm CLEARANCE FROM VEHICLE BODY



B99

	meters
Width	: 1.94
Track	: 1.84
Lock to Lock Time	: 6.0
Steering Angle	: 33.9

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STANBURY TRAFFIC PLANNING

67 PACIFIC PARADE, DEE WHY – OPTION 2
CAR PARK COMPLIANCE REVIEW
SWEPT PATH ASSESSMENT
GROUND

SCALE	0 2.0 4.0 1:200@A3	CREATED BY	Y.H
DRAWING NO.	23-179-04-V3	APPROVED BY	M.S
DATE	19 July 2024	SHEET	03 / 11

NOTES:

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LEGEND:

INDICATIVE ON–STREET PARKING

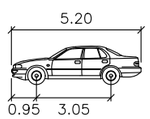
Adjacent Site
No. 65
Pacific Parade

Adjacent Site
No. 1
The Crescent

PACIFIC PARADE

SWEPT PATH KEY:

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 300mm CLEARANCE FROM VEHICLE BODY



B99

	meters
Width	: 1.94
Track	: 1.84
Lock to Lock Time	: 6.0
Steering Angle	: 33.9

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STANBURY TRAFFIC PLANNING

67 PACIFIC PARADE, DEE WHY – OPTION 2
CAR PARK COMPLIANCE REVIEW
SWEPT PATH ASSESSMENT
GROUND

SCALE 0 2.0 4.0	1:200@A3	CREATED BY Y.H
DRAWING NO.	23–179–04–V3	APPROVED BY M.S
DATE	19 July 2024	SHEET 04 / 11

NOTES:

1. THIS PLAN IS BASED ON THE ARCHITECTURAL PLANS PREPARED BY DKO ARCHITECTURE AND AERIAL IMAGERY SOURCED FROM NEARMAP (IMAGE DATE 07/12/2023)
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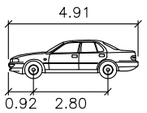
LEGEND:

INDICATIVE ON-STREET PARKING

SWEPT PATH KEY:

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 300mm CLEARANCE FROM VEHICLE BODY



B85

	meters
Width	: 1.87
Track	: 1.77
Lock to Lock Time	: 6.0
Steering Angle	: 34.1

PACIFIC PARADE

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STANBURY TRAFFIC PLANNING

67 PACIFIC PARADE, DEE WHY – OPTION 2
CAR PARK COMPLIANCE REVIEW
SWEPT PATH ASSESSMENT
GROUND

SCALE	0 2.0 4.0 1:200@A3	CREATED BY	Y.H
DRAWING NO.	23-179-04-V3	APPROVED BY	M.S
DATE	19 July 2024	SHEET	05 / 11

NOTES:

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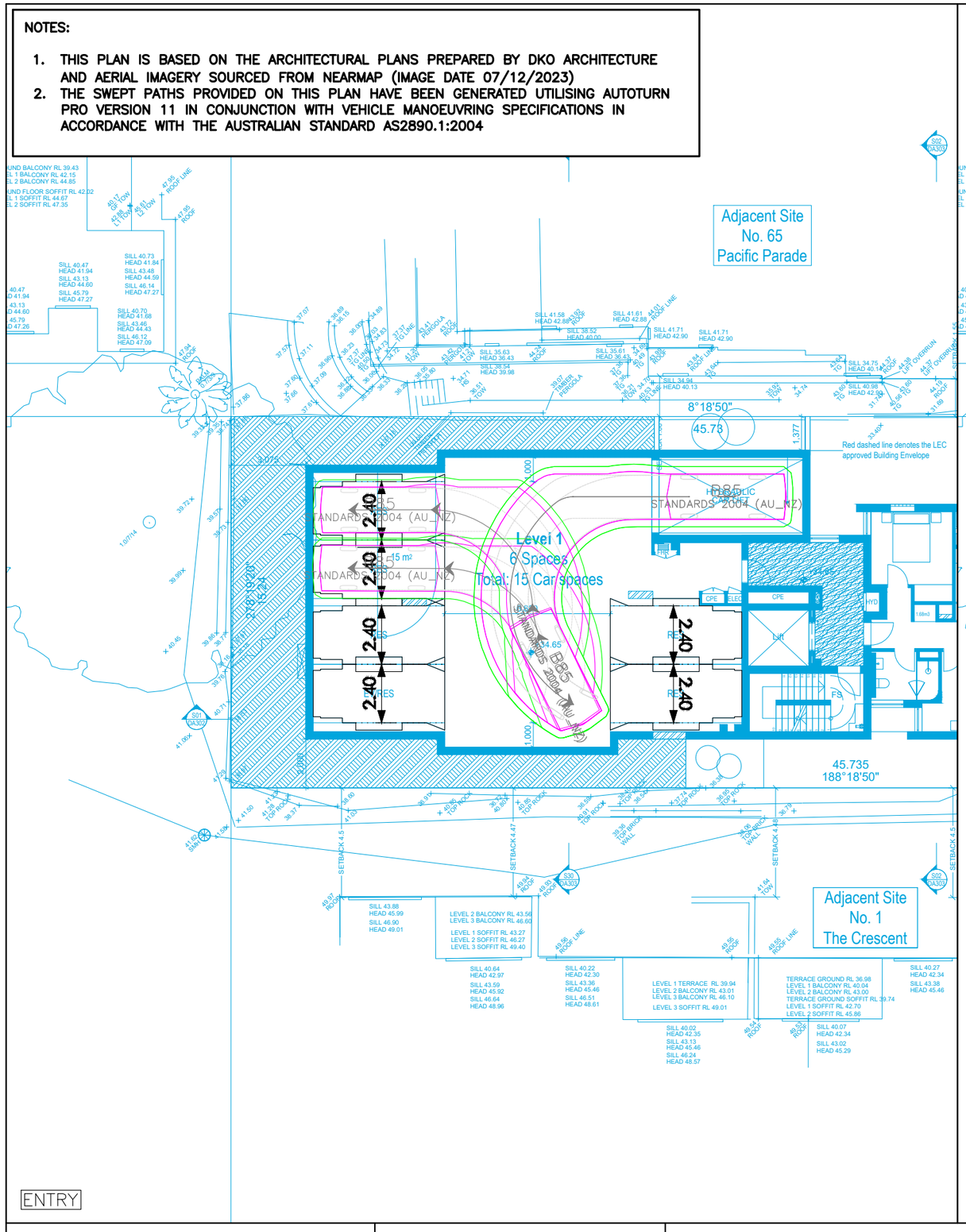

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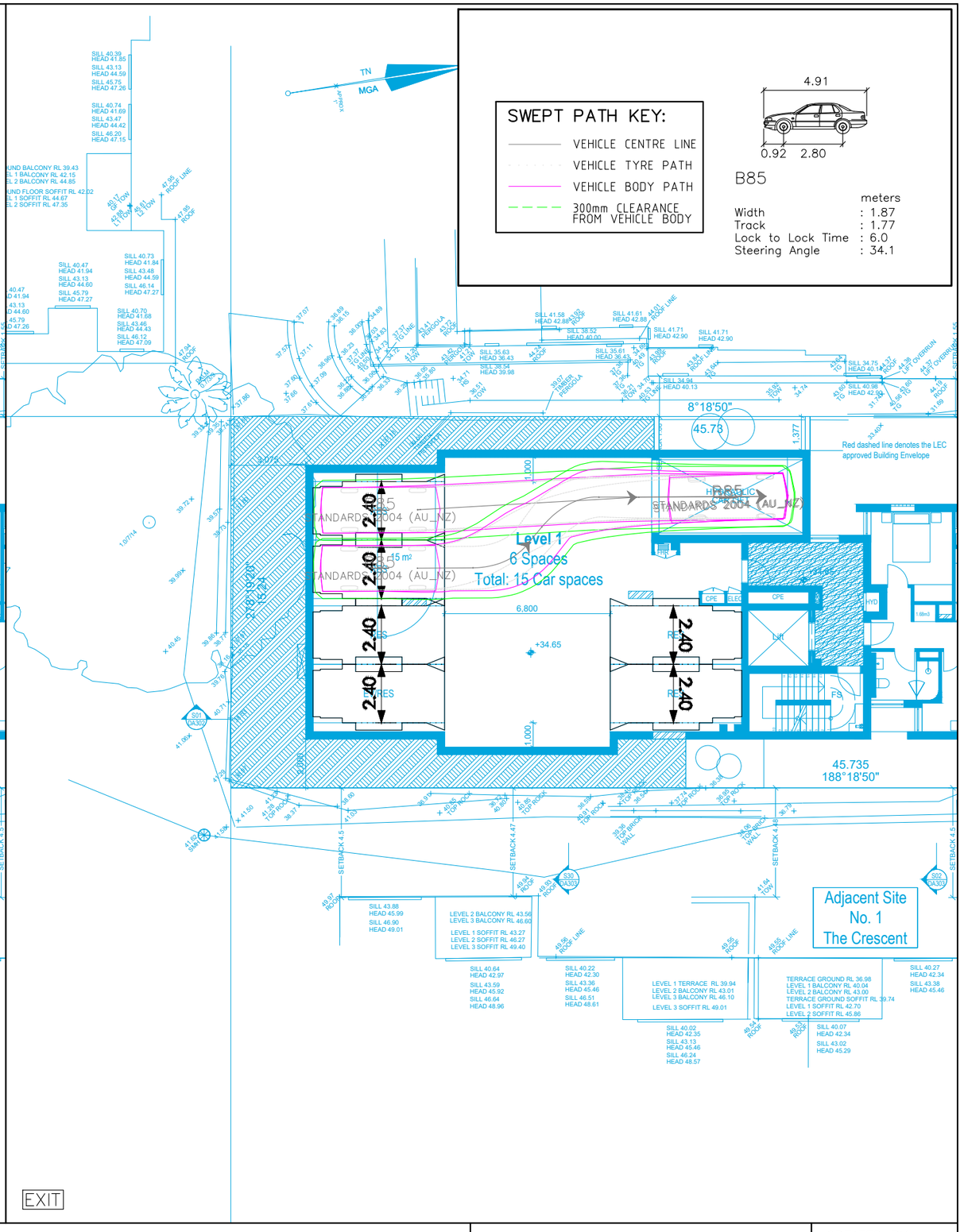

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STANBURY TRAFFIC PLANNING

67 PACIFIC PARADE, DEE WHY – OPTION 2
CAR PARK COMPLIANCE REVIEW
SWEPT PATH ASSESSMENT
LEVEL 1 AND LEVEL 2

SCALE 0 2.0 4.0 1:200@A3		CREATED BY Y.H
DRAWING NO. 23-179-04-V3		APPROVED BY M.S
DATE 19 July 2024		SHEET 06 / 11

NOTES:

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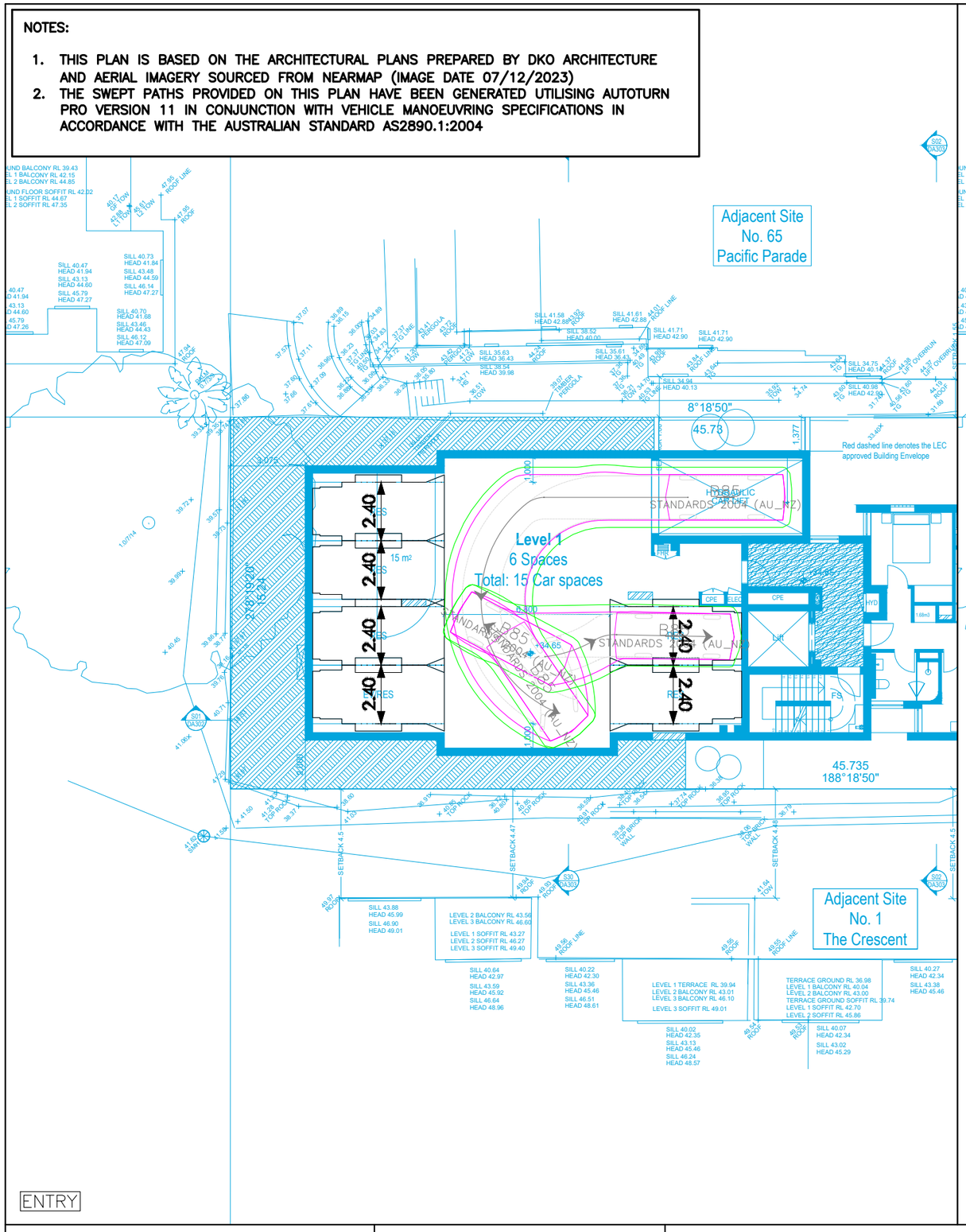

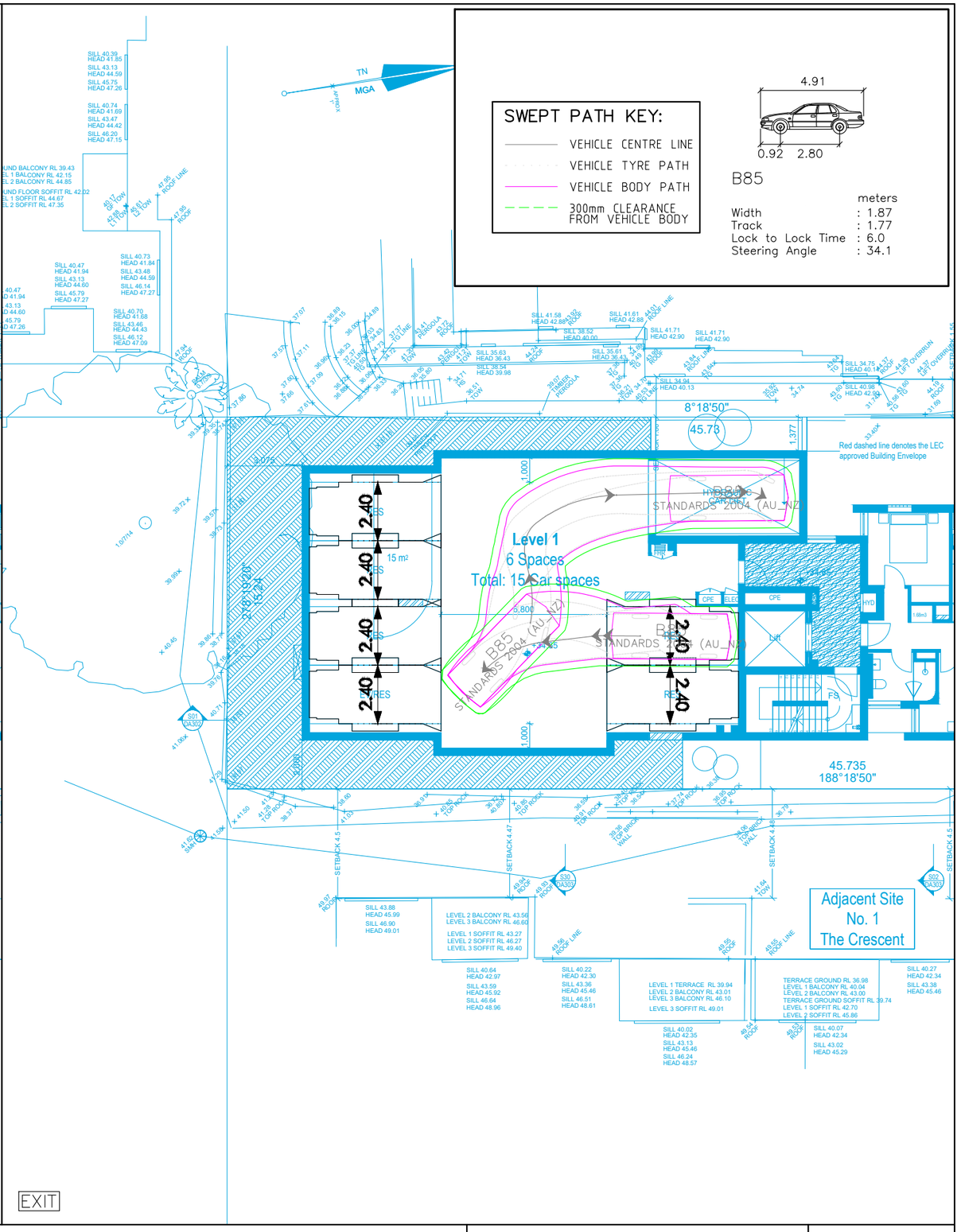

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STANBURY TRAFFIC PLANNING

67 PACIFIC PARADE, DEE WHY – OPTION 2
CAR PARK COMPLIANCE REVIEW
SWEPT PATH ASSESSMENT
LEVEL 1 AND LEVEL 2

SCALE 0 2.0 4.0 1:200@A3		CREATED BY Y.H
DRAWING NO. 23-179-04-V3		APPROVED BY M.S
DATE 19 July 2024		SHEET 07 / 11

NOTES:

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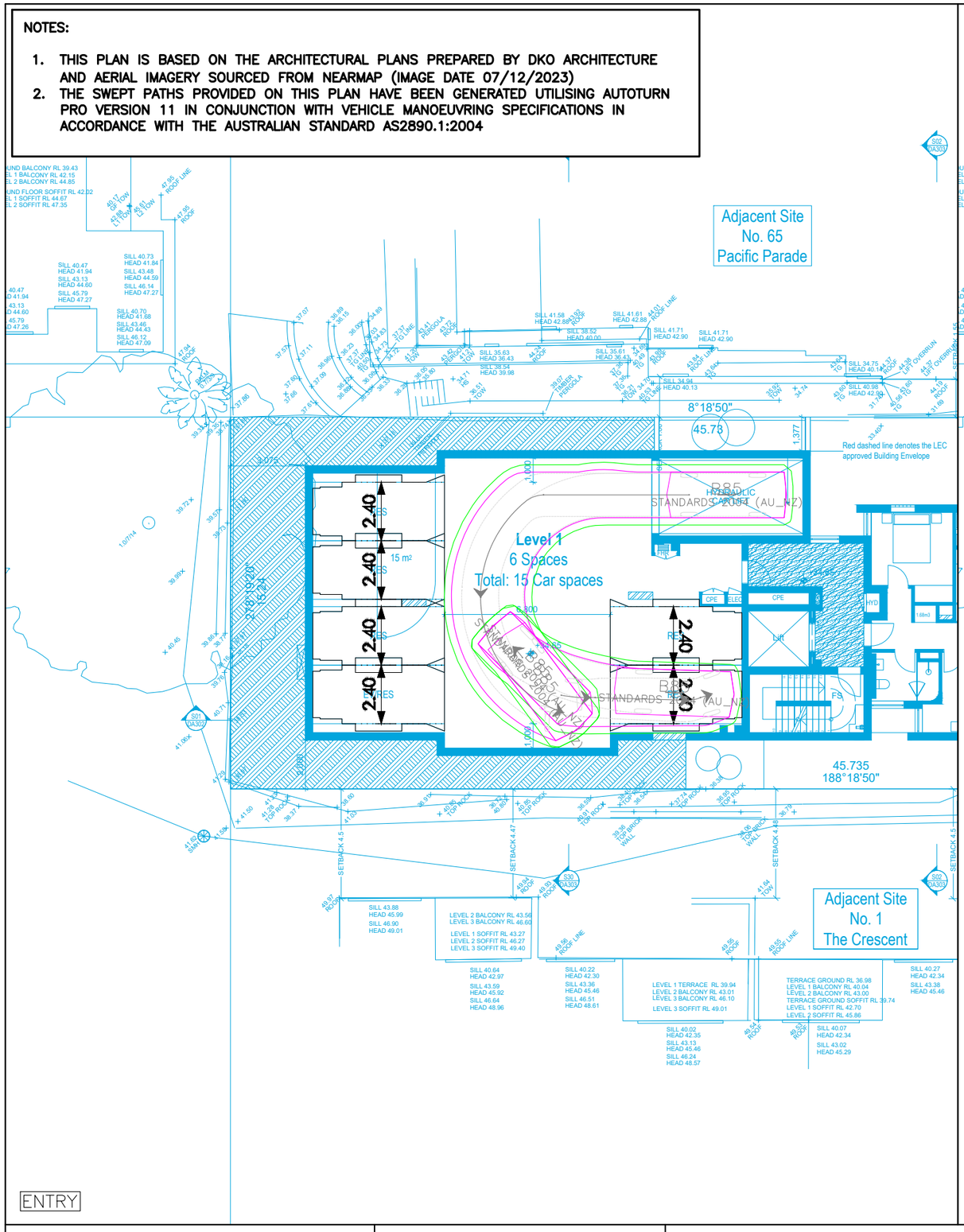

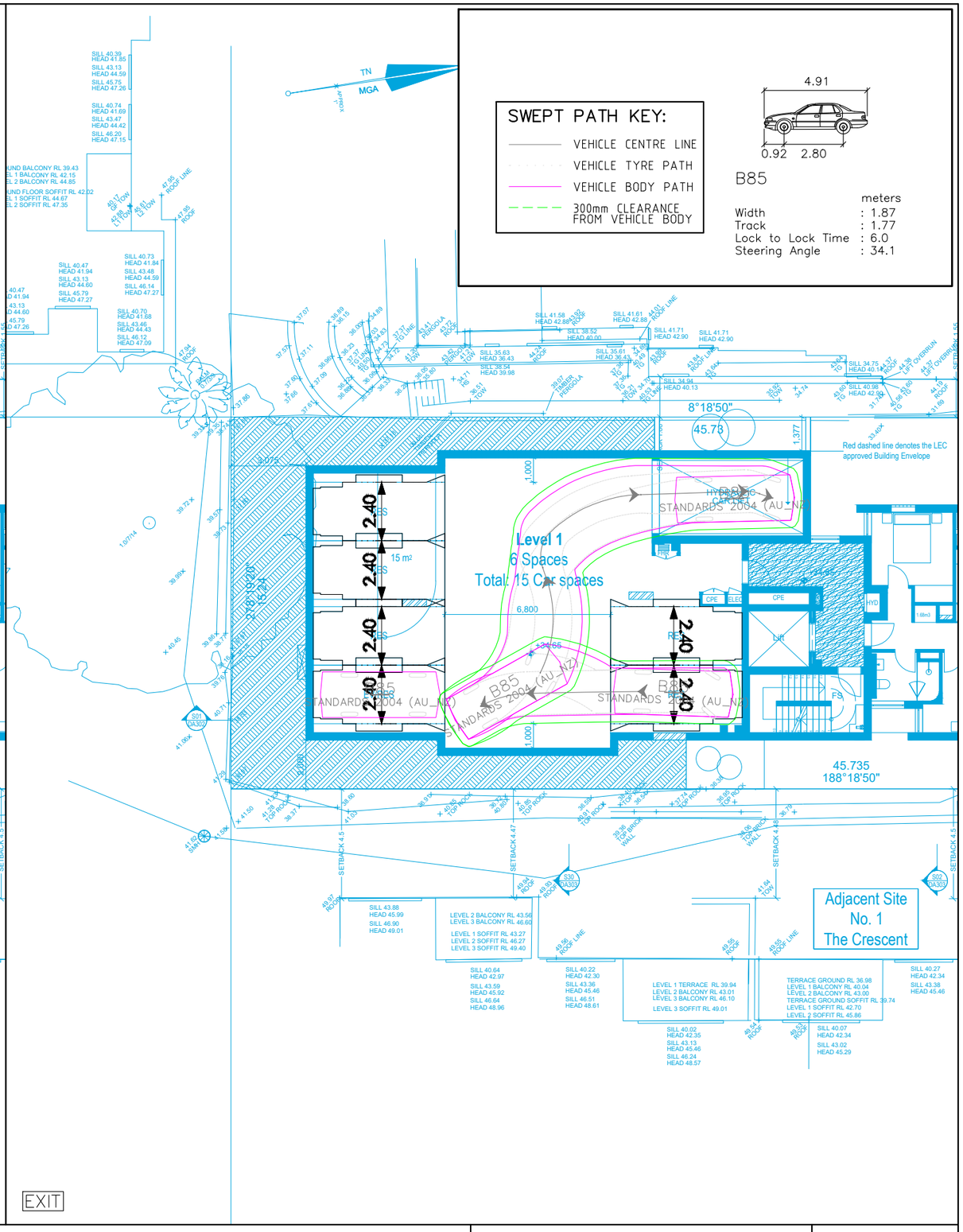

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STANBURY TRAFFIC PLANNING

67 PACIFIC PARADE, DEE WHY – OPTION 2
CAR PARK COMPLIANCE REVIEW
SWEPT PATH ASSESSMENT
LEVEL 1 AND LEVEL 2

SCALE 0 2.0 4.0 1:200@A3		CREATED BY Y.H
DRAWING NO. 23-179-04-V3		APPROVED BY M.S
DATE 19 July 2024		SHEET 08 / 11

NOTES:

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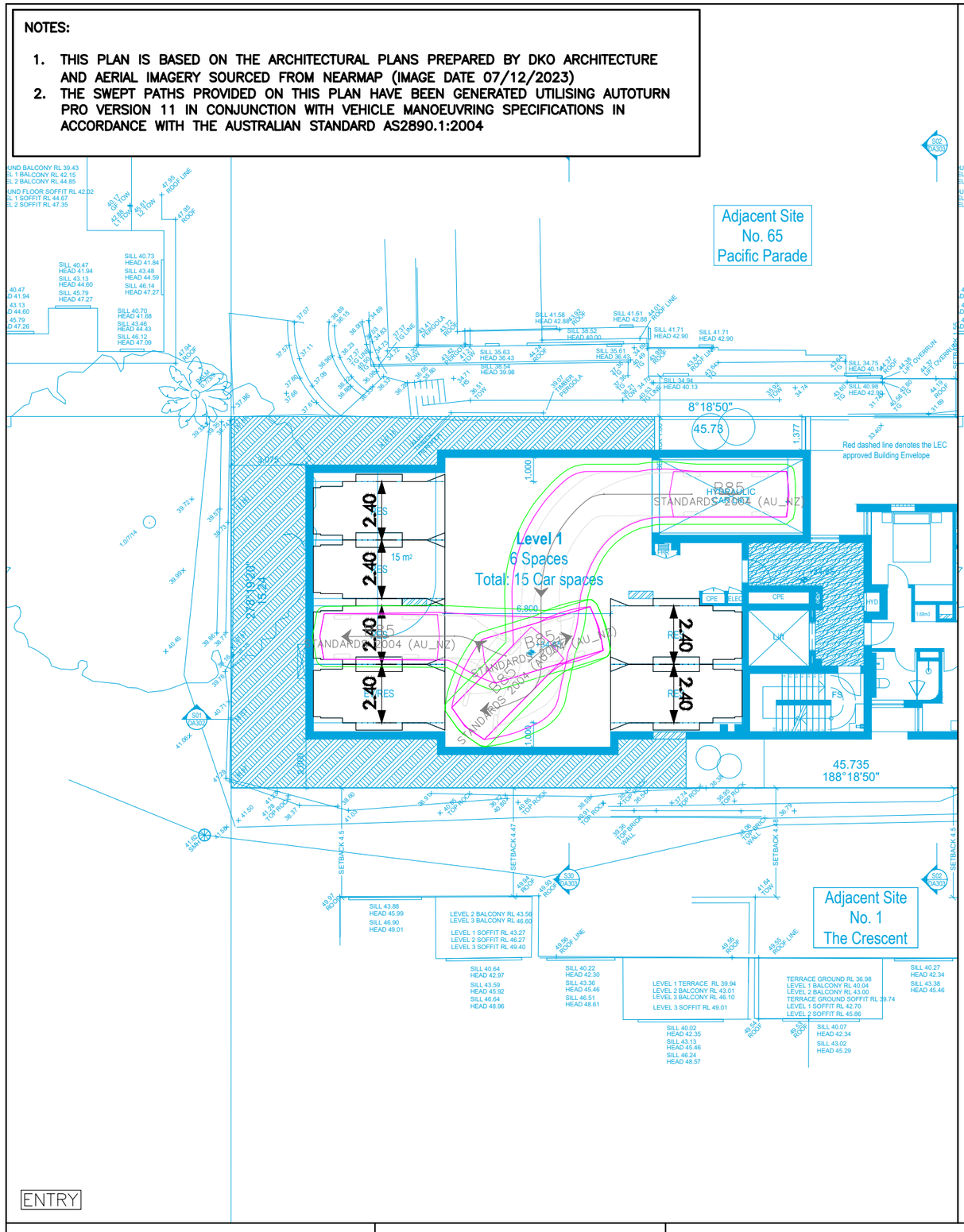

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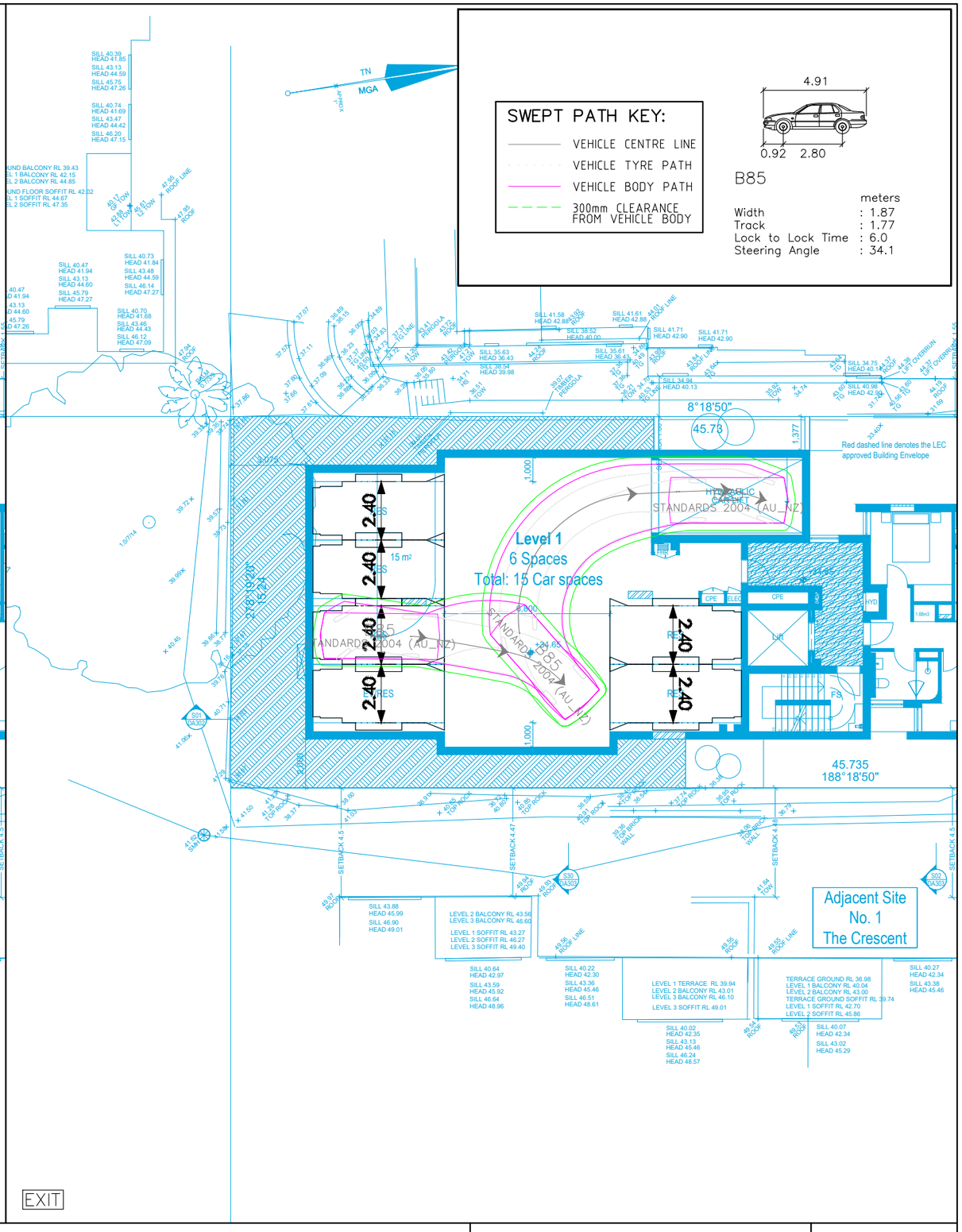

EXIT

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STANBURY TRAFFIC PLANNING

67 PACIFIC PARADE, DEE WHY – OPTION 2
CAR PARK COMPLIANCE REVIEW
SWEPT PATH ASSESSMENT
LEVEL 1 AND LEVEL 2

SCALE 0 2.0 4.0 1:200@A3		CREATED BY Y.H
DRAWING NO. 23-179-04-V3		APPROVED BY M.S
DATE 19 July 2024		SHEET 09 / 11

NOTES:

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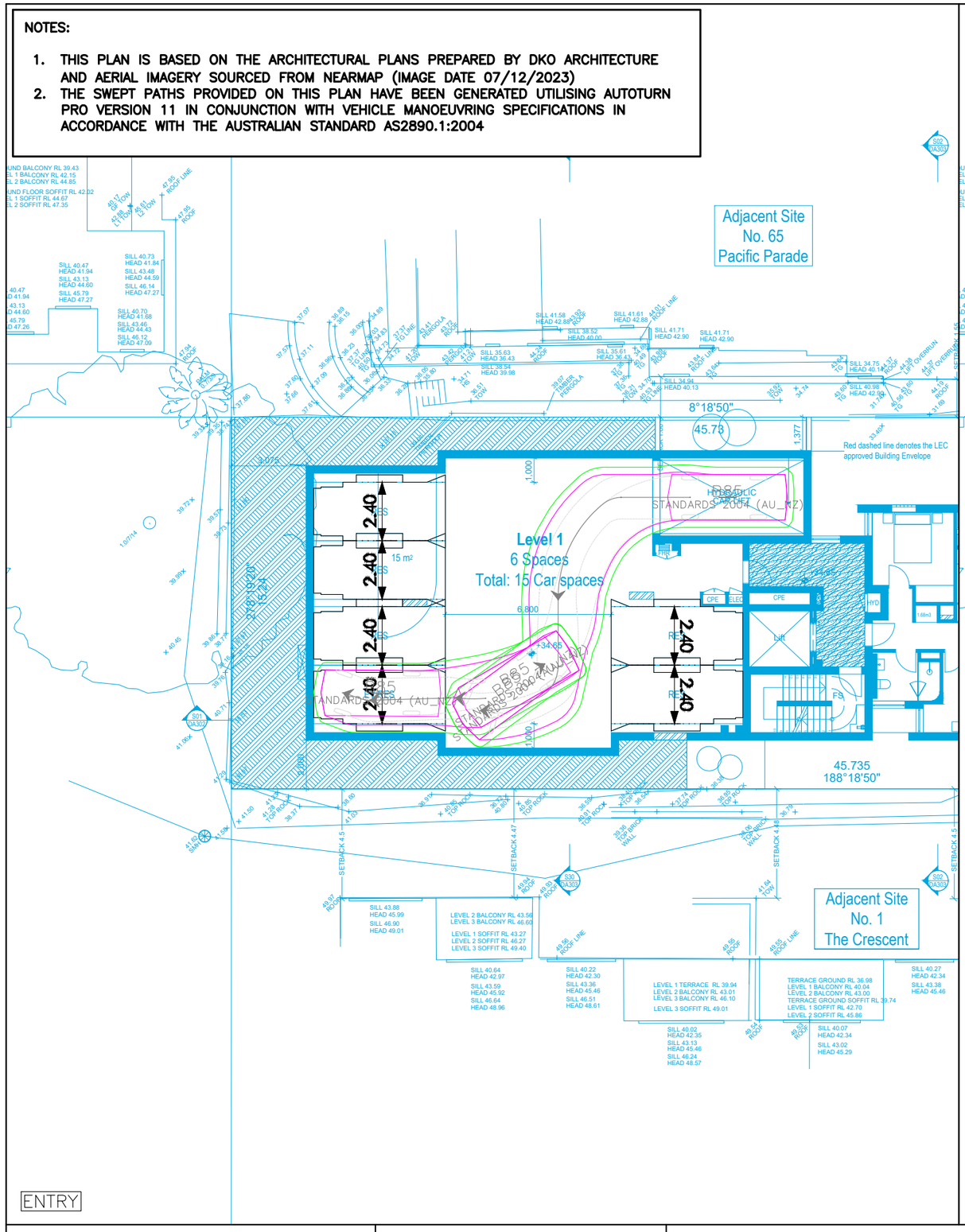

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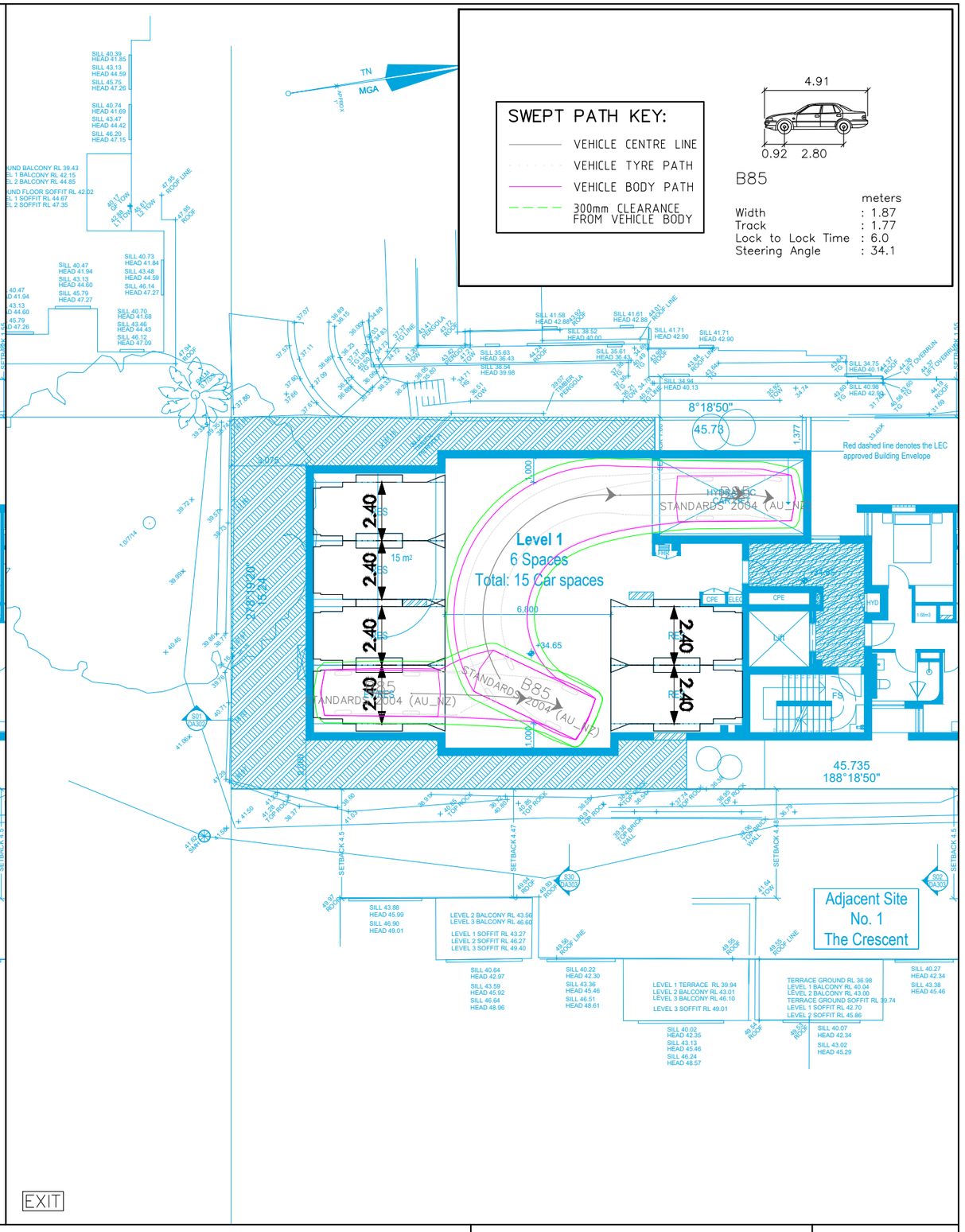

EXIT

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STANBURY TRAFFIC PLANNING

67 PACIFIC PARADE, DEE WHY – OPTION 2
CAR PARK COMPLIANCE REVIEW
SWEPT PATH ASSESSMENT
LEVEL 1 AND LEVEL 2

SCALE 0 2.0 4.0 1:200@A3		CREATED BY Y.H
DRAWING NO. 23-179-04-V3		APPROVED BY M.S
DATE 19 July 2024		SHEET 10 / 11

NOTES:

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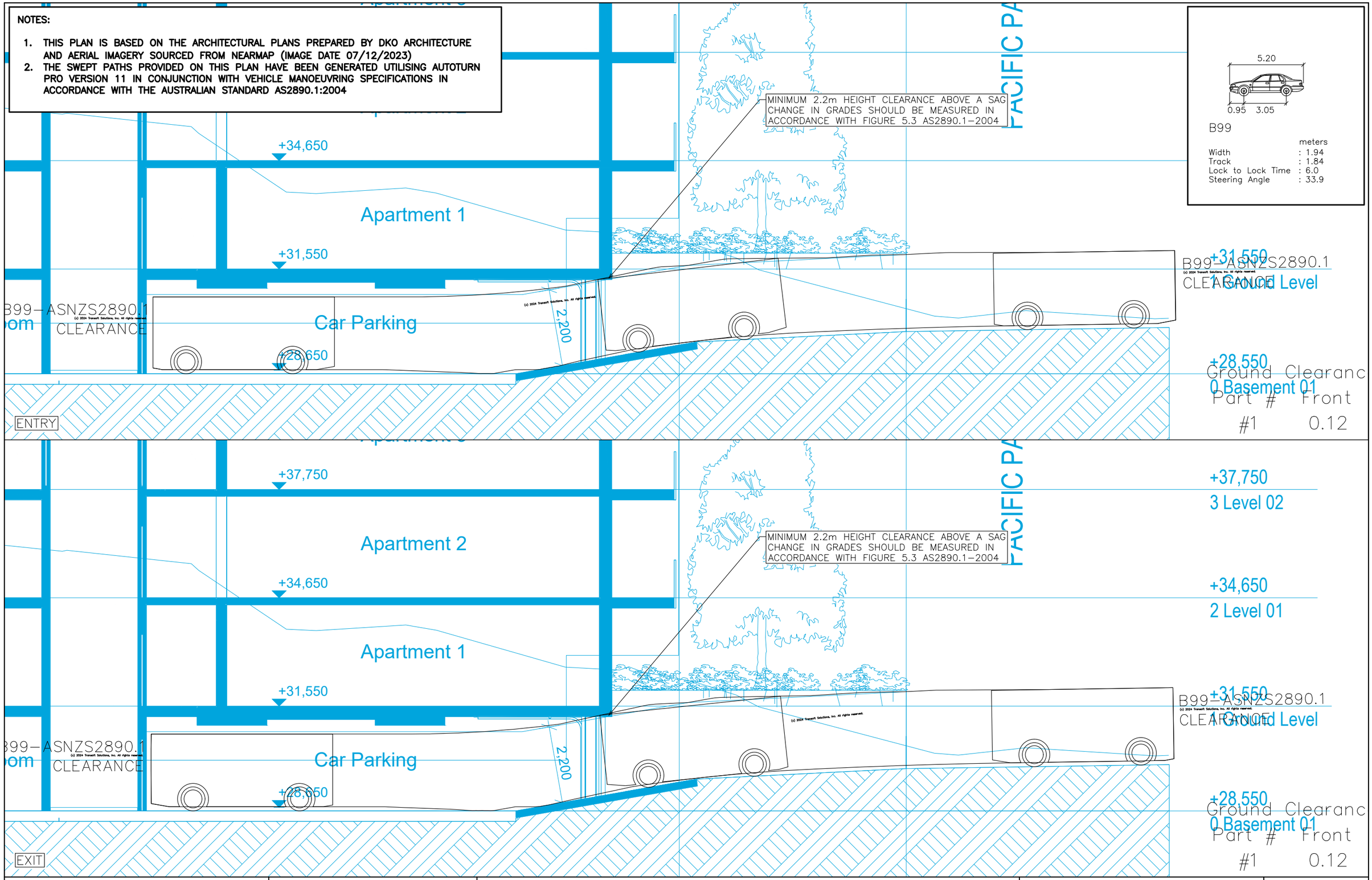

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STANBURY TRAFFIC PLANNING

67 PACIFIC PARADE, DEE WHY – OPTION 2
CAR PARK COMPLIANCE REVIEW
VERTICAL CLEARANCE ASSESSMENT
MAIN ACCESS RAMP

SCALE 0 1.0 2.0	1:100@A3	CREATED BY Y.H
DRAWING NO.	23-179-04-V3	APPROVED BY M.S
DATE	19 July 2024	SHEET 11 / 11

APPENDIX 3

IdealPark

Car Parking Solutions

IP1-HMT V08 - Hydraulic Car Lift

Driver on board;
System designed for large luxurious cars (Limousines, Lincoln, Maybach etc.);
Standard capacity: 3,200 kg;
Max. travel: 11.90 m;
Min. pit depth: 20 cm;
Platform width: from 250 to 300 cm;
Platform length: from 520 to 650 cm;
Speed of ascent: 0.075 (0.15) m/sec;
Speed of descent: 0.15 m/sec;
Motor power: 5.5 (11) kW;
Upper beam stiffener;
Systems can also be used as a goods lift with driver on board.

IdealPark

Car Parking Solutions

IP1-HMT V08

Features

Driver on board;
High level of operating and functional safety;
Safety from car theft;
Totally hot-dip galvanised with non-slip steel sheet tread platform;
Suitable for residential units, terraced houses, villas, condominiums, renovations, companies and car dealerships.

Standard features

Hold-to-run manoeuvre on the platform (2 control panels);
Automatic operation from the floor control panel;
Automatic return to selectable level;
Automatic landing door opening;
Door controls integrated in the control panel of the car lift;
Safety interface with landing doors;
Safety modules certified for security doors;
Multi-function traffic light on board (instructs the user on the system);
Control panel with PLC with self-diagnostics and touch screen colour display;
Railings made of polycarbonate with recessed courtesy lights;
2nd descent speed;
Alarm siren;
Photocell presence on board;
Photocell barrier on board with light signal;
Double hoisting rope with voltage detection sensor;
Parachute valves on the pistons;
Self-levelling floor during loading/unloading;
Pressure switch overload warning;
UPS device;
Pressure gauge on the control unit;
Metal stairs and safety pillars for access to the maintainer pit.

Optional features

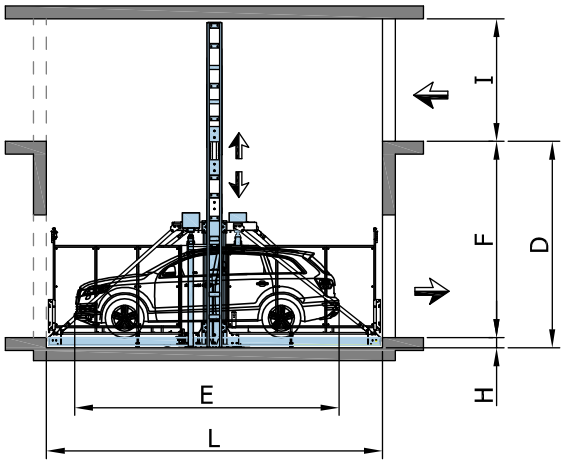
Painting with Triplex system;
Radio remote control (call for the empty platform from the car in the street);
Return to the level at programmable times;
Automatic timed closing of the landing door;
Access with badge;
Login with badge and registration of the passage;
Floor display;
Telephone dialler;
Floor traffic lights;
2nd speed of ascent with 9.5 kW motor;
LED lighting technology;
Rain kit;
Noise kit;
Remote assistance.

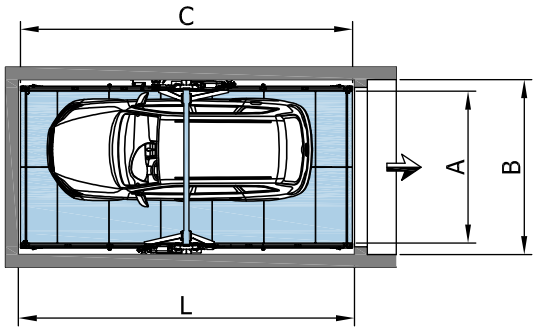
IdealPark

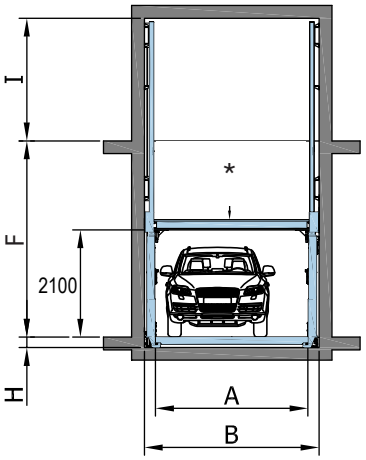
Car Parking Solutions

IP1-HMT V08 - Hydraulic Car LIft

Ascensore per auto — Car lift

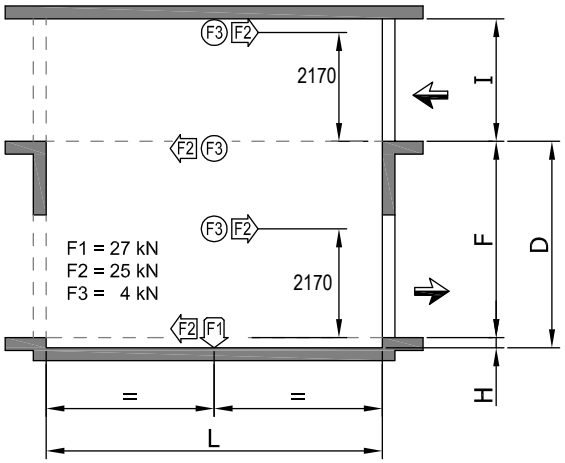


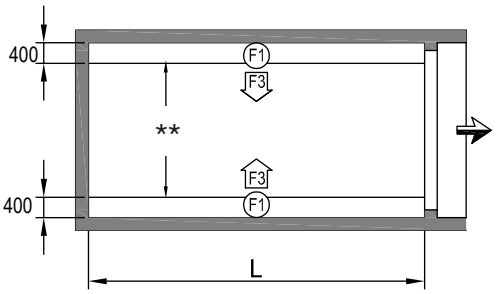




* Upper stiffening beam
Dimensions are in mm.

Carichi standard — Standard loads





** Surface with inclination 0%.

Technical features

Load (kg) 3200
Motor power (kW) 5,5 (11)
Raising speed (m/s)0,075 (0,15)
Lowering speed (m/s) 0,15

The manufacturer reserves the right to modify or alter above specifications.

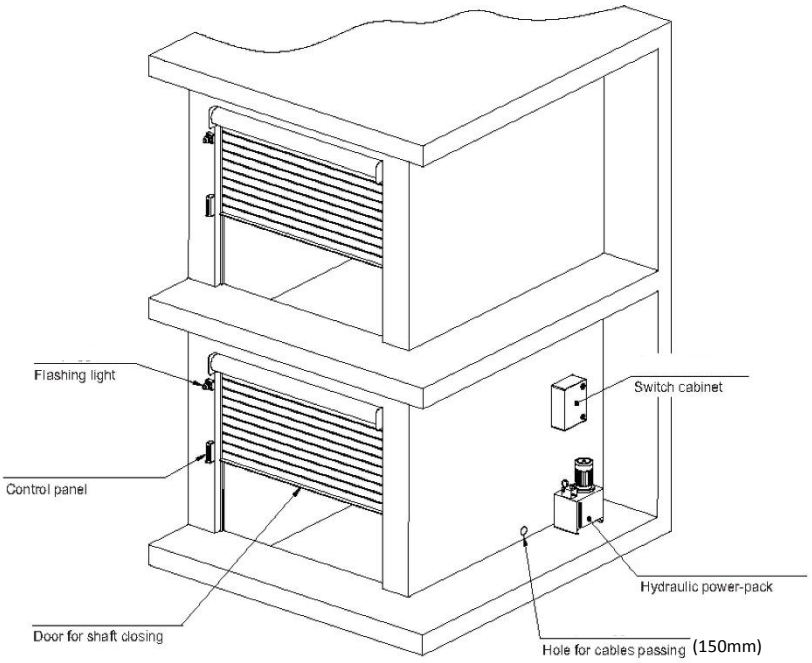
Technical data

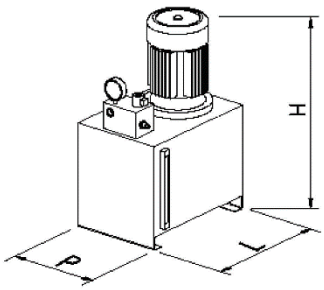
Description	Dimension	Standard	Max
Platform width	**A**	2500	3000
Platform length	**C**	5200	6500
Car length	**E**	5120	6420
Pit width	**B**	2920	3420
Pit length	**L**	5280	6580
Pit height	$\mathbf{H}^{\pm 4}_{0}$	200	200
Total height	$\mathbf{D}^{\pm 5}$	(F + H)	(F + H)
Travel	$\mathbf{F}^{\pm 5}$	3000	11900 (Max)
Headroom	**I**	2400 (Min)	2400 (Min)

IdealPark

Car Parking Solutions

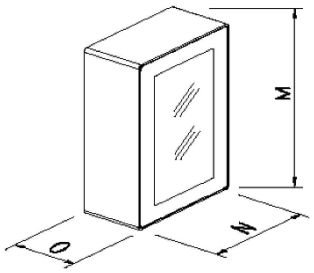
LIFT MOTOR & SWITH CABINET DETAILS





Hydraulic Power Pack

Standard Dimensions			
	4 kW	5.5 kW	7.5 kW
H	800	800	890
L	550	550	550
P	400	400	400
Power supply	380 Volt 3 phase		



Switch cabinet

Standard Dimensions	
M	650
N	510
O	250

GENERAL INSTRUCTIONS

- Hydraulic power-pack switch board have to be positioned preferably at lower level and near system.
  The place has to be far from non authorised personnel's access and has to be accessible for maintenance actions.
For this reason we suggest to set up a technical room.
Dimensions min. 900 x 16000mm
Electrical requirements:
- 32 amp 3 phase isolator switch cabinet
- 15 amp single phase GPO for UPS.

APPENDIX 4

TRAFFIC LIGHT CONTROLLERS

Traffic Light Controller Specifications:

Model SKU:	AGDTC-1
Power requirements:	240Vac, 10 Amps maximum.
Programmable Logic Controller:	Mitsubishi Alpha 2.
Vehicle detection options:	Ultra-sonic Detector (standard), Loop, PE Beam, Access Control.
Enclosure dimensions:	500 (h) x 400 (w) x 200 (d)
All red clearance:	Programmable 0 – 255 seconds.
Green period:	Programmable 0 – 255 seconds.

AGD Systems Pty Ltd

Unit 17/15 Valediction Road, Kings Park, NSW 2148

P: 02 9653 9934 E: Sales@agd-systems.com.au

LED TRAFFIC LANTERNS

100mm 12-24V**dc**

This LED type traffic lantern is suitable for a variety of applications where there is a need for traffic control or indication, such as car parks, mine sites, race circuits, weigh bridges, car & truck washes.

Made from quality materials, this traffic lantern is dust proof and weatherproof, and has much lower energy consumption and maintenance costs than incandescent or fluorescent lamps, as well as a much longer operational life.

The red, yellow and green LEDs are brighter than most lamps and will operate satisfactorily at very low voltages, making them ideal for use in harsh environments or where safety is paramount.

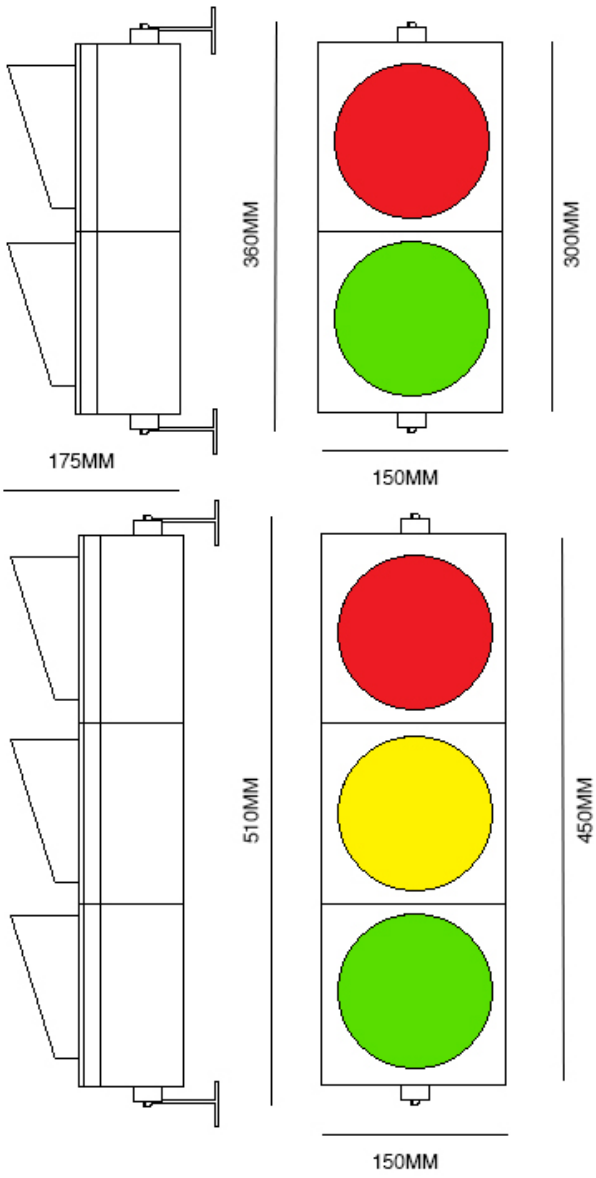
This unit is very similar to those normally seen at traffic signal controlled intersections, with a comparable light output.

Available in Red,Amber, Blue or Green LED Modules.

Specifications

Power Supply: 12-24Vdc
Power Consumption: 80mA @ 12Vdc, 50mA @ 24VDdc (Red and Yellow Module) 150mA @ 12Vdc, 80mA @ 24Vdc (Green Module)
Average life of LEDS: 80,000 hours.
Lens diameter: 100mm.
Number of LEDs: 45 per aspect.
Light output: > 2000mcd/m
Dominant wavelength: Red 625nm +/- 5, Yellow 590nm +/- 5, Green 505nm +/- 2
Housing: PMMA, UV stabilised.
Mass: 1.6kg (2 aspect) 2.4kg (3 aspect)
IP rating: IP65
Sun visors: Fixed.
Operating Temp: -40°C ~ +80°C

Dimensions:



Wiring

Two Aspect 200mm Traffic Lantern:
1 - Common (GND)
2 - LED Module (+12-24Vdc)
3 - LED Module (+12-24Vdc)
4 - Spare

Three Aspect 200mm Traffic Lantern:
1 - Common (GND)
2 - LED Module (+12-24Vdc)
3 - LED Module (+12-24Vdc)
4 - LED Module (+12-24Vdc)

Part Numbers:

100mm 2 Aspect 12/24Vdc - AGD12

100mm 3 Aspect 12/24Vdc - AGD13

AGD Systems Pty Ltd

Unit 17/15 Valediction Road
Kings Park, NSW 2148

P: 02 9653 9934

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W: www.agdsales.com.au

CUSTOMER INFORMATION

EVA510 INDUCTIVE LOOP DETECTOR
Traffic

(Ref.: 510-301 – 510-501)

■ General

The EVA510 is a single channel CW boxed inductive loop detector operating in the 18 to 130 kHz band and has been specifically designed for traffic applications. All functional selections are made by the setting of switches on the front panel of the detector. There are no selections available inside the detector.

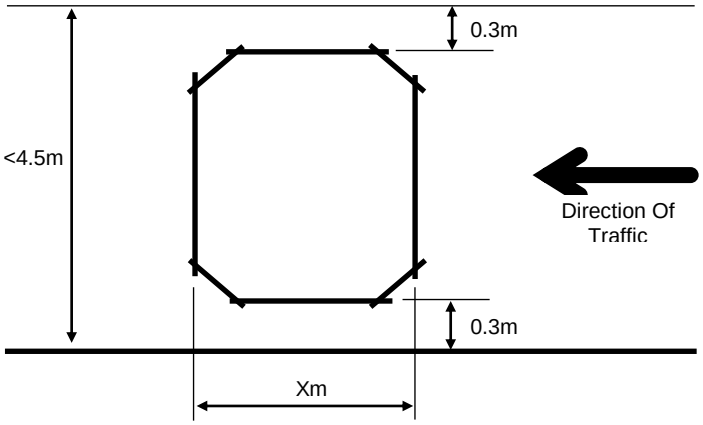
■ Electrical Connections

The detector is marked on the rear label with the voltage supply to be used and it is essential that the detector is connected to the correct power supply. Consideration must be given to the multiple grounding of supplies and to its effect on the whole system. The installation of this equipment must conform to the latest edition of the IEE Wiring Regulations (BS7671) as applicable.

Pin Number	Connection
1	Live (or positive)
2	Neutral (or negative)
3	Fault Relay O/P Low Impedance For Fault
4	Fault Relay Common
5	Presence Relay O/P Low Impedance For Detect
6	Presence Relay Common
7	Sensing Loop Connection
8	Sensing Loop Connection
9	Earth
10	Presence Relay O/P High Impedance For Detect
11	Fault Relay O/P High Impedance For Fault

■ Installation

Correct installation of the sensing loop will give optimum detection performance. The sensing loop is to be installed in the surface of the carriageway at the point of desired detection. This is performed by slot cutting the carriageway surface of width 0.5 mm greater than the diameter of sensing loop cable to be used and to a depth of n x cable diameter(in mm) +25 mm minimum (where n is the number of turns 2, 3 or 4 which is dependent on the circumference of the sensing loop). The slots should be cut to the guidelines indicated below. Cutting the corners of the rectangle at 45° helps to meet the minimum bend radius limits for the cable used. The cable from the detector to the sensing loop (feeder) should be twisted at a rate exceeding 25 turns per metre. The feeder length should not exceed 150 m.



CUSTOMER INFORMATION

The sensing loop consists of n turns of cable indicated as follows:

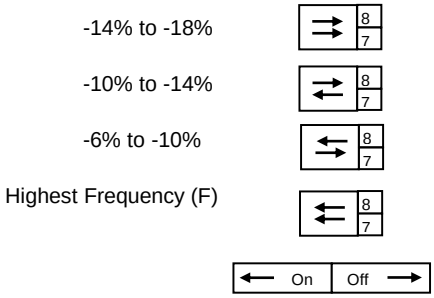
Number Of Turns (n)	Sensing Loop Circumference (m)
2	>10
3	6-10
4	<6

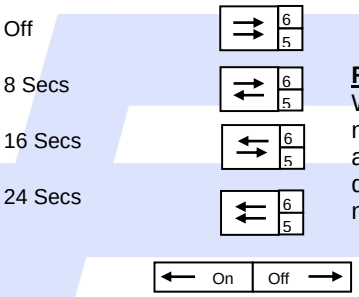
The cut slot should be back filled with quick-set epoxy or hot bitumen mastic. If a second sensing loop is to be installed in the same carriageway then the separation of adjacent edges is to be a minimum of 2 m for adjacent edges of lengths up to 2.5 m and an extra 0.5 m separation for each additional 1 m length thereafter. Care should be taken not to trap water in the slot during back filling as this may lead to unstable detection performance.

■ Detector Operation

Frequency Selection (Switches 7 & 8)

These two switches are used in combination to set four frequency bands appropriate for the inductive load presented by the sensing loop. When both switches are in the OFF position the frequency is at the lowest allowed by the load of the sensing loop. Selecting a combination of the switches as below changes the resonant frequency in increments. The magnitude of the shift in frequency is proportional to the load of the sensing loop connected to the detector. The operating frequency of adjacent sensing loops should be adjusted to be at least 15% apart in the absence of vehicles.



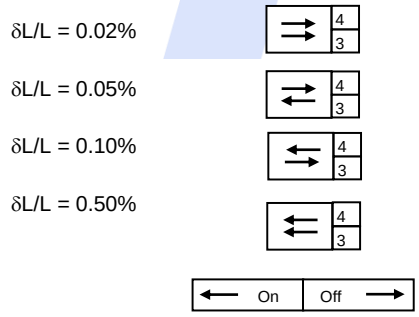


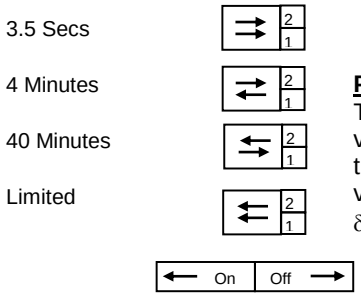
Response Delay (Switches 5 & 6)

When both switches are in the OFF position the detector has no response delay and the normal response of 60 ms applies. A response delay of 8, 16 or 24 seconds can be set as shown below. If a signal is sensed which has a magnitude capable of causing a detection but which does not persist for more than the set response delay then there is no output from the detector.

Sensitivity Selection (Switches 4 & 3)

The detect sensitivity is set by a combination of switches 4 & 3. The sensitivity is expressed as δL/L, the change in inductance above which causes a detection with 0.02% being the most sensitive setting. Settings are as follows:





Presence Time (Switches 1 & 2)

The presence time is the maximum time the detector can return a detect state when a vehicle is present over the sensing loop. The limited presence option has a presence time proportional to the signal of the target stationary over the sensing loop. A typical vehicle produces a presence time of 80 minutes in this mode if the sensitivity is set to δL/L=0.02%.

CUSTOMER INFORMATION

■ Detector Fault Monitoring

The detector monitors its own performance.
The table below shows the different situations that may occur when the detector is powered:

● LED off ● LED on ✸ flashing LED

No vehicle over the loop	●●	The right LED is on.
Vehicle over the loop	●●	Both LEDs are on.
Broken loop (Ω = ∞) or Loop > 2 mH (F < 18 kHz)	●✸	The right LED flashes once per second. The left LED is on.
Loop in short circuit (Ω = 0) or Loop < 20 µH (F > 130 kHz)	✸✸	LEDs flashes alternately at a rate of one per second

The LED(s) will continue to flash even if the fault is self-healing so that a maintenance engineer will be able to recognize that a fault occurred. The fault condition may be cleared by pressing the reset.
The frequency depends on the settings of the selection switches 7 & 8 and on the impedance of the loop. To reduce the impedance (which has the effect of increasing the frequency), it is necessary to reduce the number of turns of the loop. To increase the impedance (which has the effect of reducing the frequency), it is necessary to increase the number of turns of the loop.

IP40 RoHS compliant

USVD-4X

ULTRASONIC VEHICLE DETECTOR

Applications

This device uses Triangular Planar Array (TPA) technology to reliably detect the presence of a vehicle in a wide variety of drive-thru applications including parking, access control, car wash, banking and fast food. Unlike a vehicle loop detector configuration that requires the installation of a loop in the pavement, the USVD-4X may be simply mounted on a post or order box and aimed at the location of the vehicle when in position to perform a transaction or place an order. Also, unlike other technologies, the USVD-4X does not require any set up or functional adjustments, other than simply installing and aiming. The USVD-4X greatly reduces the cost associated with installation of vehicle detection capabilities compared to loop detectors for these types of applications.

The USVD-4X requires 12-24VDC/VAC and provides a form “C” set or relay contacts indicating vehicle presence.

Utilizing TPA technology, the detection head consists of 4 ultrasonic transducers that connect to the internal microprocessor-based control board. The detection head “scans” the expected location for a vehicle and activates its output upon detection of a vehicle.

USVD-4X

ULTRASONIC VEHICLE DETECTOR

- Easy set-up
- Reduces cost
- Triangular planar array technology
- Streamlining operation
- Robust design
- Aux. relay, settings for pulse on ENTRY, EXIT or BOTH
- Output delay option for 1, 2 and 4 seconds

USVD-4X

Technical Data

Sensing elements	4 ultrasonic in TPA configuration
Operating range	1ft. – 5ft.
Response time	2.0 seconds
Relay output configuration	2 SPDT (form C)
Relay contact rating	1A @ 24VDC
Power indicator/no vehicle	Green LED
Object in range	Flashing Green LED on each input, continuous LED on DETECT
Supply voltage	12…24 VDC/VAC
Operating current	60mA
Operating temperature	-40˚C...+85˚C (-40˚F...+182˚F)
Dimensions	5.7”(145mm) x 3.6”(90mm) x 2.3”(57mm)
Weight	0.6 lbs. (275g)
Housing	ABS NEMA 4X
Connection	10 position terminal block
Mechanical protection	NEMA 4X

Ordering Information

- USVD-4X Ultrasonic Vehicle Detector

MADE IN USA

CE

ENGLISH

Datasheet

Stock No: 145-0607, 145-0609, 145-0610, 145-0612, 145-0613

Flush Head Push Button Complete Unit

Specifications:

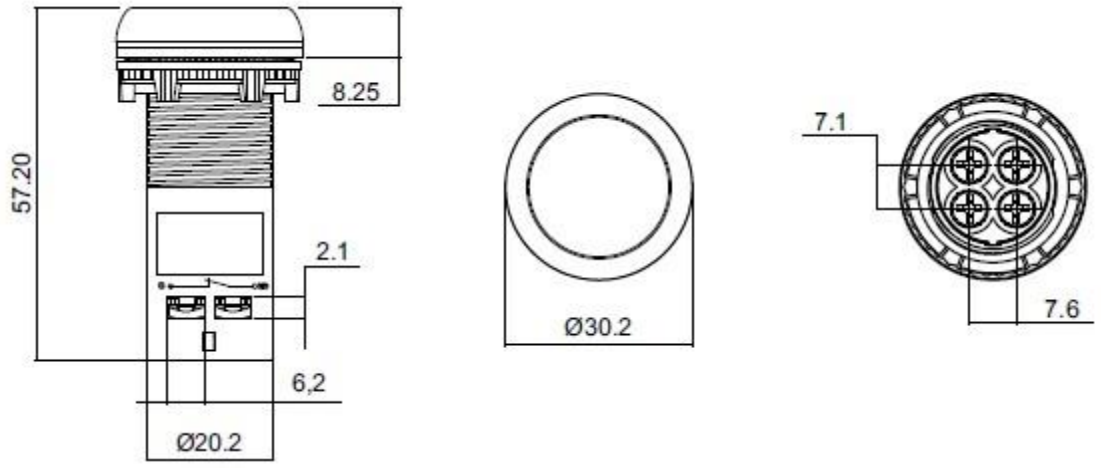
- 22mm Diameter
- Various colours and contact styles available
- Sprung return head
- IP65 rated
- Complete unit with built-in contact block
- Conformity with RoHs directive

ENGLISH

RS Stock No	145-0607	145-0609	145-0610	145-0612	145-0613
Characteristics					
Type	Flush Head				
Mounting Diameter	22mm				
Colour	Green	Red	Yellow	Black	Blue
Contact	1NO	1NC	1NO	1NO	1NO
Function	Push				
Type	Non Illuminated				
Weight	20g				
Mounting	Fixing hole: Ø 22.5 mm				
Fixing Centre	Locking nut beneath head				
Terminal Torque	0.8 Nm				
Contact Type	Make & Break				
Mechanical Life	1 million cycles				
Electrical Life of Contact	0.5 millinon cycles				
Utilization Category – Supply	**IEC-60947-5-1**	**UL-508**	**ITH/Thermal Current**		
Utilization Category – AC	AC-15	A600	10A		
Utilization Category – DC	DC-13	P300			
Rated Voltage and Current – 230Vac	6A				
Rated Voltage and Current – 120Vac	6A				
Rated Voltage and Current – 24Vdc	1.5A				
Current Carrying Material	Brass				
Contact Material	AgNi				
Housing Material	Nylon FR				
Operating Temperature	-25°C to 65°C				
Storage Temperature	-30°C to 70°C				
Hv Test for 60 sec	2.5KV (All Terminal Shorted Together)				
Insulation Resistance at 500 VDC	50 M Ohm				
Contact Resistance	20 M Ohm				
MV drop at 16 A DC	200 MV				
IP Rating	IP65 above panel (As per IEC/EN -60529) & IP20 for Terminals NEMA 1,2,3,4,4X class 12 & 13				

ENGLISH

Certification	
Product Drawing	



APPENDIX 5

Queuing Analysis Calculations

Development yield of 2 two-bedrooms and 7 three-bedroom dwellings

Lift speed of 0.5m/s

		Formulas
Arrival rate	6	a
Service rate (metres/second)	47.87	s
Utilisation rate (p)	0.125333333	p = a/s
Mean queue (E(m))	0.01795935	E(m) = (p/1-p)-p
Probability of 0 vehicles within the system (%)	87.46666667	P(0) = (1-p)p^0
Probability of 1 vehicles within the system (%)	10.96248889	P(1) = (1-p)p^1
Probability of 2 vehicles within the system (%)	1.373965274	P(2) = (1-p)p^2
Probability of 3 vehicles within the system (%)	0.172203648	P(3) = (1-p)p^3
Probability of 4 vehicles within the system (%)	0.021582857	P(4) = (1-p)p^4
Probability of 5 vehicles within the system (%)	0.002705051	P(4) = (1-p)p^4
Probability of 1 or more vehicles within the system (%)	12.53333333	P(1+) = 100 - P(0)
Probability of 2 or more vehicles within the system (%)	1.570844444	P(2+) = 100 - P(0) - P(1)
Probability of 3 or more vehicles within the system (%)	0.19687917	P(3+) = 100 - P(0) - P(1) - P(2)
Probability of 4 or more vehicles within the system (%)	0.024675523	P(4+) = 100 - P(0) - P(1) - P(2) - P(3)
Probability of 5 or more vehicles within the system (%)	0.000387614	P(4+) = 100 - P(0) - P(1) - P(2) - P(3) - P(4)

TRAFFIC GENERATION CALCULATION		
Development yield		
Development yield of 2 two-bedrooms and 7 three-bedroom dwellings		
		Formulas
Total Arrival Rate	6	(0.5 x no of two-bedrooms) + (0.65 x no. of three-bedroom)

VEHICLE LIFT SPEED		Formulas
Average vertical distance travelled (m)	6.30	
Lift speed (m/s)	0.500	Provided by lift manufactuer

SERVICE RATE CALCULATION		Formulas
Average travel time at 0.5m/s in both directions (seconds)	25.20	(Average vertical distance travelled x 2) / lift speed
Door opening, closing, locking, dwell time, vehicle manoeuvring, roof engage / disengage and lift decceleration on approach to stop (seconds)	50.00	Provided by lift manufactuer
Service time (seconds)	75.20	Total service time
Service rate (meters per second)	47.87234043	(3600 / service time)

APPENDIX 6

TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY

trafficsurvey.com.au

Intersection of Pacific Parade and The Crescent, Dee Wh

GPS	*-33.755196, 151.290094*
Date:	Wed 29/05/24
Weather:	Fine
Suburban:	Dee Why
Customer:	Stanbury

North:	N/A
East:	Pacific Parade
South:	The Crescent
West:	Pacific Parade

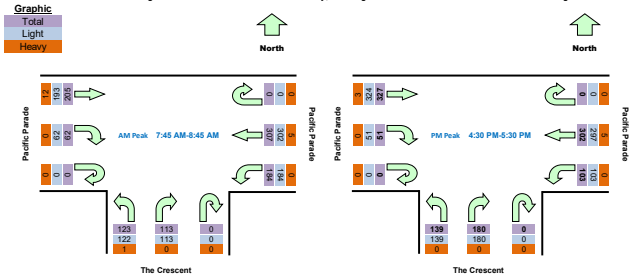
Survey Period	AM:	7:00 AM-9:00 AM
	PM:	4:00 PM-6:00 PM
Traffic Peak	AM:	7:45 AM-8:45 AM
	PM:	4:30 PM-5:30 PM

All Vehicles

Time		ast Approach Pacific Parad			outh Approach The Cresce			est Approach Pacific Parad			Hourly Total	
Period Start	Period End	U	WB	L	U	R	L	U	R	EB	Hour	Peak
7:00	7:15	0	76	20	0	10	17	0	9	35	786	
7:15	7:30	0	77	17	0	18	16	0	5	31	867	
7:30	7:45	0	76	40	0	22	19	0	6	41	975	
7:45	8:00	0	83	50	0	26	30	0	14	48	994	Peak
8:00	8:15	0	71	52	0	31	37	0	15	42	946	
8:15	8:30	0	92	46	0	38	37	0	15	44		
8:30	8:45	0	61	36	0	18	19	0	18	71		
8:45	9:00	0	79	28	0	17	12	0	13	54		
16:00	16:15	0	60	23	0	44	29	0	11	61	952	
16:15	16:30	0	63	31	0	24	29	0	9	74	1027	
16:30	16:45	0	73	23	0	46	24	0	15	74	1102	Peak
16:45	17:00	0	61	23	0	36	33	0	8	78	1092	
17:00	17:15	0	73	26	0	56	50	0	14	84	1093	
17:15	17:30	0	95	31	0	42	32	0	14	91		
17:30	17:45	0	68	36	0	43	28	0	10	60		
17:45	18:00	0	67	14	0	36	34	0	9	80		

Peak Time		ast Approach Pacific Parad			outh Approach The Cresce			est Approach Pacific Parad			Peak
Period Start	Period End	U	WB	L	U	R	L	U	R	EB	total
7:45	8:45	0	307	184	0	113	123	0	62	205	994
16:30	17:30	0	302	103	0	180	139	0	51	327	1102

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.



Light Vehicles

Time		ast Approach Pacific Parad			outh Approach The Cresce			est Approach Pacific Parad		
Period Start	Period End	U	WB	L	U	R	L	U	R	EB
7:00	7:15	0	73	20	0	10	17	0	9	34
7:15	7:30	0	72	17	0	18	16	0	5	29
7:30	7:45	0	75	40	0	21	19	0	6	37
7:45	8:00	0	83	50	0	26	29	0	14	45
8:00	8:15	0	70	52	0	31	37	0	15	41
8:15	8:30	0	90	46	0	38	37	0	15	40
8:30	8:45	0	59	36	0	18	19	0	18	67
8:45	9:00	0	77	28	0	16	12	0	12	53
16:00	16:15	0	59	23	0	44	29	0	11	60
16:15	16:30	0	60	31	0	24	29	0	9	73
16:30	16:45	0	71	23	0	46	24	0	15	74
16:45	17:00	0	60	23	0	36	33	0	8	78
17:00	17:15	0	72	26	0	56	50	0	14	83
17:15	17:30	0	94	31	0	42	32	0	14	89
17:30	17:45	0	68	35	0	43	28	0	10	60
17:45	18:00	0	67	13	0	36	34	0	9	80

Peak Time		ast Approach Pacific Parad			outh Approach The Cresce			est Approach Pacific Parad			Peak
Period Start	Period End	U	WB	L	U	R	L	U	R	EB	total
7:45	8:45	0	302	184	0	113	122	0	62	193	976
16:30	17:30	0	297	103	0	180	139	0	51	324	1094

Heavy Vehicles

Time		ast Approach Pacific Parad			outh Approach The Cresce			est Approach Pacific Parad		
Period Start	Period End	U	WB	L	U	R	L	U	R	EB
7:00	7:15	0	3	0	0	0	0	0	0	1
7:15	7:30	0	5	0	0	0	0	0	0	2
7:30	7:45	0	1	0	0	1	0	0	0	4
7:45	8:00	0	0	0	0	0	1	0	0	3
8:00	8:15	0	1	0	0	0	0	0	0	1
8:15	8:30	0	2	0	0	0	0	0	0	4
8:30	8:45	0	2	0	0	0	0	0	0	4
8:45	9:00	0	2	0	0	1	0	0	1	1
16:00	16:15	0	1	0	0	0	0	0	0	1
16:15	16:30	0	3	0	0	0	0	0	0	1
16:30	16:45	0	2	0	0	0	0	0	0	0
16:45	17:00	0	1	0	0	0	0	0	0	0
17:00	17:15	0	1	0	0	0	0	0	0	1
17:15	17:30	0	1	0	0	0	0	0	0	2
17:30	17:45	0	0	1	0	0	0	0	0	0
17:45	18:00	0	0	1	0	0	0	0	0	0

Peak Time		ast Approach Pacific Parad			outh Approach The Cresce			est Approach Pacific Parad			Peak
Period Start	Period End	U	WB	L	U	R	L	U	R	EB	total
7:45	8:45	0	5	0	0	0	1	0	0	12	18
16:30	17:30	0	5	0	0	0	0	0	0	3	8

APPENDIX 7

MOVEMENT SUMMARY

Site: 101 [Pacific Parade & The Crescent am existing (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Pacific Parade & The Crescent am existing
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 40 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: The Crescent															
1	L2	All MCs	129	5.0	129	5.0	0.504	20.2	LOS B	4.3	31.6	0.89	0.80	0.89	43.9
3	R2	All MCs	119	5.0	119	5.0	* 0.504	19.5	LOS B	4.3	31.6	0.89	0.80	0.89	43.8
Approach			248	5.0	248	5.0	0.504	19.8	LOS B	4.3	31.6	0.89	0.80	0.89	43.8
East: Pacific Parade															
4	L2	All MCs	194	5.0	194	5.0	0.227	13.5	LOS A	2.3	16.7	0.62	0.73	0.62	48.0
5	T1	All MCs	323	5.0	323	5.0	0.400	8.6	LOS A	4.2	30.7	0.69	0.58	0.69	53.4
Approach			517	5.0	517	5.0	0.400	10.4	LOS A	4.2	30.7	0.66	0.64	0.66	50.4
West: Pacific Parade															
11	T1	All MCs	216	5.0	216	5.0	0.342	7.0	LOS A	2.9	21.3	0.65	0.58	0.65	52.5
12	R2	All MCs	65	5.0	65	5.0	* 0.342	15.7	LOS B	2.9	21.3	0.69	0.63	0.69	49.6
Approach			281	5.0	281	5.0	0.342	9.0	LOS A	2.9	21.3	0.66	0.59	0.66	51.8
All Vehicles			1046	5.0	1046	5.0	0.504	12.3	LOS A	4.3	31.6	0.72	0.66	0.72	49.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
East: Pacific Parade												
P2	Full	50	53	14.5	LOS B	0.1	0.1	0.85	0.85	168.3	200.0	1.19
West: Pacific Parade												
P4	Full	50	53	14.5	LOS B	0.1	0.1	0.85	0.85	168.3	200.0	1.19
All Pedestrians		100	105	14.5	LOS B	0.1	0.1	0.85	0.85	168.3	200.0	1.19

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

MOVEMENT SUMMARY

Site: 101 [Pacific Parade & The Crescent pm existing (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Pacific Parade & The Crescent pm existing
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 50 seconds (Site User-Given Phase Times)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: The Crescent															
1	L2	All MCs	146	5.0	146	5.0	0.624	23.4	LOS B	7.4	54.3	0.91	0.83	0.93	42.2
3	R2	All MCs	189	5.0	189	5.0	* 0.624	22.7	LOS B	7.4	54.3	0.91	0.83	0.93	42.2
Approach			336	5.0	336	5.0	0.624	23.0	LOS B	7.4	54.3	0.91	0.83	0.93	42.2
East: Pacific Parade															
4	L2	All MCs	108	5.0	108	5.0	0.126	16.0	LOS B	1.5	10.8	0.58	0.71	0.58	47.3
5	T1	All MCs	318	5.0	318	5.0	0.391	11.6	LOS A	5.0	36.9	0.68	0.58	0.68	52.2
Approach			426	5.0	426	5.0	0.391	12.7	LOS A	5.0	36.9	0.66	0.61	0.66	49.1
West: Pacific Parade															
11	T1	All MCs	344	5.0	344	5.0	0.432	9.1	LOS A	5.4	39.4	0.68	0.60	0.68	51.3
12	R2	All MCs	54	5.0	54	5.0	* 0.432	19.6	LOS B	5.4	39.4	0.72	0.64	0.72	48.7
Approach			398	5.0	398	5.0	0.432	10.5	LOS A	5.4	39.4	0.69	0.60	0.69	51.0
All Vehicles			1160	5.0	1160	5.0	0.624	15.0	LOS B	7.4	54.3	0.74	0.67	0.75	47.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Green.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance

Mov ID	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
East: Pacific Parade												
P2	Full	50	53	19.4	LOS B	0.1	0.1	0.88	0.88	173.2	200.0	1.15
West: Pacific Parade												
P4	Full	50	53	19.4	LOS B	0.1	0.1	0.88	0.88	173.2	200.0	1.15
All Pedestrians		100	105	19.4	LOS B	0.1	0.1	0.88	0.88	173.2	200.0	1.15

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.