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Environmental Noise Assessment Report

Co-Living Development
67 Pacific Street, Dee Why, NSW

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TABLE OF CONTENTS

1.0	EXECUTIVE SUMMARY	6
2.0	CONSULTING BRIEF	7
3.0	PROJECT & DEVELOPMENT DESCRIPTION	8
3.1	Local Area Description	8
3.2	Development Description	9
4.0	ACOUSTICAL CRITERIA	10
4.1	Existing Ambient Noise Levels	10
4.1.1	Measured Ambient Noise Levels	10
4.1.2	Description of Existing Acoustic Environment	11
4.2	Northern Beaches Council	12
4.3	NSW Environment Protection Authority	13
4.3.1	Noise Policy for Industry 2017	13
4.3.1.1	Project Intrusiveness Noise Level	13
4.3.1.2	Protect Amenity Noise Level	14
4.3.1.3	Sleep Disturbance Criteria	16
4.3.2	NSW Road Noise Policy	17
4.3.3	Protection of the Environment Operations (Noise Control) Regulation 2017	17
4.4	Project Specific Noise Criteria	19
4.4.1	Residential Receptors	19
4.4.2	Sleep Disturbance Criteria	20
4.4.3	On – Road Traffic Criteria	20
5.0	DEVELOPMENT NOISE EMISSION	21
5.1	Communal Open Space & Indoor Communal Areas	21
5.2	Amplified Sound Equipment In Micro Apartments	23
5.3	Car Park Noise Emission	24
5.4	Mechanical Plant Noise Emission	25
5.5	Predicted Noise Levels	26
5.5.1	Resident & Guest Noise – Communal Open Space & Indoor Communal Areas	27
5.5.2	Car Park Noise	28
5.5.3	Mechanical Plant Noise	29
5.5.4	Air Conditioning Unit & Amplified Sound Equipment – Inaudibility Criterion (POEO)	30
5.5.5	Sleep Disturbance	31



5.5.6	On – Road Traffic.....	32
6.0	NOISE CONTROL RECOMMENDATIONS	33
6.1	Noise Management Plan	33
6.2	Mechanical Plant & Equipment– Construction Certificate	34
6.2.1	General Specifications.....	34
6.2.2	Carbon Monoxide Monitoring System.....	34
6.2.3	Air Conditioning Systems	34
6.2.4	Lined Ductwork.....	35
6.2.5	Silencers.....	35
6.2.6	Basement Roller Door	35
6.3	Sleep Disturbance - Maximum Noise Level Event Assessment	35
6.3.1	Communal Outdoor Space - Sleep Disturbance Noise Controls	35
6.3.2	Car Park - Sleep Disturbance Noise Controls	35
7.0	PREDICTED NOISE LEVELS - AFTER NOISE CONTROLS.....	37
8.0	NOISE IMPACT STATEMENT	38



TABLES

Table 1	Noise Sensitive Receptors.....	8
Table 2	Measured Ambient Noise Levels – 67 Pacific Parade, Dee Why, NSW	11
Table 3	Amenity Criteria (NPI - Table 2.2).....	14
Table 4	Road Traffic Noise Assessment Criteria – Residential	17
Table 5	$L_{eq, 15 \text{ minute}}$ Sound Power Levels – Communal Open Space & Indoor Communal Areas	22
Table 6	$L_{AF, \text{max}}$ Sound Power Levels – Person Shouting - Communal Open Space & Indoor Communal Areas	22
Table 7	SEL & $L_{AF, \text{max}}$ Sound Power Levels - Car Park.....	24
Table 8	$L_{eq, 15 \text{ minute}}$ Sound Power Levels – Mechanical Plant	25
Table 9	Predicted $L_{eq, 15 \text{ min}}$ Noise Levels – Resident & Guest Noise – Night (10 pm – 7 am)	27
Table 10	Predicted $L_{eq, 15 \text{ min}}$ Noise Levels – Use of the Car Park – Night (10 pm – 7 am)	28
Table 11	Predicted $L_{eq, 15 \text{ min}}$ Noise Levels – Mechanical Plant – Night (10 pm – 7 am)	29
Table 12	Predicted $L_{Aeq, 15 \text{ min}}$ Noise Levels – Inaudibility Criterion – Night (10 pm – 7 am)	30
Table 13	Predicted $L_{AF, \text{max}}$ Noise Levels – Sleep Disturbance – Night (10 pm – 7 am)	31
Table 14	Predicted $L_{eq, 1 \text{ hour}}$ Noise Levels – On – Road Traffic	32
Table 15	Total L_{max} Events at Location ‘A’ During Assessment Period	36
Table 16	Predicted $L_{eq, 15 \text{ min}}$ Noise Levels – Resident & Guest Noise – After Noise Controls	37



1.0 EXECUTIVE SUMMARY

BL 2093 Pty Ltd is preparing a Development Application for a new co-living development to be located at 67 Pacific Street, Dee Why, NSW. Northern Beaches Council will likely require an acoustic report that assesses the environmental noise impact of the proposal on the surrounding area.

The development site is located on land zoned *R3 – Medium Density Residential* under the Warringah Local Environmental Plan (LEP) 2011. The nearest noise sensitive receivers that could be potentially affected by noise associated with the co-living development are located to the north, east, south, south-west and west of the site.

The new co-living development will consist of a multi-storey building with manager's residence, 25 micro apartments, three internal communal areas (ICAs), two outdoor communal open space (COS) areas, and a two level basement car park with the provision for 13 vehicles.

The co-living development is likely to be served by mechanical plant including an air conditioning system, kitchen exhaust fans, car park exhaust/supply fans and toilet exhaust fan.

Acceptable noise limits are derived from the NSW Environment Protection Authority's (EPA) *Noise Policy for Industry* and *NSW Road Noise Policy* for mechanical plant, residents and vehicle noise. In addition, noise limits for the use of air conditioning and electrically amplified sound equipment during the night time period are assessed against the provisions of the EPA's *Protection of the Environment Operations (Noise Control) Regulation 2017* (POEO).

This assessment considers the noise impact from the co-living development. Noise emission calculations from the residents are based on the predicted activities within the ICAs and COS area, micro apartments, and the proposed use of the basement car park. Noise emission calculations from the mechanical plant is based on typical units for the size of the development.

All calculations are based on the Benson McCormack Architecture drawings for project numbers 2004A, dated 24 November 2020, attached as Appendix C.

Recommendations are made in Section 6.0 of this report to ensure the level of noise emission is within acceptable limits.

Providing the noise control recommendations presented in Section 6.0 are adhered to, the noise emission from the proposed development will comply with the NSW EPA's noise criteria as outlined in Section 4.3.



2.0 CONSULTING BRIEF

Day Design Pty Ltd has been engaged by Benson McCormack Architecture on behalf of BL 2093 Pty Ltd to assess the potential environmental noise impact of a proposed co-living development at 67 Pacific Parade, Dee Why, NSW.

This commission involves the following:

Scope of Work:

- Inspect the site and environs
- Prepare a site plan identifying the development and nearby noise sensitive locations
- Measure the background noise levels at critical locations and times
- Establish acceptable noise emission criteria
- Quantify noise emissions from the development
- Calculate the level of noise emission, taking into account building envelope transmission loss, screen walls and distance attenuation
- Provide recommendations for noise control
- Prepare an Environmental Noise Assessment Report.



3.0 PROJECT & DEVELOPMENT DESCRIPTION

3.1 Local Area Description

The development site is located at 67 Pacific Parade, Dee Why, NSW on land zoned R3 – *Medium Density Residential* under Warringah Local Environmental Plan (LEP) 2011.

The nearest noise sensitive receivers are located at the residential buildings to the north, east, south, south-west and west of the site, shown in Figure 1 as locations 'R1' to 'R5c'.

The location of the proposed development and surrounding premises, in various directions, are shown in Figure 1 and summarised below in Table 1.

Table 1 Noise Sensitive Receptors

Receptor and Type	Address	Building Height	Direction from site
R1 – Residential	62 Pacific Parade ¹ - Ground Floor	Three Storey	North
R1a – Residential	Second Floor		
R2 – Residential	1-5 The Crescent - Ground Floor (front)	Three Storey	East
R2a – Residential	Second Floor (front)		
R2b – Residential	Ground Floor (rear)		
R2c – Residential	Second Floor (rear)		
R3 – Residential	9-11 The Crescent ² - Ground Floor	Two Storey	South
R3a – Residential	First Floor		
R4 – Residential	63 Pacific Parade - Ground Floor	Three Storey	South-West
R4a – Residential	Second Floor		
R5 – Residential	65 Pacific Parade - Ground Floor (front)	Three Storey	West
R5a – Residential	Second Floor (front)		
R5b – Residential	Ground Floor (rear)		
R5c – Residential	Second Floor (rear)		

¹ Opposite side of Pacific Parade.

² Opposite side of The Crescent Reserve.



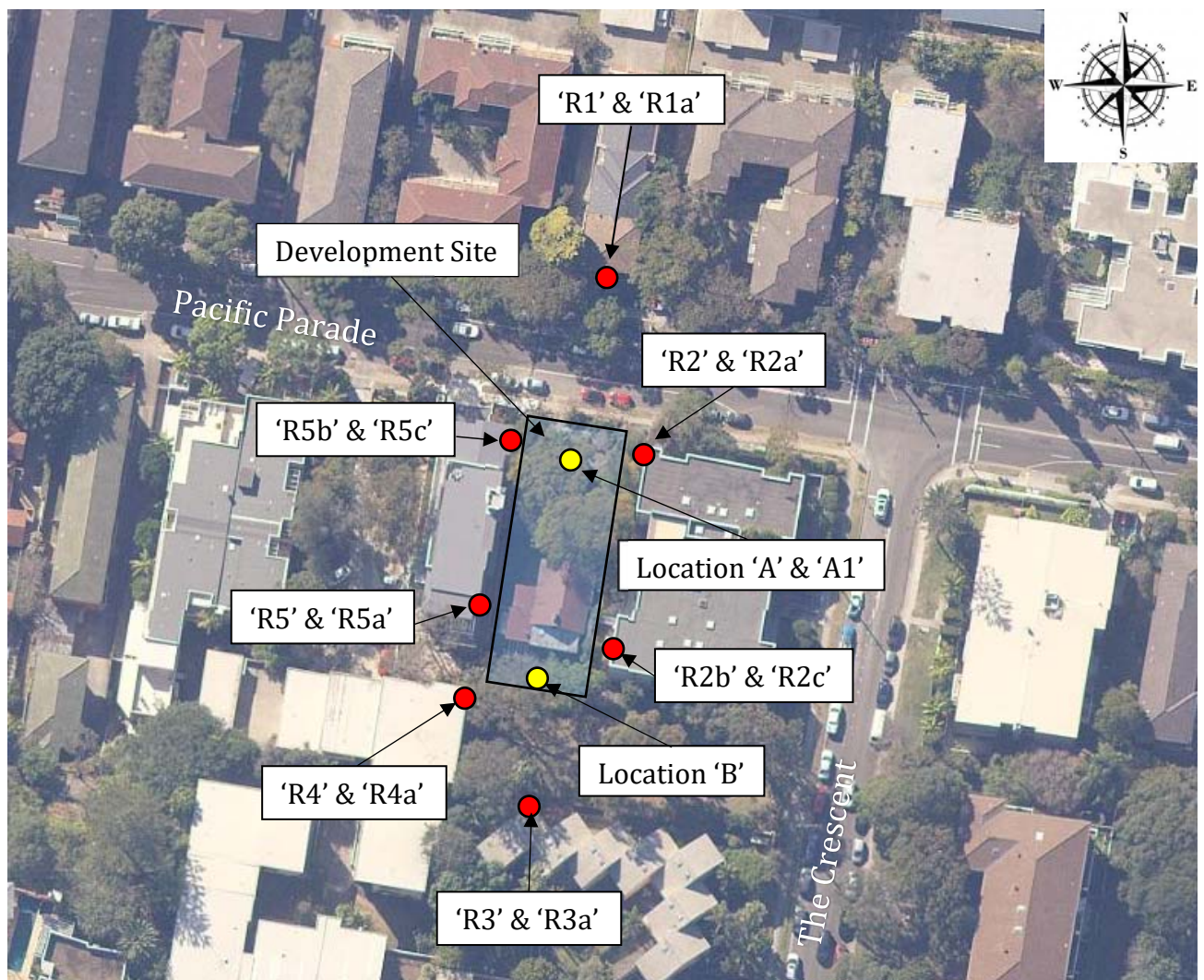


Figure 1. Location Plan – Proposed Co-Living Development, 67 Pacific Parade, Dee Why, NSW.

3.2 Development Description

It is proposed to construct a new co-living development at 67 Pacific Parade, Dee Why, NSW.

The new co-living development will consist of a multi-storey building with manager's residence, 25 micro apartments, three ICAs, two outdoor COS areas, and a two level basement car park with the provision for 13 vehicles, with entry and exit from Pacific Parade.

The co-living development will have capacity for up to 52 residents.

We have assumed each micro apartment will have its own associated mechanical plant, which may include bathroom exhaust fan, as well as air conditioning. We have also assumed the level 1 internal communal area may have a kitchen exhaust fan and the basement level car park will be served by a supply and exhaust fan.

4.0 ACOUSTICAL CRITERIA

4.1 Existing Ambient Noise Levels

4.1.1 Measured Ambient Noise Levels

In order to assess the severity of a possible environmental noise problem in a specified area it is necessary to measure the ambient background noise level at the times and locations of worst possible annoyance. The lower the background noise level, the more perceptible the intrusive noise becomes and the more potentially annoying.

The ambient L_{90} background noise level is a statistical measure of the sound pressure level that is exceeded for 90% of the measuring period (typically 15 minutes).

The Rating Background Level (RBL) is defined by the EPA as the median value of the (lower) tenth percentile of L_{90} ambient background noise levels for day, evening or night periods, measured over a number of days during the proposed days and times of operation.

The places of worst possible annoyance are the residential premises located to the north, east, south, south-west and west of the development site. These potentially affected locations can be seen in Figure 1 as 'R1' to 'R5c'. The times of worst annoyance will be during the night when ambient noise is typically at its lowest.

It was not considered feasible for Day Design to gain access and measure the background noise levels at all 14 potentially affected residential receiver locations around the site (*access to all five properties[including individual apartments] to conduct simultaneous measurements would be required*), therefore, equivalent locations on the site were selected. The locations are considered suitable as the background noise level has been measured both in the front (also at first floor height) and rear set back of the site, providing representative background noise levels for all surrounding receptor locations. Day Design notes that the background noise in the area is mainly influenced by local fauna, local residents, and intermittent road traffic noise on Pacific Parade.

Ambient noise levels were measured on site at 67 Pacific Parade, Dee Why in the front at ground and first floor level, Locations 'A' and 'A1', and in the rear at ground level, Location 'B', as shown on Figure 1, from Tuesday 22 to Tuesday 29 September 2020.

The measured noise levels are presented in the attached Appendix B1, B2 and B3 and also below in Table 2.



Table 2 Measured Ambient Noise Levels – 67 Pacific Parade, Dee Why, NSW

Noise Measurement Location	Time Period	L ₉₀ Rating Background Level	Existing L _{eq} Noise Levels
Location 'A' - Front – Ground Floor	Day (7 am to 6 pm)	44 dBA	52 dBA
	Evening (6 pm to 10 pm)	41 dBA	50 dBA
	Night (10 pm to 7 am)	37 dBA	47 dBA
Location 'A1' - Front – First Floor	Day (7 am to 6 pm)	48 dBA	55 dBA
	Evening (6 pm to 10 pm)	44 dBA	53 dBA
	Night (10 pm to 7 am)	39 dBA	50 dBA
Location 'B' - Rear – Ground Floor	Day (7 am to 6 pm)	42 dBA	51 dBA
	Evening (6 pm to 10 pm)	39 dBA	45 dBA
	Night (10 pm to 7 am)	36 dBA	48 dBA

Meteorological conditions typically consisted of clear skies during the assessment period with temperatures ranging from 7 to 26°C. Some periods of rainfall and wind speeds greater than 5 m/s were recorded during the measurement survey period, however, this data has been removed from the RBL noise calculations. Ambient noise measurements were therefore considered reliable and typical for the receptor areas.

In addition to the above, short term attended noise level measurements were performed on Tuesday 22 September between 11.50 am – 12.05 pm at the rear of 67 Pacific Parade, adjacent to Location 'B', at ground and first floor level to establish the noise level difference, if any, at varying heights at the rear of the development site. The measured L₉₀, 15 minute existing ambient noise levels were 46 dBA at ground level and 48 dBA at first floor level.

Considering the above, first and second floor receiver locations at the rear of 67 Pacific Parade will be assessed against the long term measured ambient noise levels shown in Table 2 at Location 'B' plus 2 dB – to be referred to as Location 'B1' throughout the remainder of this report.

4.1.2 Description of Existing Acoustic Environment

Site inspections of the residential area surrounding the development site were conducted by Mr Ricky Thom of Day Design during the installation and retrieval of the environmental noise loggers with the following observations made:

- ambient noise in the area is dominated by the natural environment, predominantly local fauna and local residential based noise (such as lawn mowing, music, etc), with occasional local traffic noise;
- through traffic on Pacific Parade is intermittent;
- the nearest commercial zone is located circa 150 metres to the north-west – noise from the commercial zone was not heard on the development site.



4.2 Northern Beaches Council

Northern Beaches Council, in their Warringah Development Control Plan (DCP) 2011, as amended 28 February 2020, Part D3 – Noise, specifies the following requirements in relation to noise emissions:

D3 Noise

Applies to Land

This control applies to land to which Warringah Local Environmental Plan 2011 applies.

Objectives

- To encourage innovative design solutions to improve the urban environment.*
- To ensure that noise emission does not unreasonably diminish the amenity of the area or result in noise intrusion which would be unreasonable for occupants, users or visitors.*

Requirements

- Noise from combined operation of all mechanical plant and equipment must not generate noise levels that exceed the ambient background noise by more than 5 dB(A) when measured in accordance with the NSW Industrial Noise Policy at the receiving boundary of residential and other noise sensitive land uses.*
See also NSW Industrial Noise Policy Appendices
- Development near existing noise generating activities, such as industry and roads, is to be designed to mitigate the effect of that noise.*
- Waste collection and delivery vehicles are not to operate in the vicinity of residential uses between 10 pm and 6 am.*
- Where possible, locate noise sensitive rooms such as bedrooms and private open space away from noise sources. For example, locate kitchens or service areas closer to busy road frontages and bedrooms away from road frontages.*
- Where possible, locate noise sources away from the bedroom areas of adjoining dwellings/properties to minimise impact.'*

NOTE: The NSW Environment Protection Authority's *Industrial Noise Policy* 2000 was superseded by the *Noise Policy for Industry* in 2017. Therefore, the *Noise Policy for Industry* will be used to establish the appropriate noise criteria in this assessment.



4.3 NSW Environment Protection Authority

4.3.1 Noise Policy for Industry 2017

The NSW Environment Protection Authority (EPA) published the *Noise Policy for Industry* (NPI) in October 2017. The NPI is specifically aimed at assessing noise from industrial noise sources listed in Schedule 1 of the Protection of the Environment Operations Act 1997 (POEO, 1997).

The NPI provides a framework to assess noise emission from a premises, and whether that premises produces intrusive or non-intrusive noise.

4.3.1.1 Project Intrusiveness Noise Level

The EPA states in Section 2.3 of its NPI (October 2017) that the intrusiveness of an industrial noise source may generally be considered acceptable if the level of noise from the source (represented by the L_{Aeq} descriptor), measured over a 15-minute period, does not exceed the rating background noise level by more than 5 dB when beyond a minimum threshold (EPA NPI, 2017, Section 2.3).

The Rating Background Level at Location 'A', 67 Pacific Parade, Dee Why was 44 dBA during the day, 41 dBA in the evening and 37 dBA at night (see Table 2).

Therefore, the acceptable $L_{eq, 15 \text{ minute}}$ noise intrusiveness criteria in Location 'A':

- $(44 + 5 =) 49 \text{ dBA } L_{eq, 15 \text{ minute}}$ during the day;
- $(41 + 5 =) 46 \text{ dBA } L_{eq, 15 \text{ minute}}$ in the evening; and
- $(37 + 5 =) 42 \text{ dBA } L_{eq, 15 \text{ minute}}$ at night.

The Rating Background Level at Location 'A1', 67 Pacific Parade, Dee Why was 48 dBA during the day, 44 dBA in the evening and 39 dBA at night (see Table 2).

Therefore, the acceptable $L_{eq, 15 \text{ minute}}$ noise intrusiveness criteria in Location 'A1':

- $(48 + 5 =) 53 \text{ dBA } L_{eq, 15 \text{ minute}}$ during the day;
- $(44 + 5 =) 49 \text{ dBA } L_{eq, 15 \text{ minute}}$ in the evening; and
- $(39 + 5 =) 44 \text{ dBA } L_{eq, 15 \text{ minute}}$ at night.

The Rating Background Level at Location 'B', 67 Pacific Parade, Dee Why was 42 dBA during the day, 39 dBA in the evening and 36 dBA at night (see Table 2).

Therefore, the acceptable $L_{eq, 15 \text{ minute}}$ noise intrusiveness criteria in Location 'B':

- $(42 + 5 =) 47 \text{ dBA } L_{eq, 15 \text{ minute}}$ during the day;
- $(39 + 5 =) 44 \text{ dBA } L_{eq, 15 \text{ minute}}$ in the evening; and
- $(36 + 5 =) 41 \text{ dBA } L_{eq, 15 \text{ minute}}$ at night.



Based on the Rating Background Level at Location 'B' plus 2 dB, the acceptable $L_{eq, 15 \text{ minute}}$ noise intrusiveness criteria in Location 'B1' is as follows:

- $(44 + 5 =) 49 \text{ dBA } L_{eq, 15 \text{ minute}}$ during the day;
- $(41 + 5 =) 46 \text{ dBA } L_{eq, 15 \text{ minute}}$ in the evening; and
- $(38 + 5 =) 43 \text{ dBA } L_{eq, 15 \text{ minute}}$ at night.

4.3.1.2 Protect Amenity Noise Level

Depending on the type of area in which the noise is being made, there is a certain reasonable expectancy for noise amenity. The NSW *NPI* provides a schedule of recommended L_{eq} industrial noise levels that under normal circumstances should not be exceeded. If successive developments occur near a residential area, each one allowing a criterion of background noise level plus 5 dB, the ambient noise level will gradually creep higher.

Section 2.4, Table 2.3 of the *NPI* provides guidance on assigning residential receiver noise categories. A site inspection of the residential area surrounding the development site was conducted by Mr Ricky Thom of Day Design during the installation and retrieval of the environmental noise logger, see Sections 4.1.2 for observations.

The observations in Section 4.1.2 indicate the residential area around the development site is considered 'Suburban', as per Table 2.3 of the *NPI*. The 'Suburban' amenity noise levels as per Table 2.3 of the *NPI* will be used to assess residential receivers in the area.

The recommended L_{eq} noise levels below in Table 3 are taken from Section 2.4, Table 2.2 of the *NPI*. Compliance with the Noise Amenity levels in Table 2.2 will limit ambient noise creep.

Table 3 Amenity Criteria (NPI - Table 2.2)

Receiver	Noise Amenity Area	Time of Day	L_{eq} , dBA, Recommended Amenity Noise Level
Residential	Suburban	Day	55
		Evening	45
		Night	40

The L_{Aeq} is determined over a 15-minute period for the project intrusiveness noise level and over an assessment period (day, evening and night) for the project amenity noise level. This leads to the situation where, because of the different averaging periods, the same numerical value does not necessarily represent the same amount of noise heard by a person for different time periods. To standardise the time periods for the intrusiveness and amenity noise levels, the *NPI* assumes that the $L_{Aeq, 15 \text{ min}}$ will be taken to be equal to the $L_{Aeq, \text{period}} + 3 \text{ decibels (dB)}$ (Section 2.2, *NPI*).



Compliance with the amenity criteria will limit ambient noise creep. **Section 2.4** of the *NPI* states the following:

*'To ensure that industrial noise levels (existing plus new) remain within the recommended amenity noise levels for an area, a **project amenity noise level** applies for each new source of industrial noise as follows:*

- ***Project amenity noise level for industrial developments = recommended amenity noise level (Table 2.2) minus 5 dB (A).***

The following exceptions to the above method to derive the project amenity noise level apply:

3. *Where the resultant project amenity noise level is 10 dB or more lower than the existing industrial noise level. In this case the project amenity noise levels can be set at 10 dB below existing industrial noise levels if it can be demonstrated that existing industrial noise levels are unlikely to reduce over time.'*

The existing L_{eq} noise level at Location 'A', 67 Pacific Parade, Dee Why was 52 dBA during the day, 50 dBA in the evening and 47 dBA at night (see Table 2).

Therefore, the acceptable amenity criteria in Location 'A' are:

- $(55 - 5 + 3 =) 53$ dBA $L_{eq, 15 \text{ minute}}$ during the day;
- $(45 - 5 + 3 =) 43$ dBA $L_{eq, 15 \text{ minute}}$ in the evening; and
- $(47 - 10 + 3 =) 40$ dBA $L_{eq, 15 \text{ minute}}$ at night.

The existing L_{eq} noise level at Location 'A1', 67 Pacific Parade, Dee Why was 55 dBA during the day, 53 dBA in the evening and 50 dBA at night (see Table 2).

Therefore, the acceptable amenity criteria in Location 'A1' are:

- $(55 - 5 + 3 =) 53$ dBA $L_{eq, 15 \text{ minute}}$ during the day;
- $(53 - 10 + 3 =) 46$ dBA $L_{eq, 15 \text{ minute}}$ in the evening; and
- $(50 - 10 + 3 =) 43$ dBA $L_{eq, 15 \text{ minute}}$ at night.

The existing L_{eq} noise level at Location 'B', 67 Pacific Parade, Dee Why was 51 dBA during the day, 45 dBA in the evening and 48 dBA at night (see Table 2).

Therefore, the acceptable amenity criteria in Location 'B' are:

- $(55 - 5 + 3 =) 53$ dBA $L_{eq, 15 \text{ minute}}$ during the day;
- $(45 - 5 + 3 =) 43$ dBA $L_{eq, 15 \text{ minute}}$ in the evening; and
- $(48 - 10 + 3 =) 41$ dBA $L_{eq, 15 \text{ minute}}$ at night.

Based on the measured ambient noise level at Location 'B' plus 2 dB, the acceptable $L_{eq, 15 \text{ minute}}$ amenity criteria in Location 'B1' is as follows:

- $(55 - 5 + 3 =) 53$ dBA $L_{eq, 15 \text{ minute}}$ during the day;
- $(45 - 5 + 3 =) 43$ dBA $L_{eq, 15 \text{ minute}}$ in the evening; and
- $(50 - 10 + 3 =) 43$ dBA $L_{eq, 15 \text{ minute}}$ at night.



4.3.1.3 Sleep Disturbance Criteria

The EPA's *NPI* states in Section 2.5 that the potential for sleep disturbance from maximum noise level events from premises during the night-time period needs to be considered. Sleep disturbance is considered to be both awakenings and disturbance to sleep stages.

Sleep may be disturbed if the subject development night-time noise levels at a residential location exceed the following:

- $L_{Aeq, 15min}$ 40 dBA or the prevailing RBL plus 5 dB, whichever is greater; and/or
- L_{AFmax} 52 dBA or the prevailing RBL plus 15 dB, whichever is greater.

Where either of the above criteria are triggered, a detailed maximum noise level event assessment should be undertaken.

The RBL at Location 'A', 67 Pacific Parade, Dee Why was 37 dBA at night (see Table 2).

Therefore, the acceptable $L_{eq, 15 \text{ minute}}$ and L_{AFmax} noise sleep disturbance criteria in Location 'A' are:

- 42 dBA $L_{eq, 15 \text{ minute}}$ at night; and/or
- 52 dBA L_{AFmax} at night.

The RBL at Location 'A1', 67 Pacific Parade, Dee Why was 39 dBA at night (see Table 2).

Therefore, the acceptable $L_{eq, 15 \text{ minute}}$ and L_{AFmax} noise sleep disturbance criteria in Location 'A1' are:

- 44 dBA $L_{eq, 15 \text{ minute}}$ at night; and/or
- 54 dBA L_{AFmax} at night.

The RBL at Location 'B', 67 Pacific Parade, Dee Why was 36 dBA at night (see Table 2).

Therefore, the acceptable $L_{eq, 15 \text{ minute}}$ and L_{AFmax} noise sleep disturbance criteria in Location 'B' are:

- 41 dBA $L_{eq, 15 \text{ minute}}$ at night; and/or
- 52 dBA L_{AFmax} at night.

Based on the Rating Background Level at Location 'B' plus 2 dB, the acceptable $L_{eq, 15 \text{ minute}}$ and L_{AFmax} noise sleep disturbance criteria in Location 'B1' are:

- 43 dBA $L_{eq, 15 \text{ minute}}$ at night; and/or
- 53 dBA L_{AFmax} at night.



4.3.2 NSW Road Noise Policy

The EPA's NSW Road Noise Policy, Table 3 of Section 2.3.1, sets out road traffic noise assessment criteria for residential land uses. The information in the aforementioned table is extracted below in Table 4.

Table 4 Road Traffic Noise Assessment Criteria – Residential

Road Category	Type of project/land use	Assessment Criteria – dBA	
		Day (7 am – 10 pm)	Night (10 pm – 7 am)
Local roads	6. Existing residences affected by additional traffic on existing local roads generated by land use developments	L _{Aeq} , (1 hour) 55 (external)	L _{Aeq} , (1 hour) 50 (external)

4.3.3 Protection of the Environment Operations (Noise Control) Regulation 2017

The Protection of the Environment Operations (POEO) (Noise Control) Regulation 2017 provides specific controls for common neighbourhood noise problems such as air conditioners, swimming pool pumps, power tools, alarms and loud music.

The Regulation (clause 45) states the following in relation to the use of air conditioners:

“45 Use of air conditioners on residential premises

A person is guilty of an offence if:

- (a) *the person causes or permits an air conditioner to be used on residential premises in such a manner that it emits noise that can be heard within any room in any other residential premises (that is not a garage, storage area, bathroom, laundry, toilet or pantry) whether or not any door or window to that room is open:*
 - (i) *before 8 am or after 10 pm on any Saturday, Sunday or public holiday, or*
 - (ii) *before 7 am or after 10 pm on any other day.”*

Provided the noise emission from an air conditioner complies with the inaudibility criterion of the Regulation, the air conditioner may operate at any time of day or night. To comply with the inaudibility criterion, we recommend that the L_{eq} (15 min) noise level from domestic air conditioners not exceed a noise level equal to ('external background' -5 dB =) outside the window of the nearest habitable room of an adjacent residence.



The Regulation (clause 58) states the following in relation to the use of amplified music:

“58 Use of electrically amplified sound equipment

(1) A person is guilty of an offence if:

- (a) the person causes or permits electrically amplified sound equipment to be used on residential premises in such a manner that it emits noise that can be heard within any room in any other residential premises (that is not a garage, storage area, bathroom, laundry, toilet or pantry) whether or not any door or window to that room is open:*
 - (i) Before 8 am or after midnight on any Friday, Saturday or day immediately before a public holiday, or*
 - (ii) Before 8 am or after 10 pm on any other day, and*
- (b) within 7 days of doing so, the person is warned by an authorised officer or enforcement officer not to cause or permit electrically amplified sound equipment to be used on residential premises in that manner, and*
- (c) the person again causes or permits electrically amplified sound equipment to be used on residential premises in a manner referred to in paragraph (a) within 28 days after the warning has been given.*

Maximum penalty : 100 penalty units in the case of a corporation or 50 penalty units in the case of an individual.

(2) In this clause:

electrically amplified sound equipment means any electrical or battery powered device that can be used to make or amplify sound including television sets and home entertainment systems.”



4.4 Project Specific Noise Criteria

The measured background noise level at Locations 'A', 'A1' and 'B', has been used to establish the noise criteria at all receptor locations.

4.4.1 Residential Receptors

The L_{eq} noise emissions from the residents, use of the car park and mechanical plant are assessed against the NSW NPI at the residential receptors as follows:

'R1', 'R2' and 'R5b' – Based on measured noise levels in Location 'A'

- **49 dBA** $L_{Aeq, 15 \text{ minute}}$ during the day;
- **43 dBA** $L_{Aeq, 15 \text{ minute}}$ in the evening; and
- **40 dBA** $L_{Aeq, 15 \text{ minute}}$ at night.

'R1A', 'R2A' and 'R5c' – Based on measured noise levels in Location 'A1'

- **53 dBA** $L_{Aeq, 15 \text{ minute}}$ during the day;
- **46 dBA** $L_{Aeq, 15 \text{ minute}}$ in the evening; and
- **43 dBA** $L_{Aeq, 15 \text{ minute}}$ at night.

'R2b', 'R3', 'R4', and 'R5' – Based on measured noise levels in Location 'B'

- **47 dBA** $L_{Aeq, 15 \text{ minute}}$ during the day;
- **43 dBA** $L_{Aeq, 15 \text{ minute}}$ in the evening; and
- **41 dBA** $L_{Aeq, 15 \text{ minute}}$ at night.

'R2c', 'R3a', 'R4a', and 'R5a' – Based on measured noise levels in Location 'B1'

- **49 dBA** $L_{Aeq, 15 \text{ minute}}$ during the day;
- **43 dBA** $L_{Aeq, 15 \text{ minute}}$ in the evening; and
- **43 dBA** $L_{Aeq, 15 \text{ minute}}$ at night.

These criteria are to be assessed at the most affected point on or within the property boundary during the day. For upper residential floors, the noise is assessed outside the nearest window.

In addition, for the noise emission from domestic air conditioning units or amplified sound equipment to be inaudible within a habitable room of an adjacent residential dwelling, the level of noise should not exceed the following noise levels:

- Location 'A' - (37 – 5 =) **32 dBA** outside the nearest window during the night;
- Location 'A1' - (39 – 5 =) **34 dBA** outside the nearest window during the night;
- Location 'B' - (36 – 5 =) **31 dBA** outside the nearest window during the night; &
- Location 'B1' - (38 – 5 =) **33 dBA** outside the nearest window during the night.



4.4.2 Sleep Disturbance Criteria

The following criteria will be applied for *sleep disturbance* outside a bedroom window between 10 pm and 7 am at the nearby residential receptors, as follows:

'R1', 'R2' and 'R5b' – Based on measured noise levels in Location 'A'

- **52 dBA** L_{AFmax} between 10 pm and 7 am.

'R1A', 'R2A' and 'R5c' – Based on measured noise levels in Location 'A1'

- **54 dBA** L_{AFmax} between 10 pm and 7 am.

'R2b', 'R3', 'R4', and 'R5' – Based on measured noise levels in Location 'B'

- **52 dBA** L_{AFmax} between 10 pm and 7 am.

'R2c', 'R3a', 'R4a', and 'R5a' – Based on measured noise levels in Location 'B1'

- **53 dBA** L_{AFmax} between 10 pm and 7 am.

4.4.3 On – Road Traffic Criteria

The following criteria will be applied at 1 metre from the most affected façade of 'R1', 'R1a', 'R2', 'R2a', 'R5b' and 'R5c', for on – road traffic noise:

- **55 dBA** (external) $L_{eq, 1 \text{ hour}}$ between 7 am and 10 pm; and
- **50 dBA** (external) $L_{eq, 1 \text{ hour}}$ between 10 pm and 7 am.



5.0 DEVELOPMENT NOISE EMISSION

The main sources of noise from the proposed development will be as follows:

- COS areas;
- ICAs;
- Amplified sound equipment in micro apartments;
- Mechanical plant; and
- Vehicles entering and exiting the car park.

The noise impact from the above potential noise sources has been calculated, and the noise impact established for the most affected residential receptors.

The location of the COS areas, ICAs, plant area and car park are shown on the drawings provided by Benson McCormack Architecture for project numbers 2004A, dated 24 November 2020, attached as Appendix C.

5.1 Communal Open Space & Indoor Communal Areas

The COS areas are located on the southern side of level 1 (area of 32.8 m²) and the northern side of level 3 (area of 35.7 m²). The ICAs are located on the southern side of the upper ground level (area of 76.8 m²), the southern side of level 1 (area of 58.4 m²) and the northern side of level 3 (area of 19.0 m²).

Based on the floor areas (one person per 2 m²), we have been advised that the capacity for people in the COS and ICAs at any given time, are as follows:

- Level 1 COS 16 people;
- Level 3 COS 18 people;
- Upper ground indoor communal area 38 people;
- Level 1 indoor communal area 29 people; and
- Level 3 indoor communal area 10 people.

We have modelled the noise emission from the COS areas and ICAs as people speaking with a raised voice (10%), a normal voice (40%) and the rest listening or not speaking (50%). For the assessment of sleep disturbance, we have modelled the noise emission from the COS areas and ICAs and as one person shouting.

We have modelled windows and doors (upper ground level and level 3, only) to the ICAs as being partially open (10% of floor area).



Based on information in Harris¹ and in our noise level database gathered over many years, we calculate the sound power levels for people talking with a raised voice, a normal voice and shouting as shown below in Tables 5 and 6.

Table 5 **Leq, 15 minute Sound Power Levels – Communal Open Space & Indoor Communal Areas**

Description	Leq, 15 minute Sound Power Levels (dBA)
	dBA
One man talking with raised voice	69
One man talking with normal voice	63
Level 1 – Communal Open Space	
16 people talking (10% raised, 40% normal & 50% listening)	74
Level 3 – Communal Open Space	
18 people talking (10% raised, 40% normal & 50% listening)	75
Upper Ground - Indoor Communal Area	
38 people talking (10% raised, 40% normal & 50% listening)	78
Level 1 - Indoor Communal Area	
29 people talking (10% raised, 40% normal & 50% listening)	77
Level 3 - Indoor Communal Area	
10 people talking (10% raised, 40% normal & 50% listening)	72

Table 6 **LAF, max Sound Power Levels – Person Shouting - Communal Open Space & Indoor Communal Areas**

Description	LAF, max Sound Power Level dBA
Female/Male Shout	88 - 98

¹ Handbook of Acoustical Measurements and Noise Control, Third Edition, Cyril M. Harris, McGraw-Hill Inc, New York, (Page 16.2)



5.2 Amplified Sound Equipment In Micro Apartments

We have been advised that there will be no connection point for a traditional television antennae or high speed internet cabling in the building. All services to the building will be via broadband / fibre supported Wi-Fi.

We have also been advised that as part of the lodging agreement, future tenants are advised that they are bound by a strict policy of no amplified music or entertainment that could adversely affect the acoustic amenity of fellow residents or neighbours, failure to comply with this can lead to grounds for, at the discretion of the on-site manager, termination of the lodging agreement.

All micro apartments are air-conditioned and have at least one openable window.

Notwithstanding the above, the noise level from amplified sound equipment can vary depending on each person's personal preference. A test was carried out by Day Design staff to determine the noise level created when listening to a YouTube video. The sound was set to be loud enough to fill a small room at a medium volume.

The measured $L_{eq,15\text{minute}}$ reverberant sound pressure level of 61 dBA has been used to calculate the noise impact of residents' amplified sound equipment on neighbours.

We have modelled windows to the micro apartments as being partially open (50% of the window areas).



5.3 Car Park Noise Emission

Traffic movement has been calculated using the 'Traffic & Parking Impact Assessment, Proposed Co-Living Development, 67 Pacific Parade, Dee Why' prepared by Stanbury Traffic Planning dated November 2020 (Reference: 20-176-2).

The abovementioned report calculates the number of vehicle trips during the peak usage hour to be 10, equivalent to 3 vehicle trips/15 minutes.

We have assumed that during the night time period (10 pm to 7 am) the number of vehicle trips will halve. Therefore, number of vehicle trips during the night time period is equivalent to 1.5 vehicle trips/15 minutes.

For the assessment of sleep disturbance we have assumed a vehicle may leave/arrive at the car park between 10 pm and 7 am.

The Sound Exposure Level¹ (SEL) and $L_{AF, max}$ sound power level and spectra of vehicle noise is shown below in Table 7 and is based on previous measurements by Day Design.

Table 7 SEL & $L_{AF, max}$ Sound Power Levels - Car Park

Description	Sound Power Levels (dB) at Octave Band Centre Frequencies (Hz)								
	dBA	63	125	250	500	1k	2k	4k	8k
SEL level of car drive by at approximately 10 km/h	82	90	87	80	78	77	72	70	64
SEL level of car drive by at approximately 20 km/h	86	101	94	85	81	81	76	75	68
$L_{AF, max}$ level of car entering -exiting the car park	92	98	92	90	88	88	83	80	76

¹ SEL is the total sound energy of a single noise event condensed into a one second duration.



5.4 Mechanical Plant Noise Emission

The mechanical plant, including kitchen exhaust fans, car park exhaust/supply fans, and lift motor, have not been selected at this stage. Details of the proposed air conditioning condensers and bathroom exhaust fans have been provided by the client.

A preliminary noise assessment will be based on typical kitchen exhaust fans, car park exhaust/supply fans, and lift motor for the size of the development, with sound power levels from typical units being used. Sound level data has been provided by the client for the proposed air conditioning condensers and bathroom exhaust fans.

The architectural drawings show that the air conditioning condenser units will be located in a designated plant area in the middle of the eastern façade on each level (3 x units for each floor) with the services risers located adjacent to the south. We have assumed that the bathroom exhaust fans will penetrate the external wall of the micro apartment it services, the level 1 kitchen exhaust fan, car park exhaust fan and car park supply fan will exhaust/intake at roof level between grid lines 3 and 4 and C and D, and the lift motor will be located in the basement level in close proximity to the lift shaft.

Sound power levels used in the calculation of noise emission from the mechanical plant are shown below in Table 8.

Table 8 **Leq, 15 minute Sound Power Levels – Mechanical Plant**

Description	Sound Power Levels (dB)								
	at Octave Band Centre Frequencies (Hz)								
	dBA	63	125	250	500	1k	2k	4k	8k
Outdoor Condenser Unit ¹	61	66	64	64	60	54	48	40	34
Bathroom Exhaust Fan ²	55	53	52	57	55	48	43	36	27
Kitchen Exhaust Fan ³	60	66	60	59	57	54	52	49	46
Car Park Exhaust Fan ⁴	85	87	86	85	83	79	77	75	67
Car Park Supply Fan ⁵	79	77	77	80	79	73	70	63	54
Hydraulic Lift Motor ⁶	63	59	61	55	59	58	56	52	48

We recommend a detailed analysis be carried out once the mechanical plant is selected and locations are finalised, prior to the issue of a Construction Certificate.

¹ Spectral sound power level based on Daiken 5MXM100RVMA, outdoor condenser unit.

² Spectral Sound power level based on Chico 125 – Thru-Wall Wall Mounted Exhaust

³ Spectral sound power level based on a domestic kitchen exhaust fan previously assessed by Day Design.

⁴ Spectral Sound power level based on Fantech AP0714BA7/30.

⁵ Spectral Sound power level based on Fantech AP0564LP12/17.

⁶ Spectral sound power level based on a residential lift system previously measured by Day Design.



5.5 Predicted Noise Levels

Knowing the sound power level (see Table 5 to Table 8) and sound pressure level (see Section 5.2) of a noise source, the sound pressure level (as measured with a sound level meter) can be calculated at a remote location using suitable formulae to account for distance losses and sound barriers.

The most stringent noise criteria have been used to assess the noise impact from the COS areas, ICAs, amplified sound equipment in micro apartments, the use of the car park and the mechanical plant, as outlined below. The noise impact from these sources has been assessed against the *NPI* night time and sleep disturbance criteria, as stated within Section 4.4. Compliance with the most stringent noise criteria will ensure compliance during all other time periods.

The noise impact from the use of air conditioners and amplified sound equipment has also been assessed against the provisions of the *POEO*, as stated in Section 4.4.1.

The noise impact from additional on road traffic associated with the development has been assessed against the NSW *RNP*, as stated in Section 4.4.3.

The following boundary fence heights have been assumed, to account for the attenuation of noise produced by the proposed co-living development:

- Assumed 1.2 metre high fence bounding the level 3 COS area.

Where applicable, calculations also include reductions for the acoustic screening provided by the co-living development building.

All predictions in Table 9 to Table 14 are based on the assumptions outlined above and the proposed construction detailed in the architectural drawings, attached as Appendix C.



5.5.1 Resident & Guest Noise – Communal Open Space & Indoor Communal Areas

The predicted $L_{eq, 15 \text{ minute}}$ level of noise from residents and their guests using the COS and ICAs, assessed at the nearest affected residential premises during the night time period, is shown below in Table 9.

Table 9 Predicted $L_{eq, 15 \text{ min}}$ Noise Levels – Resident & Guest Noise – Night (10 pm – 7 am)

Description	Predicted Noise Level $L_{eq, 15 \text{ minute}}$ (dBA) at Receptor Locations						Acceptable Noise Limit	Compliance Yes/No
	L1 COS	L3 COS	UG ICA	L1 ICA	L3 ICA	Cumulative Noise Level		
R1	< 10	25	< 10	< 10	15	25	40	Yes
R1a	< 10	29	11	12	20	30	43	Yes
R2	12	35	< 10	28	22	36	40	Yes
R2a	12	42	< 10	28	31	43	43	Yes
R2b	45	24	< 10	41	< 10	46	41	No (+5 dB)
R2c	43	33	< 10	41	< 10	46	43	No (+3 dB)
R3	22	15	< 10	20	< 10	25	41	Yes
R3a	25	17	< 10	24	< 10	28	43	Yes
R4	31	15	< 10	26	< 10	32	41	Yes
R4a	43	22	15	39	< 10	45	43	No (+2 dB)
R5	34	20	25	40	< 10	41	41	Yes
R5a	46	25	33	44	< 10	48	43	No (+5 dB)
R5b	12	24	37	35	20	40	40	Yes
R5c	12	26	37	35	26	40	43	Yes

The predicted $L_{eq, 15 \text{ minute}}$ noise levels from residents and their guests within the COS areas and ICAs at the residential receptors exceed the are below the night time noise criteria established in Section 4.4 of this report for receptor locations 'R1' to 'R2a', 'R3' to 'R4', 'R5' and 'R5b' to 'R5c', but exceed the night time noise criteria for receptor locations 'R2b' to 'R2c', 'R4a' and 'R5a'. Therefore, noise controls will be required, as recommended within Section 6.0.



5.5.2 Car Park Noise

The predicted $L_{eq, 15 \text{ minute}}$ level of noise from the use of the car park driveway, assessed at the nearest affected residential premises during the night time period, is shown in Table 10.

Table 10 Predicted $L_{eq, 15 \text{ min}}$ Noise Levels – Use of the Car Park – Night (10 pm – 7 am)

Description	Predicted Noise Level $L_{eq, 15 \text{ minute}}$ (dBA) at Receptor Locations		
	Use of Car Park Driveway	Acceptable Noise Limit	Compliance - Yes/No
R1	32	40	Yes
R1a	34	43	Yes
R2	30	40	Yes
R2a	36	43	Yes
R2b	10	41	Yes
R2c	11	43	Yes
R3	11	41	Yes
R3a	< 10	43	Yes
R4	< 10	41	Yes
R4a	< 10	43	Yes
R5	10	41	Yes
R5a	11	43	Yes
R5b	36	40	Yes
R5c	37	43	Yes

The predicted $L_{eq, 15 \text{ minute}}$ noise levels from the use of the car park driveway at the residential receptors are below the night time noise criteria in Section 4.4 of this report, and are therefore acceptable.



5.5.3 Mechanical Plant Noise

The predicted $L_{eq, 15 \text{ minute}}$ level of noise from the operation of mechanical plant, assessed at the nearest affected residential premises during the night time period, is shown in Table 11.

Table 11 Predicted $L_{eq, 15 \text{ min}}$ Noise Levels – Mechanical Plant – Night (10 pm – 7 am)

Description	Predicted Noise Level $L_{eq, 15 \text{ minute}}$ (dBA) at Receptor Locations		
	Mechanical Plant	Acceptable Noise Limit	Compliance - Yes/No
R1	32	40	Yes
R1a	36	43	Yes
R2	50	40	No (+ 10 dB)
R2a	54	43	No (+ 11 dB)
R2b	48	41	No (+ 7 dB)
R2c	52	43	No (+ 11 dB)
R3	30	41	Yes
R3a	33	43	Yes
R4	30	41	Yes
R4a	36	43	Yes
R5	28	41	Yes
R5a	31	43	Yes
R5b	40	40	Yes
R5c	45	43	No (+ 2 dB)

The predicted $L_{eq, 15 \text{ minute}}$ noise levels from the use of mechanical plant are below the night time noise criteria established in Section 4.4 of this report for receptor locations 'R1' to 'R1a' and 'R3' to 'R5b', but exceed the night time noise criteria for receptor location 'R2' to 'R2c' and 'R5c'. Therefore, noise controls will be required, as recommended within Section 6.0.



5.5.4 Air Conditioning Unit & Amplified Sound Equipment – Inaudibility Criterion (POEO)

The predicted $L_{Aeq, 15 \text{ minute}}$ levels of noise from the air conditioning condenser units and amplified sound equipment within the micro apartments, at the residential receptors, are shown below in Table 12.

Table 12 Predicted $L_{Aeq, 15 \text{ min}}$ Noise Levels – Inaudibility Criterion – Night (10 pm – 7 am)

Description	Predicted Noise Level $L_{eq, 15 \text{ minute}}$ (dBA) at Receptor Locations			
	Air Conditioning Operating (ACO)	Amplified Sound Equipment (ASE)	Acceptable Noise Limit	Compliance - Yes/No (ACO/ASE)
R1	15	21	32	Yes/Yes
R1a	17	21	34	Yes/Yes
R2	39	27	32	No/Yes
R2a	39	27	34	No/Yes
R2b	40	27	31	No/Yes
R2c	38	27	33	No/Yes
R3	22	19	31	Yes/Yes
R3a	26	24	33	Yes/Yes
R4	< 10	28	31	Yes/Yes
R4a	< 10	28	33	Yes/Yes
R5	< 10	29	31	Yes/Yes
R5a	< 10	29	33	Yes/Yes
R5b	< 10	29	32	Yes/Yes
R5c	< 10	29	34	Yes/Yes

The predicted L_{Aeq} levels of noise from the amplified sound equipment within the micro apartments at the residential receptors comply with the inaudibility criteria outlined in Section 4.4.1 for all receptor locations, and are therefore acceptable.

However, the predicted L_{Aeq} levels of noise from the air conditioning units at residential receptors 'R2' to 'R2c' exceed the inaudibility criteria outlined in Section 4.4.1, and will therefore require noise controls, as recommended within Section 6.0.



5.5.5 Sleep Disturbance

The predicted $L_{AF, max}$ levels of noise from residents shouting in the closest COS (to the receiver) or a car entering the car park are shown in Table 13.

Table 13 Predicted $L_{AF, max}$ Noise Levels – Sleep Disturbance – Night (10 pm – 7 am)

Description	Predicted Noise Level $L_{eq, 15 \text{ minute}}$ (dBA) at Receptor Locations			
	Resident Shouting (RS)	Car Entering Car Park (CECP)	Acceptable Noise Limit	Compliance - Yes/No (RS/CECP)
R1	46	53	52	Yes/No
R1a	52	54	54	Yes/Yes
R2	57	52	52	No/Yes
R2a	66	58	54	No/No
R2b	68	29	52	No/Yes
R2c	67	29	53	No/Yes
R3	44	24	52	Yes/Yes
R3a	47	24	53	Yes/Yes
R4	52	27	52	Yes/Yes
R4a	68	27	53	No/Yes
R5	55	30	52	No/Yes
R5a	70	30	53	No/Yes
R5b	45	64	52	Yes/No
R5c	47	62	54	Yes/No

The predicted maximum $L_{AF, max}$ level of noise from residents shouting within the COS areas or a car entering the car park, outside the nearest potentially affected residences, is shown above in Table 13. The predicted noise levels at residential receptors 'R1' to 'R2c' and 'R4a' to 'R5c' are in excess of the night time sleep disturbance criteria, as established in Section 4.4.2 of this report, and will require a maximum noise level event assessment, as shown in Section 6.0.



5.5.6 On – Road Traffic

The external $L_{eq, 1 \text{ hour}}$ noise levels at the most affected receptor locations, from noise associated with on – road traffic travelling on Pacific Parade throughout day and night, are calculated to be as shown below in Table 14.

We have assumed that on-road traffic associated with the co-living development will halve during the night time period.

Table 14 Predicted $L_{eq, 1 \text{ hour}}$ Noise Levels – On – Road Traffic

Receptor Location	Predicted Noise Level (dBA)	Noise Criterion (dBA)	Compliance - Yes/No
Day – 7 am to 10 pm			
R1	40	55	Yes
R1a	41	55	Yes
R2	41	55	Yes
R2a	41	55	Yes
R5b	40	55	Yes
R5c	40	55	Yes
Night – 10 pm to 7 am			
R1	37	50	Yes
R1a	38	50	Yes
R2	38	50	Yes
R2a	38	50	Yes
R5b	37	50	Yes
R5c	37	50	Yes

The predicted external levels of noise from on-road traffic are within the day and night time noise criteria as established in Section 4.4.3, and are therefore acceptable.



6.0 NOISE CONTROL RECOMMENDATIONS

6.1 Noise Management Plan

The noise management plan below should be incorporated into the co-living development's Plan of Management.

We recommend administrative noise controls be adopted by the management of the co-living development, as follows:

- The COS areas and ICAs should not be used at any time for organised social events where amplified music or people speaking with loud voices may be expected.
- Normal conversation within the COS areas will be acceptable, however shouting would not, and should be subject to management by the co-living development management.
- Level 1 COS and ICA management during the evening period (6.00 pm to 10.00 pm)–

Option 1:

- The Level 1 COS area should be restricted to a capacity of nine residents between 6.00 pm and 10.00 pm.
- All operable external doors and windows to the Level 1 ICA should be kept closed between 6.00 pm and 10.00 pm. The external doors to the Level 1 COS may be opened and closed for entry/exit, only.

Option 2:

- The Level 1 COS area should be restricted to a capacity of five residents between 6.00 pm and 10.00 pm.
- The Level 1 ICA area should be restricted to a capacity of 12 residents between 6.00 pm and 10.00 pm.
- The external doors to the Level 1 ICA may be left open between 6.00 pm and 10.00 pm.
- The Level 1 COS area should not be used between 10.00 pm and 7.00 am.
- The Level 3 COS area should not be used between 10.00 pm and 7.00 am.
- All operable external windows to the Upper Ground ICA should be closed between 10.00 pm and 7.00 am.
- All operable external windows/doors to the Level 1 ICA should be closed between 10.00 pm and 7.00 am.
- All operable external doors to the Level 3 ICA should be closed between 10.00 pm and 7.00 am.
- Residents should be instructed to keep the noise output from individual amplified sound equipment to a reasonable level, i.e. a reverberant $L_{eq, 15 \text{ minute}}$ sound pressure level of no more than 61 dBA.



- Signs should be posted around the car park, COS areas and ICAs, in clearly visible locations, reminding residents to be mindful of the neighbouring residential properties and the importance of respecting their amenity.
- A complaint resolution process for residents and nearby neighbours should be documented in the Plan of Management to address any issues of unwelcomed loud noise from residents.
- The Manager shall be available 24 hours a day by phone.

6.2 Mechanical Plant & Equipment– Construction Certificate

The specifications for the mechanical plant have not yet been selected for this development. For typical mechanical plant equipment with sound power levels not exceeding those listed in Table 8, it is reasonable and feasible to acoustically treat the associated ducting, plant area or equipment itself so that noise will not impact the neighbouring properties.

Once mechanical plant and its location has been selected, a detailed acoustic assessment should be made, prior to the issue of a Construction Certificate (or during the detailed design stage) which ensures the use of the mechanical plant will comply with the project specific noise criteria in Section 4.4 of this report. We recommend that the mechanical services engineers select mechanical plant equipment with the lowest sound power levels to reduce the amount of acoustic treatment necessary to achieve the noise criteria at nearby residential receivers.

We offer to provide detailed noise controls when specifications of the mechanical plant equipment have been finalised.

In the following Sections we have provided examples of reasonable noise controls that may be implemented if necessary:

6.2.1 General Specifications

All mechanical plant including pumps and fans should be vibration isolated from the building structure.

The vibration isolators should achieve a minimum static deflection of 25 mm. We recommend that fans mounted on the roof are not located directly above living areas or bedrooms.

6.2.2 Carbon Monoxide Monitoring System

A carbon monoxide monitoring system may be installed in the car park to activate the exhaust and supply fans only when necessary.

6.2.3 Air Conditioning Systems

If required to operate during the night, the air conditioning systems may be set to run in silent mode between 10 pm and 7 am.



6.2.4 Lined Ductwork

Ductwork may be internally lined on the intake or discharge side of the fans with 25 to 50 mm thick insulation (min density 32 kg/m³), faced with a minimum of 20% open area perforated steel or foil.

6.2.5 Silencers

Silencers may be installed on the intake and discharge side of the fans

6.2.6 Basement Roller Door

The basement roller door (if required) motor shall be resiliently mounted to the building structure to prevent excessive noise and vibration.

6.3 Sleep Disturbance - Maximum Noise Level Event Assessment

There is potential for the sleep disturbance criteria to be exceeded at several neighbouring residential receivers from the use of the COS area and the car park driveway.

6.3.1 Communal Outdoor Space - Sleep Disturbance Noise Controls

Recommendations in Section 6.1 above limit the use of the COS areas to the day and evening time only, therefore eliminating noise emissions from the COS areas that could cause sleep disturbance at the neighbouring residential receivers, particularly 'R2' to 'R2c' and 'R4a' to 'R5a'.

6.3.2 Car Park - Sleep Disturbance Noise Controls

Day Design has conducted a detailed maximum noise level event assessment of the existing ambient noise levels – particularly the L_{max} events - at Location 'A' to determine the likelihood of noise associated with the use of the car park drive way causing sleep disturbance at the most affected nearby residential receiver 'R5b' (see Table 13). Compliance at the most affected nearby residential receiver will ensure compliance at all other receiver locations.

Table 15 shows the total L_{max} events greater than or equal to the sleep disturbance criteria of 52 dBA or more between 10 pm and 7 am over the assessment period.



Table 15 Total L_{max} Events at Location 'A' During Assessment Period

Receptor Location	Measured L_{max} Noise Level Events ≥ 52 dBA	Measured L_{max} Noise Level (dBA) Range ≥ 52 dBA
<i>Night – 10 pm to 7 am (36 x 15 minute periods each night)</i>		
Night 1 - 22/09/2020	33	53 - 74
Night 2 - 23/09/2020	36	52 - 84
Night 3 - 24/09/2020	34	53 - 76
Night 4 - 25/09/2020	36	59 - 74
Night 5 - 26/09/2020	36	54 - 81
Night 6 - 27/09/2020	30	54 - 78
Night 7 - 28/09/2020	32	54 - 78
Average per night	34	68
Total	237	-

Table 15 above shows that L_{max} noise events greater than or equal to 52 dBA are common at Location 'A' during the night periods. A total of 252 sample 15 – minute periods (night) were analysed, with 237, or 94%, featuring an L_{max} noise event greater than or equal to 52 dBA.

An average of 34 L_{max} noise events (out of 36) greater than or equal to 52 dBA were measured over the assessment period for each night period, with an average L_{max} noise level (greater than or equal to 52 dBA) of 68 dBA. As shown in Table 13, the predicted L_{max} noise level from noise associated with residents using the car park driveway at 'R5b' is 64 dBA – 4 dB lower than the average.

Day Design is of the opinion that due to the existing number and level of the L_{max} noise events greater than or equal to 52 dBA at Location 'A', the L_{max} noise events associated with the development site are not likely to cause sleep disturbance at 'R5b', and will therefore be acceptable at all residential receiver locations.



7.0 PREDICTED NOISE LEVELS - AFTER NOISE CONTROLS

NOTE: noise controls to address the exceedances shown in Tables 11, 12 and 13 have been addressed in Section 6.2 and 6.3 of this report.

Once the noise control recommendations in Section 6 are incorporated into the Plan of Management and building design, the calculated sound pressure level at the nearby receptors 'R2b', 'R2c', 'R4a' and 'R5a', will be as shown in Table 16.

The predicted $L_{eq, 15 \text{ minute}}$ level of noise from residents and their guests using the COS and ICAs after noise controls have been incorporated into the Plan of Management and building design, assessed at the nearest affected residential premises during the evening and night time periods, is shown below in Table 16

Table 16 Predicted $L_{eq, 15 \text{ min}}$ Noise Levels – Resident & Guest Noise – After Noise Controls

Description	Predicted Noise Level $L_{eq, 15 \text{ minute}}$ (dBA) at Receptor Locations						Acceptable Noise Limit	Compliance Yes/No
	L1 COS	L3 COS	UG ICA	L1 ICA	L3 ICA	Cumulative Noise Level		
Evening – 6 pm to 10 pm – Option 1								
R2b	42	24	< 10	< 10	< 10	42	43	Yes
R2c	41	33	< 10	12	< 10	41	43	Yes
R4a	41	22	15	< 10	< 10	41	43	Yes
R5a	42	25	33	15	< 10	43	43	Yes
Evening – 6 pm to 10 pm – Option 2								
R2b	40	24	< 10	36	< 10	41	43	Yes
R2c	38	33	< 10	37	< 10	42	43	Yes
R4a	38	22	15	35	< 10	40	43	Yes
R5a	39	25	33	40	< 10	43	43	Yes
Night – 10 pm to 7 am								
R2b	-	-	< 10	14	< 10	15	41	Yes
R2c	-	-	< 10	12	< 10	13	43	Yes
R4a	-	-	< 10	< 10	< 10	< 10	43	Yes
R5a	-	-	< 10	15	< 10	16	43	Yes

The predicted $L_{eq, 15 \text{ minute}}$ noise levels from residents and their guests within the COS areas and ICAs at the residential receptors after noise controls have been incorporated into the Plan of Management and building design comply with the noise criteria established in Section 4.4 of this report at all receptor locations, and are therefore acceptable.



8.0 NOISE IMPACT STATEMENT

Day Design Pty Ltd has been engaged by Benson McCormack Architecture on behalf of BL 2093 Pty Ltd to assess the potential environmental noise impact of a proposed co-living development at 67 Pacific Parade, Dee Why, NSW.

Calculations show that, provided the recommendations in Section 6.0 of this report are implemented, the level of noise emitted by the co-living development at 67 Pacific Parade, Dee Why, NSW, will meet the noise level requirements of the Environment Protection Authority's *Noise Policy for Industry*, *NSW Road Noise Policy* and the *Protection of the Environment Operations (Noise Control) Regulation 2017* as detailed in Section 4.0 of this report, and be considered acceptable.

Adam Shearer, BCT (Audio), MDesSc (Audio & Acoustics), MAAS

Senior Acoustical Consultant

for and on behalf of Day Design Pty Ltd

AAAC MEMBERSHIP

Day Design Pty Ltd is a member company of the Association of Australasian Acoustical Consultants, and the work herein reported has been performed in accordance with the terms of membership.

Attachments:

Appendix A – Noise Survey Instrumentation

Appendix B1 – Ambient Noise Survey – Ground Floor, Front 67 Pacific Parade, Dee Why (#107)

Appendix B2 – Ambient Noise Survey – First Floor, Front 67 Pacific Parade, Dee Why (#118)

Appendix B3 – Ambient Noise Survey – Ground Floor, Rear 67 Pacific Parade, Dee Why (#117)

Appendix C – Architectural Drawings



Environmental Noise Assessment Report**NOISE SURVEY INSTRUMENTATION**

Noise level measurements and analysis in this report were made with instrumentation as follows:

Table A Noise Survey Instrumentation

Description	Model No	Serial No
Infobyte Noise Logger (Type 2)	iM4	107
Condenser Microphone 0.5" diameter	MK 250	107
Infobyte Noise Logger (Type 2)	iM4	117
Condenser Microphone 0.5" diameter	MK 250	117
Infobyte Noise Logger (Type 2)	iM4	118
Condenser Microphone 0.5" diameter	MK 250	118
Acoustical Calibrator	B&K 4231	302 1796

An environmental noise logger is used to continuously monitor ambient noise levels and provide information on the statistical distribution of noise during an extended period of time. The Infobyte Noise Monitor iM4s are Type 2 precision environmental noise monitor meeting all the applicable requirements of AS1259 for an integrating-averaging sound level meter.

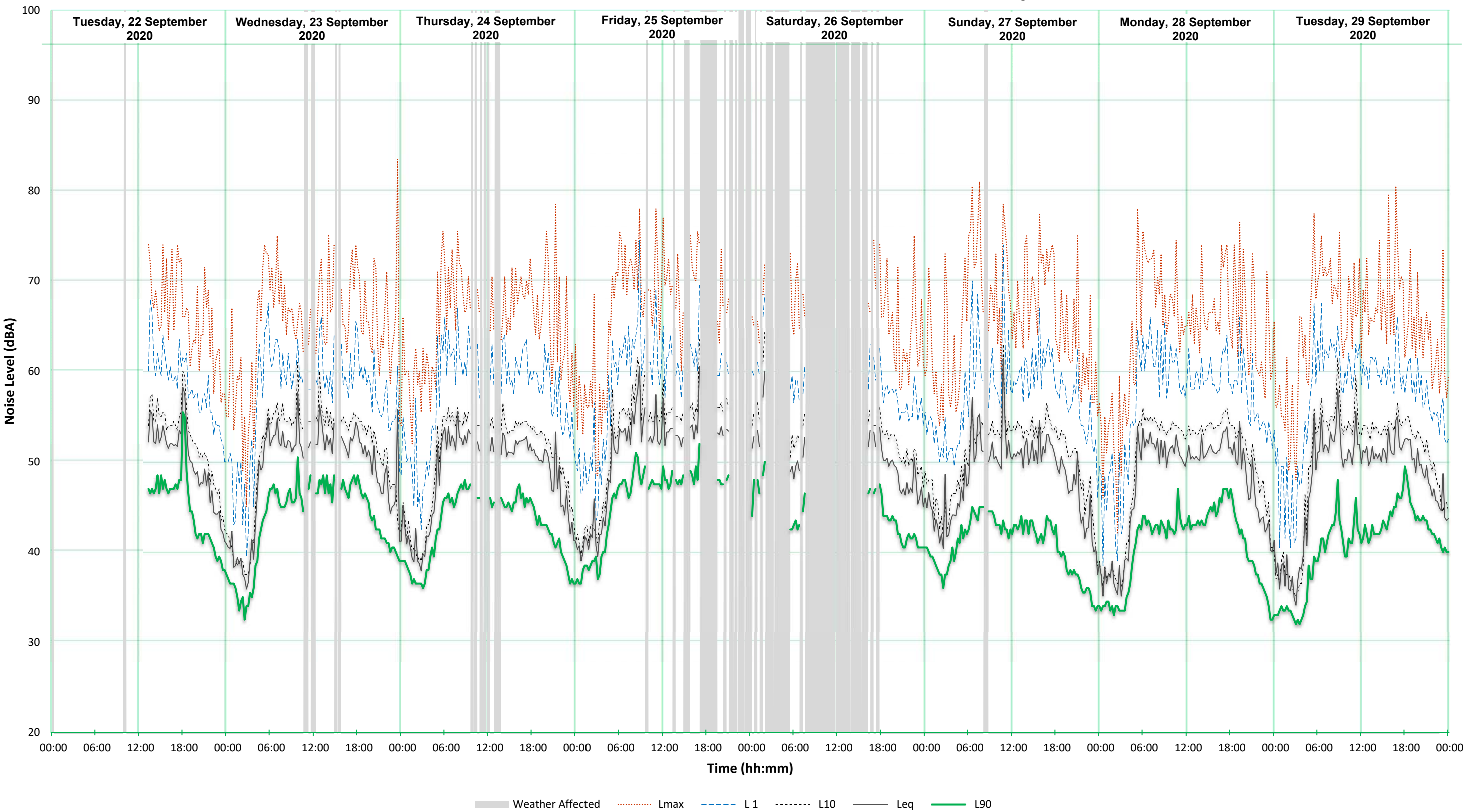
All instrument systems had been laboratory calibrated using instrumentation traceable to Australian National Standards and certified within the last two years thus conforming to Australian Standards. The measurement system was also field calibrated prior to and after noise surveys. Calibration drift was found to be less than 1 dB during unattended measurements. No adjustments for instrument drift during the measurement period were warranted.



AMBIENT NOISE SURVEY

7066-1.2R
Appendix B

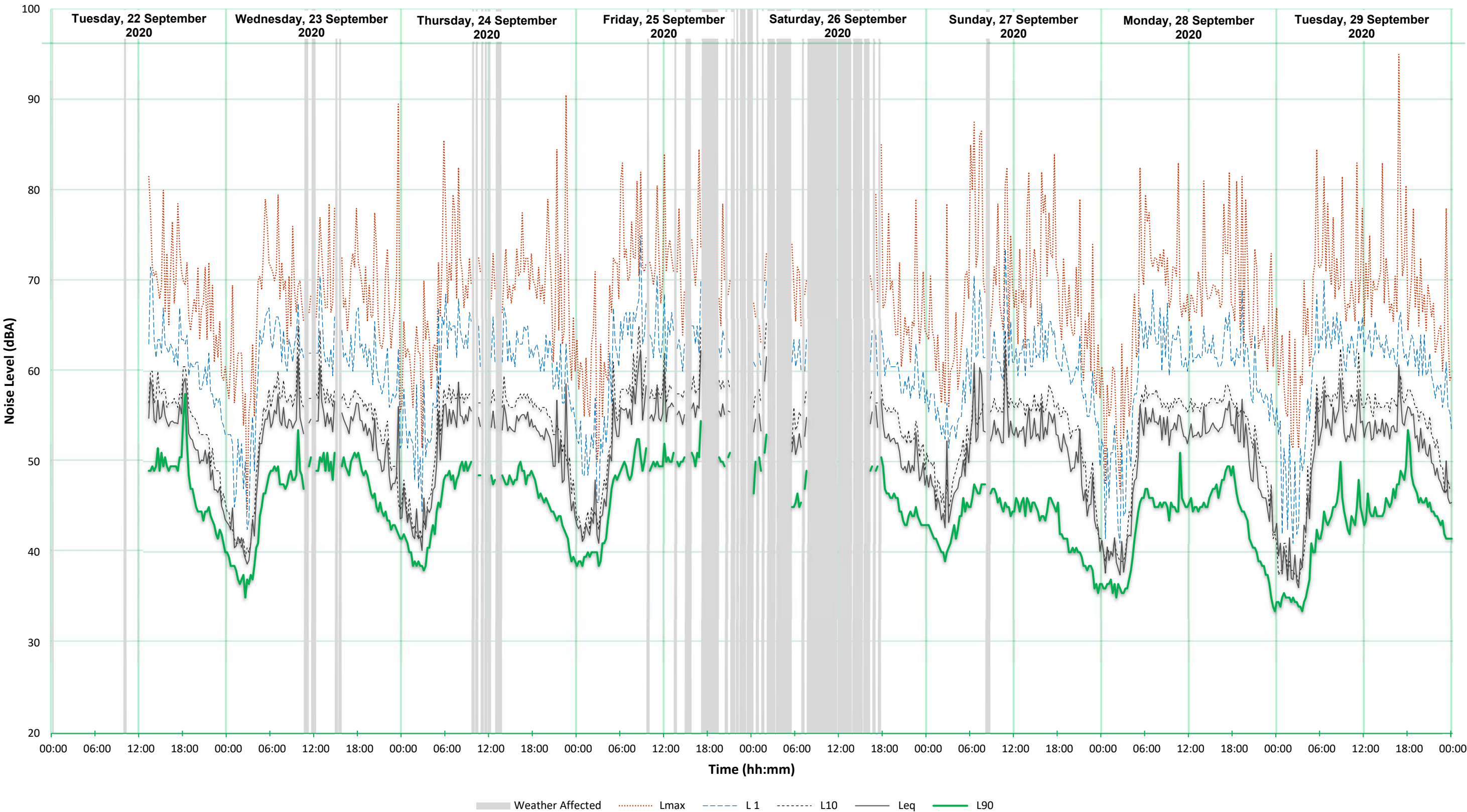
Located at Front Ground Floor, 67 Pacific Parade, Dee Why, NSW



AMBIENT NOISE SURVEY

7066-1.2R
Appendix B

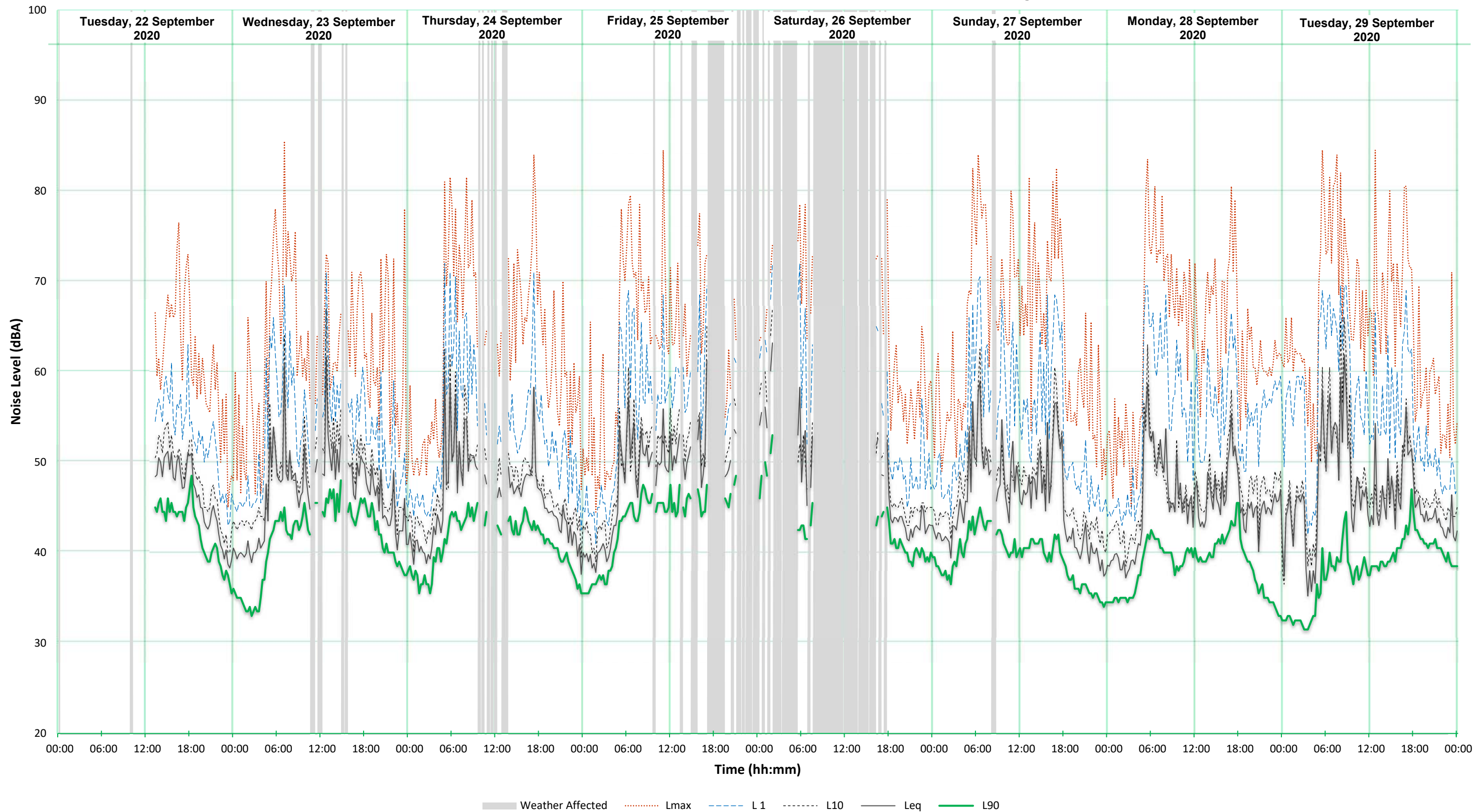
Located at Front First Floor, 67 Pacific Parade, Dee Why, NSW



AMBIENT NOISE SURVEY

7066-1.2R
Appendix B

Located at Rear Ground Floor, 67 Pacific Parade, Dee Why, NSW





67 PP

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PROJECT DETAILS

67 PP
67 Pacific Parade DEE WHY NSW 2099

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THE SITE
67 Pacific Parade DEE WHY NSW 2099

THE CRESCENT RESERVE/PLAYGROUND



LOCATION PLAN 03

THE SITE (CIRCA 1943)
67 Pacific Parade DEE WHY NSW 2099



LOCATION PLAN - CIRCA 1943

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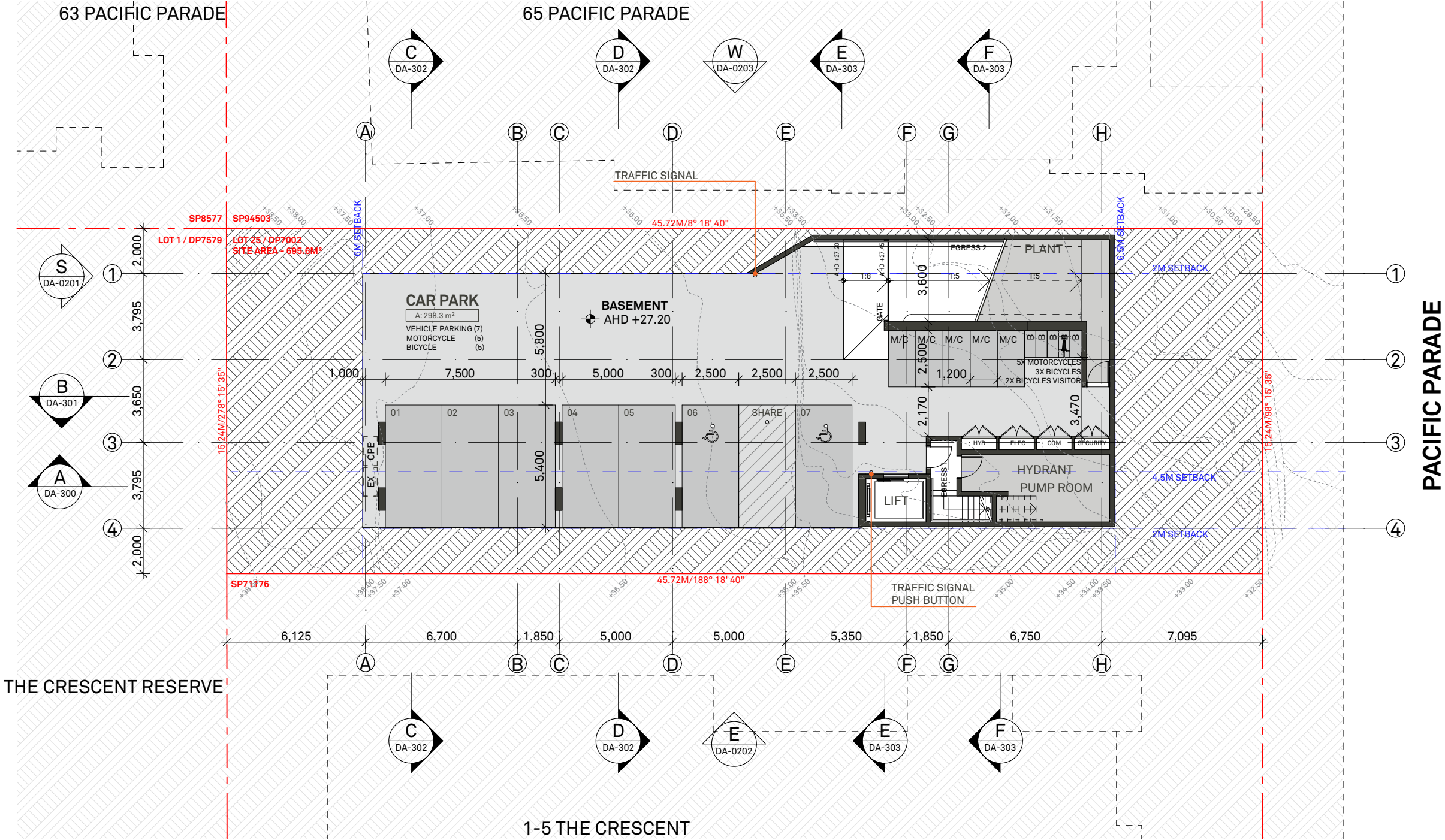
WARRINGAH LEP 2011		
LAND ZONING		R3
MIN. LOT SIZE		NA
FSR		NA
HEIGHT OF BUILDING		11M (ZONE L)
LAND RESERVATION		NA
HERITAGE		NA
FLOOD		NA
ACID SULFATE		NA
KEY SITE		NA
BIODIVERSITY		NA
LANDSLIP RISK		AREA B

PARKING RATE
ARHSEPP RATE APPLIED: BOARDING HOUSE
0,5 SPACE PER MICRO APARTMENT DWELLING

CAR PARK

RESIDENTIAL: 25 ROOMS + 1 MANAGER			
		REQUIRED	PROPOSED
	Residential	13	13
VEHICLE	Visitor	-	-
MOTORCYCLE		5	5
BICYCLE	Residential	3	3
	Visitor	2	2

TOTAL CARPARK PROVIDED
13 (INCLUDING 2 DISABLED SPACES)



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LEGEND

A/C	Air Conditioning Unit	COS	Communal Open Space	GBC	Garbage Chute	POS	Private Open Space
ACC	Accessible	CEX	Carpark Exhaust	GBR	Garbage Room	R	Robe
ADP	Adaptable	DRY	Dining	GBX	Garbage Exhaust	RWT	Rainwater Tank
AHD	Aust. Height Datum	DP	Dryer	GFA	Gross Floor Area	SCR	Screen
B	Basement	DW	Down Pipe	GM	Gas Meter	SW	Sewer
BAL	Balustrade	F	Dishwasher	H	Hydraulic Services	ST	Storage
BALC	Balcony	FEX	Fridge	LY	Laundry	SD	Study
BED	Bedroom	FFL	Fire Extinguisher	M	Meter Room	STP	Stormwater Pit
BT	Bathroom	FN	Finish floor level	MC	Motorcycle Parking	STW	Stormwater
COL	Column	FS	Fence	MSB	Main Switch Board	SFL	Structural floor level
COMM	Comms Room	FSR	Fire Stairs	NGL	Natural Ground Level	TOF	Top of Fence
		GBA	Floor Space Ratio	OSD	Onsite Detention Tank	TOW	Top of Wall
			Gross Building Area	P	Pantry	VIS	Visitor Parking

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MANLY NSW 2095

PROJECT DETAILS
67 PP
67 Pacific Parade
DEE WHY NSW 2099

DRAWING TITLE
GENERAL
ARRANGEMENT -
BASEMENT PLAN

SCALE
1:200@A3
STATUS
DA
PROJECT No
2004A

APPROVED
GM
DRAWN BY
DB
DRAWING No
DA-0100

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WARRINGAH LEP 2011		
LAND ZONING		R3
MIN. LOT SIZE		NA
FSR		NA
HEIGHT OF BUILDING		11M (ZONE L)
LAND RESERVATION		NA
HERITAGE		NA
FLOOD		NA
ACID SULFATE		NA
KEY SITE		NA
BIODIVERSITY		NA
LANDSLIP RISK		AREA B

PARKING RATE
ARHSEPP RATE APPLIED: BOARDING HOUSE
0,5 SPACE PER MICRO APARTMENT DWELLING

CAR PARK

RESIDENTIAL: 25 ROOMS + 1 MANAGER			
	REQUIRED	PROPOSED	
	Residential	13	13
VEHICLE	Visitor	-	-
MOTORCYCLE		5	5
BICYCLE	Residential	3	3
	Visitor	2	2

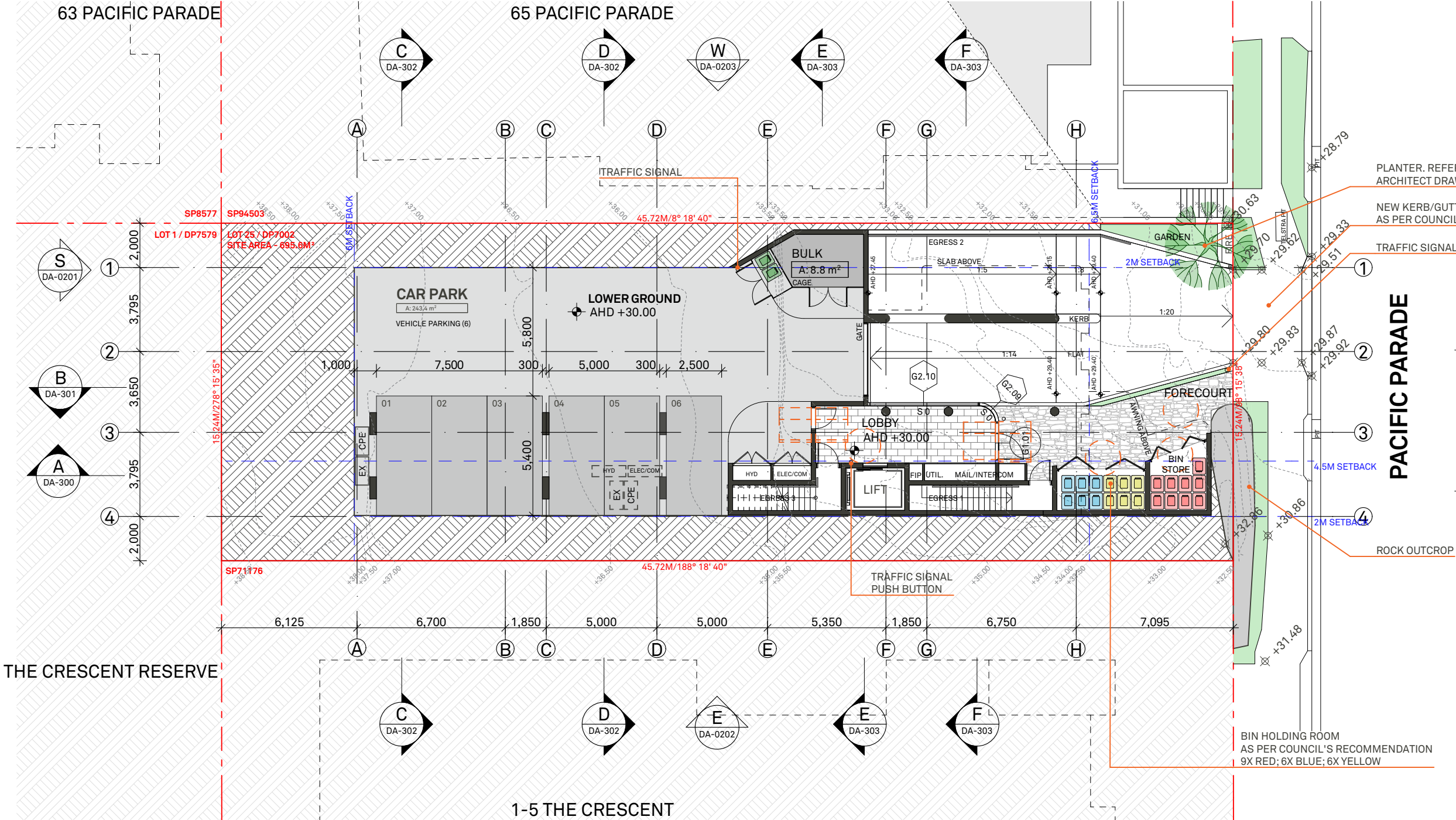
TOTAL CARPARK PROVIDED
13 (INCLUDING 2 DISABLED SPACES)

WASTE MANAGEMENT

25 UNITS + 1 MANAGER			
	REQUIRED	PROVIDED	
	(Northern Beaches DCP)*		
GENERAL WASTE	Red	9	9
	Yellow	6	6
RECYCLING	Blue	6	6
	Green	2	2
TOTAL		23	23

* Northern Beaches Waste Management Guidelines
(for development in the area of WLEP2011 and WLEP 2000) - Appendix A

COLLECTION:
GENERAL WASTE - 1 x weekly
RECYCLING (YELLOW) - 1 x weekly
RECYCLING (BLUE) - 1 x weekly



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REVISION		
Rev	Date	Description
01	24/11/2020	DA ISSUE 01

LEGEND	
A/C	Air Conditioning Unit
ACC	Accessible
ADP	Adaptable
AHD	Aust. Height Datum
B	Basement
BAL	Balustrade
BALC	Balcony
BED	Bedroom
BT	Bathroom
COL	Column
COMM	Comms Room
COS	Communal Open Space
CEX	Carpark Exhaust
DRY	Dryer
DP	Down Pipe
DW	Dishwasher
F	Fridge
FEX	Fire Extinguisher
FFL	Finish floor level
FN	Fence
FS	Fire Stairs
FSR	Fire Space Ratio
GBA	Gross Building Area
GBR	Garbage Room
GBX	Garbage Exhaust
GFA	Gross Floor Area
GM	Gas Meter
H	Hydraulic Services
LY	Laundry
M	Meter Room
MC	Motorcycle Parking
MSB	Main Switch Board
NGL	Natural Ground Level
OSD	Onsite Detention Tank
P	Pantry
POS	Private Open Space
R	Robe
RWT	Rainwater Tank
SCR	Screen
SW	Sewer
ST	Storage
SD	Study
STP	Stormwater Pit
STW	Stormwater
SFL	Structural floor level
TOF	Top of Fence
TOW	Top of Wall
VIS	Visitor Parking

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PROJECT DETAILS
67 PP
67 Pacific Parade
DEE WHY NSW 2099

DRAWING TITLE
GENERAL
ARRANGEMENT -
LOWER GROUND
PLAN

SCALE
1:200@A3
STATUS
DA
PROJECT No
2004A

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DB
DRAWING No
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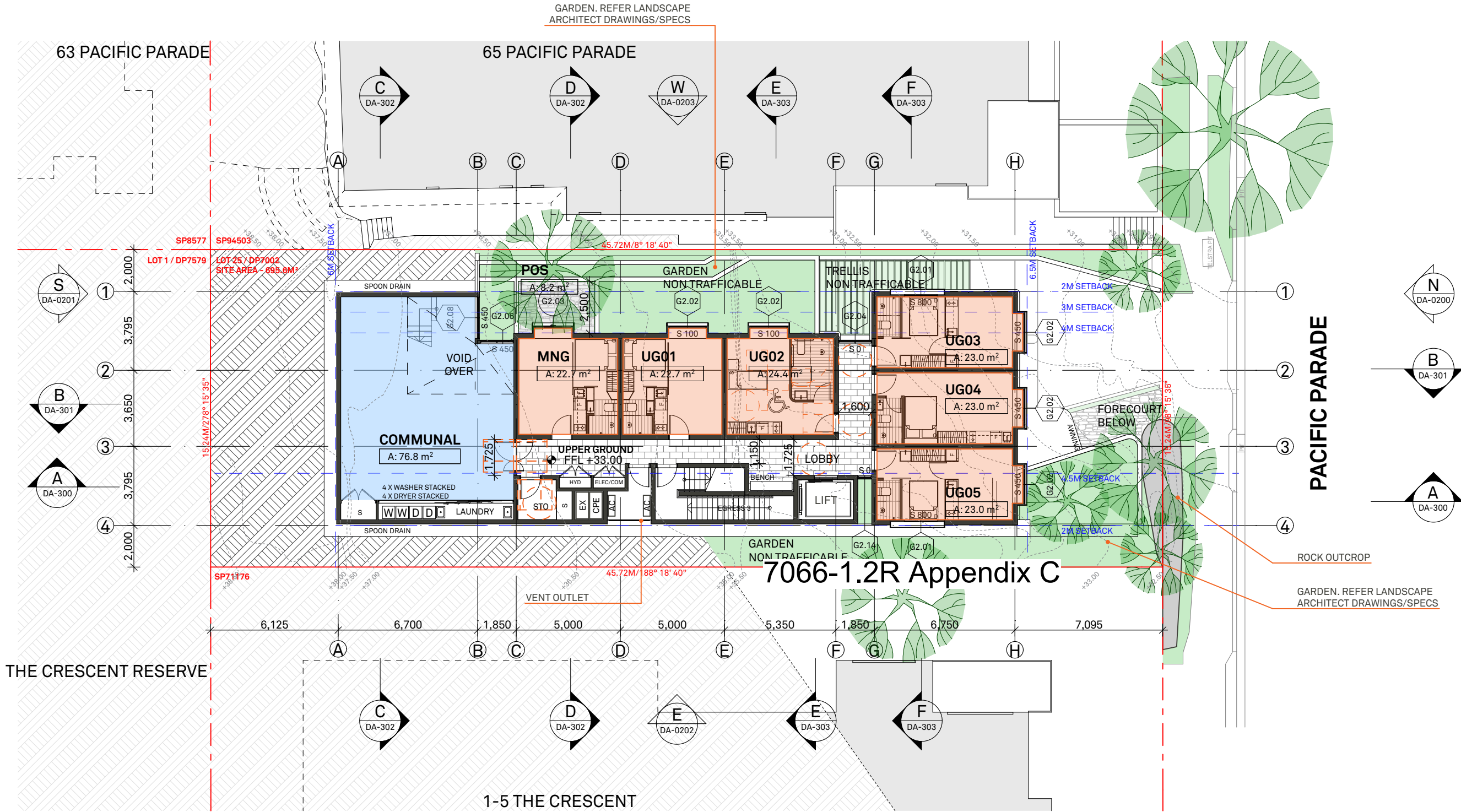
WARRINGAH LEP 2011

LAND ZONING	R3
MIN. LOT SIZE	NA
FSR	NA
HEIGHT OF BUILDING	11M (ZONE L)
LAND RESERVATION	NA
HERITAGE	NA
FLOOD	NA
ACID SULFATE	NA
KEY SITE	NA
BIODIVERSITY	NA
LANDSLIP RISK	AREA B

PARKING RATE

ARHSEPP RATE APPLIED: BOARDING HOUSE

0,5 SPACE PER MICRO APARTMENT DWELLING



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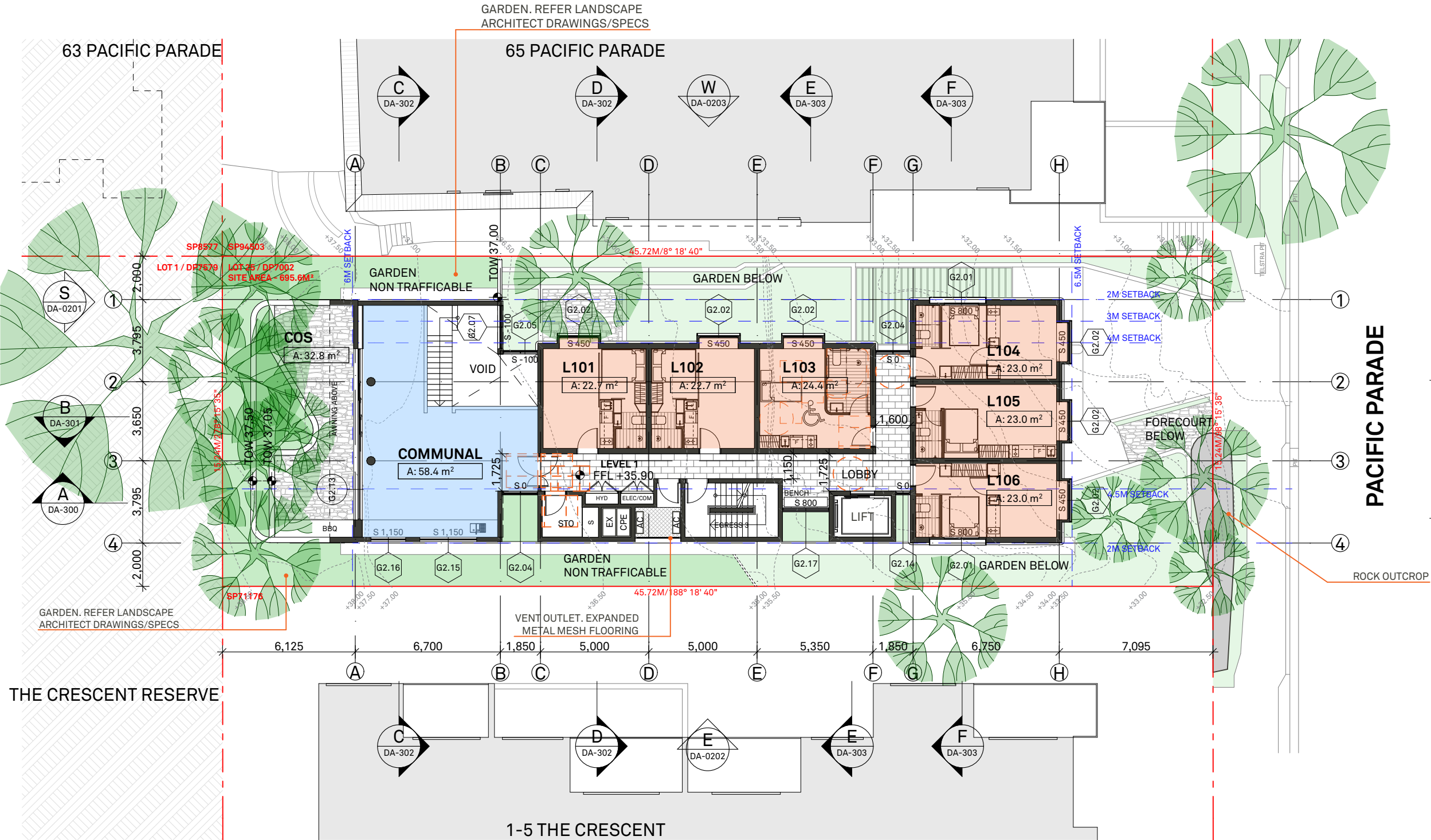
WARRINGAH LEP 2011

LAND ZONING	R3
MIN. LOT SIZE	NA
FSR	NA
HEIGHT OF BUILDING	11M (ZONE L)
LAND RESERVATION	NA
HERITAGE	NA
FLOOD	NA
ACID SULFATE	NA
KEY SITE	NA
BIODIVERSITY	NA
LANDSLIP RISK	AREA B

PARKING RATE

ARHSEPP RATE APPLIED: BOARDING HOUSE

0,5 SPACE PER MICRO APARTMENT DWELLING



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LEGEND

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ACC	Accessible	CEX	Carpark Exhaust	GBR	Garbage Room	R	Robe
ADP	Adaptable	D	Dining	GBX	Garbage Exhaust	RWT	Rainwater Tank
AHD	Aust. Height Datum	DP	Down Pipe	GFA	Gross Floor Area	SCR	Screen
B	Basement	DW	Dryer	GM	Gas Meter	ST	Sewer
BAL	Balustrade	F	Fridge	LY	Laundry	SD	Storage
BALC	Balcony	FEX	Fire Extinguisher	M	Meter Room	STP	Stormwater Pit
BED	Bedroom	FFL	Finish floor level	MC	Motorcycle Parking	STW	Stormwater
BT	Bathroom	FN	Fence	MSB	Main Switch Board	SFL	Structural floor level
COL	Column	FS	Fire Stairs	NGL	Natural Ground Level	TOF	Top of Fence
COMM	Comms Room	FSR	Floor Space Ratio	OSD	Onsite Detention Tank	TOW	Top of Wall
		GBA	Gross Building Area	P	Pantry	VIS	Visitor Parking

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PROJECT DETAILS
67 PP
67 Pacific Parade
DEE WHY NSW 2099

DRAWING TITLE
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SCALE
1:200@A3
STATUS
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PROJECT No
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GM
DRAWN BY
DB
DRAWING No
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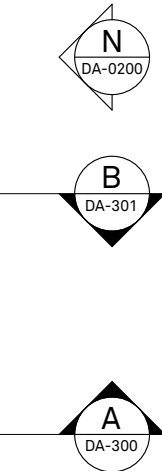
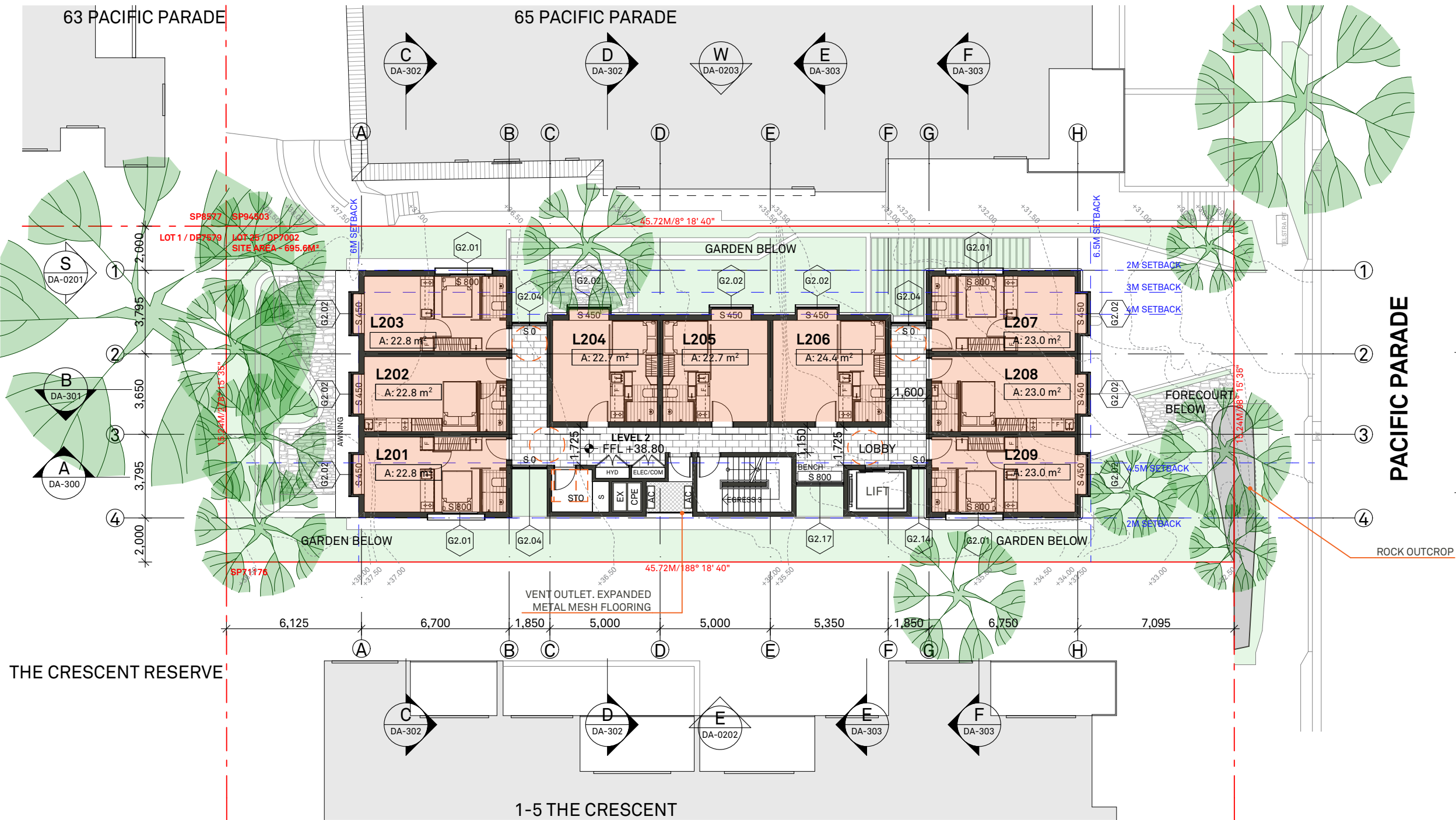
WARRINGAH LEP 2011

LAND ZONING	R3
MIN. LOT SIZE	NA
FSR	NA
HEIGHT OF BUILDING	11M (ZONE L)
LAND RESERVATION	NA
HERITAGE	NA
FLOOD	NA
ACID SULFATE	NA
KEY SITE	NA
BIODIVERSITY	NA
LANDSLIP RISK	AREA B

PARKING RATE

ARHSEPP RATE APPLIED: BOARDING HOUSE

0,5 SPACE PER MICRO APARTMENT DWELLING



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Rev	Date	Description
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LEGEND

A/C	Air Conditioning Unit	COS	Communal Open Space	GBC	Garbage Chute	POS	Private Open Space
ACC	Accessible	CEX	Carpark Exhaust	GBR	Garbage Room	R	Robe
ADP	Adaptable	DRY	Dining	GBX	Garbage Exhaust	RWT	Rainwater Tank
AHD	Aust. Height Datum	DW	Dryer	GFA	Gross Floor Area	SCR	Screen
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BAL	Balustrade	F	Fridge	LY	Laundry	ST	Storage
BALC	Balcony	FEX	Fire Extinguisher	MC	Motorcycle Parking	SD	Study
BED	Bedroom	FFL	Finish floor level	MSB	Main Switch Board	STP	Stormwater Pit
BT	Bathroom	FN	Fence	NGL	Natural Ground Level	STW	Stormwater
COL	Column	FS	Fire Stairs	OSD	Onsite Detention Tank	SFL	Structural floor level
COMM	Comms Room	FSR	Floor Space Ratio	P	Pantry	TOF	Top of Fence
		GBA	Gross Building Area			TOW	Top of Wall
						VIS	Visitor Parking

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MANLY NSW 2095

PROJECT DETAILS
67 PP
67 Pacific Parade
DEE WHY NSW 2099

DRAWING TITLE
GENERAL
ARRANGEMENT -
LEVEL 2 PLAN

SCALE
1:200@A3
STATUS
DA
PROJECT No
2004A

APPROVED
GM
DRAWN BY
DB
DRAWING No
DA-0104

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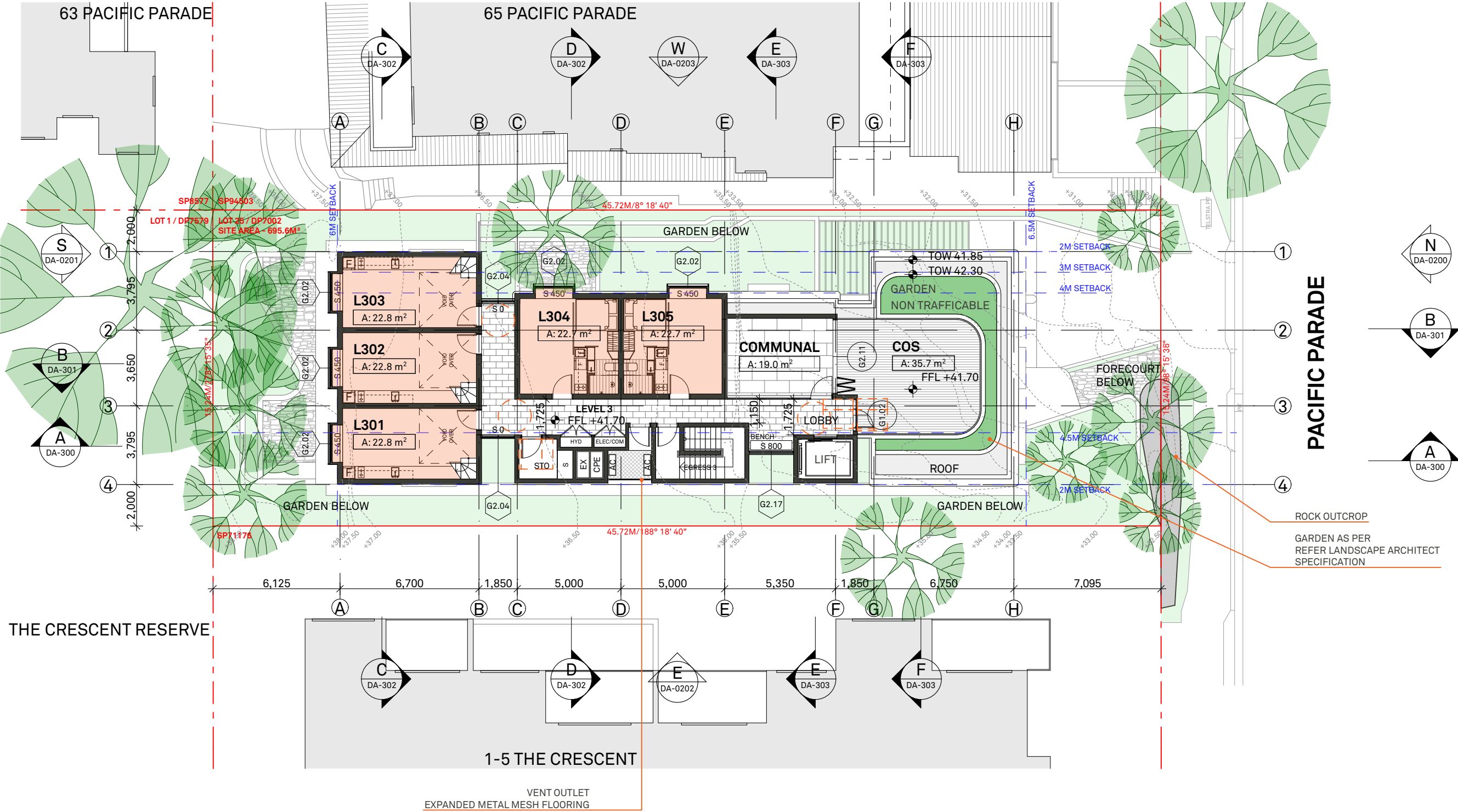
WARRINGAH LEP 2011

LAND ZONING	R3
MIN. LOT SIZE	NA
FSR	NA
HEIGHT OF BUILDING	11M (ZONE L)
LAND RESERVATION	NA
HERITAGE	NA
FLOOD	NA
ACID SULFATE	NA
KEY SITE	NA
BIODIVERSITY	NA
LANDSLIP RISK	AREA B

PARKING RATE

ARHSEPP RATE APPLIED: BOARDING HOUSE

0,5 SPACE PER MICRO APARTMENT DWELLING



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LEGEND

A/C	Air Conditioning Unit	COS	Communal Open Space	GBC	Garbage Chute	POS	Private Open Space
ACC	Accessible	CEX	Carpark Exhaust	GBR	Garbage Room	R	Robe
ADP	Adaptable	D	Dining	GBX	Garbage Exhaust	RWT	Rainwater Tank
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		FSR	Floor Space Ratio	P	Pantry	TOW	Top of Wall
		GBA	Gross Building Area			VIS	Visitor Parking

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MANLY NSW 2095

PROJECT DETAILS
67 PP
67 Pacific Parade
DEE WHY NSW 2099

DRAWING TITLE
GENERAL ARRANGEMENT - LEVEL 3 PLAN

SCALE
1:200@A3
STATUS
DA
PROJECT No
2004A

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DRAWING No
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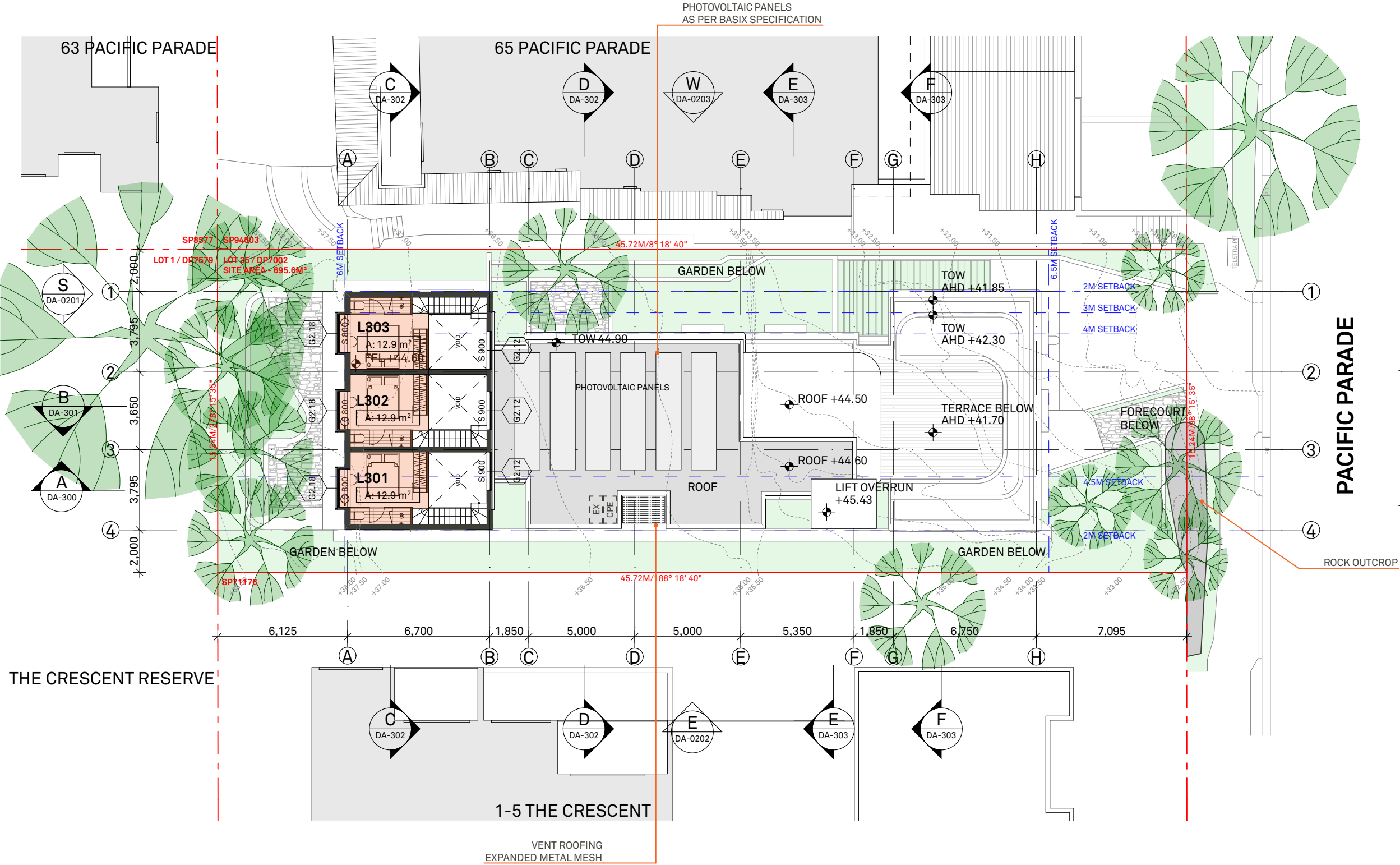
WARRINGAH LEP 2011

LAND ZONING	R3
MIN. LOT SIZE	NA
FSR	NA
HEIGHT OF BUILDING	11M (ZONE L)
LAND RESERVATION	NA
HERITAGE	NA
FLOOD	NA
ACID SULFATE	NA
KEY SITE	NA
BIODIVERSITY	NA
LANDSLIP RISK	AREA B

PARKING RATE

ARHSEPP RATE APPLIED: BOARDING HOUSE

0,5 SPACE PER MICRO APARTMENT DWELLING



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LEGEND

A/C	Air Conditioning Unit	COS	Communal Open Space	GBC	Garbage Chute	POS	Private Open Space
ACC	Accessible	CEX	Carpark Exhaust	GBR	Garbage Room	R	Robe
ADP	Adaptable	D	Dining	GBX	Garbage Exhaust	RWT	Rainwater Tank
AHD	Aust. Height Datum	DRY	Dryer	GFA	Gross Floor Area	SCR	Screen
B	Basement	DP	Down Pipe	GM	Gas Meter	ST	Sewer
BAL	Balustrade	DW	Dishwasher	LY	Laundry	SD	Storage
BALC	Balcony	F	Fridge	M	Meter Room	STP	Stormwater Pit
BED	Bedroom	FEX	Fire Extinguisher	MC	Motorcycle Parking	STW	Stormwater
BT	Bathroom	FFL	Finish floor level	MSB	Main Switch Board	SFL	Structural floor level
COL	Column	FS	Fence	NGL	Natural Ground Level	TOF	Top of Fence
COMM	Comms Room	FSR	Fire Stairs	OSD	Onsite Detention Tank	TOW	Top of Wall
		GBA	Gross Building Area	P	Pantry	VIS	Visitor Parking

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PROJECT DETAILS
67 PP
67 Pacific Parade
DEE WHY NSW 2099

DRAWING TITLE
GENERAL
ARRANGEMENT -
LEVEL 4 PLAN (MEZZ)

SCALE
1:200@A3
STATUS
DA
PROJECT No
2004A

APPROVED
GM
DRAWN BY
DB
DRAWING No
DA-0106
REV
01

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NORTHERN BEACHES COUNCIL

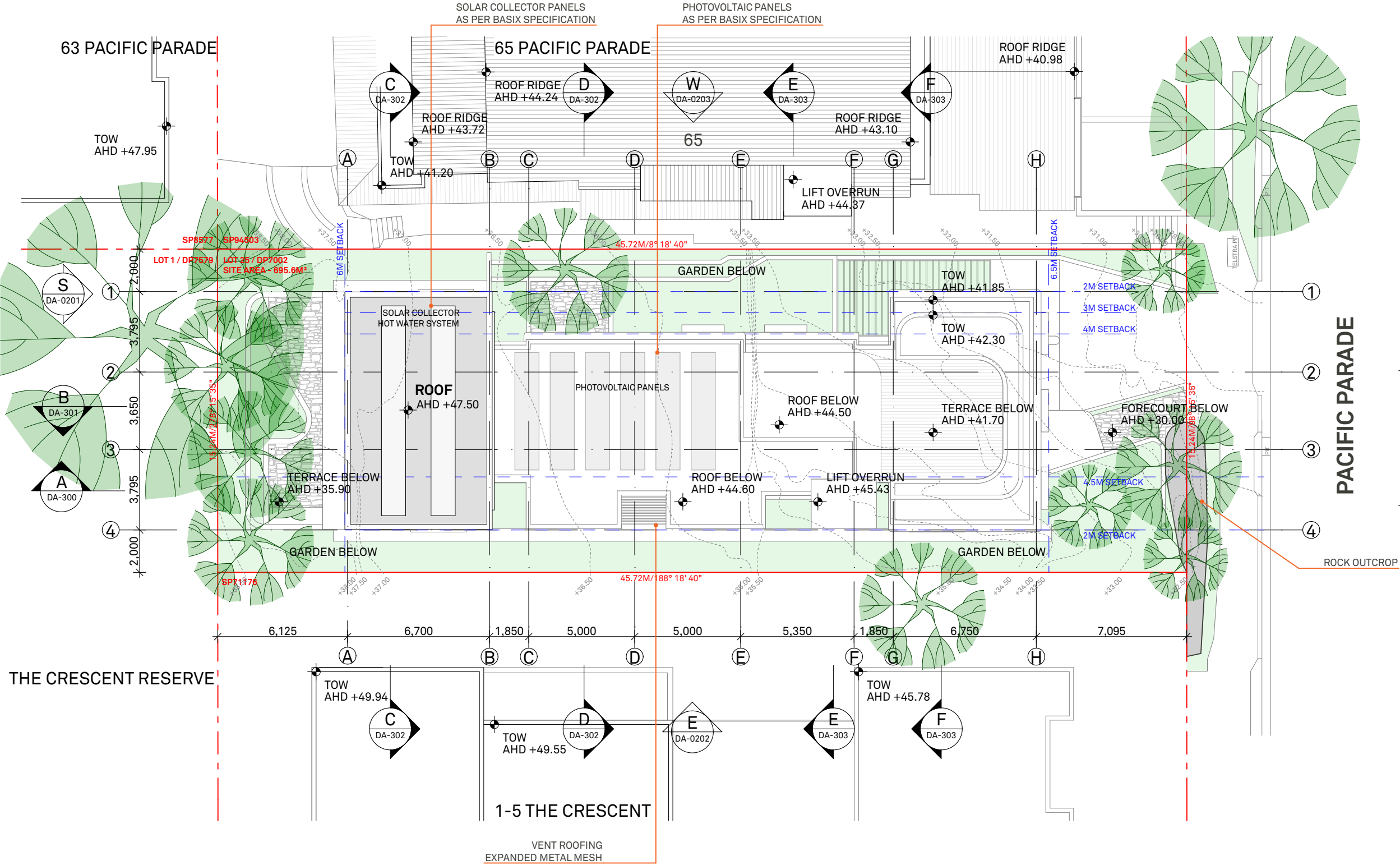
WARRINGAH LEP 2011

LAND ZONING	R3
MIN. LOT SIZE	NA
FSR	NA
HEIGHT OF BUILDING	11M (ZONE L)
LAND RESERVATION	NA
HERITAGE	NA
FLOOD	NA
ACID SULFATE	NA
KEY SITE	NA
BIODIVERSITY	NA
LANDSLIP RISK	AREA B

PARKING RATE

ARHSEPP RATE APPLIED: BOARDING HOUSE

0,5 SPACE PER MICRO APARTMENT DWELLING



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REVISION

Rev	Date	Description
01	24/11/2020	DA ISSUE 01

LEGEND

A/C	Air Conditioning Unit	COS	Communal Open Space	GBC	Garbage Room	POS	Private Open Space
ACC	Accessible	CEX	Carpark Exhaust	GBR	Garbage Room	R	Robe
ADP	Adaptable	D	Dining	GBX	Garbage Exhaust	RWT	Rainwater Tank
AHD	Aust. Height Datum	DRY	Dryer	GFA	Gross Floor Area	SCR	Screen
B	Basement	DP	Down Pipe	GM	Gas Meter	ST	Sewer
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COMM	Comms Room	FSR	Fire Stairs	OSD	Onsite Detention Tank	TOW	Top of Wall
		GBA	Gross Building Area	P	Pantry	VIS	Visitor Parking

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MANLY NSW 2095

PROJECT DETAILS
67 PP
67 Pacific Parade
DEE WHY NSW 2099

DRAWING TITLE
GENERAL ARRANGEMENT - ROOF PLAN

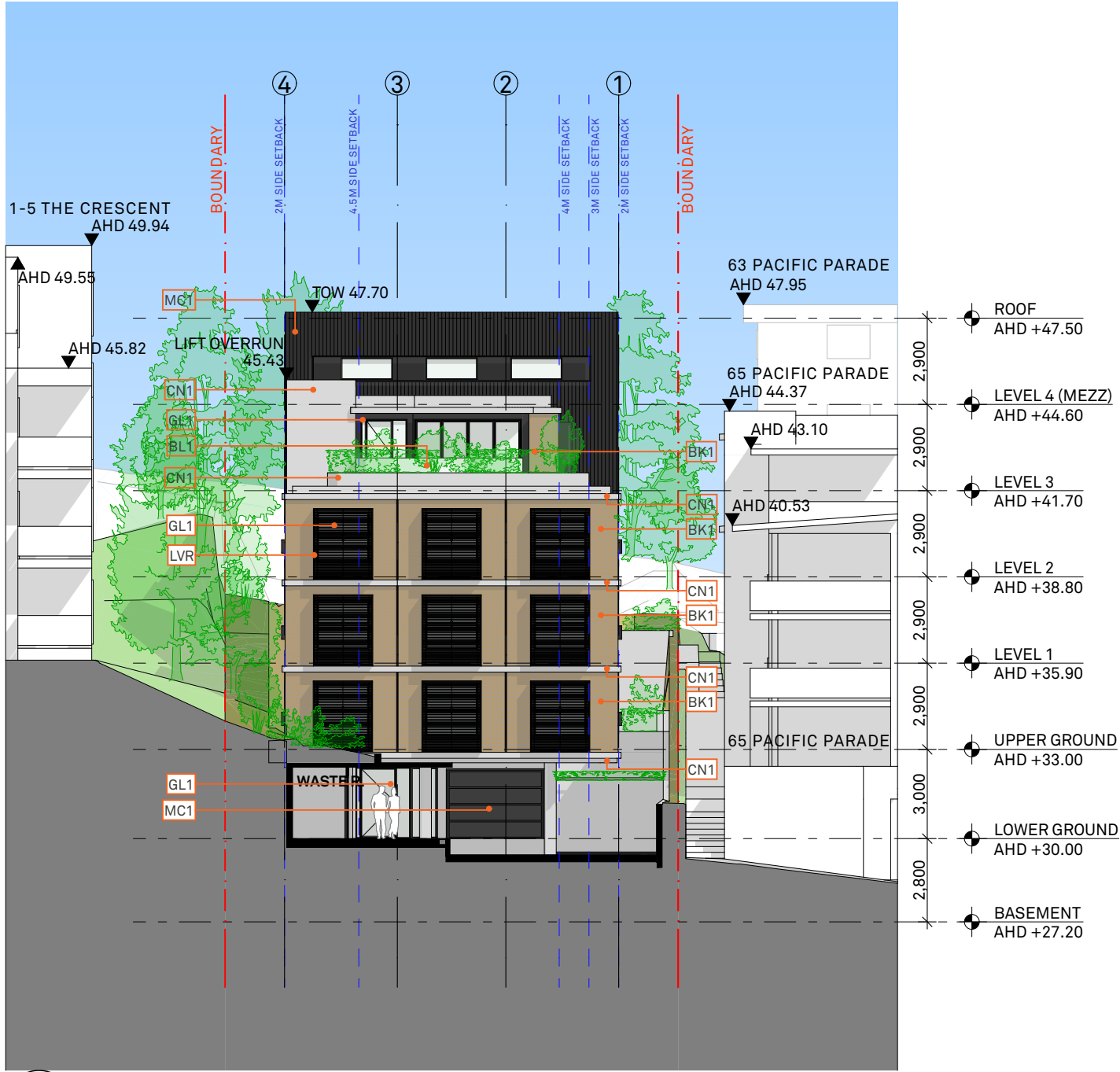
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STATUS
DA
PROJECT No
2004A

APPROVED
GM
DRAWN BY
DB
DRAWING No
DA-0107
NORTH

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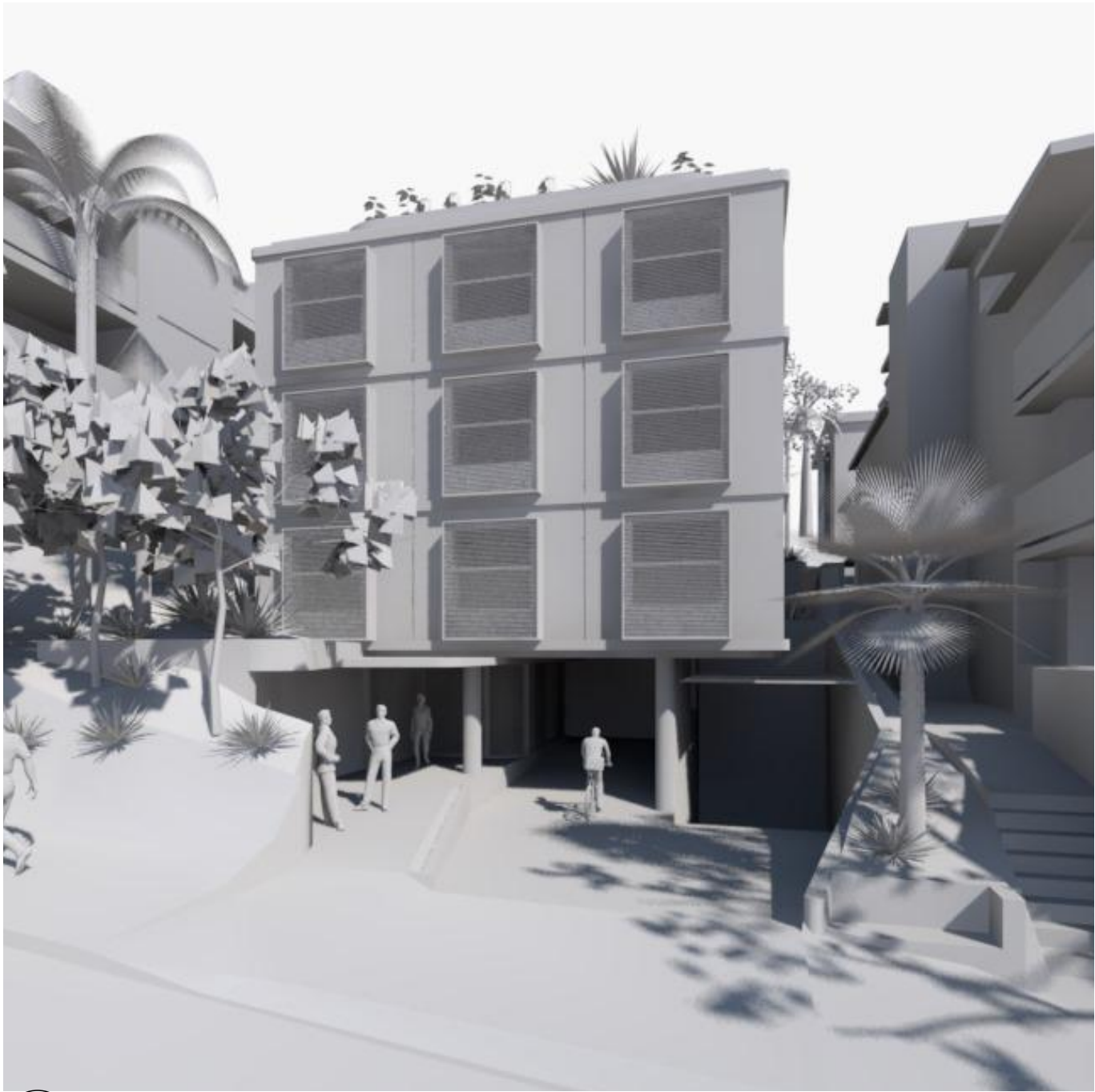




1 NORTH ELEVATION
1:200

FINISHES LEGEND:

CN1 - OFF FORM CONCRETE NATURAL LIGHT COLOUR
BK1 - BRICK VENEER - LIGHT BEIGE COLOUR
MC1 - ANODISED ALUMINIUM CLADDING - DARK COLOUR
LVR - ANODISED ALUMINIUM BLINDS - DARK COLOUR
STN - STONE CLADDING SAND STONE
GL1 - POWDERCOATED ALUM. FRAME & CLEAR GLAZING
GL2 - POWDERCOATED ALUM. FRAME & OBSCURE GLAZING
BL1 - BALUSTRADE CLEAR GLAZING FRAMELESS



2 3D VIEW - NORTH ELEVATION

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ADP	Adaptable	DP	Down Pipe	GFA	Gross Floor Area	SCR	Screen
AHD	Aust. Height Datum	DW	Dryer	GM	Gas Meter	SW	Sewer
B	Basement	DW	Dishwasher	H	Hydraulic Services	ST	Storage
BAL	Balustrade	FEX	Fire Extinguisher	LY	Laundry	SD	Study
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COL	Column	FSR	Fire Stairs Ratio	OSD	Onsite Detention Tank	TOF	Top of Fence
COMM	Comms Room	GBA	Gross Building Area	P	Pantry	TOW	Top of Wall
						VIS	Visitor Parking

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PROJECT DETAILS
67 PP
67 Pacific Parade
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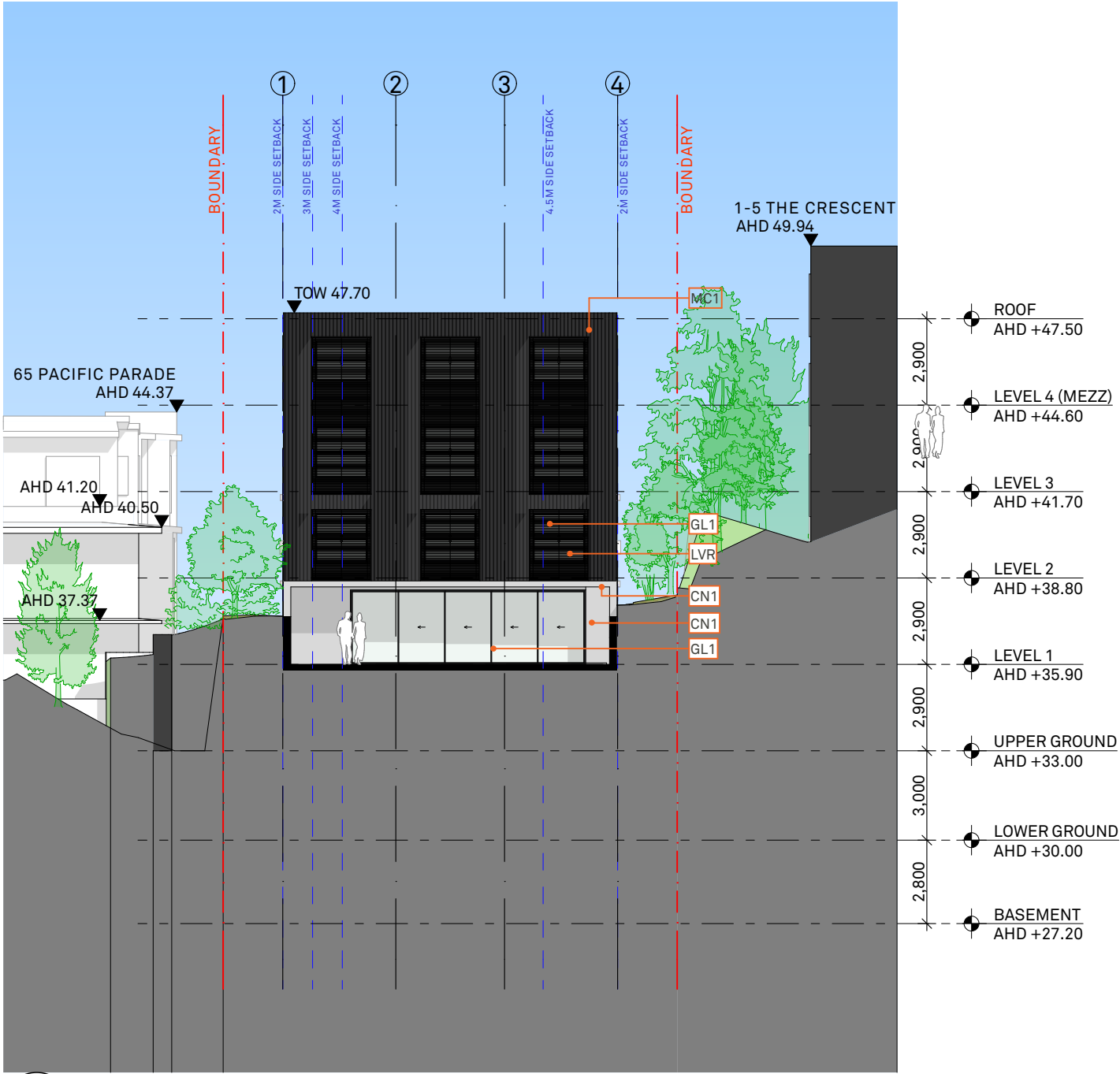
DRAWING TITLE
**ELEVATIONS - NORTH
ELEVATION**

SCALE
1:200@A3
STATUS
DA
PROJECT No
2004A

APPROVED
GM
DRAWN BY
DB
DRAWING No
DA-0200
REV
01

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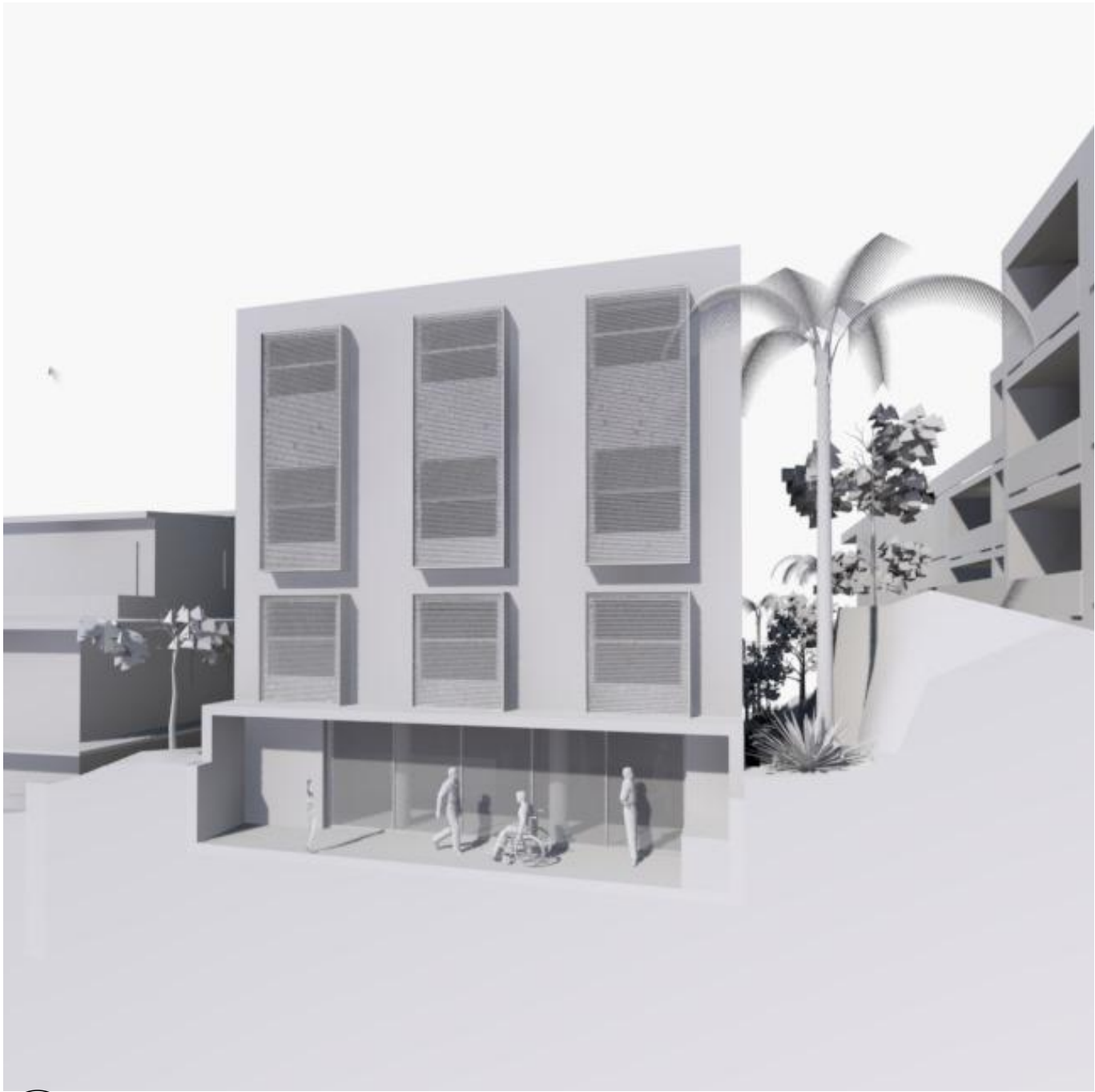




1 SOUTH ELEVATION
1:200

FINISHES LEGEND:

CN1 - OFF FORM CONCRETE NATURAL LIGHT COLOUR
BK1 - BRICK VENEER - LIGHT BEIGE COLOUR
MC1 - ANODISED ALUMINIUM CLADDING - DARK COLOUR
LVR - ANODISED ALUMINIUM BLINDS - DARK COLOUR
STN - STONE CLADDING SAND STONE
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2 VIEW 3D - SOUTH ELEVATION

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COL	Column	FS	Fire Stairs	OSD	Onsite Detention Tank	TOF	Top of Fence
COMM	Comms Room	FSR	Floor Space Ratio	P	Pantry	TOW	Top of Wall
		GBA	Gross Building Area			VIS	Visitor Parking

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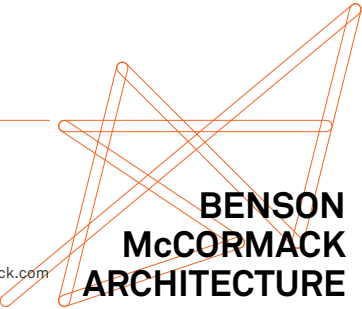
PROJECT DETAILS
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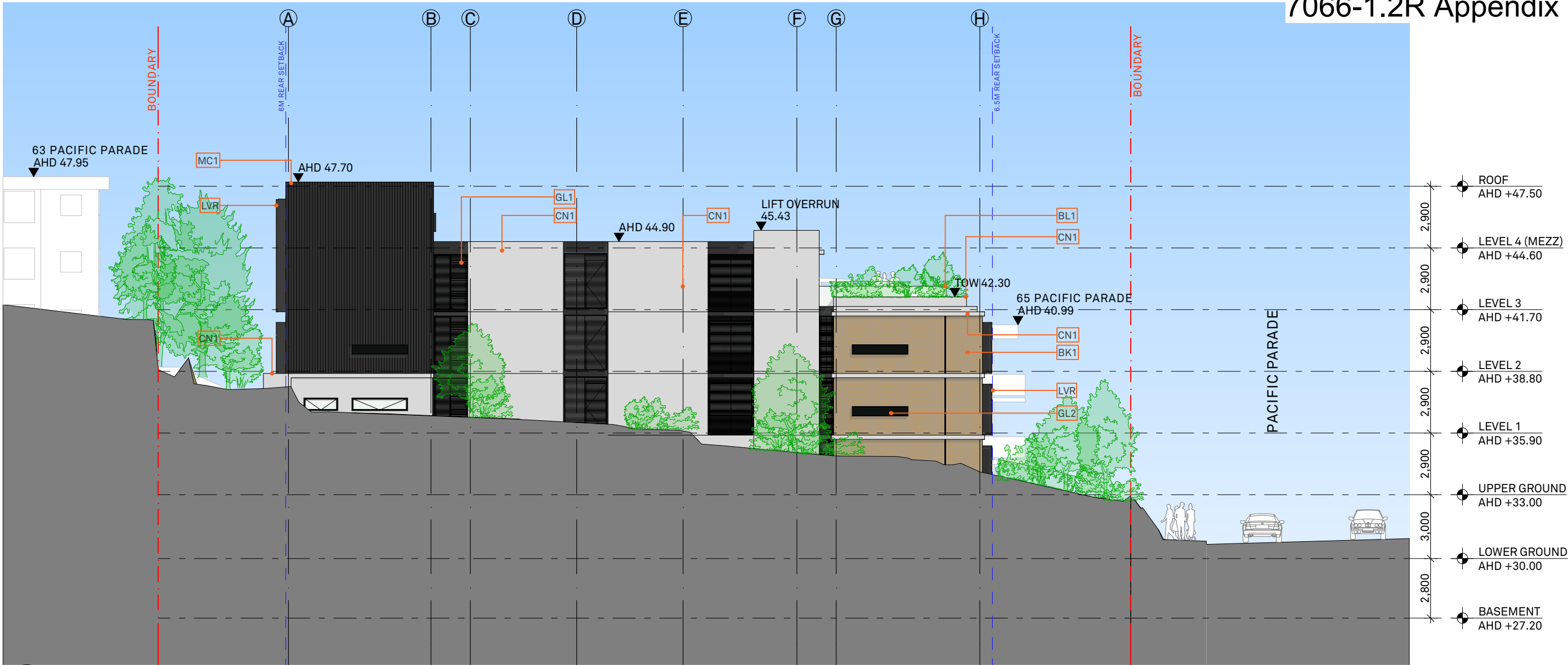
DRAWING TITLE
**ELEVATIONS - SOUTH
ELEVATION**

SCALE
1:200@A3
STATUS
DA
PROJECT No
2004A

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DB
DRAWING No
DA-0201
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WEST ELEVATION
1:200



3D VIEW - WEST ELEVATION

FINISHES LEGEND:

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PROJECT DETAILS
67 PP
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DRAWING TITLE
**ELEVATION - WEST
ELEVATION**

SCALE
1:200@A3
STATUS
DA
PROJECT No
2004A

APPROVED
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DRAWN BY
DB
DRAWING No
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