ANAVS-ACOUSTIC NOISE & VIBRATION SOLUTIONS P/L
Office 9, 438 Forest Rd, Hurstville , NSW 2220. ABN: 42 663 590 430
Phone: 9793 1393 Fax: 9708 3113 Email: info@acousticsolutions.com.au

Acoustic Report

For Proposed Commercial Development including Childcare Centre at

No. 1-3 Careel Head Road, Avalon Beach

Prepared by Domeniki Tsagaris (M.I.E Aust), B.E. (UNSW)
Australian Acoustical Society (Sub).
Approved by Moussa Zaioor M.I.E. Aust, CPENG
Australian Acoustical Society (Member).

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1.0 INTRODUCTION

ANAVS, Acoustic, Noise & Vibration Solutions Pty Ltd was commissioned to investigate the environmental noise impact of the demolition of proposed commercial building and the construction of new commercial structure including a Childcare centre at No. 1-3 Careel Head Rd, Avalon Beach on the surrounding environment (Figure 1 – Site Location). ANAVS P/L is to prepare a noise report including all necessary noise control measures.

This report is prepared in accordance with the Architectural plans prepared by CD Architects dated June, 2024 and the Traffic & Parking Impact by CJP Consulting Engineer dated 18th July, 2024.

The operation of the proposed building including the Childcare centre will comply with the Road Noise Policy, the NSW Noise Policy for Industry 2017, the Noise Guide for Local Government and the Northern Beaches Council requirements. The operation of the Childcare Centre including its mechanical plant will comply with the Association of Australasian Acoustical Consultants (AAAC) Guideline for Childcare Centre Acoustic Assessment (Version 3.0) dated September 2020.

2.0 GENERAL DESCRIPTION AND ENVIRONMENT

The site is located on the corner of Careel Head Rd & Barrenjoey Rd in the suburb of Avalon Beach (Figure 1 – Site Location). The Childcare centre will be located on the top floor of the proposed two (2) storey commercial development (Figure 2-3 – Proposed Retail Tenancies & Childcare Layout). As per CD Architects' architectural plans, the proposed mixed-use development will include one (1) level of basement parking and the following:

- Ground Floor – Commercial Tenants
- Level 1 – Childcare Centre

The surrounding area contains a mixture of residential properties (Figure 4 – Surrounding Environment).

The nearest residential receivers (Figure 5 – Nearest Residential Receivers) that have the potential to be affected by the operation of the commercial tenancies and Childcare centre are the tenancies located as follows:

Table 2.1 – Nearest Residential Receivers

Receiver	Address & Location	Dwelling Type
R1	712 Barrenjoey Rd, Avalon Beach (south of site)	Single Storey Residential Dwelling
R2	712A Barrenjoey Rd, Avalon Beach (south of site)	Single Storey Residential Dwelling.
R3	Units at No. 5-7 Careel Head Rd, Avalon Beach (east of site)	Multi-Storey Residential Building.
R4	2 Careel Head Rd, Avalon Beach (north of site)	Single Storey Residential Dwelling.
R5	N. 4 & 4A Careel Head Rd, Avalon Beach (north of site)	Two Storey Residential Dwellings.

The proposed childcare centre will accommodate a total of sixty (60) children between the ages of 0 and 5 years old, as well as nine (9) staff members. Composition of the children and staff will be as follows:

Table 2.2 - Composition of Children and Staff

Age Group:	No. of Children	No. of Staff
0-2 years old	8	2
2-3 years old	15	3
3-5 years old	37	4
Max Total:	**60**	**9**

The proposed childcare centre will have the following hours of operations:

- Monday to Friday: 7:00 am to 6:00pm
- Saturday and Sunday: Closed

Children will mainly be dropped off in the morning between the hours of 7:00am – 9:00am and picked up in the afternoon between the hours of 4:00pm – 6:00pm.

The basement carpark will accommodate a total of fifteen (15) car spaces designated for the childcare centre. (Figure 6 – Proposed Basement Parking).

The proposed childcare centre will include three (3) indoor play areas as well as one (1) outdoor play area adjacent to the southern boundary of the site (Figure 7 – Proposed Indoor & Outdoor Play Areas). The children will be taken outside for outdoor play in different age groups at various times throughout the day. The childcare centre will also have a staff room, kitchen and a safe haven.

Four major noise producing activities at the proposed building including the childcare centre have been considered:

- Vehicles entering and exiting the car park,
- Children playing in the outdoor play area,
- Indoor activities, and,
- Noise from proposed mechanical plant and air-conditioning units.

3.0 NOISE SURVEY, INSTRUMENTATION & RESULTS

On the 21st of June 2024, an engineer from this office visited site at the above address and carried out noise measurements at the proposed development. Unattended noise measurements were carried out near the proposed building line in direct line of sight of Barrenjoey Rd in order to determine traffic noise levels from Barrenjoey Rd & Careel Head Rd- Point A-.

Background noise readings were also carried out (away from the main road) near the rear of the site in order to determine existing background noise levels - Point B-. (Figure 8 – Noise Reading Locations – Point A & Point B).

The unattended noise measurements at Points A & B were carried out for a period of seven (7) days between June 21st, 2024 and June 27th, 2024. The noise survey was conducted to determine the $L_{(A90,\ 15\ minutes)}$ and $L_{(Aeq,\ 15\ minutes)}$ of the existing background noise levels during the Day (7:00-18:00), Evening (18:00-22:00) and Night (22:00-7:00).

All unattended sound level measurements and analysis performed throughout this project are carried out with a NSRTW_MK3 wireless sound level data logger (Serial No. Alv8DHWQUXU3grtCZwJZPD- Office Tag- machine 4 & logger (Serial No. CPp0Dd04c1c9iLtiSwBRPD- Office tag -machine 1-). The sound loggers' specifications are as follows:

- Type 1 digital MEMS microphone
- Non-volatile 128 Mb recording memory
- Records L-max, L-min and Leq levels
- Log interval adjustable from 125 ms (8 points per second) up to hours
- A, C and Z weighting curves
- Oscilloscope and spectrum analyser features
- Observes and records 100% of the acoustic signal
- Software calculates global Leq according to ISO and OSHA methods
- WIFI connectivity to report measured levels remotely
- Weatherproof casing designed for indoor/outdoor applications
- Activity detection and logging.
- Long-term measurement and recording of acoustic levels for environmental impact studies.

The loggers are factory calibrated and calibration certificates dated 05/07/2022 & 14/08/2023 are presented in Figure 9 – Calibration Certificates.

The microphones were positioned 1.5m from ground level. The machines were calibrated prior and after reading using our Svantek SV 33A S/N: 90200 Class 1 Calibrator with no significant drift recorded. Any noise readings affected by strong wind or rain have been disregarded [(1)].

The Full Average Statistical Noise Parameters, $L_{(Aeq,\ 15\ minutes)}$, $L_{(Rear\ ,\ 15\ minutes)}$, $L_{(A10,\ 15\ minutes)}$, are presented in Figure 10 & 11 – Noise Surveys (Points A & B). A summary of those readings is presented in the Tables below.

Table 3.1- Unattended Traffic Noise Readings at Point A from June 21 -June 27th, 2024*

Location	*Time of Day*	*Leq 15 Minute dB(A)*	*L90 15 Minute dB(A)*	*RBL **
Point A – Near Northern Boundary of Site (Traffic Noise)	Day 7:00-18:00	60	57	52
	Evening 18:00-22:00	57	46	44
	Night 22:00-7:00	52	44	42

***Site is mainly affected by traffic noise from Barrenjoey Rd.**
****RBL is calculated as per Fact Sheet B of the NPfI (2017)**

Table 3.2- Day & Night Noise Readings at Point A – *June 21-June 27th, 2024*

Location	*$L_{Aeq,\ 15\ hr}$ -Day- dB(A) Logarithmic Average*	*$L_{Aeq,\ 9hr}$ -Night- dB(A) Logarithmic Average*
Point A	60 dB(A)	52dB(A)

Table 3.3 - Summary of Unattended Background Noise Readings at Point B- June 21st -June 27th, 2024

Measurement Location	*Time Period*	*LAeq 15min dB(A)*	*LA90 15min dB(A)*	*Rating Background Level (RBL)* dB(A)*
Point B	*Day (7am-6pm)*	52	45	42
	Evening (6pm-10pm)	51	45	41
	Night (10pm-7am)	48	44	39

***RBL is calculated as per Fact Sheet B of the NPfI (2017)**

(1) Noise data is validated using the weather zone websites addresses:

https://www.weatherzone.com.au/station/SITE/66059/observations/2024-06-21 to
https://www.weatherzone.com.au/station/SITE/66059/observations/2024-06-27

4.0 INTERNAL ACOUSTIC AMENITY (NOISE BREAK IN)

The proposed childcare centre must be built to comply with the internal noise amenity levels stated in the NSW Department of Planning Document 'Development Near Rail Corridors And Busy Roads – Interim Guideline–' referred to in this report as " The Interim", AS 2107:2016 *'Acoustics – Recommended Design Sound Levels and Reverberation Times',* and the AAAC Technical Guideline for Childcare Noise Assessments V3.0.

4.1 THE INTERIM GUIDELINE

Barrenjoey Rd has an Annual Average Daily Traffic (AADT) > 20,000 vehicles and is classified as a busy Road. Since the proposed Childcare centre is located on Barrenjoey Rd, according to Figure 3.4(a) of the Interim Guideline, an acoustic assessment is required for the proposed development in accordance with Table 3.1 presented below.

Table 3.1: Noise criteria

Residential Buildings		
Type of occupancy	Noise Level dBA	Applicable time period
Sleeping areas (bedroom)	35	Night 10 pm to 7 am
Other habitable rooms (excl. garages, kitchens, bathrooms & hallways)	40	At any time
Non-Residential Buildings		
Type of occupancy		Recommended Max Level dBA
Educational Institutions including child care centres		40
Places of Worship		40
Hospitals	- Wards	35
	- Other noise sensitive areas	45

Note: airborne noise is calculated as L_{eq} (9h) (night) and L_{eq} (15h)(day). Groundborne noise is calculated as L_{max} (slow) for 95% of rail pass-by events.

4.2 AUSTRALIAN/NEW ZEALAND STANDARD AS/NZS 2107:2016

It is usual practice, when we find it necessary to recommend internal sound levels in buildings to refer to Australian/New Zealand Standard AS/NZS 2107:2016 *"Acoustics – Recommended Design Sound Levels and Reverberations times for Building Interiors"*.

This standard provides recommended noise levels for steady state such as noise from building services and quasi-steady state sounds, such as traffic and rail noise. The noise levels recommended in AS/NZS 2107:2016 take into account the function of the area that applies to the sound level measured within the space unoccupied although ready for occupancy. The standard recommends the following noise levels for educational developments.

TABLE 1
DESIGN SOUND LEVELS AND REVERBERATION TIMES FOR DIFFERENT AREAS OF OCCUPANCY IN BUILDINGS

Item	Type of occupancy/activity	Design sound level ($L_{Aeq,t}$) range	Design reverberation time (T) range, s
1	EDUCATIONAL BUILDINGS		
	Art/craft studios	40 to 45	< 0.8
	Assembly halls up to 250 seats	30 to 40	0.6 to 0.8
	Assembly halls over 250 seats	30 to 35	Curve 1*
	Audio-visual areas	35 to 45	0.6 to 0.8
	Computer rooms—		
	Teaching	40 to 45	0.4 to 0.6
	Laboratories	45 to 50	0.4 to 0.6
	Conference rooms	35 to 40	0.6 to 0.7
	Corridors and lobbies	< 50	< 0.8
	Drama studios	35 to 40	Curve 1*
	Engineering workshops—		
	Teaching	< 45	See Note 1
	Non-teaching	< 60	See Note 1
	Weight training/Fitness room	< 50	< 1.0
	Interview/counselling rooms	40 to 45	0.3 to 0.6
	Laboratories—		
	Teaching	35 to 45	0.5 to 0.8
	Working	40 to 50	0.5 to 0.8
	Lecture rooms up to 50 seats	30 to 35	Curve 3*
	Lecture theatres—		
	Without speech reinforcement	30 to 35	Curve 3*
	With speech reinforcement	30 to 40	Curve 3*
	Libraries—		
	General areas	40 to 50	< 0.6
	Reading areas	40 to 45	< 0.6
	Manual arts workshops	< 45	< 0.8
	Medical rooms (First Aid)	40 to 45	0.6 to 0.8
	Music practice rooms	40 to 45	0.7 to 0.9
	Music studios	30 to 35	Curve 2* (see Note 3)
	Office areas	40 to 45	0.4 to 0.7
	Professional and administrative offices	35 to 40	0.6 to 0.8
	Teaching spaces/single classroom—		
	Open plan teaching spaces	35 to 45	Curve 3* (see Note 1)
	Primary schools	35 to 45	Curve 3* (see Note 2)
	Secondary schools	35 to 45	Curve 3*

As for the reverberation time we assume that this will be around 0.4 seconds.

4.3 AAAC INTERNAL ACOUSTIC AMENITY (NOISE BREAK IN)

There are guidelines for internal acoustic amenity for childcare centres, as well as outdoor play areas. The AAAC Technical Guideline for Childcare Noise Assessments states the following:

- The Leq,1hr noise level from road traffic, rail or industry at any location within the indoor activity or sleeping areas of the Centre during the hours when the centre is operating shall be capable (i.e. with doors and/or windows closed) of achieving 40 dB(A) within indoor activity areas and 35 dB(A) in sleeping areas.
- The Leq,1hr intrusive noise level from road traffic, rail or industry at any location within the outdoor play or activity area of the Centre during the hours when the centre is operating shall not exceed 55 dB(A).
- The Leq,1hr intrusive noise level from aircraft at any location within the indoor activity or sleeping areas of the Centre during the hours when the centre is operating shall not exceed 50 dB(A) in accordance with Australian Standard AS 2021.

In order for the proposed Childcare centre to comply with the Noise break-in criteria discussed in sections 4.1,4.2 & 4.3 above the childcare façade & roof is to comply with Table 4.3.1 below.

Table 4.3.1 Windows/Sliders, Doors, Walls & Roof Specifications

Building Component	Rw Rating & reverberation time to be Achieved
Windows & Sliding Doors are to be minimum 6.38 mm Laminated with full perimeter Fin Mohair Woven Brush Seals (1)(2)(3).	**Rw>= 32**
External Walls 270/250 mm double brick/ brick veneer with 13mm thick plasterboard plus stud cavity filled with 75mm thick, 11kg/m³ insulation batts (2)(3).	**Rw>=50**
Internal Walls- We recommend that all internal walls in the inside play areas are to be internally lined with noise absorbing material of NRC>0.8 (eg. echo soft 25 or any panelling system that can achieve an NRC of 0.85).	**Reverberation time < 0.4**
Roof is to be Colorbond Steel Roofing with R2 insulation over battens, 13mm plasterboard ceiling with 75mm thick, 11kg/m3 insulation, in the ceiling cavity (3).	**40-45**

NB: This report is to be read in conjunction with the BASIX certificate and any other related building specification.
(1). No through weep holes in windows/sliders. (2) All gaps between window & door frames and the masonry walls are to be sealed using acoustic foam Hilti CP620 or similar. Glass wool batts should be applied prior to the application of the foam to seal larger gaps. (3) All gaps are to be acoustically sealed.

5.0 NOISE CONTROL LEGISLATIONS – Noise Break-Out

5.1 NSW NOISE POLICY FOR INDUSTRY (2017)

The above policy seeks to promote environmental well-being through preventing and minimizing noise by providing a framework and process for deriving noise limits conditions for consent and licenses.

The Noise Policy for Industry 2017 recommends two separate noise criteria to be considered, the Intrusive Noise Criteria and the Amenity Noise Criteria. A project noise trigger level being the lowest of the amenity and the intrusiveness noise level is then determined.

If the predicted noise level L_{Aeq} from the proposed project exceeds the noise trigger level, then noise mitigation is required. The extent of any 'reasonable and feasible' noise mitigation required whether at the source or along the noise path is to ensure that the predicted noise level L_{Aeq} from the project at the boundary of most affected residential receiver is not greater than the noise trigger level.

5.1.1 AMENITY NOISE CRITERIA

The amenity noise levels presented for different residential categories are presented in Table 2.2 of the Noise Policy for Industry 2017. For the proposed development at No. 1-3 Careel Head Rd, Avalon Beach, the recommended amenity noise levels are presented in Table 5.1.1.1 below:

Table 5.1.1.1- Recommended Amenity Noise Levels

Type of Receiver	***Area***	***Time Period***	***Recommended Leq Noise Level, dB(A)***
Residence	Urban*	Day	60
		Evening	50
		Night	45

*RBL>45 dB(A) Dayy, >40 dB(A) Evening & >35 Night time.

Where a noise source contains certain characteristics such as tonality, impulsiveness, intermittency, irregularity or dominant low-frequency content, a correction is to be applied which is to be added to the measured or predicted noise levels at the receiver, before comparison with the criteria. Shown below are the correction factors that are to be applied:

Table 5.1.1.2 – Modifying Factor Corrections as per Fact Sheet C (Noise Policy for Industry 2017)

Factor	***Correction***
Tonal Noise	+ 5 dB [1,2]
Low-Frequency Noise	+ 2 or 5 dB [1]
Intermittent Noise	+ 5 dB

Duration	+ 0 to 2 dB(A)
Maximum Adjustment	Maximum correction of 10 dB(A)[1](excluding duration correction)

1. Where a source emits tonal and low-frequency noise, only one 5-dB correction should be applied if the tone is in the low-frequency range, that is, at or below 160 Hz.
2. Where narrow-band analysis using the reference method is required, as outlined in column 5, the correction will be determined by the ISO1996-2:2007 standard.

Correction for duration is to be applied where a single-event noise is continuous for a period of less than two and a half hours in any assessment period. The allowable exceedance of the $L_{Aequ,15min}$ equivalent noise criterion is depicted in Table 5.1.1.3 for the duration of the event. This adjustment accounts for unusual and one-off events and does not apply to regular and/or routine high-noise level events.

Table 5.1.1.3 – Adjustment for Duration as per Fact Sheet C (Noise Policy for Industry 2017)

Allowable duration of noise (one event in any 24-hour period)	***Allowable exceedance of LAeq,15min equivalent project noise trigger level at receptor for the period of the noise event, dB(A)***	
	Daytime & evening (7 am–10 pm)	***Night-time (10 pm–7 am)***
1 to 2.5 hours	2	Nil
15 minutes to 1 hour	5	Nil
6 minutes to 15 minutes	7	2
1.5 minutes to 6 minutes	15	5
less than 1.5 minutes	20	10

According to Section 2.4 of the above policy, the project amenity noise level is determined as follows:

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

To convert from a period level to a 15-minute level, a plus 3 is added as per section 2.2 of the policy.

Therefore, the project amenity noise levels for the proposed childcare at No. 1-3 Careel Head Rd, Avalon Beach is as follows:

Daytime: **60 – 5 + 3 = 58 dB(A)**
Evening: **50 – 5 + 3 = 48 dB(A)**
Night-time: **45 – 5 + 3 = 43 dB(A)**

5.1.2 INTRUSIVE NOISE CRITERIA

Section 2.3 of the Noise Policy for Industry 2017 summarizes the intrusive criteria as below:

$L_{Aeq,\,15\,minute} \leq$ rating background level plus 5

Therefore, the acceptable L_{eq} noise intrusiveness criterion for the proposed development at No.1-3 Careel Head Rd, Avalon Beach is as follows:

Daytime: **42 + 5 = 47 dB(A)**
Evening: **41 + 5 = 46 dB(A)**
Night-time: **39+ 5= 44 dB(A)**

5.1.3 PROJECT NOISE TRIGGER LEVEL

A summary of intrusiveness and amenity noise levels as determined in Sections 5.1.1 and 5.1.2 are shown in Table 5.1.3.1 below:

Table 5.1.3.1 - Summary of Intrusiveness and Project Amenity Noise Levels

Period	Intrusiveness Noise Level	Project Amenity Noise level
Day Time (7:00am-6:00pm)	47	58
Evening Time (6:00pm-10:00pm)	46	48
Night & Early Morning (10:00pm – 7:00am)	44	43

The project noise trigger level is the lower (that is, the most stringent) value of the amenity and intrusiveness noise levels for the day, evening and night. Therefore, the project noise trigger levels for the proposed development are as shown below:

Daytime: **$L_{Aeq,15\,min}$ 47 dB(A)**
Evening: **$L_{Aeq,15\,min}$ 46 dB(A)**
Night: **$L_{Aeq,15\,min}$ 43 dB(A)**

The above are the Project Trigger Noise levels at the rear of the site - Point B-.
Similarly, the Project Trigger Noise levels at the front of the site - Point A-. are as follows

Daytime: **$L_{Aeq,15\,min}$ 57 dB(A)**
Evening: **$L_{Aeq,15\,min}$ 48 dB(A)**
Night: **$L_{Aeq,15\,min}$ 43 dB(A)**

The proposed development will not exceed the project noise trigger level at the most sensitive locations, provided all noise control recommendations detailed in this report are adhered to.

5.2 AAAC GUIDELINE FOR CHILDCARE ACOUSTIC ASSESSMENT

5.2.1 OUTDOOR PLAY AREAS

The AAAC Guideline sets out recommended noise levels from outdoor play areas of childcare centres. For most childcare centres, the duration of time that children can play outside is directly associated with the overall noise impact. The less amount of time a child is allowed to play outside, the overall noise impact reduces. Therefore, it is reasonable to allow a higher level of noise impact for shorter duration of outdoor play.

Section 3.2.1 of the AAAC Technical Guideline for Childcare Noise Assessment on Page 6, allows an increase of ***10 dB above the background noise level*** for outdoor play time of up to ***four (4) hours per day (2 hours in the morning and 2 hours in the afternoon)*** and 5 dB above the background noise levels if outdoor play time *exceeds four (4) hours per day.*

As children will be in the outdoor play area for up to 4 hours per day (during daytime hours only), the noise emission criterion from outdoor play times is:

- **Daytime:** **45 + 10 = 55 dB(A)**
- **Evening:** **NA**
- **Night-time:** **NA**

5.2.2 INDOOR PLAY AREA, MECHANICAL PLANT, PICK UP/DROP OFF

Section 3.2.2 of the AAAC Guideline for Childcare Centre Acoustic Assessment, lists the following criteria to all other noise emission from a Childcare Centre including children playing in indoor play areas, operation of mechanical plant and parent pick up/drop off:

"The cumulative Leq,15min noise emission level resulting from the use and operation of the childcare centre, with the exception of noise emission from outdoor play discussed above, shall not exceed the background noise level by more than 5 dB at the assessment location".

Therefore, the cumulative noise emission criterion from indoor play, mechanical plant and pickup/drop off is:

- **Daytime:** **45 + 5 = 50 dB(A)**
- **Evening:** **NA**

- **Night-time: NA**

5.3 TRAFFIC NOISE CRITERIA

Table 3 on Page 11 of the NSW Road Noise Policy states that the Leq (1 hour) level of noise intrusion from land use developments with potential to create additional traffic on local roads should not exceed 55 dB(A) during the daytime (7am to 10pm) and 50 dB(A) during nighttime (10pm to 7am).

5.4 NOISE GUIDE FOR LOCAL GOVERNMENT

The Department of Environment and Conservation (NSW) published the amended *Noise Guide for Local Government* in October 2010. The policy is specifically aimed at assessing noise from light industry, shops, entertainment, public buildings, air conditioners, pool pumps and other noise sources in residential areas.

Section 2.2.3 of the Noise Guide for Local Government recommends noise measurements and an intrusive noise level when attempting to achieve acceptable and achievable noise limits.

Section 2.2.1 of the Noise Guide for Local Government states that a noise source is generally considered to be intrusive if the noise from the source when measured over a 15-minute period exceeds the background noise by more than 5 dB(A).

Therefore, the noise criteria are as follows:

- **Day period: 45 + 5 = 50 dB(A)**
- **Evening period: 45 + 5 = 50 dB(A)**
- **Night period: 44 + 5 = 49 dB(A)**

The appropriate regulatory authority (Local Council) may, by notice in writing given to such a person, prohibit the person from causing, permitting or allowing:

1. any specified activity to be carried on at the premises, or
2. any specified article to be used or operated at the premises.

or both, in such a manner as to cause the emission from the premises, at all times or on specified days, or between specified times on all days or on specified days, of noise that, when measured at any specified point (whether within or outside the premises,) is in excess of a specified level.

It is an offence to contravene a noise control notice. Prior to being issued with a noise control notice, no offence has been committed.

5.4.1 SLEEP DISTURBANCE

This applies to the staff arriving at opening time of the childcare centre just before 7:00 a.m.

In order to minimize the potential of sleep disturbance due to transient noises from staff arriving during the early morning hours (6:00am – 7:00am), Section 2.2.4 of the Noise Guide For Local Government recommends that $L_{A1,1\text{-minute}}$ level of any noise outside a bedroom should not exceed the background noise level by more than 15dB. Therefore, the following criteria will apply at the outside window of the nearest residential receivers:

$L_{A1,\ 1\ minute}$ =< 44 + 15= 59 dB(A) outside bedroom window of nearest residential receiver.

Similar text about sleep arousal is adopted in the Noise Policy for Industry 2017 as below:

Where the subject development/premises night-time noise levels at a residential location exceed:

- **$L_{Aeq,15min}$ 40 dB(A) or the prevailing RBL plus 5 dB, whichever is the greater, and/or**
- **L_{AFmax} 52 dB(A) or the prevailing RBL plus 15 dB, whichever is the greater,**

a detailed maximum noise level event assessment should be undertaken.

Additionally, Section 5.4 of the NSW Road Noise Policy states the following:

Further studies by the enHealth Council (2004) and the guidelines published by the World Health Organisation (1999) were reviewed and analysed in terms of the guidance on noise exposure and sleep disturbance. The enHealth report states that:
'as a rule for planning for short-term or transient noise events, for good sleep over 8 hours the indoor sound pressure level measured as a maximum instantaneous value should not exceed approximately 45 dB(A) $L_{A,\ (Max)}$ more than 10 or 15 times per night'.

6.0 PREDICTED NOISE FROM PROPOSED BUILDING INCLUDING THE CHILDCARE

As stated in Section 2.0 of this report, noise levels from the proposed building including the childcare are classified into four main noise sources:

- Noise on surrounding streets from additional vehicles approaching/leaving the proposed development and noise from vehicles entering/exiting the carpark;
- Noise from Indoor activities.
- Noise from Children playing in the outdoor playground and patrons in the outside seating areas

- Noise from Mechanical plant & Air-conditioning.

6.1 CARS ARRIVING AT AND DEPARTING THE PROPOSED BUILDING

Designated parking for the proposed building including the Childcare Centre will be available in the proposed basement parking of the development at No. 1-3 Careel Head Rd, Avalon Beach. As for the childcare, a total of fifteen (15) parking spaces will be available. (Figure 6 – Proposed Basement Parking).

In addition to customers parking, parents will mainly drop children off in the morning between 7:00am - 9:00am and pick them up in the afternoon between 4:00pm - 6:00pm from Monday to Friday only.

Essentially, staff will arrive in the shoulder period prior to 7:00 am opening time and post 6:00 pm closing time. Since staff vehicles will enter & exit the building only once, an assessment of Sleep Disturbance in the night hours (10:00 pm - 7:00 am) is not applicable.

Additional traffic noise generated on Careel Head Rd & Barrenjoey Rd will need to comply with the Traffic Noise Criteria listed in Section 5.3 of this report. Noise generated by cars in the carpark and internal driveways will need to comply with criteria listed in Section 5.1.3 of this report.

6.1.1 NOISE ON CAREEL HEAD & Barrenjoey Rd FROM ADDITIONAL TRAFFIC GENERATION

The Traffic & Parking Impact Assessment prepared by CJP Consulting Engineering predicted a net increase of 26 vehicles trips in the AM morning peak hour and 46 vehicle movements in the afternoon PM peak hour.

The nearest residential receivers that will be affected by vehicles entering/exiting the proposed car park will be the residential properties along Careel Head Rd and Barrenjoey Rd (Figures 7 & 8). Predicted noise levels at the building line of Careel Head Rd & Barrenjoey Rd, Avalon Beach, due to additional traffic generation on Careel Head Rd and Barrenjoey Rd are presented in Table 6.1.1.1 below:

Table 6.1.1.1 – Predicted Noise from Traffic Generation on Careel Head Rd & Barrenjoey Rd at 1.0m From Existing Facades

Activity	Period	Expected Leq 1hr dB(A) from Additional Traffic Noise	Complies with Traffic Noise Criteria- as per Section 5.3
Noise on Careel Head Rd and Barrenjoey Rd from Additional Traffic Generation	7:00am – 9:00am	49 dB(A)	Yes <55 dB(A)
	4:00pm-6:00pm	51 dB(A)	

6.1.2 NOISE FROM CARS IN THE CARPARKING AREAS & DRIVEWAYS

Car park noises may typically comprise of adult's and children's voices, car radios, cars starting up and car doors closing. Measurements and observations conducted at various other childcare centres were saved in our data base in order to obtain the generic car park noise data presented below.

Table 6.1.2.1 – Car Park Noise Source Levels

Car Park Noise Source	Average Sound Power Level, dB(A)
Car Door Closing	91*
Car Starting	91*
Car Accelerating	91*
Car Moving	81
Roller Door Opening and Closing	85*

*Noise levels occurring inside fully enclosed basement.

For vehicles entering the basement carpark, the only noise generated will be by cars moving in and out of the driveway. The remainder of car activities listed in the table above will occur inside the basement and therefore noise produced by those activities will be attenuated by the basement enclosure.

Entry to the basement carpark will be via Careel Head Rd and the exist of the carpark will be from Barrenjoey Rd. Predicted noise levels at the boundary of the nearest residential receiver due to cars entering and exiting the basement and ground floor carpark are presented in Table 6.1.2.2 below. Noise attenuation loss from the basement enclosure, distance to the nearest receiver, as well as any sound barriers (fences) have been taken into account.

Table 6.1.2.2 – Predicted Noise from Vehicles entering and exiting the carpark at boundary of Most Critical Receivers [*,**]

Activity	Period	Expected Leq dB(A) R2	Expected Leq dB(A) R4	Complies with Noise Trigger level- as per Section 5.1.3 [*,**]
Vehicles Entering/Exiting the Basement Car Park	7:00am - 9:00am	44* dB(A)	39* dB(A)	Yes <57 dB(A) [Nosie Trigger level]
	4:00pm - 6:00pm	44.5* dB(A)	39.5 * dB(A)	Yes <57 dB(A) [Nosie Trigger level]

*Based on Traffic Report by CPG dated July 18th, 2024
** Assuming all noise mitigations as per section 7.0 are adhered to.

6.2 NOISE FROM INDOOR ACTIVITIES

The predicted noise levels at the boundaries of the most affected neighbouring residence from the inside of the commercial tenancies and the childcare of maximum sixty (60) children and nine (9) staff members congregating indoors is presented in Table 6.2.1 below. Construction assumed to be of masonry/masonry veneer or concrete construction.

The sound loss through the façade of the is calculated using Templeton/Saunders equation (A-Weighted):

$$L_{p2} = L_{p1} - R + 10Log_{10}(S) - 20Log_{10}(r) - 17 + DI \ \ dB$$

Where;

- L_{p2} Noise level at location 2 from the source;
- L_{p1} Noise level at the source;
- R Weighted sound reduction index of the façade;
- S Area of the façade;
- r Distance in meters to location 2 from the source; and
- DI Directivity associated with the source =3.

Table 6.2.1 – Predicted Noise from Childcare Proposed Indoor Activities at Most critical Residential Receivers *,**

Activity	Period	Expected Leq dB(A) at 712 Barrenjoey Rd, Avalon Beach R1	Expected Leq dB(A) at 712A Barrenjoey Rd, Avalon Beach R2	Expected Leq dB(A) at 5-7 Careel Head Rd, Avalon Beach R3	Compliance with the Noise Guide for Local Government as per Section 5.4 *,**
Sixty (60) Children and Nine (9) Staff members indoors	7:00am – 6:00pm	27 dB(A)	18 dB(A)	31 dB(A)	Yes <50 dB(A) =L90+5

*Assumed all recommendations of Section 7 are adhered to.
** NPfI does not apply – Exclusions listed in section 1.5 page 5 of the policy.

The cumulative internal noise levels from other commercial premises within the development in addition to noise levels from the childcare will be below the noise trigger levels determined in Section 5.4 of this report**,** provided all Noise Control recommendations presented in section 7.0 are adhered to.

6.3 NOISE FROM CHILDREN PLAYING IN THE OUTDOOR AREA & TENANCIES OUTDOOR AREAS

The proposed childcare centre on the first floor of No. 1-3 Careel Head Rd will include three (3) indoor areas and one (1) outdoor play area that will face the southern boundaries of the site (Figure 7– Indoor & Outdoor Play Area).

Children spend the majority of the day doing indoor activities. They are taken outside for external educational play activities that are supervised in accordance with the Department of Community Services' guidelines.

The children will be taken outside for outdoor play time at various times of the day in different age groups. The highest predicted noise source from the proposed childcare centre will be from children playing outside in the outdoor play area.

Based on the sound data published in the AAAC 'Guideline for Childcare Centre Acoustic Assessment' (September 2020 V3.0) the sound levels of 10 children playing from various age groups are summarised in Table 6.3.1 below.

Table 6.3.1 – Sound Power levels of 10 Children Playing in Different Age Groups

	Sound Power Level [dB] at Octave Band Centre Frequencies [Hz]								
Number of Children & Age Group	***63***	***125***	***250***	***500***	***1k***	***2k***	***4k***	***8k***	***dBA***
10 Children – 0 to 2 Years Old	80	82	84	87	86	83	78	71	**78**
10 Children – 2 to 3 Years Old	71	69	67	61	58	54	47	44	**85**
10 Children – 3 to 5 Years Old	69	63	65	65	77	78	80	79	**87**

The residential properties that have the potential to be affected most by the use of the Outdoor Play Areas are the residential dwellings located south, north and east of the site (R1, R2, R3 & R4). (Figure 5 – Nearest Receivers).

All noise arising from the outdoor play areas of the childcare was modelled by SoundPlan 8.2 in the geo-database module (as shown in Figure 12). This allows for predicted noise levels and contours to be generated whilst accounting for ground elevation and noise attenuation/reflection/reverberation. The predicted noise levels are presented in Table 6.3.2 below:

Table 6.3.2 – Predicted Noise from Children Playing in the Outdoor Play Areas at Most Critical Receivers

Activity	**Period**	**Expected Leq dB(A) at Front Façade of No. 712 - Barrenjoey Rd, Avalon Beach R1**	**Expected Leq dB(A) at Front Façade of No. 712A - Barrenjoey Rd, Avalon Beach R2**	**Expected Leq dB(A) at Front Façade of No. 5-7 Careel head Rd, Avalon Beach R3**	**Expected Leq dB(A) at Front Façade of No.2 Careel head Rd, Avalon Beach R4**	**Complies with AAAC Criteria**
Group 1 - 0-2 & 2-3 age group (Total 23 children)	Various times throughout the day **(total of up to 4 hours/day)**	**39 dB(A)** (1),(2)	**35 dB(A)** (1),(2)	**36 dB(A)** (1),(2	**34 dB(A)** (1),(2	Yes<55 dB(A) [L90+10]
Group 2 – 3-5 age group (Total 37children)		**45 dB(A)** (1),(2)	**41 dB(A)** (1),(2	**42 dB(A)** (1),(2	**40 dB(A)** (1),(2	Yes<55 dB(A) [L90+10]

Note*

(1) Provided recommendations in Section 7 of this report are adhered to.
(2) Noise level calculated depending on age group playing outside

The cumulative external noise levels from other commercial premises within the development in addition to noise levels from the childcare will be below the noise trigger levels determined in Section 5.4 of this report**,** provided all Noise Control recommendations presented in section 7.0 are adhered to.

6.4 MECHANICAL PLANT NOISE EMISSION

A range of mechanical plant and equipment will be installed at the proposed childcare centre to allow for ventilation and fresh air compensating for the closed windows/sliding doors. Air-conditioning will also be installed. As per Section 4.2 of the AAAC Guideline, the typical range of sound power levels for mechanical plant is listed in Table 6.3.1 below:

Table 6.3.1 – Typical Mechanical Plant Sound Power Levels

Small (single fan) condenser (outdoor unit)	65 dB
Medium (double fan) condenser (outdoor unit)	70 dB
Large (double fan) condenser (outdoor unit)	80 dB
Small Exhaust Fan (toilet, garbage room)	60 dB
Small Kitchen Exhaust Fan	70 dB
Carpark Exhaust Fan	85 dB

In addition, the proposed parking area is located below ground level which makes natural ventilation unachievable. Thus, a mechanical extract system will also be used. The mechanical ventilation system will include the use of supply air fans/exhaust air fans to achieve all required air changes for exhaust fume and extract smoke clearance in accordance with Australian Standard AS 1668.2 *"The use of ventilation and air-conditioning in buildings Mechanical ventilation in buildings".*

As the proposed development is still in the initial application stage, we recommend that further acoustic assessment is carried out when the development has been approved and Mechanical Services plans have been prepared for our review.

In general, we recommend that all new external air-conditioning units are to be acoustically enclosed or set away from any boundary by more than 3.0m. The assessment of the mechanical plans once available will recommend proper silencer/(s) and duct lagging such that noise levels emitted from the mechanical plant servicing the childcare centre will meet the requirements of this report.

For the operation of the car park and basement garage door to meet the requirements of the NSW Noise Policy for Industry 2017, we recommend the following:

- Ensure maintenance and lubrication of motor bearings, door tracks and joints.

- The proposed security door fitted to the car parking area entrance must be independently mounted on rubber pads to prevent vibration noise transmission through the concrete walls and/or columns.

7.0 NOISE CONTROL RECOMMENDATIONS

7.1 OUTDOOR PLAY TIME

Kids using the outdoors areas are to be taken outside in groups as below:

Activity	Period
Group 1 (Total 23) **Outdoor Play Area** 8 Children from the 0-2 age group + 15 Children from the 2-3 age group **Group 2 (Total 37)** **Outdoor Play Area** 37 Children from the 3-5 age group	**Each Group Max. 2 hours outside per day** (Various times throughout the day)

In addition to the above, children are to be in the outdoor play areas during daytime hours only (7:00am – 6:00pm). **Children are not permitted to be in the outdoor play areas during the early morning hours (6:00 am – 7:00 am).**

7.2 MUSIC, SLIDING DOORS & NATURAL VENTILATION

The following acoustic recommendations with regards to music being played at the proposed childcare centre are as follows:

1) Whilst music is being played inside the proposed childcare centre, the windows and doors of the areas that the music is played in are to be closed.
2) No music is to be played outdoors at any time.
3) Windows/sliding doors can be left 20% opened for cross ventilation while music is not played, and kids are talking in casual/normal voice.

External doors are to be Solid Core with acoustic seals fitted around the door. A drop seal is required at the base of the external door. The seals should be similar to the Raven RP47 for the top and sides and RP38 at the base of the door. All windows to the childcare are to be 6.38mm laminated.

7.3 PLAY AREAS

Additionally, we recommend the following take place with respect to play areas:

1) Fixed play equipment should be plastic. If metal fixed play equipment is used, then hollow metal sections shall be filled with expanding foam or sand.
2) Concrete or brick paved areas, if any, should be minimised and where practicable covered with synthetic grass carpet to minimise noise of play equipment on the hard surfaces.
3) Children are to be separated into groups during outdoor play time as to not allow a large number of them to congregate in a single area at any one time.

7.4 SIGNS

Signs reminding staff and parents to arrive and depart in a quiet and orderly manner at all times shall be installed at entry and exit points of the childcare centre.

7.5 SUPERVISION

Ensuring that children are supervised at all times will minimize the noise generated by the children. In instances where typically louder activities are to take place, smaller groups are to be taken outside at different intervals throughout the day and they are to be properly supervised. Staff must be informed of the residential noise receivers and the importance of minimizing the outdoor noise produced by the children.

Additionally, childcare staffs are to be appropriately trained and are to keep the children occupied in educational and instructive play so as to keep them occupied less noisy. It is recommended that there be continuous monitoring of the activities within the outdoor areas to ensure casual-normal speech is used. The following table is indicative of children sound level of speech and the associated standard deviation variation.

Table 7.5.1 – Children Speech Sound Levels- *

Descriptor	Sound Pressure Level- -Anechoic Chamber-	Standard Deviation
Casual Speech	53 dB(A)	± 5dB
Normal Speech	58 dB(A)	± 5dB
Raised Speech	65 dB(A)	± 7dB
Loud Speech	74 dB(A)	± 9dB
Shouting	82 dB(A)	± 9dB

*Pearson, Bennett & Fidell (1977).

Children taken out are to be supervised within the outdoor play area and to not allow a large group to congregate in one area at any one time.

7.6 SOUND BARRIER FENCES

We recommend that a 2.0 m metre high tapered to 1.0 m lapped and capped timber, or brick gap free fence to be installed at the southern boundary of the site along the basement carpark driveway. In addition, a 1.5 m high gap free capped & lapped timber/Glass/Perspex fencing is to be installed surrounding the childcare outdoor play area. Refer to Figure 13&14 – Proposed Sound Barrier Locations.

7.7 MECHANICAL PLANT AND EQUIPMENT

The assessment of the mechanical plans once available will recommend proper silencer/(s) and duct lagging such that noise levels from the mechanical plant and equipment servicing the proposed development meet the Noise Trigger Levels determined in section 5.2.3 of this report.

Preliminary recommendations to comply with the criteria set out in Section 5 of this report is as follows:

- Airconditioning units are to be located no less than 3.0 metres from any residential boundary of the site.
- The outdoor Sound Power Level of any air conditioning unit is not to exceed 70 dB(A).
- Basement Air supply/Air exhaust fans to be placed away from R1,R2 & R3 towards Careel Head Rd facing Barrenjoey Rd.
- *As the proposed development is still in the initial application stage, we recommend that further acoustic assessments are carried out when the development has been approved and mechanical services plans have been prepared for our review.*

7.8 DELIVERIES AND WASTER REMOVALS

All deliveries and waste removals to take place between the operating hours of 7:00 a.m. and 6:00 p.m.

7.9 NOISE MANAGEMENT PLAN

A Noise Management Plan should be implemented and should include the following:

- Install a contact number at the front of the childcare centre so that complaints regarding the centre operation can be made.
- Implement a complaint handling procedure. If a noise complaint is received the complaint should be recorded on a Complaint Form. The Complaint Form should contain the

following:

- Name and Address of the Complainant
- Time and Date the Complaint was received
- The nature of the complaint and the time/date the noise was heard
- The name of the employee that received the complaint
- Actions taken to investigate the complaint and the summary of the results of the investigation
- Indication of what was occurring at the time the noise was happening (if applicable)
- Required remedial action (if applicable)
- Validation of the remedial action
- Summary of feedback to the Complainant

A register of complaints should also be held on the premises for at least 24 months and shall be reviewed monthly by staff to ensure all complaints are being responded to. All complaints received shall be reported to management with initial action/investigation commencing within 7 days. The complainant should also be notified of the results and actions arising from the investigation.

8.0 NOISE IMPACT STATEMENT

ANAVS, Acoustic, Noise & Vibration Solutions Pty Ltd have taken background noise level measurements at the most noise sensitive locations near the proposed commercial development including the Childcare Centre at No. 1-3 Careel Head Rd, Avalon Beach. The levels of noise emission from the proposed development including Childcare centre have been calculated and quantified using reliable test data.

Provided the noise controls recommended in Section 7.0 of this report are fully implemented, the noise emission levels will be controlled and not exceed the criteria outlined in this report, including the Northern Beach Council, the AAAC Childcare Guideline and the NSW Noise Policy for Industry.

Should you require further explanations, please do not hesitate to contact us.

Yours Sincerely,

M. Zaioor
M.S. Eng'g Sci. (UNSW).
M.I.E.(Aust), CPEng
Australian Acoustical Society (Member #1032).

APPENDIX

Figure 1 – Site Location

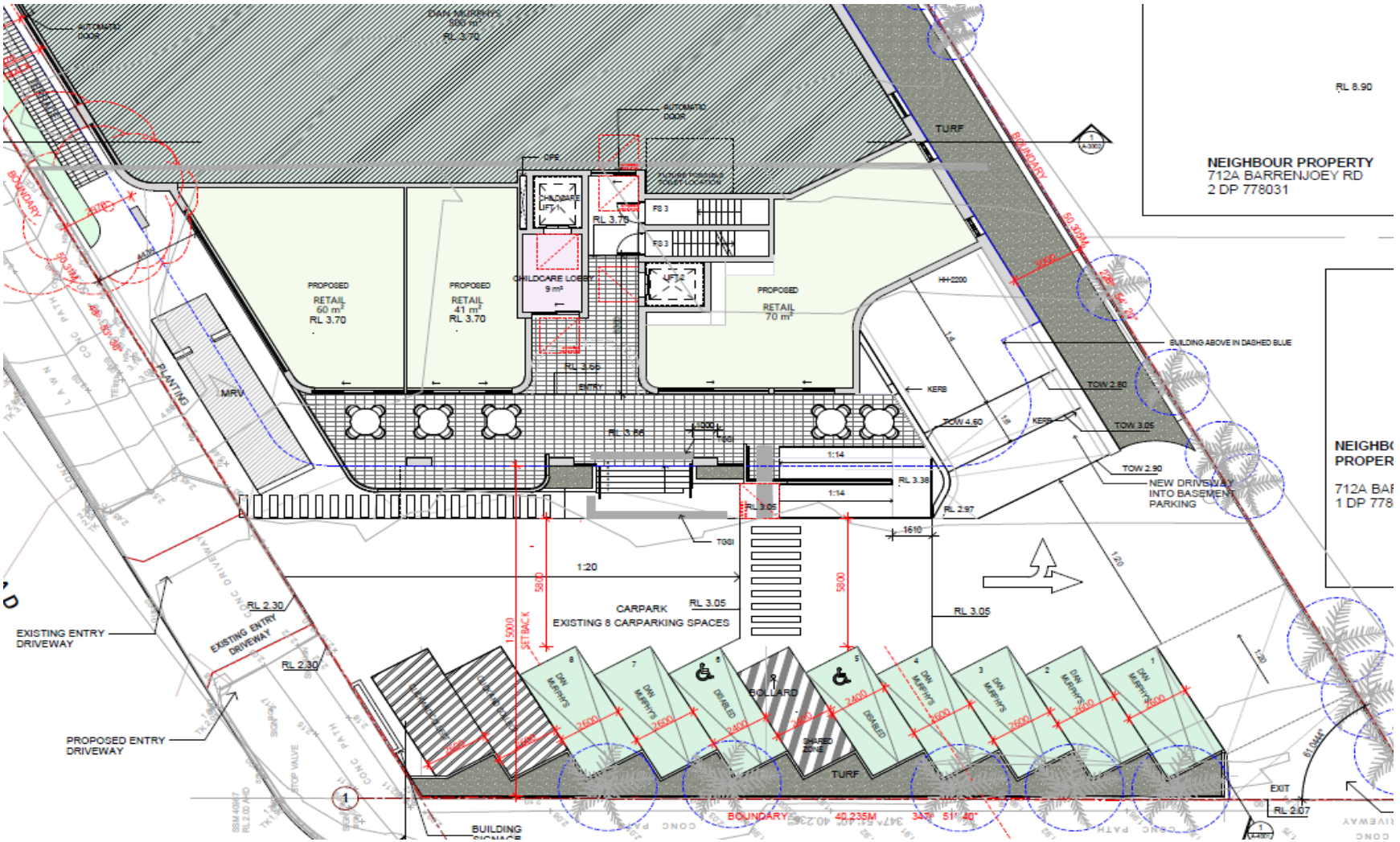


Figure 2 - Proposed Retail Tenancies (Ground Floor)

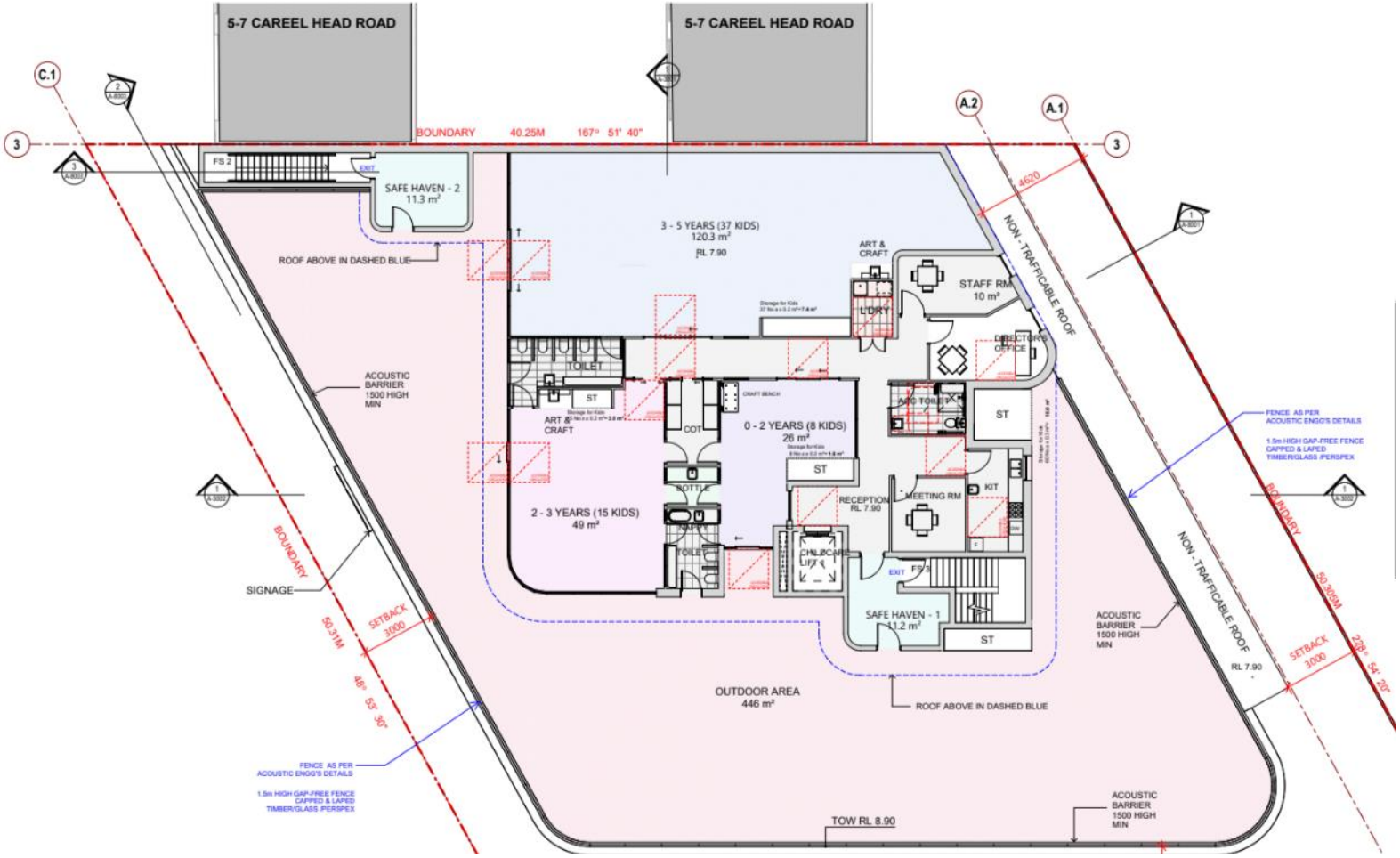


Figure 3 - Proposed Childcare Layout (First Floor)

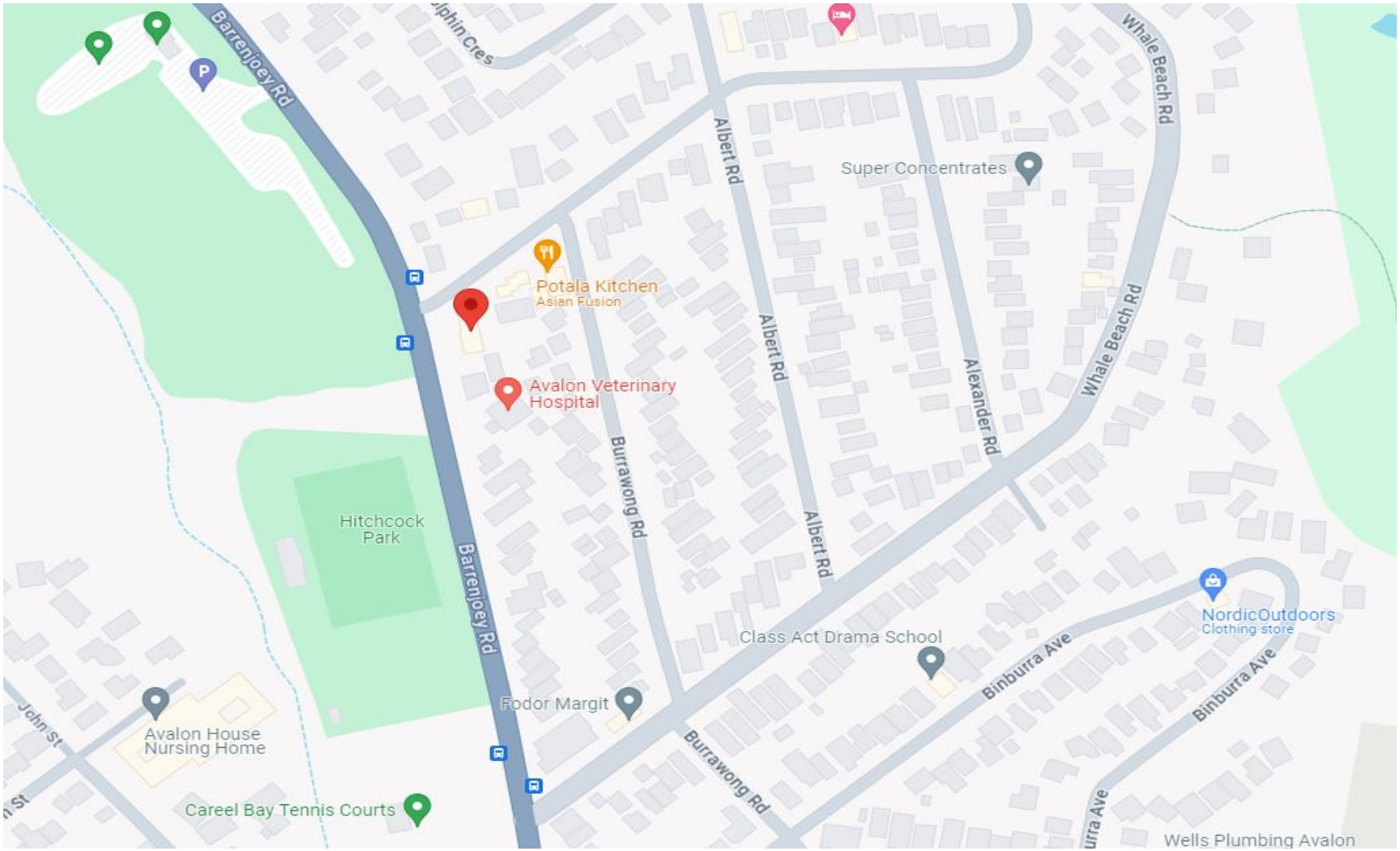


Figure 4 - Surrounding Environment

Figure 5 – Nearest Residential Receivers

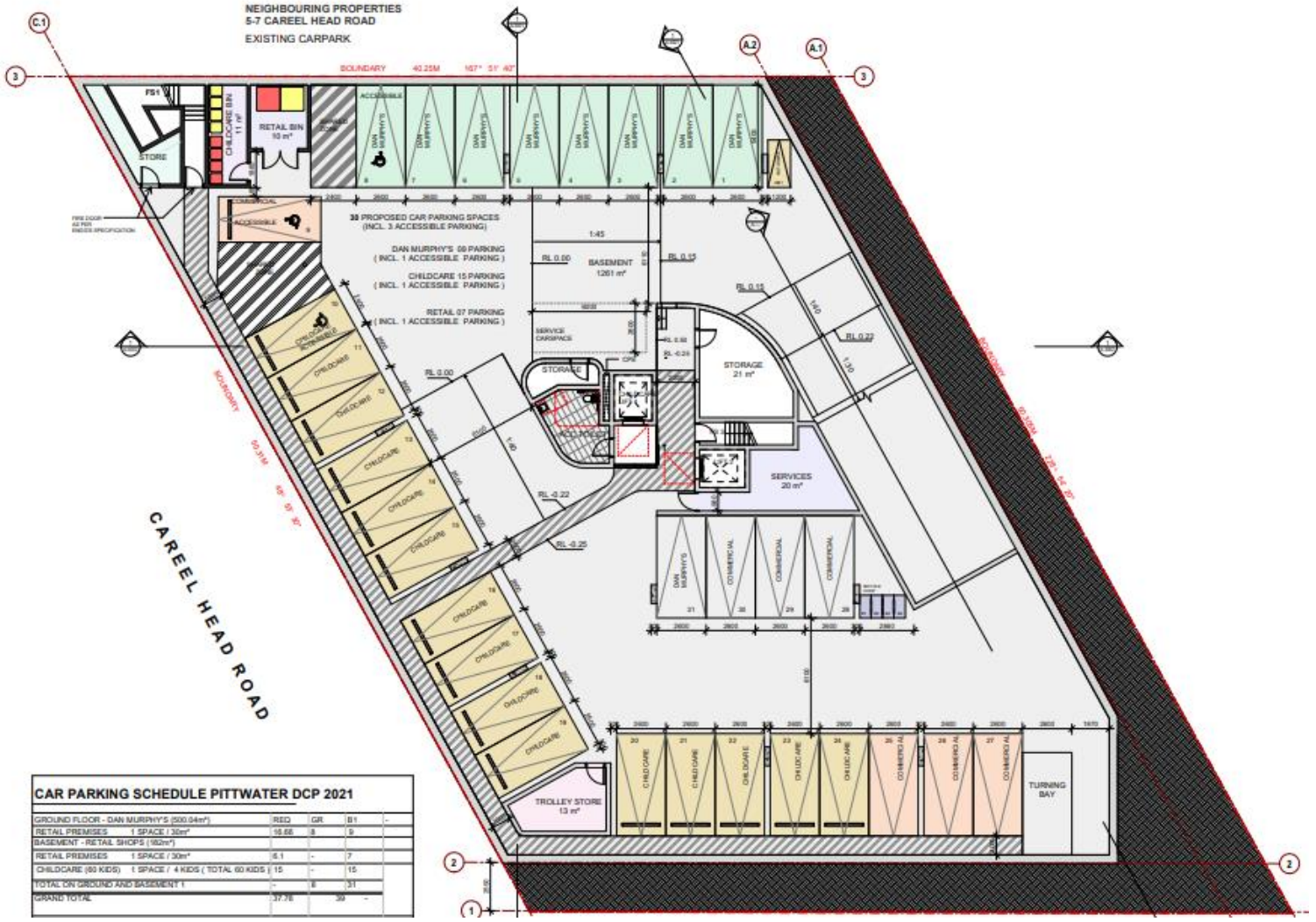


Figure 6 – Proposed Basement Parking

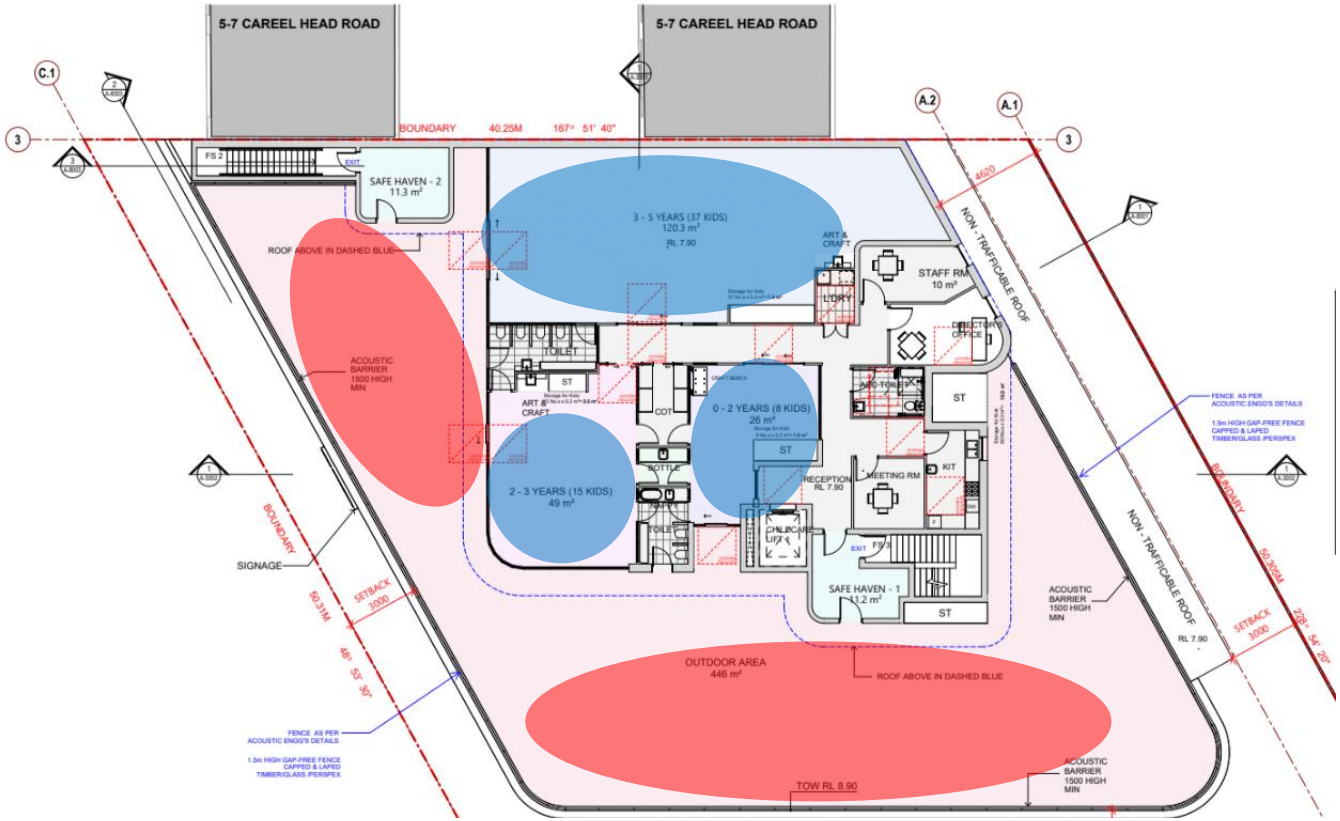
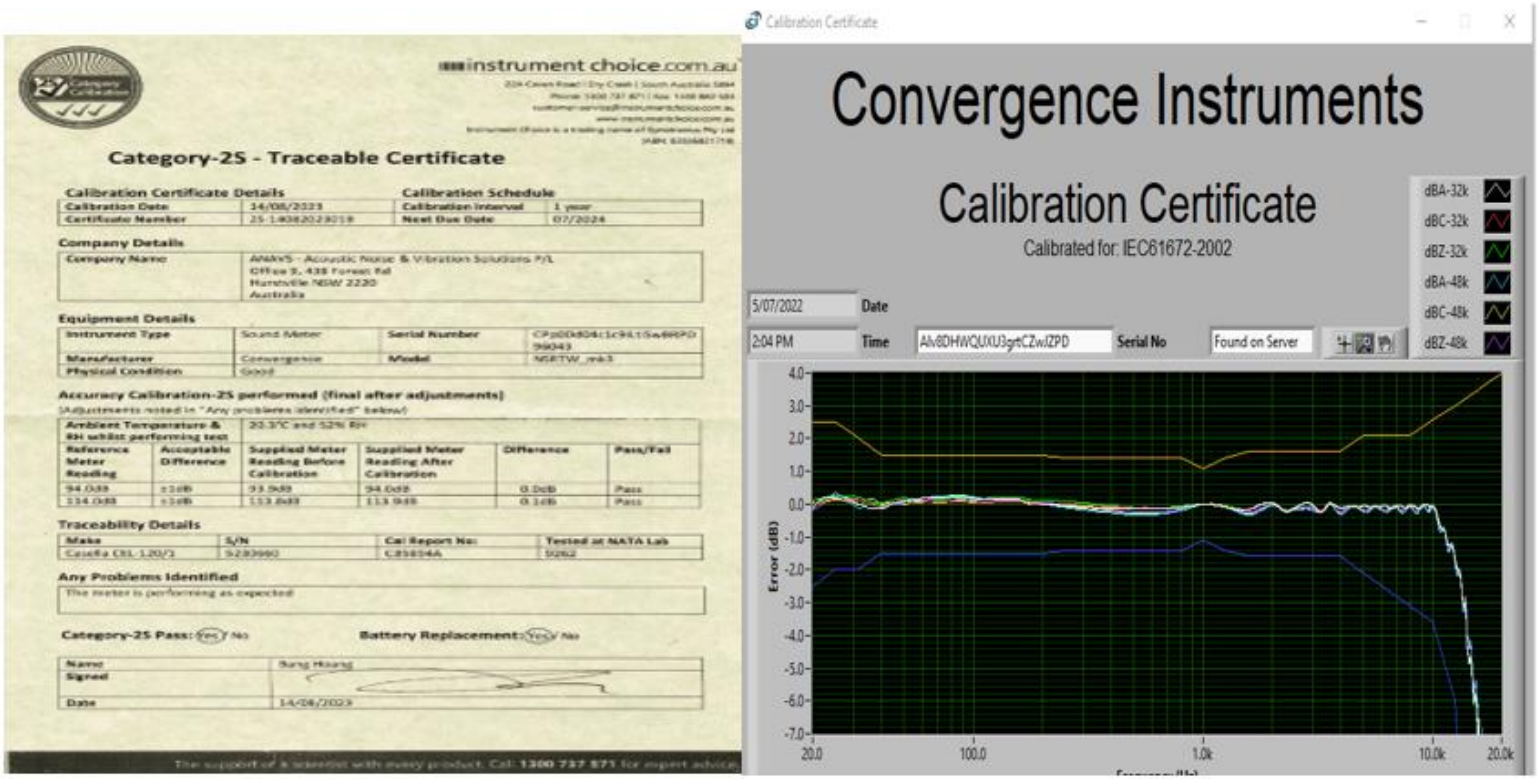


Figure 7 - Proposed Indoor and Outdoor Play Areas

Outdoor Play Area

Indoor Play Area

Figure 8 – Noise Reading Locations (Point A & B)



instrument choice.com.au

Category-2S - Traceable Certificate

Calibration Certificate Details

Calibration Date	14/06/2023	Calibration Interval	1 year
Certificate Number	23-1408202301P	Next Due Date	07/2024

Company Details

Company Name	ANAVS - Acoustic Noise & Vibration Solutions P/L Office 3, 438 Forest Rd Hurstville NSW 2220 Australia

Equipment Details

Instrument Type	Sound Meter	Serial Number	CPp00d04c1c94,1Sw6RPD 96043
Manufacturer	Convergence	Model	NSRTW_mk3
Physical Condition	Good		

Accuracy Calibration-2S performed (final after adjustments)

(Adjustments noted in "Any problems identified" below)

Ambient Temperature & RH whilst performing test		20.3°C and 52% RH			
Reference Meter Reading	Acceptable Difference	Supplied Meter Reading Before Calibration	Supplied Meter Reading After Calibration	Difference	Pass/Fail
94.0dB	±1dB	93.9dB	94.0dB	0.0dB	Pass
114.0dB	±1dB	113.8dB	113.9dB	0.1dB	Pass

Traceability Details

Make	S/N	Cal Report No:	Tested at NATA Lab
Casella CEL-120/1	5283980	C25034A	5262

Any Problems Identified

The meter is performing as expected

Category-2S Pass: (Yes) / No Battery Replacement: (Yes) / No

Name	Rung Hoang
Signed	
Date	14/06/2023

The support of a scientist with every product. Call: 1300 737 571 for expert advice

Calibration Certificate

Convergence Instruments

Calibration Certificate

Calibrated for: IEC61672-2002

5/07/2022 Date

2:04 PM Time

AIv8DHWQUXU3grtCZwiZPD Serial No

Found on Server

dBA-32k
dBC-32k
dBZ-32k
dBA-48k
dBC-48k
dBZ-48k

Error (dB)

4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
-6.0
-7.0

20.0 100.0 1.0k 10.0k 20.0k

Figure 9 - Calibration Certificate

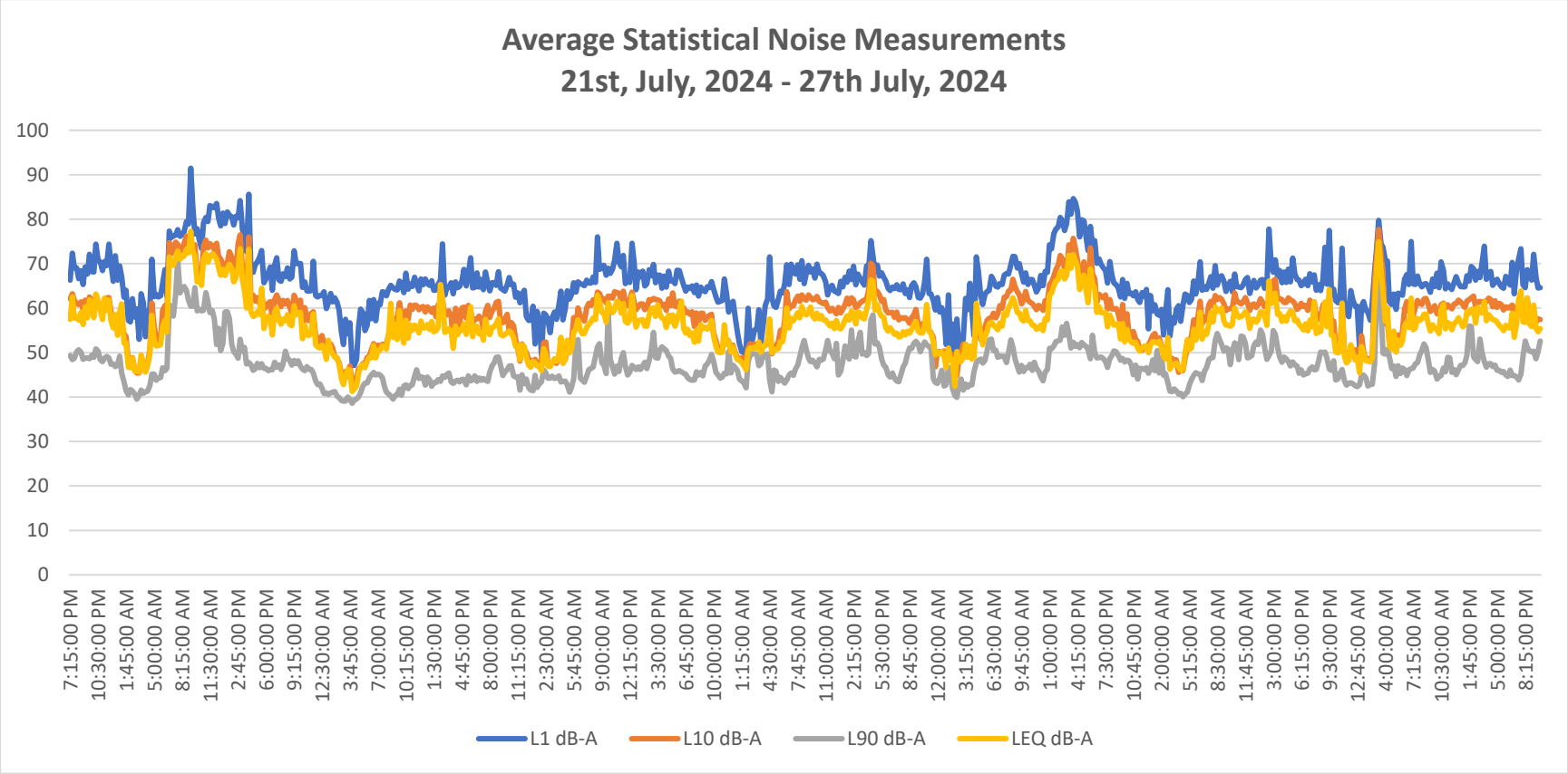


Figure 10 – Noise Survey (Point A)

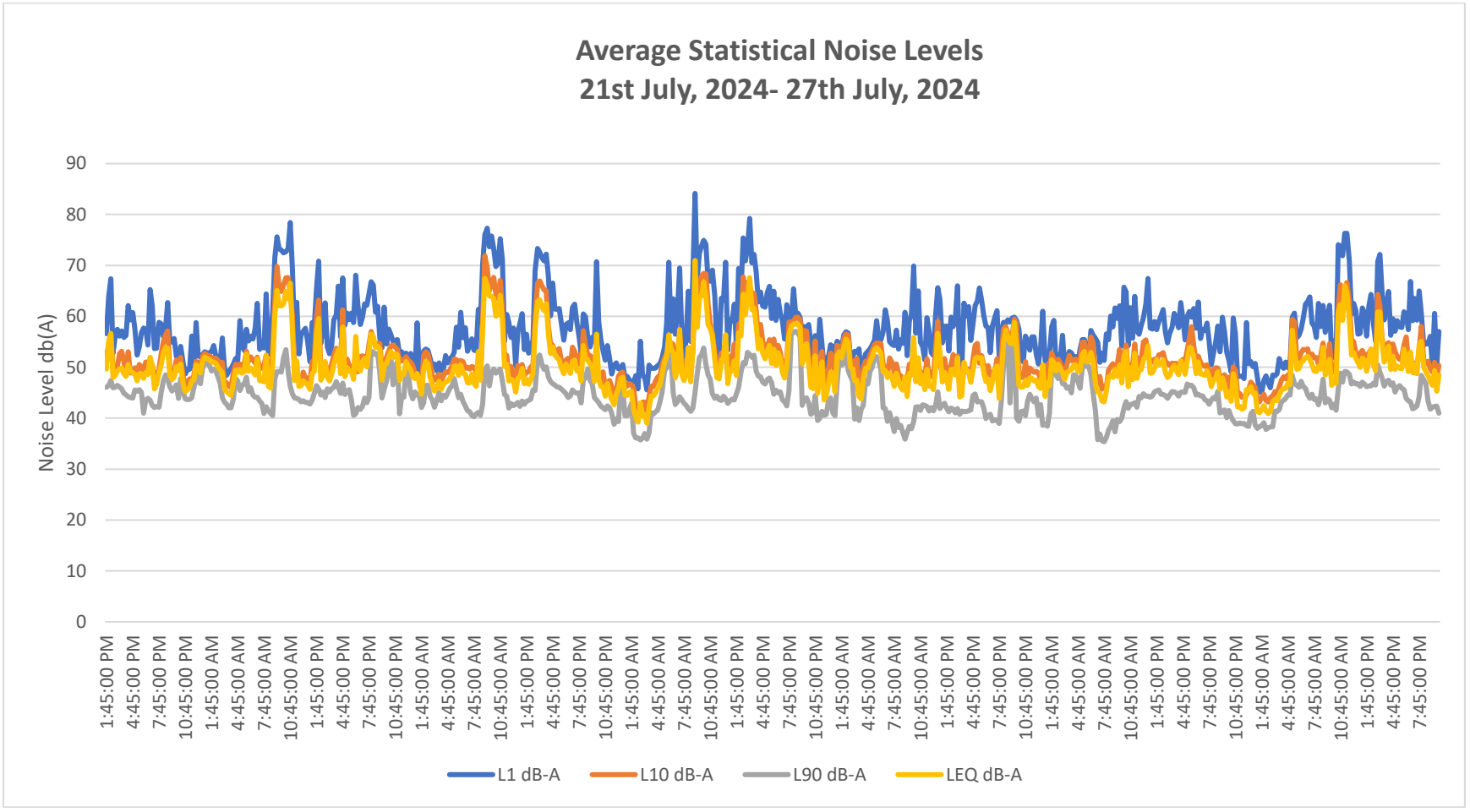


Figure 11 - Noise Survey (Point B)

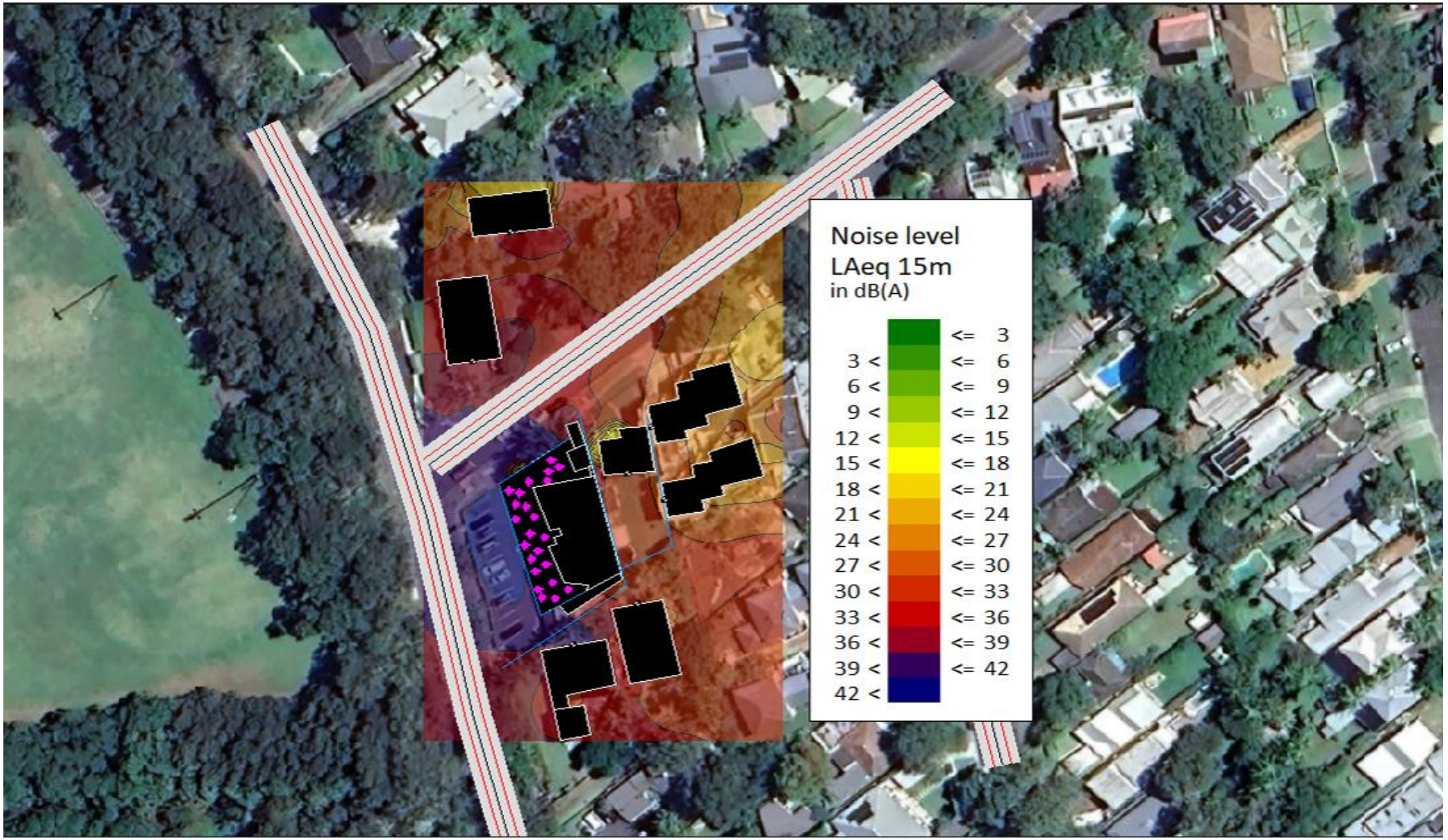


Figure 12 – Outdoor Noise Modelling and Resulting Noise Contours

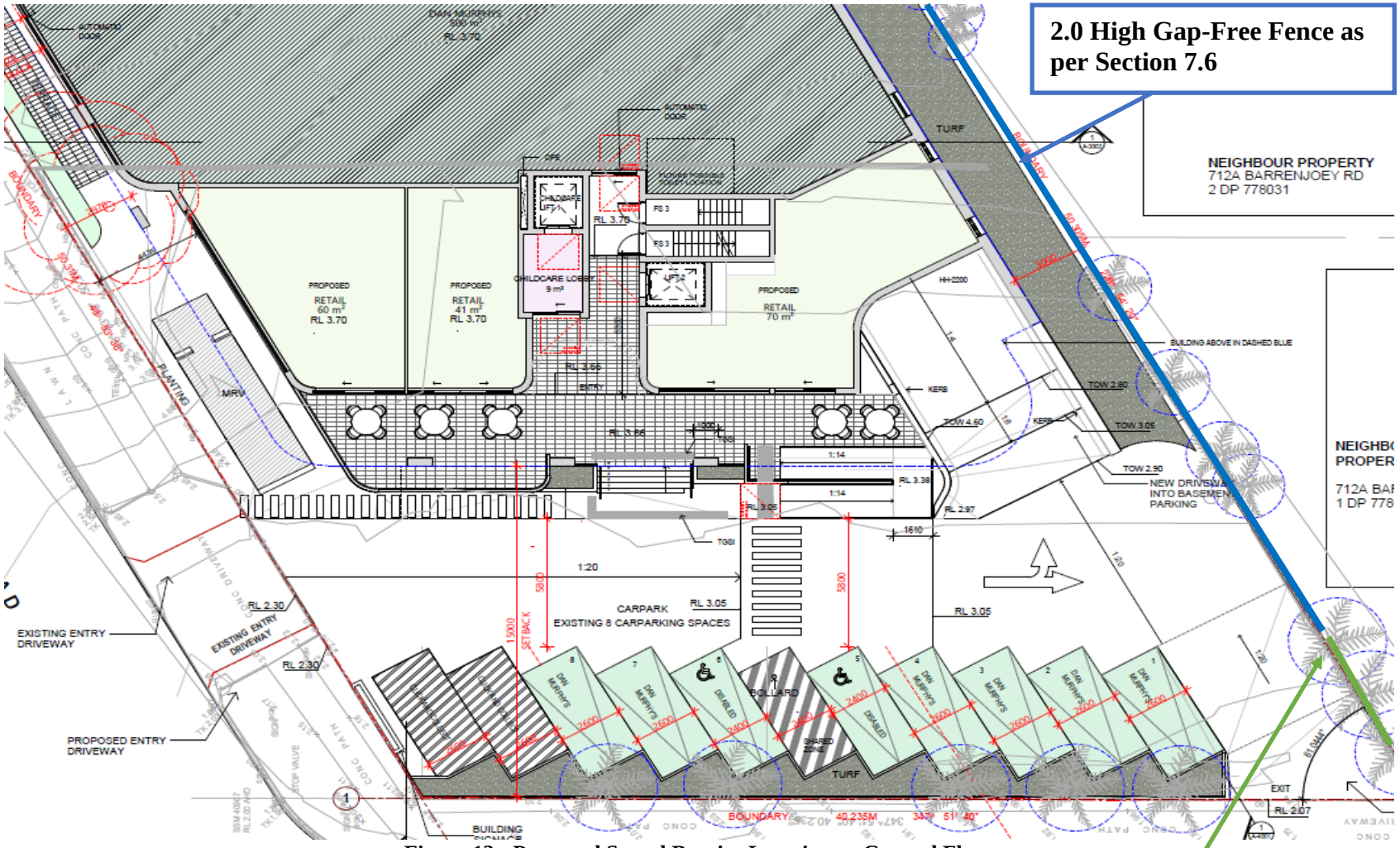


Figure 13 - Proposed Sound Barrier Locations – Ground Floor

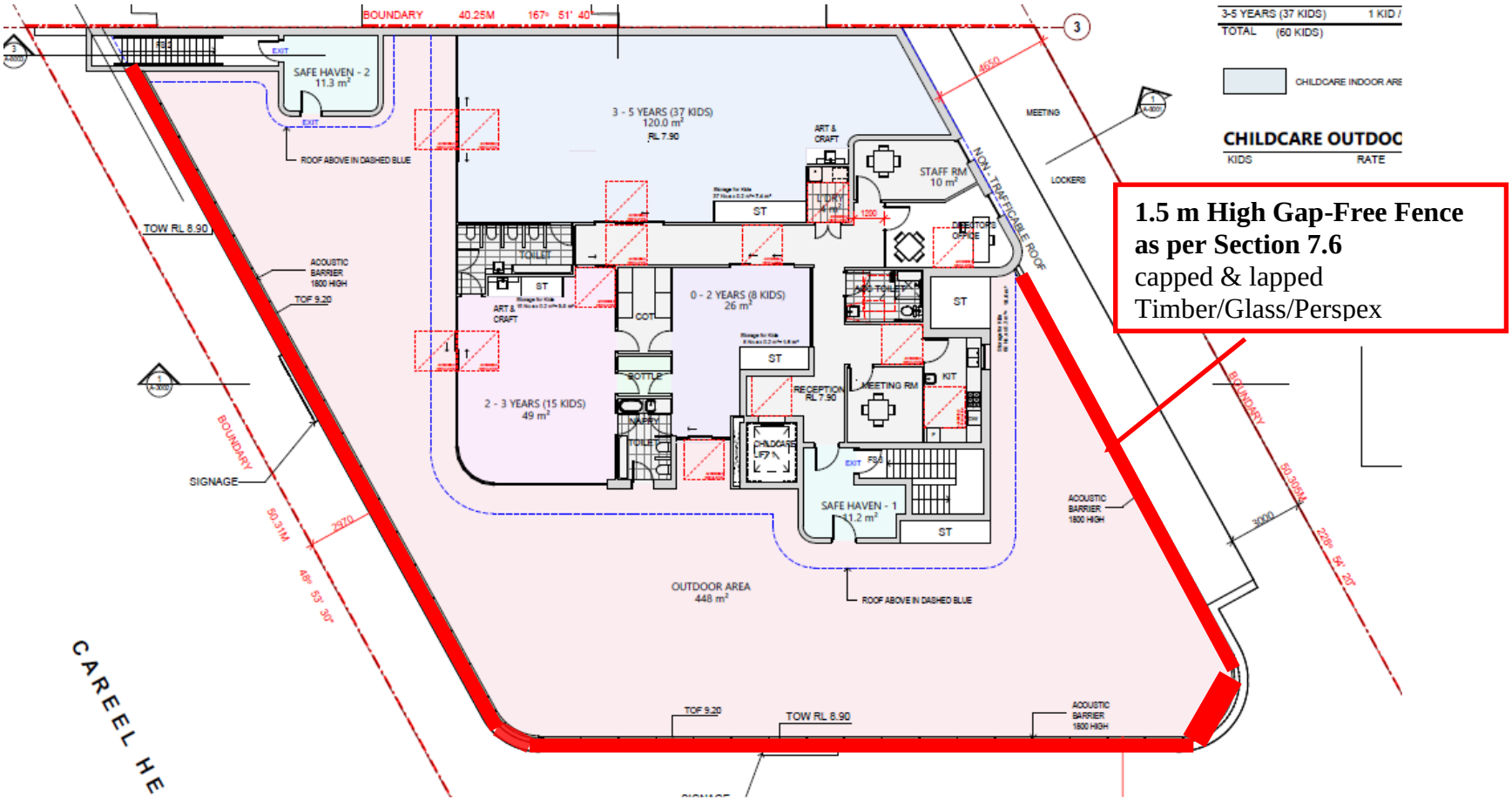


Figure 14 - Outdoor Play Area Sound Barrier