



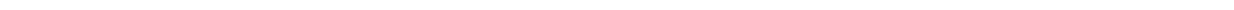
NATIONAL NOISE & VIBRATION

9 N AVALON RD AVALON BEACH NSW 2107

NOISE IMPACT ASSESSMENT - EARLY EDUCATION AND CARE CENTRE

JULY 11, 2025

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Project Information

Details	
Report Title:	NOISE IMPACT ASSESSMENT
Address:	9 N Avalon Rd AVALON BEACH NSW 2107
Client:	Happy Hearts Avalon Early Education and Care Centre
Attention:	Richard Smith Architect

Document Control

Reference	Issue Date	Details	Revision	Prepared	Reviewed	Authorised
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TABLE OF CONTENTS

1	INTRODUCTION	3
2	SITE DESCRIPTION.....	3
2.1	PROJECT DESCRIPTION.....	3
2.2	PROJECT LOCALITY	4
2.3	NEAREST NOISE SENSITIVE RECEIVERS	4
3	EXISTING AMBIENT NOISE LEVELS	5
3.1	SOUND LEVEL DESCRIPTORS	5
3.2	UNATTENDED BACKGROUND NOISE MEASUREMENTS.....	6
4	NOISE EMISSION CRITERIA.....	6
4.1	NORTHERN BEACHES COUNCIL – PITTWATER 21 DCP	6
4.2	NSW EPA NOISE POLICY FOR INDUSTRY 2017	7
4.2.1	<i>Project Intrusiveness Criteria</i>	<i>7</i>
4.2.2	<i>Project Amenity Criteria.....</i>	<i>7</i>
4.2.3	<i>Project Amenity Time Correction</i>	<i>7</i>
4.3	AAAC GUIDELINE FOR CHILDCARE ACOUSTIC ASSESSMENT CRITERIA	8
4.3.1	<i>Noise Emissions form Outdoor Play Area – Residential Receptor Criteria</i>	<i>8</i>
4.3.2	<i>Other Noise Emissions</i>	<i>9</i>
4.4	RESULTANT CRITERIA.....	9
5	NOISE EMISSION ASSESSMENT	9
5.1	OPERATIONAL SCENARIO.....	9
5.2	NOISE SOURCES	10
5.2.1	<i>Noise Modelling</i>	<i>11</i>
5.3	NOISE MODELLING SCENARIOS AND PREDICTED NOISE LEVELS	11
5.4	DISCUSSION.....	12
5.5	MANAGEMENT PLAN	13
6	CONCLUSION	13
	APPENDIX A – INOISE NOISE CONTOURS (OUTDOOR PLAY).....	15
	APPENDIX B – BACKGROUND NOISE MONITORING DATA.....	16

1 INTRODUCTION

National Noise & Vibration has been engaged by Happy Hearts Avalon Early Education and Care Centre to conduct a noise impact assessment for the expansion of an existing Childcare Centre from 38 to 54 places located at 9 N Avalon Rd AVALON BEACH NSW 2107.

The nearest noise sensitive receivers that may be impacted by noise emissions from the operation of the business have been identified. This report also sets out recommendations (where deemed feasible and reasonable) to reduce any impact on the amenity of the adjacent noise sensitive receivers.

The potential noise emissions from the reception centre have been assessed against the requirements of:

- **Pre-lodgement Notes** - Application Number: PLM2024/0070 dated 25 July 2024
- **Northern Beaches Council** – Pittwater 21 DCP
- **NSW Environment Protection Authority (EPA)** - Noise Policy for Industry (NPfI) 2017
- **Association of Australian Acoustical Consultants (AAAC)** - Guideline for Childcare Acoustic Assessment V3.0

This report has been prepared with reference to the architectural drawings provided by Richard Smith Architect, outlined in Table 1.

Table 1 - Architectural Drawings

Drawing. No	Drawing Title	Date
SK 01	Site & Landscape Plan	26/11/2024

2 SITE DESCRIPTION

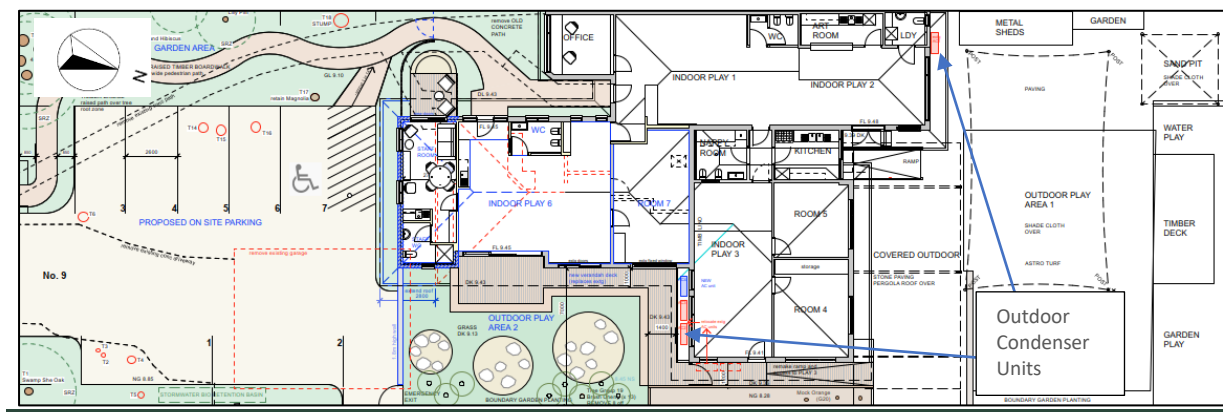
2.1 Project Description

The childcare centre proposed operating hours are outlined in Table 2. The proposed site plan is included in Figure 1. The childcare centre has a proposed maximum capacity of 54 places.

Table 2 - Operating Hours

Activity	Day of Week	Operating Hours
Childcare Centre	Monday to Friday	7:30am-5:30pm (9:30am – 12:30pm & 4pm – 5pm Outdoor Play)

Figure 1 –Site Plan & Outdoor Condenser Unit Location



2.2 Project Locality

The subject site, outlined in a red dashed line, is located within and surrounded by R2 Low Density Residential.

Figure 2 -Subject Site and Land Zoning of Surrounding Areas (Mecone Mosaic)



2.3 Nearest Noise Sensitive Receivers

The nearest noise sensitive receivers are summarised in Table 3 and are presented in Figure 3. The background noise monitoring location is also included in Figure 3.

Figure 3 - Aerial imagery of Project Site (Google Earth)



Table 3 - Noise Sensitive Receivers Locations

ID	Type	Receiver Description
R1	Residential	11 N Avalon Rd Avalon Beach NSW 2107
R2		7 N Avalon Rd Avalon Beach NSW 2107
R3		10 Catalina Cres, Avalon Beach NSW 2107
R4		60 Tasman Rd, Avalon Beach NSW 2107
R5		8 Catalina Cres, Avalon Beach NSW 2107
R6		10 N Avalon Rd, Avalon Beach NSW 2107

3 EXISTING AMBIENT NOISE LEVELS

3.1 Sound level Descriptors

Noise level descriptors used in the assessment are explained below. For analysing noise, the following descriptors are used:

- L_{90} is known as background noise. L_{90} is a statistical sound level which describes the percentage of times a sound level is exceeded. This parameter is used to set up the allowable noise levels for intrusive noise sources since the level of disturbance of the intrusive noise source will be dependent on how audible it is above the existing noise environment.
- L_{eq} is the equivalent sound level which represents the average noise level during a measurement period. L_{eq} describes a receiver's cumulative noise exposure from all events over a specified period for compliance assessment purposes.
- L_{01} is the noise level exceeded for 1% of the measurement period. During the measurement period, the noise level is below the L_{01} level for 99% of the time

- L_{10} is the noise level exceeded for 10% of the measurement period. During the measurement period, the noise level is below the L_{10} level for 90% of the time. The L_{A10} is a common noise descriptor for environmental noise and road traffic noise
- L_{Amax} is the maximum instantaneous noise level during a measurement period
- A-weighted Sound Level (instantaneous) is the most common weighting used in noise measurements, and it represents the frequency range detectable by the human ear. A-weighted is used for noise measurements and prediction purposes.

3.2 Unattended Background Noise Measurements

Long-term environmental noise monitoring was conducted to quantify the existing ambient background levels of the area. The noise logger was placed in the location shown in Figure 3.

Unattended background noise monitoring was conducted using a Ngara ARL Environmental Noise Logger set on A-weighted fast response mode and recording in 15-minute intervals. Unattended noise measurements were undertaken with the microphone located 1.5m above the natural surface level and at least 3m from buildings, fences, and other reflective surfaces.

Instrument calibration was checked before and after measurements, with variation in calibrated levels not exceeding ± 0.5 dB. The acoustic instrumentation employed was designed to comply with the requirements of AS IEC 61672.1—2004 – Electroacoustics—Sound level meters, Part 1: Specifications and carries current manufacturer calibration certificates.

Unattended Noise Monitoring Results are shown below in Table 4. Full unattended noise monitoring data is included in Appendix B – Background Noise Monitoring Data.

Table 4 – Unattended Background Noise Monitoring Results

Unattended Measurement Location	Date	Measured Background Noise Level, L_{90} dB(A)		
		Day (7am – 6pm)	Evening (6pm – 10pm)	Night (10pm – 7am)
9 N AVALON RD AVALON BEACH NSW 2107	Wednesday, 6 November 2024	42	41	43
	Thursday, 7 November 2024	43	40	36
	Friday, 8 November 2024	43	39	39
	Saturday, 9 November 2024	41	40	34
	Sunday, 10 November 2024	47	45	40
	Monday, 11 November 2024	48	45	41
	Tuesday, 12 November 2024	48	45	41
	Overall Background Noise Level	43	41	40
Note:	- Long-term background measurements were taken as unaffected by adverse meteorological conditions including abnormal wind conditions above 5ms^{-1} or any precipitation.			

4 NOISE EMISSION CRITERIA

4.1 Northern Beaches Council – Pittwater 21 DCP

In assessing noise impacts for childcare centres within the Northern Beaches Council area, particularly in the absence of specific local criteria in the Pittwater 21 DCP, it is pertinent to rely on broader legal precedents and guidelines. Notably, the NSW Land and Environment Court has established a benchmark for acceptable noise levels at childcare centres. For instance, in proceedings number 10002 of 2005, acoustical experts supported a criterion of background noise plus 10 dBA, provided that the noise from children's activities does not exceed four hours per day. This criterion was similarly

upheld in another case (Huntington and MacGillivray v Strathfield Municipal Council, 2005) where Commissioner Murrell agreed that a noise level of background plus ten dB(A) was appropriate, given the intermittent and limited nature of noise from childcare facilities.

Given the lack of specific noise criteria in the Pittwater 21 DCP, adherence to the NSW Environment Protection Authority's Noise Policy for Industry (2017) and the Association of Australian Acoustical Consultants' Guideline for Childcare Acoustic Assessment V3.0 (outdoor play areas are addressed in a similar direction as the 2005 court rulings) will ensure that the childcare centre manages noise levels responsibly and in line with established acoustic standards. These guidelines provide a consistent framework for evaluating and managing noise, ensuring that both the community's needs and regulatory expectations are met efficiently.

4.2 NSW EPA Noise Policy for Industry 2017

Noise sources covered by this code will be operational noise, including noise from mechanical plant and equipment. The *EPA Noise Policy for Industry (NPfI) 2017* has developed a method for determination of a Project Noise Trigger Level, such that exceedances of the trigger level require a management response. The Project Noise Trigger Level is determined by the most stringent of the Intrusiveness and Amenity Criteria.

4.2.1 Project Intrusiveness Criteria

The intrusiveness guideline is intended to limit the degree of change that a new noise source introduces to an existing environment for residential receivers only. It requires to measure the noise emissions from a source (using the L_{Aeq} descriptor), measured over a 15-minute period, and ensure it does not exceed the Rating Background Level (RBL) by more than 5dB. The resultant Project Intrusiveness Criterion is stated in Table 5.

Table 5 – Project Intrusiveness Criterion (NPfI)

Location	Period	Measured RBL, $L_{90,period}$ dB(A)	Project Intrusiveness Criterion (RBL +5dB), $L_{eq,15min}$ dB(A)
Residential	Day	43	48
	Evening	41	46
	Night	40	45

4.2.2 Project Amenity Criteria

A project amenity criterion is determined based on the land use in the area to limit the ambient noise level within an area to a level that is consistent with the general environment, categorised as rural, urban or suburban. The subject site is classified as suburban in accordance with the criteria established in Table 2.3 of the NPfI 2017 policy documentation.

4.2.3 Project Amenity Time Correction

Under the NPfI, the assessable 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. Under section 2.2 of the NPfI, the assessable 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 following correction applicable under the NPfI has been adopted:

- **ANL $L_{Aeq,15min}$ will be taken to be equal to RANL $L_{Aeq, period} + 3$ decibels (dB).**

The established amenity criteria for the project has been established based on the EPA's NPfl Section 2.2 and 2.4 project corrections made to the Recommended Amenity Noise Levels (RANL), as shown in Table 6 below.

Table 6 – Amenity Noise Criterion (NPfl)

Receiver	Period	Recommended Amenity Noise Level (ANL), $L_{Aeq, period}$ dB(A)	Project Amenity Criterion (ANL-5dB + 3dB), $L_{Aeq, period}$ dB(A)
Residential - Suburban	Day	55	53
	Evening	45	43
	Night	40	38
Note:	Assessment Period is defined in accordance with the NPfl as: Day: - 7 am to 6 pm Monday to Saturday or - 8 am to 6 pm on Sundays and public holidays Evening: - 6 pm to 10 pm Night: - All other times		

4.3 AAAC Guideline for Childcare Acoustic Assessment Criteria

4.3.1 Noise Emissions form Outdoor Play Area – Residential Receptor Criteria

The AAAC Guideline establishes criteria for noise generated by children using outdoor play areas. The guideline establishes two criteria applicable to assessing noise generated by outdoor play areas. These are described as follows:

Background Greater Than 40 dB(A) – The contributed $L_{eq,15min}$ noise level emitted from an outdoor play and internal activity areas shall not exceed the background noise level by more than 5 or 10 dB at the assessment location, depending on the usage of the outdoor play area. AAAC members regard that a total time limit of approximately 2 hours outdoor play per morning and afternoon period should allow an emergence above the background of 10 dB (ie background +10 dB if outdoor play is limited to 2 hours in the morning and 2 hours in the afternoon).

Up to 4 Hours (total) per day

If outdoor play is limited to no more than 2 hours in the morning and 2 hours in the afternoon, the contributed $L_{eq,15-minute}$ noise level emitted from the outdoor play shall not exceed the background noise level by more than 10 dB at the assessment location.

More than 4 hours (total) per day.

If outdoor play is not limited to no more than 2 hours in the morning and 2 hours in the afternoon, the contributed $L_{eq,15-minute}$ noise level emitted from the outdoor play area shall not exceed the background noise level by more than 5 dB at the assessment location.

4.3.2 Other Noise Emissions

The cumulative $L_{eq,15\text{-minute}}$ noise emission level resulting from the use and operation of the childcare center, 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 as defined above. This includes the noise emission resulting from:

- Mechanical Plant
- Vehicle Drop Off and Pick Up
- Indoor play
- Other activities/operations (not including outdoor play).

Mechanical Plant

Childcare centers may include air-conditioning plant and equipment, kitchen and wet area exhaust fans, car park and garbage room ventilation fans. Depending on the requirements of the state or territory where the center is located, any such mechanical equipment should be assessed in accordance with this section and should not be audible outside the premises between 6pm and 7am.

Indoor Play

Noise emission from indoor play and activities should be considered, including scenarios with windows and doors both open and closed. Some childcare centers may need to close their windows and doors during active indoor play or music.

4.4 Resultant Criteria

Following a review of the relevant noise regulations and standards in this Section, the resultant criteria applicable to this project have been established and presented in the Table below. These criteria are tailored to ensure that all operational noise levels meet the stipulated guidelines for environmental noise control.

Table 7 – Project Noise Trigger Levels (PNTLs)

Receiver	Period	Project Noise Trigger Levels, $L_{eq,15\text{min}}$ dB(A)
Residential	Day	48
	Evening	43
	Night	38

5 NOISE EMISSION ASSESSMENT

5.1 Operational Scenario

In order to assess a worst-case operational scenario of the childcare centre, the following assumptions have been considered in the noise emission assessment:

General

- Childcare centre operates between 7:30am to 5:30pm (Including children pick up and drop off).
- Sound Power Levels as per Table 8.
- 54 Children in total, split into the rooms in the following order:
 - Indoor Play 1 & 2: 20 Children 2 - 3 Years Old
 - Indoor Play 6: 28 Children Over 3 Years Old
 - Indoor Play 3: 6 Children 0 - 2 Years Old
- Building Specifications:
 - Façade elements (External Walls/Roof) assumed to have a minimum R_w of 50.

- Glazing has a minimum Rw of 28 (Equivalent to 3mm Float).
- Boundary Fence:
 - The subject site is surrounded by solid 1.8m high Colorbond steel fence or lap and capped timber, **however, to the East & West will be upgraded to a cranked fence 2.1 metres high vertical with a 0.87m crank at 45-degree angle. The assessment will be conducted based on this new installation.**

Children outdoor play (Outdoor play area 1, Existing)

- Hours of Outdoor Play: The outdoor play time is proposed up to 4 hours for each day with up to 14 children at a time.
 - Children 0 - 3 Years Old: Morning 2 hours (14 Children) and Afternoon 2 hours (14 Children).
- Children in the outdoor play area are continuously emitting noise for 70% of the 15 min assessment period.

Children outdoor play (Outdoor play area 2, New Proposed)

- Hours of Outdoor Play: The outdoor play time is proposed up to a maximum 4 hours for each day with up to 15 children at a time.
 - Children Over 3 Years Old: Morning 2 hours (15 Children) and Afternoon 2 hours (15 Children).
- Children in the outdoor play area are continuously emitting noise for 70% of the 15 min assessment period.

Other Noise Emissions (Indoor play, vehicles and mechanical plant)

- Children in each class are continuously emitting noise for 40% of the 15 min assessment period.
- Vehicle movements
 - Each car space is used once in the 15 min assessment period.
 - 8 cars are driving in and out of the car park in the 15 min assessment period.
- Mechanical Equipment (Mech units are continuously emitting noise in the 15 min assessment period).
 - 1 Kitchen exhaust, 4 Air conditioning Units, 1 Toilet/Laundry exhaust Fans.
 - All mechanical units have been placed on the facades of the building for the purpose of this assessment as per Figure 1.

5.2 Noise Sources

The sound power levels of the AC units, kitchen fans, toilet exhaust fans, and cars has been taken from our technical database. Sound power levels of human voices have been taken from AAAC – Guideline for Childcare Centre Acoustic Assessment v3. Octave band sound power levels used within the assessment are provided within Table 8. Octave band sound power levels are reported in A-weighting (Noise level perception of human ear).

Table 8 – Sources Sound Power Levels and Reverberant Sound Pressure Level

Noise Source	Total Sound Power Level, L _{Aw} dB(A)	Octave Band Frequency (Hz) Sound Power Levels dB(A)								
		31.5	63	125	250	500	1k	2k	4k	8k
AC Outdoor Unit (Rear of Building)	59	44	53	53	55	45	52	37	33	28
AC Outdoor Unit X3 Combined (West of Building)	64	49	59	59	60	50	48	43	39	32
10 Children (0 to 2 years)	78	48	54	60	66	72	74	71	67	64
10 Children (2 to 3 years)	85	53	61	67	73	79	81	78	74	70
10 Children (3 to 5 years)	87	55	64	70	75	81	83	80	76	72
Car < 10km/h	81	45	61	65	66	70	76	74	74	69
Car Idling	73	33	48	53	59	62	65	70	65	57
Car Door Slam	86	70	81	78	80	79	73	70	67	61
Kitchen Exhaust Fans	71	60	62	67	64	59	59	56	53	53
Toilet Exhaust Fan	67	55	58	63	60	56	55	53	50	50

5.2.1 Noise Modelling

Noise emissions levels at the nearest noise sensitive receivers have been calculated using computer-based 3D acoustic noise modelling software iNoise version 2023.1.1. iNoise utilizes ISO 9613 calculation algorithms to determine noise emission levels at the nearest affected noise sensitive receivers. The following assumptions have been included within the noise model:

- Distance attenuation.
- Atmospheric attenuation.
- Directivity.
- Ground absorption (G = 0.5)
- Barrier effects/screening.
- Ground Elevation Contours.

Noise contours have been generated to clearly identify the resulting noise level impacts at adjacent noise sensitive receivers at a height where the receiver is most impacted. Noise contours generated with iNoise can be found in Appendix A – iNoise Noise Contours.

5.3 Noise Modelling Scenarios and Predicted Noise Levels

The calculated noise emission levels at the nearest residential receiver locations resulting from the various noise sources associated with the childcare centre are presented against the relevant noise emission assessment objectives detailed within Section 4. Noise modelling has been conducted for the operational scenarios outlined in Table 9.

Table 9 - Noise Modelling Scenarios

Scenario	Assessment	Time Period	Windows/ Doors Open or Closed	Assessment Table
1a	Cumulative play from all age groups	2 hours in the morning and 2 hours in the afternoon	N/A	Table 10
2a	Other Noise Emissions	Day: 7:30am-5:30pm	Open	Table 11
2b		Day: 7:30am-5:30pm	Closed	Table 12

Table 10 - Outdoor Playground Noise Emissions Assessment 1a

Metric	Result					
Receivers	R1	R2	R3	R4	R5	R6
Criteria dB(A) over 4 hours Play?	48					
Criteria dB(A) up to 4 hours Play	53					
Calculated L_{Aeq} Noise Level, dB	48	52	47	50	46	44
Compliant up to 4 hours Play?	✓	✓	✓	✓	✓	✓
Compliant over 4 hours Play?	✓	✗	✓	✗	✓	✓

Table 11 - Other Noise Emissions Assessment Windows Closed 2a

Metric	Result					
Receivers	R1	R2	R3	R4	R5	R6
Criteria dB(A)	48					
Calculated L_{Aeq} Noise Level, dB	41	45	36	34	35	40
Complies?	✓	✓	✓	✓	✓	✓

Table 12 - Other Noise Emissions Assessment Windows Open 2b

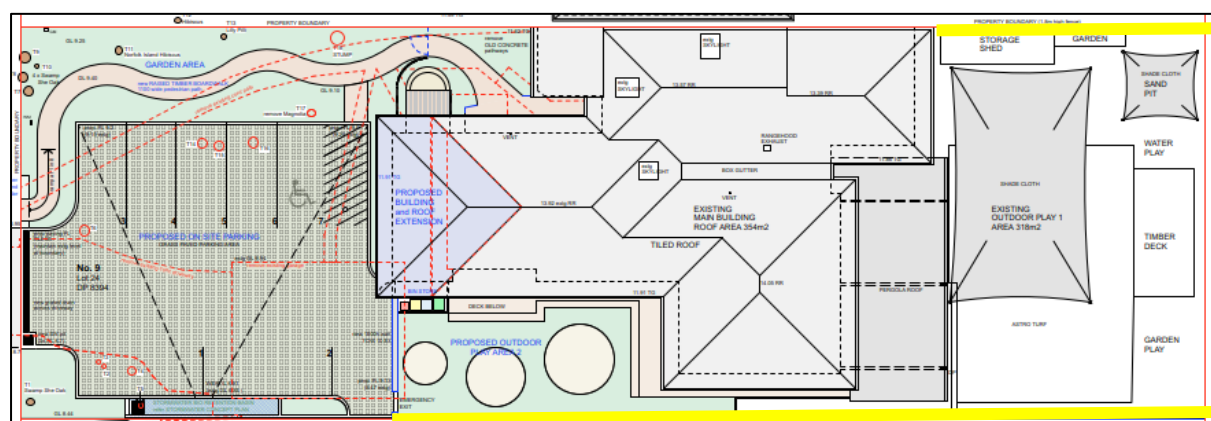
Metric	Result					
Receivers	R1	R2	R3	R4	R5	R6
Criteria dB(A)	48					
Calculated L_{Aeq} Noise Level, dB	41	47	37	35	35	40
Complies?	✓	✓	✓	✓	✓	✓

5.4 Discussion

The noise assessment conducted for Happy Hearts Avalon Early Education and Care Centre at 9 N Avalon Rd, Avalon Beach, has comprehensively evaluated the potential acoustic impacts associated with the proposed expansion of the childcare facility. The assessment has been guided by robust criteria drawn from local regulations, including the Northern Beaches Council – Pittwater 21 DCP, NSW EPA Noise Policy for Industry 2017, and the AAAC Guideline for Childcare Acoustic Assessment.

Key findings from the assessment with regard to the proposed increase in child numbers indicate that the operational noise, primarily from children's activities in the outdoor play areas, remains within acceptable limits as per established criteria for all of the assessment points. The planned acoustic upgrade to the fence (Figure 4 below) will further improve existing noise levels, enhancing acoustic performance and ensuring compliance with established noise criteria.

Figure 4 – Acoustic Fence Upgrade Location



5.5 Management Plan

As recommended by the AAAC (Australian Acoustical Society), implementing a Noise Management Plan (NMP) is one of the best measures to effectively manage noise. The NMP should include various management measures, some examples of which are outlined below:

- A separate daily program for both the warmer and cooler months should be established to regulate the total time spent outdoors and indoors;
- The NMP should be made publicly available to parents and neighbours;
- A contact phone number for the Centre's director should be made available to neighbours to facilitate communication and to resolve any neighbourhood issues that may arise due to operation of the Centre;
- The number of children playing outside at any one time may need to be limited to meet the noise criteria. The assessment results indicate that compliance is achieved with all the children playing outside. However, it is strongly suggested only to have half of the total Children playing outside at any given time.
- The type of outdoor activities may be programmed to only allow quiet or "passive" activities such as painting, garden exploration, reading, block play or drawing in certain areas of the centre's outdoor play area;
- Crying children should be taken inside the centre and comforted;
- The behaviour of children should be monitored and modified as required by adequately trained childcare workers;
- Parents and guardians should be informed of the importance of noise minimisation when entering the site, dropping off or picking up children;
- Carers / staff should be educated to control the level of their voice while outside; and
- To meet the noise criteria, amplified music may need to be controlled.

By incorporating these management measures into a comprehensive Noise Management Plan, the childcare centre can effectively address and minimise noise-related issues, ensuring a harmonious coexistence with the surrounding community.

6 CONCLUSION

This Noise Impact Assessment for the expansion of Happy Hearts Avalon Early Education and Care Centre at 9 N Avalon Rd, Avalon Beach NSW 2107 has methodically evaluated the potential noise impacts of increasing capacity from 38 to 54 places. This evaluation was performed against a backdrop of rigorous criteria from local regulations including the Northern Beaches Council – Pittwater 21 DCP, the NSW EPA Noise Policy for Industry 2017, and the AAAC Guideline for Childcare Acoustic Assessment.

The results demonstrate that the planned operation and physical upgrades at the childcare centre can be effectively managed to meet the stipulated noise criteria. Specifically, the centre's operations, including outdoor play activities, are within acceptable noise levels for up to 4 hours per day across all receivers.

The adoption of a Noise Management Plan (NMP), as outlined in Section 5.5, will further ensure that the centre maintains compliance with the established noise criteria and continues to minimise its impact on the surrounding residential areas. This plan includes measures such as modified play schedules, enhanced physical barriers, and ongoing monitoring and community engagement.

Given the thorough assessment and the proposed strategies for noise management, it is our assessment that the expansion of the childcare centre will not result in significant adverse noise impacts on the nearby noise-sensitive receivers, provided that the recommendations in this report are strictly implemented and adhered to.

We appreciate the opportunity to provide this assessment and are confident that the measures recommended will ensure a balance between the operational needs of Happy Hearts Avalon Early Education and Care Centre and the tranquillity of the Avalon Beach community.

Please contact us if you have any further queries.

Sincerely,

Michael Phillips

Head of Engineering

M.A.A.S.

MArchSc (Audio & Acoustics), AssocDeg (Audio Eng.)



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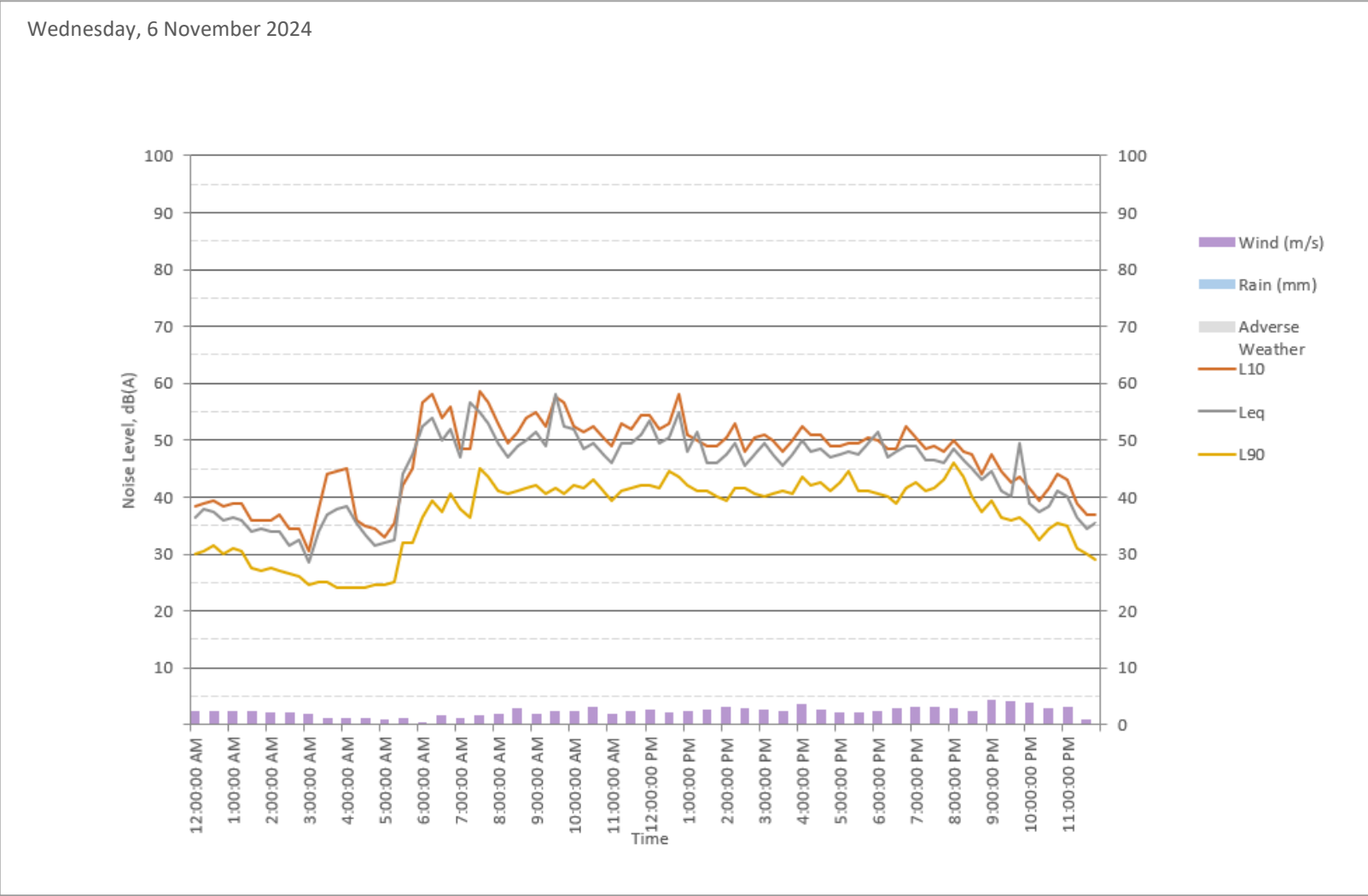
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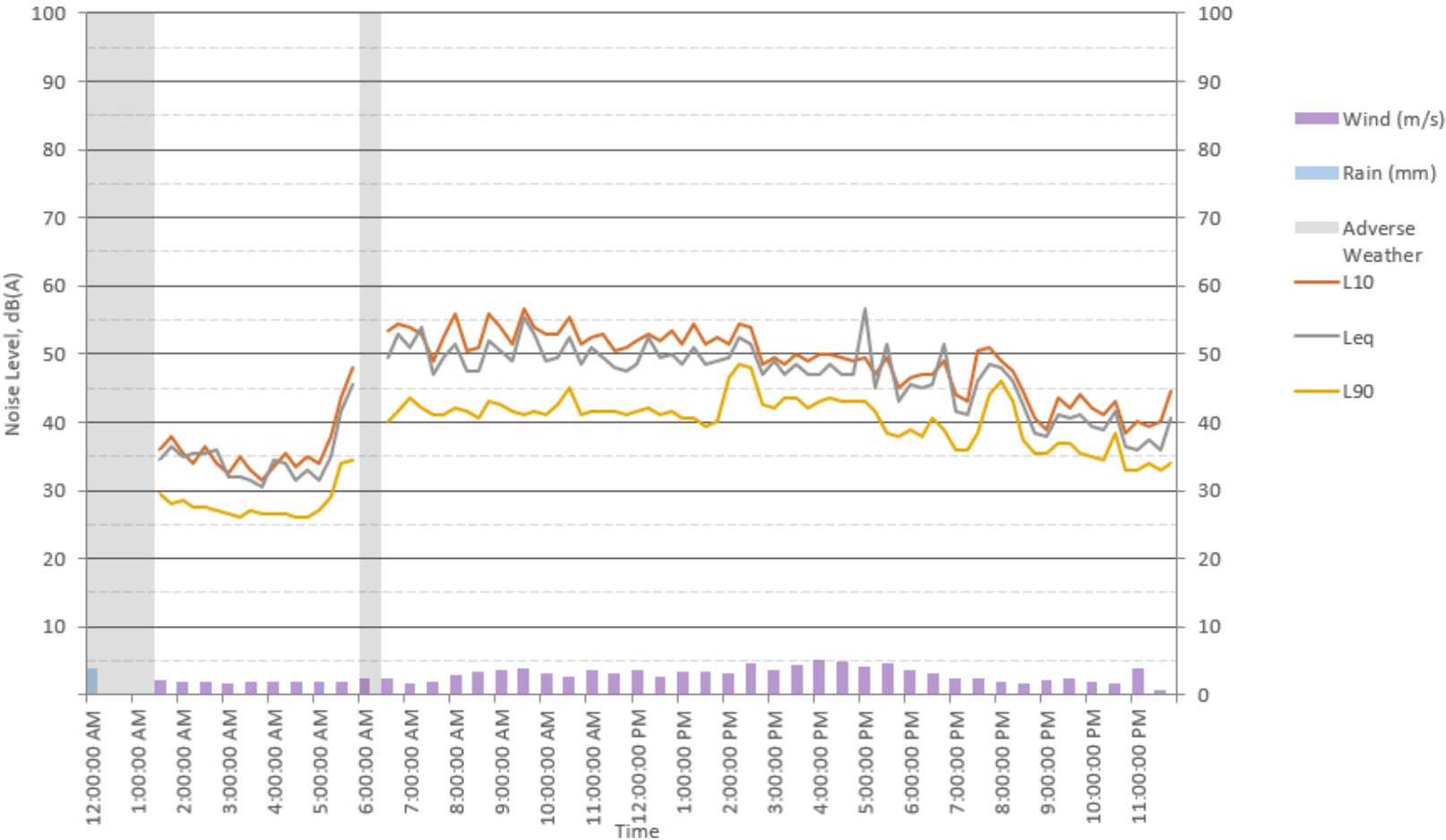
Appendix A – iNoise Noise Contours (Outdoor Play)



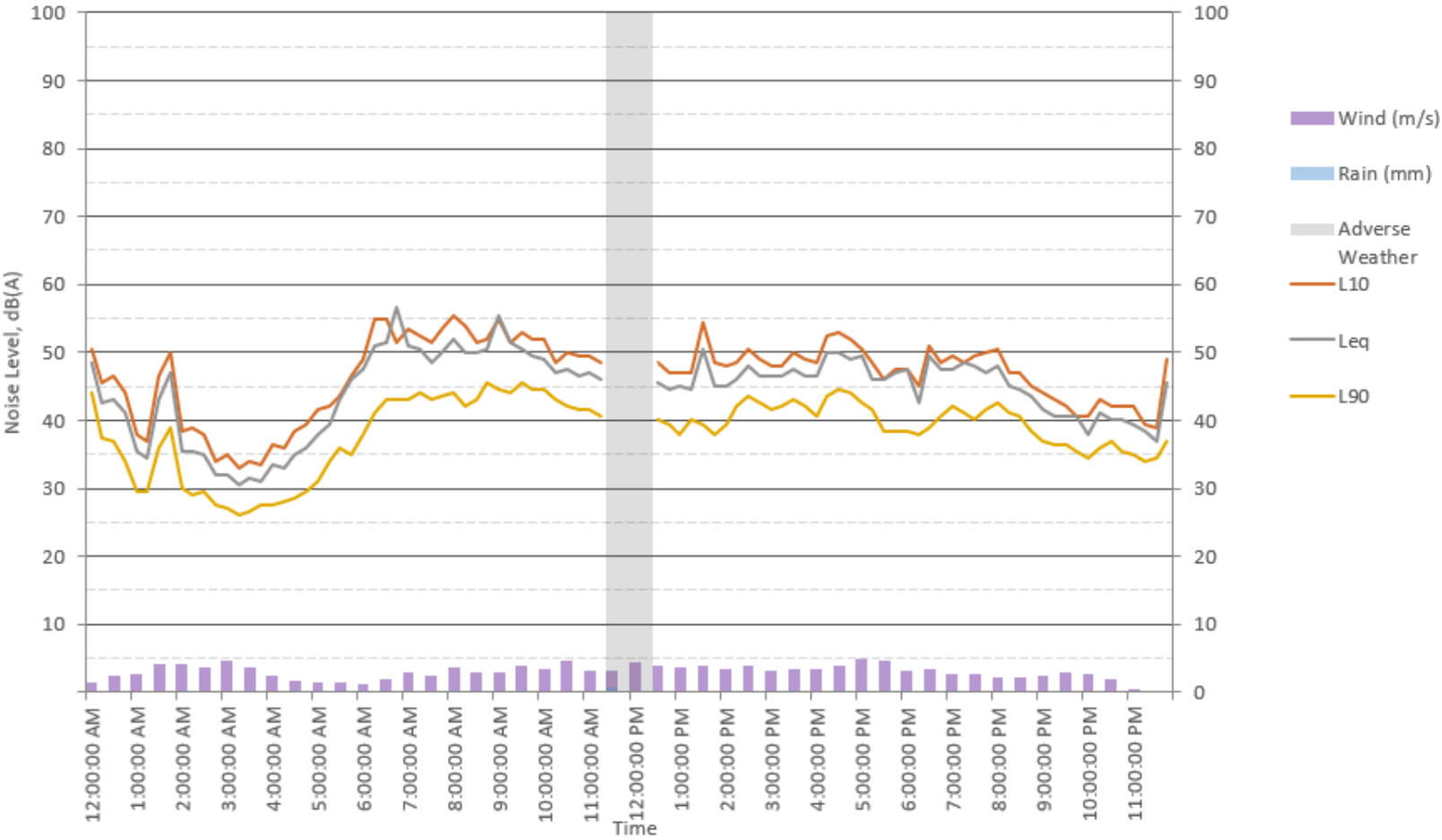
Appendix B – Background Noise Monitoring Data



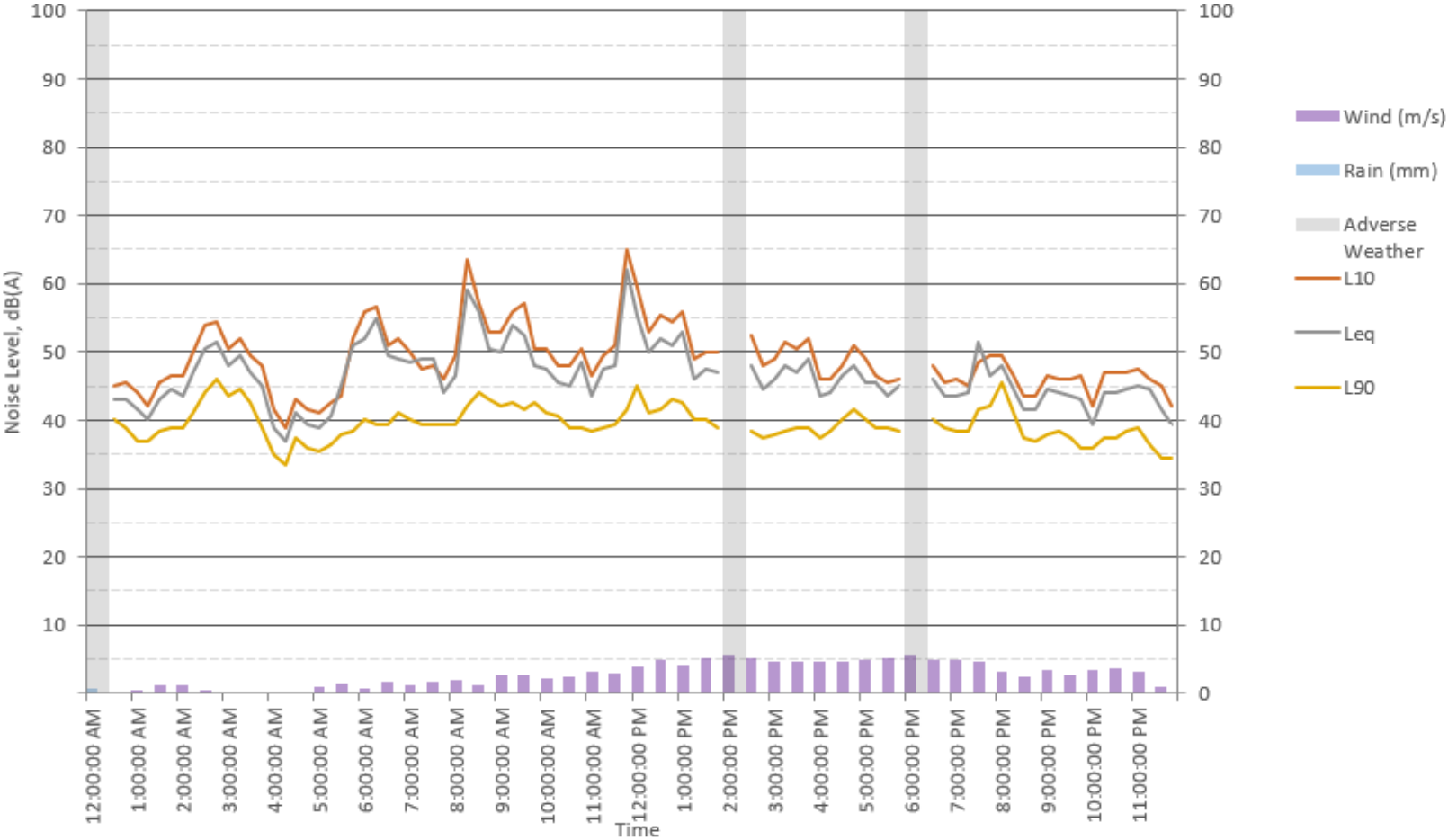
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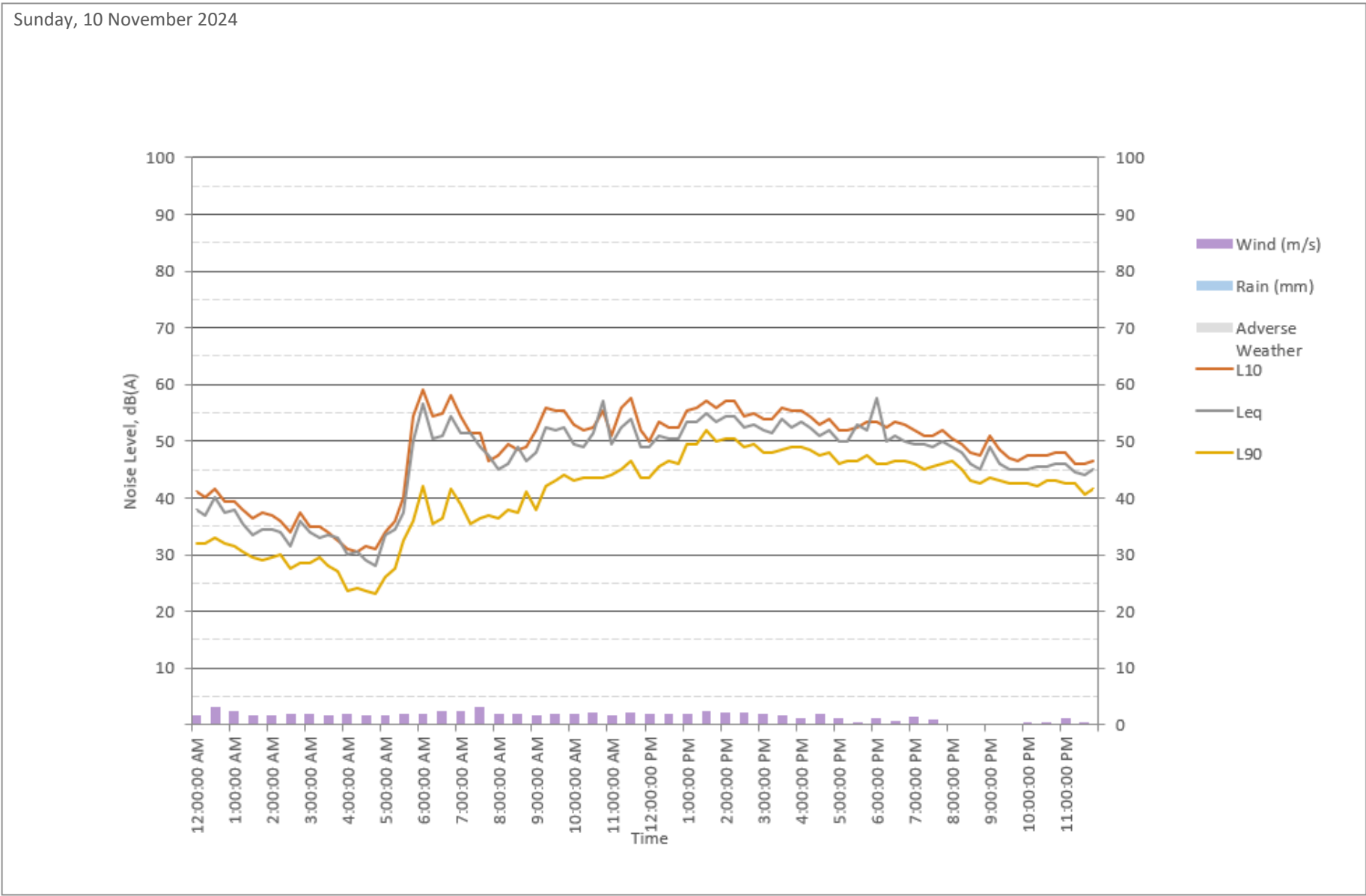


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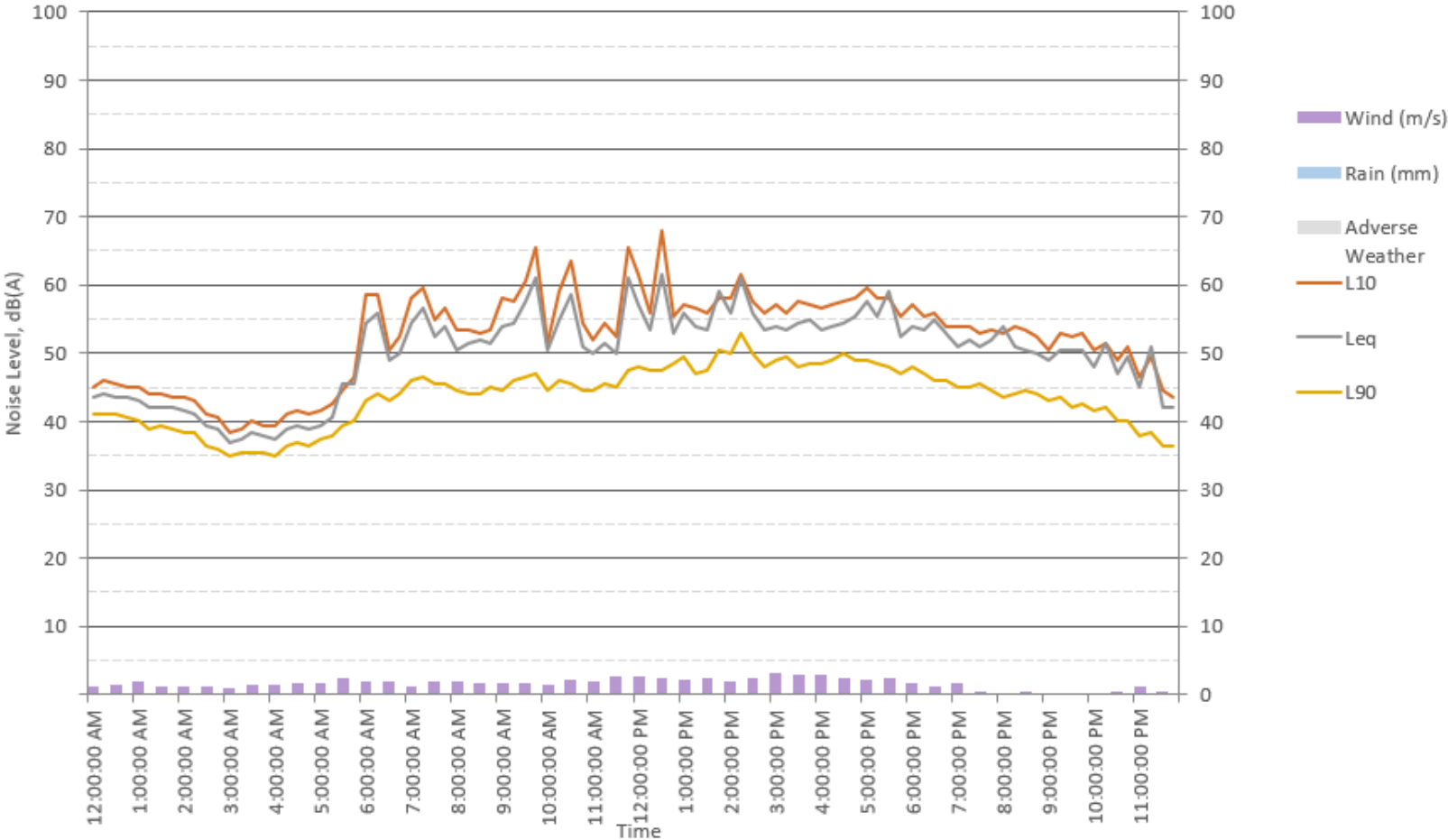


Saturday, 9 November 2024





Monday, 11 November 2024



Tuesday, 12 November 2024

