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CHILD CARE CENTRE, BARRINGTON

NOISE ASSESSMENT

Client: Gloucester Pre School & Early Years Learning Centre

Report No.	M25139.01
Site:	82-86 Argyle St Barrington NSW 2422
Reviewed by:	Philip Thornton BE(UNSW) MIEAust CPEng NER Principal Engineer & Director Matrix Thornton Consulting Engineers
Date:	10 July 2025

SUMMARY

A childcare facility for 58 children is proposed at 82-86 Argyle St, Barrington NSW 2422.

Noise from children playing outside the centre is predicted to comply with the guideline if the children playing for less than two hours a day. Minor exceedances of the guideline are predicted if more than two hours of outdoor play is required for all the children at the facility, and mitigation options are described.

Traffic noise into the centre will be generally satisfactory, however two rooms will require ventilation to allow windows facing Argyle St to remain closed for noise control.

Noise from traffic generated by the development will be satisfactory.

Mechanical services have not been designed; however they should meet the noise emission requirements of the NPfI as outlined in this report.

CONTENTS

FIGURES

TABLES

1 INTRODUCTION

A childcare facility for 58 children is proposed at 82-86 Argyle St, Barrington NSW 2422. This report gives the noise assessment of the proposal, including:

- noise from children playing.
- noise from mechanical services.
- noise from car parking; and
- noise from traffic generated by the development.

The report also discusses noise intrusion into the development from traffic on nearby roads.

2 LOCATION AND DESCRIPTION OF THE DEVELOPMENT

2.1 LOCATION

The location of the development is shown on Figure 2-1. There are residential neighbours on all sides. We will assess noise emission from the development at the four nearest residences:

Receiver Number	Address
1	88 Argyle St
2	76 Argyle St
3	80 Argyle St
4	49 Argyle St

Table 2-1 List of receivers around the proposed childcare centre

Figure 2-1 Location of Development and Noise Logger

Figure 2-2 shows the proposed layout of the development. Figure 2-3 shows the plan of the ground floor classrooms.

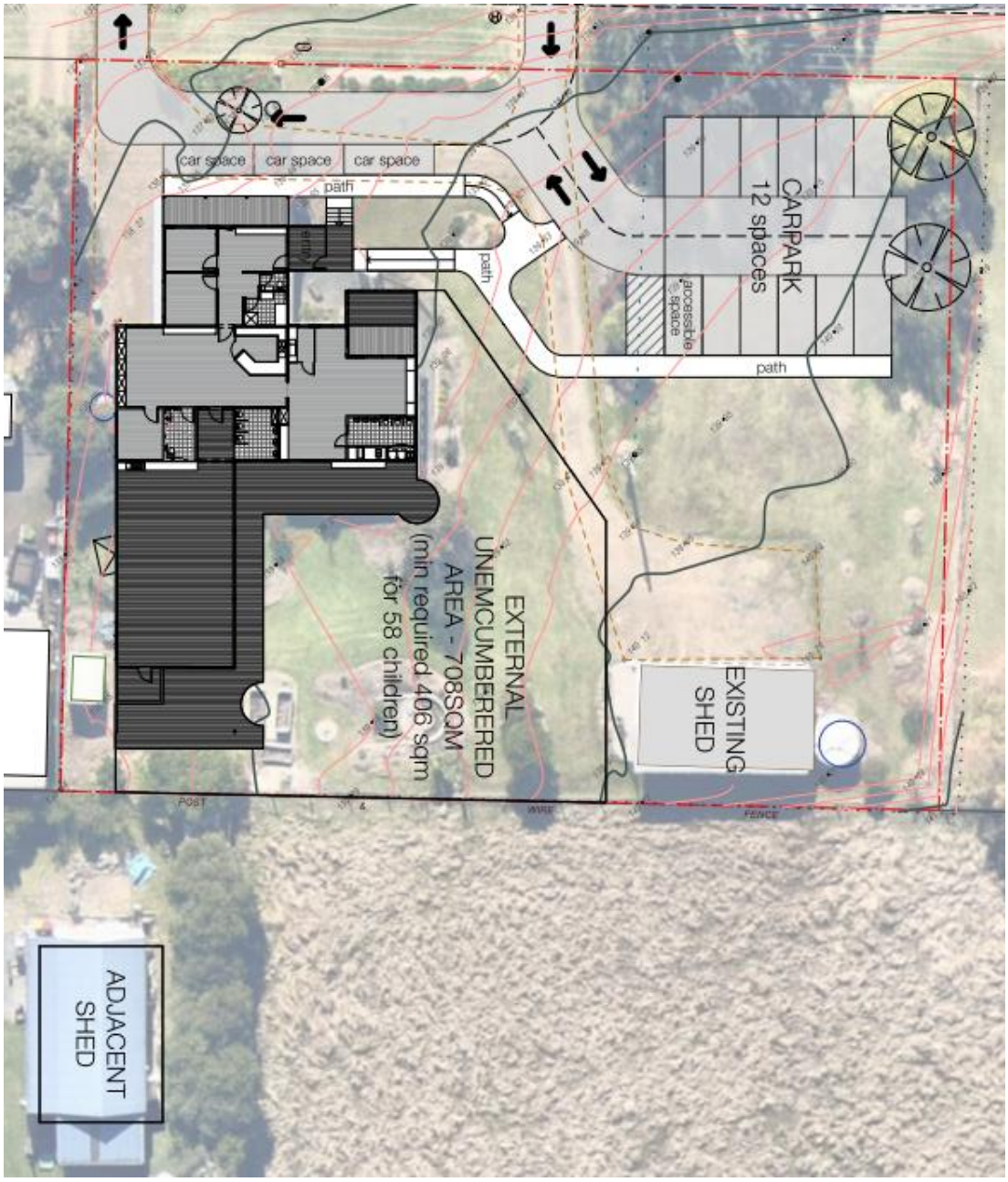

Figure 2-2 Layout of Development

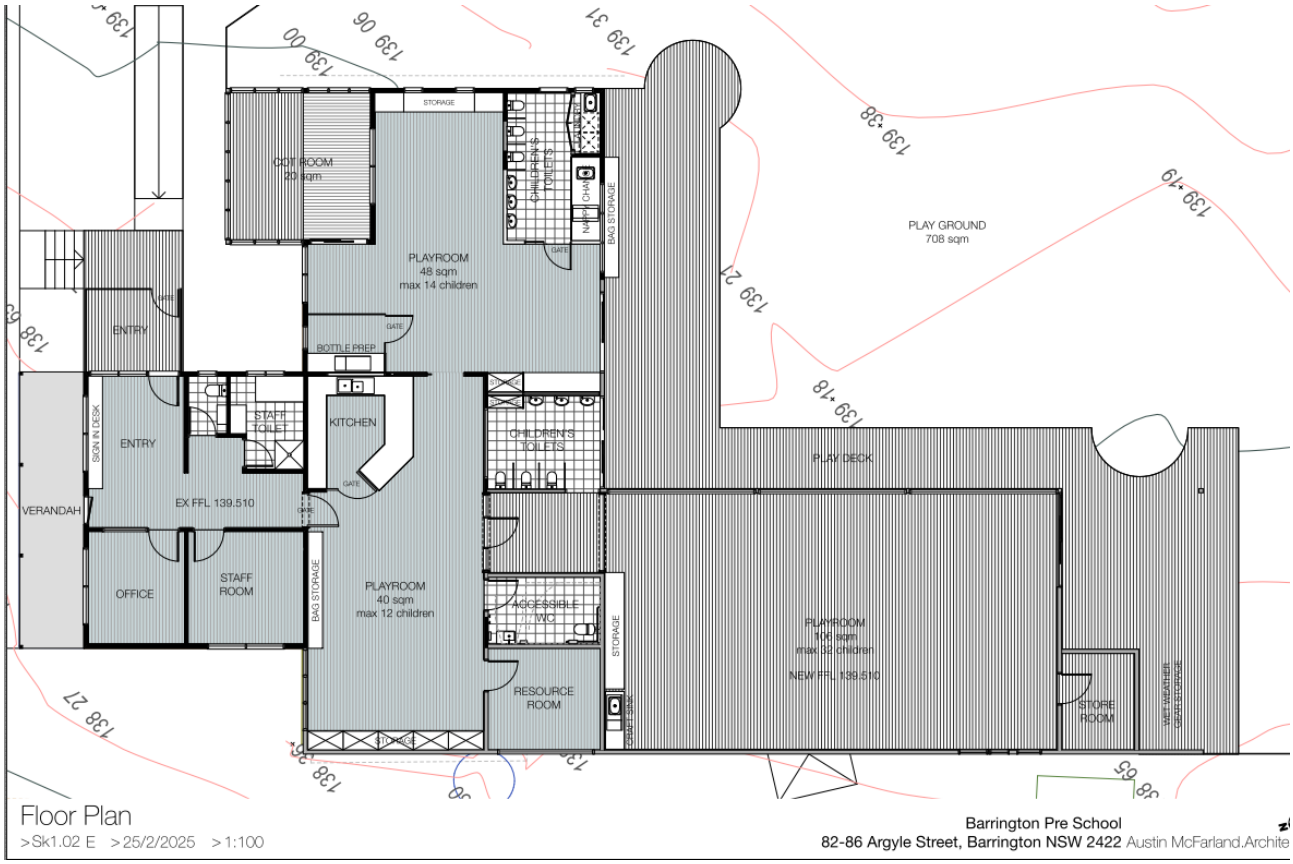

Figure 2-3 Plan of Ground Floor

2.2 Operating Hours and Number of Children

Opening hours will be from 8:00 am to 5:30 pm. This is wholly within the daytime period as defined by the EPA.

The breakdown of numbers for each age is:

- 12 children 0 to 2 year old;
- 15 children to 3 year olds; and
- 31 children 4 to 5 year old.

The outside play time (weather dependant):

- 0 to 2 years old outside playtime (12 children)
    - Arrival until 10am
    - 12.30pm to 2pm
- To 3 years old outside playtime (15 children)
    - Arrival until 10.30am
    - 3pm unit pick up
- To 5 years old outside playtime (31 children)
    - Arrival until 10.30am
    - 3pm unit pick up

3 NOISE MEASUREMENTS

Noise measurements were taken on site to determine the existing noise environment. As the results are used to set noise limits, the results of the measurements will be presented first.

Noise measurements were conducted from 15 to 26 May 2025 at the location shown in Figure 2-1.

Long term background noise measurements were recorded using a Type I integrating sound level meter (SLM), model EL-316X, manufactured by Acoustic Research Labs. A Lutron sound level calibrator, model SC-941, was used as a reference sound source immediately before and after measurements were taken. Both instruments are in current calibration from a NATA registered laboratory. An integrating sound level meter can process a continuous, variable, intermittent or impulsive signal to give a single integrated level or L_{Aeq} for the sampling period. This equipment complies with AS 1259 'Acoustics-Sound level meters", Part 2 "Integrating-Averaging" and the testing procedure with AS 2659 "Guide to the use of sound measuring equipment.

Appendix B shows the daily noise charts. Periods of excess wind or rain have been excluded as per NPfI recommendations.

3.1 Background Noise Levels

Table 3-1 shows the measured background noise levels.

Period	RBL
Daytime	36
Evening	32
Night-time	30

Note: Daytime is defined as 7.00am to 6.00pm, Monday to Saturday; 8.00am to 6.00pm Sunday and Public Holidays.
Evening is defined as 6.00pm to 10.00pm, Monday to Saturday and Public Holidays.
Night is defined as 10.00pm to 7.00am, Monday to Saturday; 10.00pm to 8.00am Sunday and Public Holidays.

Table 3-1 Measured background A-weighted sound pressure levels.

4 NOISE ASSESSMENT CRITERIA

4.1 Environment Protection Agency Guidelines

For noise emission other than from children playing, assessment criteria are discussed in the New South Wales Noise Policy for Industry (NPfI). The NPfI gives a procedure for setting "trigger" noise levels. If noise is above a trigger level, a residual noise impact may exist. Depending on the severity of the residual noise impact mitigation or management needs to be considered.

The policy discusses "intrusiveness" and "amenity" levels which are a set based on the existing noise environment, and the type of residential area. The project specific trigger levels become the most stringent of the two.

4.1.1 Intrusiveness Noise Level

For assessing intrusiveness, the background noise level (L_{A90}) is measured, and the Rating Background Level (RBL) determined. The intrusiveness of an industrial noise source may generally be considered acceptable if the equivalent continuous noise level (L_{Aeq}) of the source (measured over a 15-minute period) does not exceed the RBL by more than 5 dB.

4.1.2 Amenity Noise Level

The amenity assessment is based on noise criteria specific to land use and associated activities. The criteria relate only to industrial-type noise and do not include transportation noise.

The amenity noise level aims to limit continuing increases in noise levels which may occur if the intrusiveness level alone is applied to successive development within an area.

The recommended amenity noise level represents the objective for total industrial noise at a receiver location. The project amenity noise level represents the objective for noise from a single industrial development at a receiver location.

To prevent increases in industrial noise due to the cumulative effect of several developments, the project amenity noise level for each new source of industrial noise is set at 5 dB below the recommended amenity nose level. While amenity is assessed over the entire 13-hour daytime period, under the NPfI it can be compared directly to the 15-minute assessment of intrusiveness by adding 3 dB to the period level.

Amenity noise levels are not used directly as regulatory limits. They are used in combination with the project intrusiveness noise level to assess the potential impact of noise, assess mitigation options and determine achievable noise requirements.

An extract from the NSW NPfI that relates to the amenity noise levels for surrounding receivers is given in Table 4-1 and applies to all receivers in this study.

Type of Receiver	Indicative Noise Amenity Area	Time of Day	Recommended L_{Aeq} Noise Level dB
Residential	Suburban	Day	55
		Evening	45
		Night	45

Note: Daytime is defined as 7.00am to 6.00pm, Monday to Saturday; 8.00am to 6.00pm Sunday and Public Holidays.
Evening is defined as 6.00pm to 10.00pm, Monday to Saturday and Public Holidays.
Night is defined as 10.00pm to 7.00am, Monday to Saturday; 10.00pm to 8.00am Sunday and Public Holidays.

Table 4-1 Recommended amenity criteria from the NSW Noise Policy for Industry.

4.1.3 PROJECT NOISE TRIGGER LEVELS

The project noise trigger levels are given in Table 4-2. The NPfI gives guidance on assessing the noise impact if the noise from industry exceeds the trigger level.

Period	Rating Background Level $L_{A90,15min}$ (dBA)	Intrusiveness Noise Level[1] $L_{Aeq,15min}$ (dBA)	Project Amenity Noise Level[2] $L_{Aeq,15min}$ (dBA)	Project Trigger Levels $L_{Aeq,15min}$ (dBA)
Daytime	36	41	53	41
Evening	32	37	43	37
Night-time	30	35	38	35

Note 1: Intrusiveness noise level is LAeq,15min ≤ RBL +5 dB
Note 2: Project amenity noise level (PANL) is suburban ANL minus 5dBA plus 3dBA to convert from a period level to a 15-minute level.

Table 4-2 Project trigger levels for all Receivers

4.2 NOISE FROM CHILDREN PLAYING

The *NPfI* and Noise Guide for Local Government (*NGLG*) are unsuitable for assessment of noise from children playing. Matrix Thornton considers that the *Guideline for Child Care Centre Acoustic Assessment* (2010) published by the Australian Association of Acoustical Consultants (AAAC) provides appropriate noise goals. They are:

- **Up to 2 hours (total) per day** – The $L_{eq,15min}$ noise level emitted from the outdoor play area shall not exceed the background noise level by more than 10dB at the assessment location.
- **More than 2 hours per day** – The $L_{eq,15min}$ noise level emitted from the outdoor play area shall not exceed the background noise level by more than 5dB at the assessment location.

The daytime RBL is 36dBA, hence the guideline for children playing is therefore $L_{Aeq,15min}$ 46dBA for up to 2 hours play, and 41dBA for more than 2 hours outdoor play.

4.3 Noise into the Child Care Centre

The *NPfI* recommends two criteria for schools. For assessing childcare centers, it is usual to consider play areas as active recreation area playgrounds, and internal areas such as sleeping areas and activity rooms/classrooms. The relevant criteria are:

- Outdoor play areas L_{Aeq} 55dBA when in use; and
- Classrooms (internal) 35-40dBA (the AAAC guideline recommends 40dBA).

There are no current sources of industrial noise that could affect the Centre, however there is traffic noise. The NSW Road Noise Policy (RNP) recommends school classrooms traffic noise levels less than $L_{Aeq,1hr}$ 40dBA.

4.4 Maximum Noise Level Events

Noise sources of short duration and high level that may cause disturbance to sleep if occurring during the night time need to be considered. This childcare centre does not operate during night time hours, therefore no assessment of maximum noise level events is recorded.

5 NOISE PREDICTIONS AND ASSESSMENT

5.1 Noise Modelling

Noise emission from the development was modelled using iNoise modelling software, with predictions based on the ISO9613 algorithms.

Noise from the development will be from the carpark, noise from inside the building, noise from children playing outside and noise from any mechanical services such as airconditioning.

Mechanical services have not been designed at this stage but we recommend they be designed to achieve a level below the noise trigger levels set out in Section 4.1.3.

5.2 NOISE FROM OUTDOOR PLAY

To predict noise from inside the centre we have to assume the classroom noise level of 80 dBA and windows open.
For noise from the play area we have used the sound power level (L_{AW})of children playing from the AAAC guide.

- 10 Children aged 0 to 2 years – $L_{AW,eq}$ 77 to 80 dB(A)
- 10 Children aged 2 to 3 years – L_{AW},e_q 83 to 87 dB(A)
- 10 Children aged 3 to 6 years – $L_{AW,eq}$ 84 to 90 dB(A)

The worst case for noise will be after 3pm when all children older than 2 years could be in the play area. Because the children will be well supervised the predictions are based on the middle part of the range of source noise levels reported by the AAAC guide. The typical sound power level of children playing externally:

- 15 Children aged 2 to 3 years – L_{AW},e_q 88 dB(A)
- 31 Children aged 3 to 5 years – $L_{AW,eq}$ 92 dB(A)
- Total sound power level – $L_{AW,eq}$ 94 dB(A)

Noise was modelled with children spread over the external play area. The predicted noise levels of children playing are shown in Table 5-1. As shown in the table the predicted levels at neighbouring residences comply with the 46 dBA guideline for two hours of outdoor play. There are some minor exceedances of the guideline for more then two hours of play (41 dBA). Those exceedances occur near the western boundary of Receiver 1.

If more than 2 hours of play is required, there are two ways of mitigating noise: staggered playtimes or an acoustic fence on the eastern boundar. For example, as shown in the table, the noise from 30 children are in the external area at any time complies with the guideline. Alternatively, a solid fence cold be built on the boundary with Receiver 1, to minimise noise to that receiver. A 1.8m high solid fence on the boundary would attenuate noise to Receiver 1 by 7dBA, as show in the table. The fence should extend along the full length of the boundary to provide noise mitigation to all areas of the garden. The height can be reduced at the front of the block for visual purposes (say a reduction to 1.2m for the 5m closest to Argyle St) without compromising the noise properties of the fence. It can be built from any solid material such as Colorbond or timber (lapped and capped).

Receiver	46 2-5 year old Children playing No fence	30 Children playing	46 2-5 year old Children playing Boundary fence with Receiver 1
1	44	41	37
2	38	35	38
3	29	24	29
4	33	28	33

Table 5-1 Predicted Noise Levels of Children Playing, Residential Receivers, $L_{Aeq,15min}$ dBA

5.3 NOISE FROM INDOOR AREAS

Noise in the classrooms, playrooms and cot room will be highly variable.

Assuming a noise level of L_{Aeq} 80dBA, typical for well supervised young children, for all the classrooms and the cot room, and fully open windows, the predicted noise level from indoor activities is as shown in Table 5-2. This noise level complies with 41dBA criterion at all receivers.

Receiver	Noise from Inside Classrooms
1	40
2	40
3	39
4	19

Table 5-2 Predicted Noise Levels of Classroom Activities, $L_{Aeq,15min}$ dBA

5.4 NOISE FROM THE CARPARK

Noise from the carpark depends on the number and frequency of vehicles visiting. At childcare facilities this typically peaks in the morning drop-off period, with a lower peak in the afternoon.

There is no traffic report available for the development. To predict noise from the carpark, we have estimated the number of vehicles visiting the site based on the RMS (2002) Guide to Traffic Generating Developments, and typical assumptions made by traffic consultants for previous childcare facilities we have assessed.

Assuming a staff ratio of 1 to every 4 children, and that at this centre all children and staff arrive by vehicle we estimate the traffic generation as shown in

Traffic Generator		Morning Peak Hour	Afternoon Peak Hour
Children	Number of Children	58	58
	Trips per child in peak hour	0.8	0.7
	Trips in peak hour	**46**	**41**
Staff	Number of Staff	15	15
	% driving	100%	100%
	% during peak hour	80%	70%
	Staff Trips in peak hour	**12**	**11**
Total	Total Trips, Staff plus Children	**58**	**52**

Table 5-3 Traffic Generation during Peak Hours

The typical source noise level of a car entering and leaving a carpark, including door slams, car starts and accelerations, is $L_{AEq,15min}$ 78dBA. The noise model was used to predict the noise at neighbouring residents and the results are shown in Table 5-4.

Noise from the proposed carpark is predicted to comply with the 41dBA trigger level at all locations during the afternoon peak periods, with a single 1dBA exceedance at Receivers 1 and 4 in the morning peak period.

The NPfI considers this 1dBA exceedance a "residual" impact. A 1dBA residual is considered to have a negligible impact, and given that it is predicted to occur for only 1 hour per day, no mitigation is recommended.

Receiver	Morning Peak Hour	Afternoon Peak Hour
1	42	41
2	22	21
3	25	24
4	42	41

Table 5-4 Predicted Noise Levels of Carpark, $L_{Aeq,15min}$ dBA

5.5 Combined Noise from all Sources

The previous sections assessed noise from individual sources, analysing worst-case noise levels from those sources. At the receiver locations noise will be perceived as a total noise level, combining noise from external play, internal activities, carpark noise and air conditioning noise.

The worst-case noise levels from all sources will not occur simultaneously. For example, if all children are playing outside, there will be no noise from inside and the peak noise from the carpark will occur before all children have arrived.

6 Traffic Noise Into the Centre

6.1 Internal Areas

The only significant source of external noise impacting the facility is the traffic noise from Argyle Street. The cot room and the 40m^2 playroom have facades facing Argyle St, and traffic noise can potentially impact the interior of those rooms.

Traffic noise at the noise logger location was typically $L_{Aeq,1hr}$ 60dBA.

Based on this the predicted level at the front façade of the facility is $L_{Aeq,1hr}$ 56dBA.

The noise reduction of a façade with open windows is typically 10dBA, so the predicted noise level in those rooms with windows open is 46dBA, exceeding the recommended maximum of 40dBA.

It is recommended that windows facing the traffic in the cot room and 40m^2 playroom remain closed during use of those rooms. Windows facing away from the traffic, mechanical ventilation or air conditioning can be used for ventilation.

Standard 4mm float glass will provide sufficient attenuation to reduce the noise level to below 40dBA in those rooms.

6.2 EXTERNAL PLAYGROUND

The playground is partially shielded from traffic noise by the building itself.

Based on our measurements, and the layout of the proposal, the predicted traffic noise to the worst affected part of external play area is $L_{Aeq,1hr}$ 53dBA. This complies with the recommended $L_{Aeq,1hr}$ 55dBA.

7 TRAFFIC NOISE GENERATED BY THE DEVELOPMENT

The NSW Road Noise Policy (RNP) traffic noise assessment criteria for existing residences affected by additional traffic due to the developments on existing roads. Argyle St would be considered an arterial or sub-arterial road; hence the criterion is $L_{Aeq,15hr}$ 60dBA for daytime.

Houses along Argyle St are typically set back 13m from the kerb.

Based on the traffic volumes derived in Section 5.4, and using the Calculation of Road Traffic Noise (CoRTN) algorithms, the noise level at a typical façade, due to extra traffic generated by the proposal would be $L_{Aeq,1hr}$ 51 dBA during the morning peak hour. Averaging the traffic over the 15 hour assessment period, the $L_{Aeq,15\ hr}$ would be less than 50dBA, which is significantly less than the 60dBA criterion. Hence no traffic noise impact is predicted.

8 CONCLUSION

Noise issues associated with the proposed child care facility at 82-86 Argyle St, Barrington were assessed.

The child care facility is proposed for 58 children of mixed ages, operating between 8.00am and 5:30pm.

Noise from children playing outside the centre is predicted to comply with the guideline if the children playing for less than two hours a day. Minor exceedances of the guideline are predicted if more than two hours of outdoor play is required for all the children at the facility. Consider staggering the playtime so that only half the children are playing outside at any time. Noise could also be mitigated by a solid barrier on the eastern boundary with Receiver 1.

Concerning traffic noise into the centre, it is recommended that windows facing Argyle St in the cot room and 40m^2 playroom remain closed during use of those rooms. Windows facing away from the traffic, mechanical ventilation or air conditioning can be used for ventilation.

Noise from traffic generated by the development will be satisfactory.

Mechanical services have not been designed; however, they should meet the noise emission requirements of the NPfI as outlined in this report.

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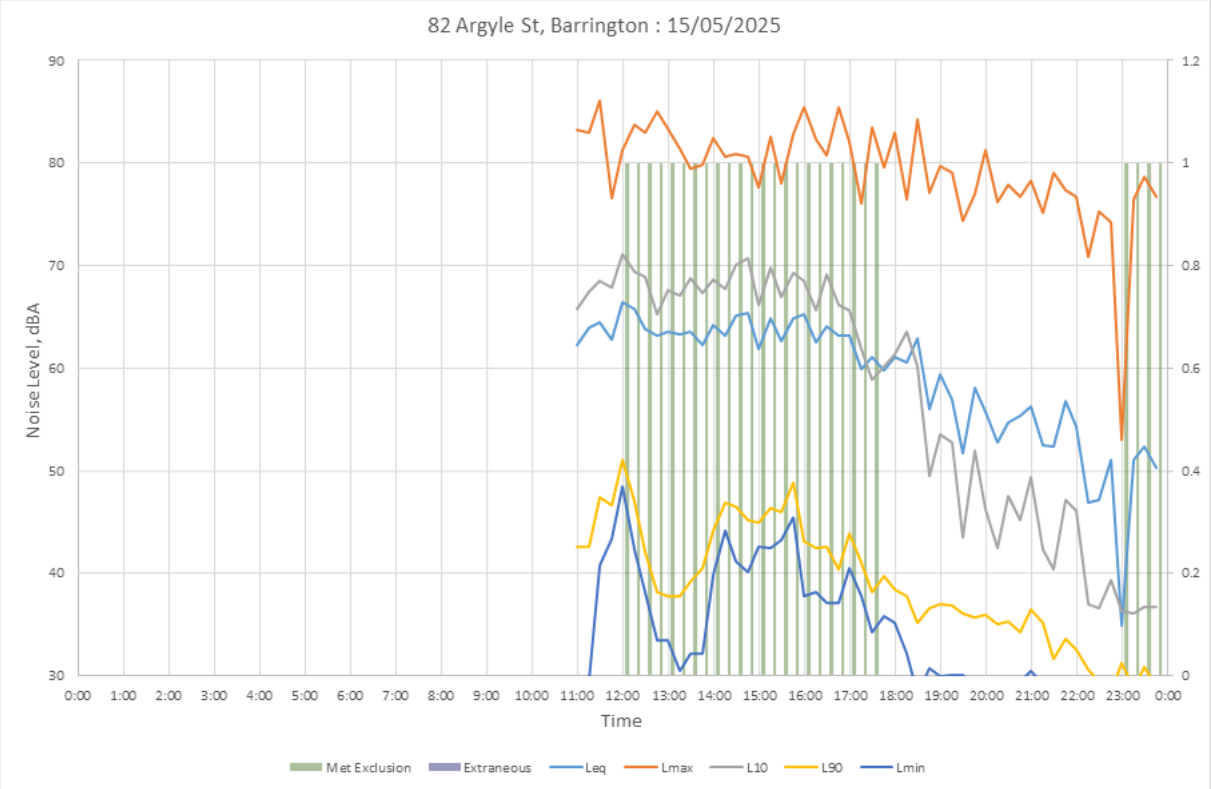
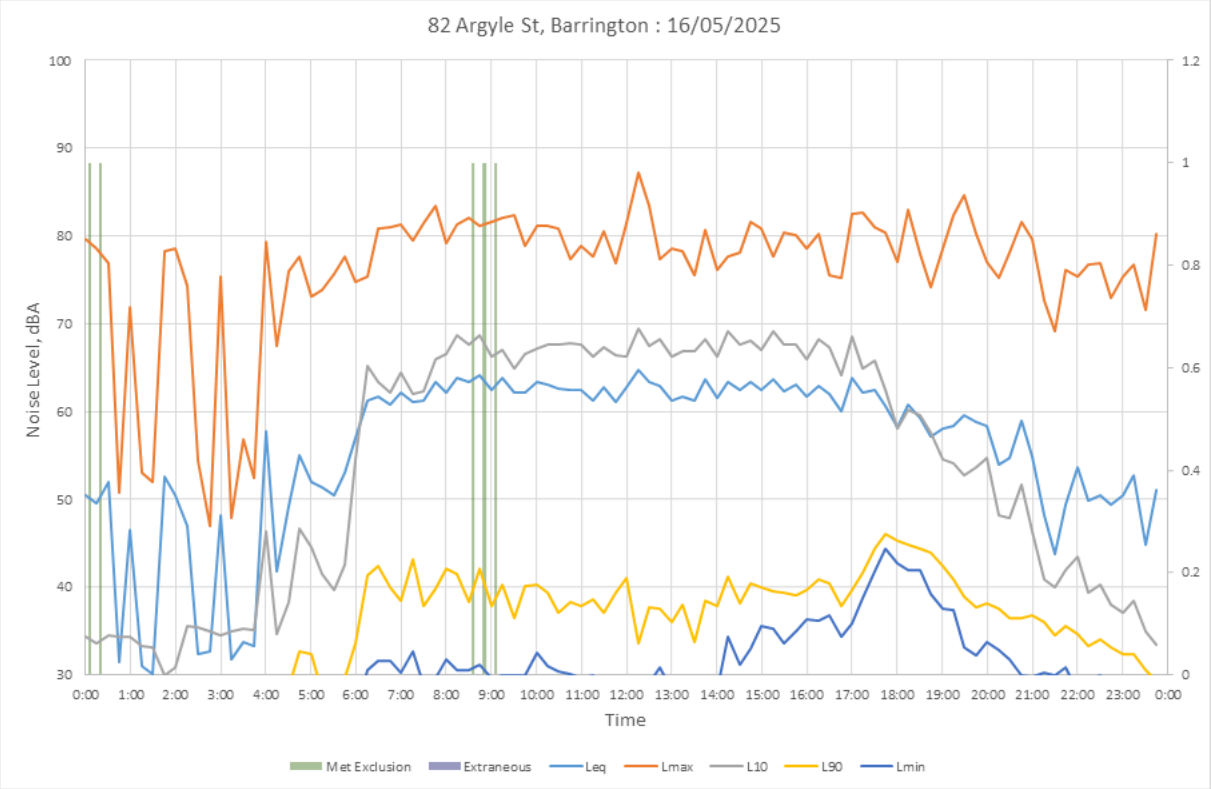
AUSTRALIA
Chartered Professional Engineer
MEMBER

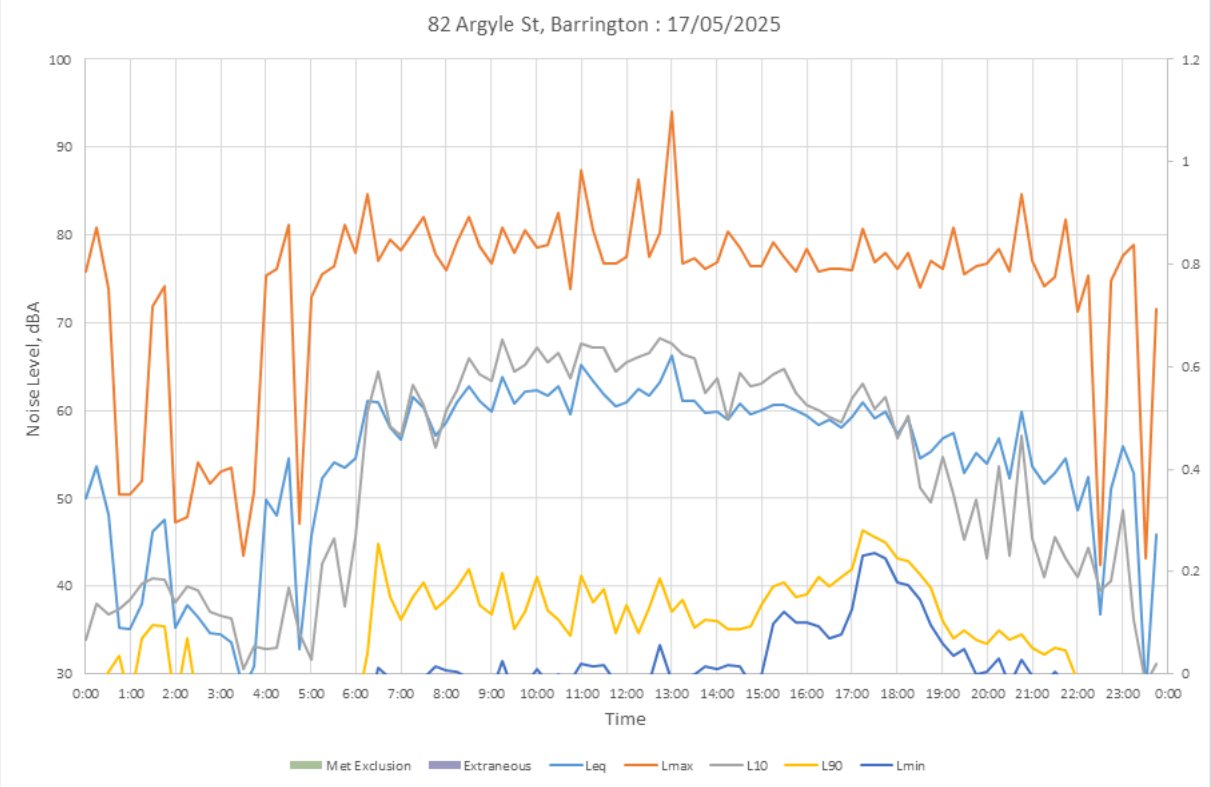
APPENDIX A: GLOSSARY OF ACOUSTIC TERMS

Assessment Period	The period in a day over which assessments are made.
dB(A)	Unit of sound level in A-weighted decibels. The A-weighting approximates the sensitivity of the human ear by filtering these frequencies. The dB(A) measurement is considered representative of average human hearing.
L_{Aeq}	The A-weighted equivalent continuous sound pressure level, used to quantify the average noise level over a time period.
L_{A10}	The A-weighted sound pressure level exceeded for 10% of the measurement period. It is usually used as the descriptor for intrusive noise level.
L_{A90}	The A-weighted sound pressure level exceeded for 90% of the measurement period. It is usually used as the descriptor for background noise level.
$L_{Aeq15min}$	Refers to the A-weighted energy averaged equivalent noise level over a 15 minute time period.
L_{Cpeak}	The highest instantaneous C-weighted sound pressure level over the measurement period. It is usually used for high impulsive noise.
L_{Amax}	The maximum A-weighted sound pressure level for the measurement period.
Loudness	A 3dB(A) change in sound pressure level is just noticeable or perceptible to the average human ear; a 5dB(A) increase is quite noticeable and a 10dB(A) increase is typically perceived as a doubling in loudness.
RBL	The overall single figure background level representing the assessment period over the whole monitoring period. For the short-term method of assessment, the RBL is the measured $L_{A90,\ 15min}$ value, or where a number of measurements have been made, the lowest $L_{A90,\ 15min}$ value.

APPENDIX B: NOISE LOGGER RESULTS



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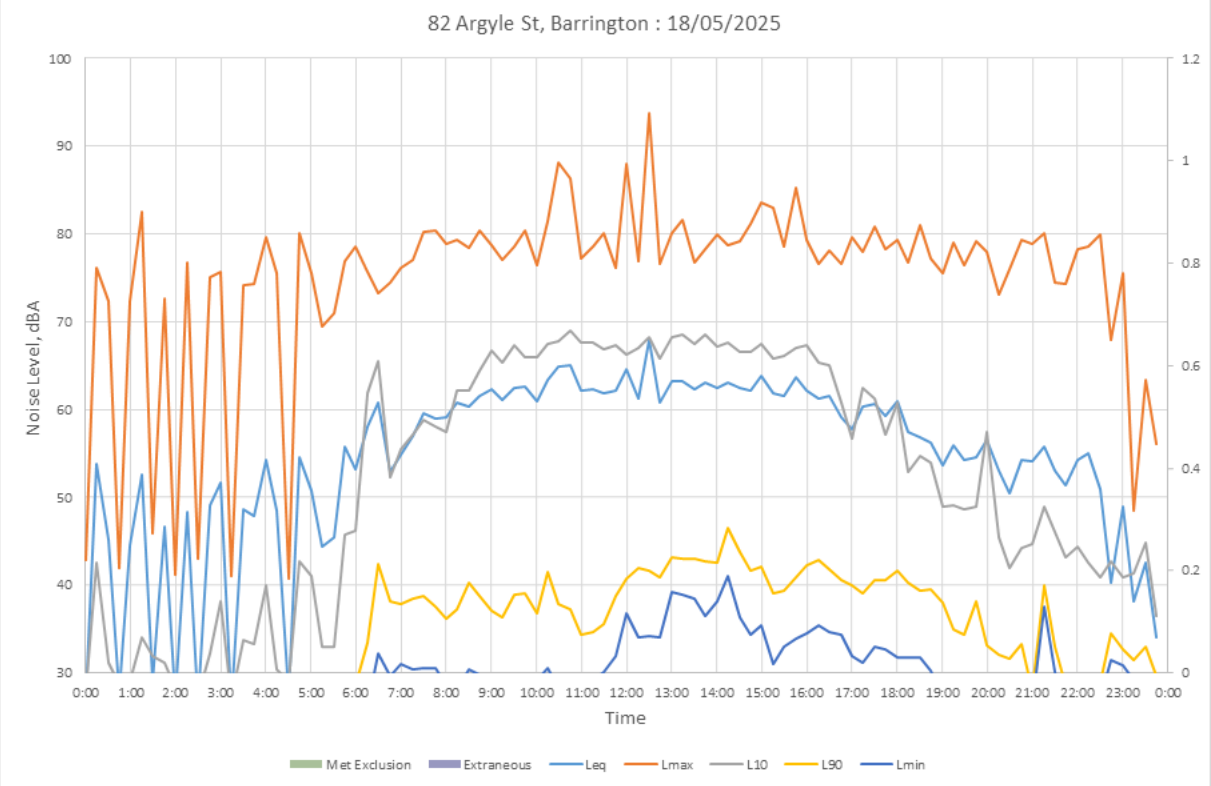
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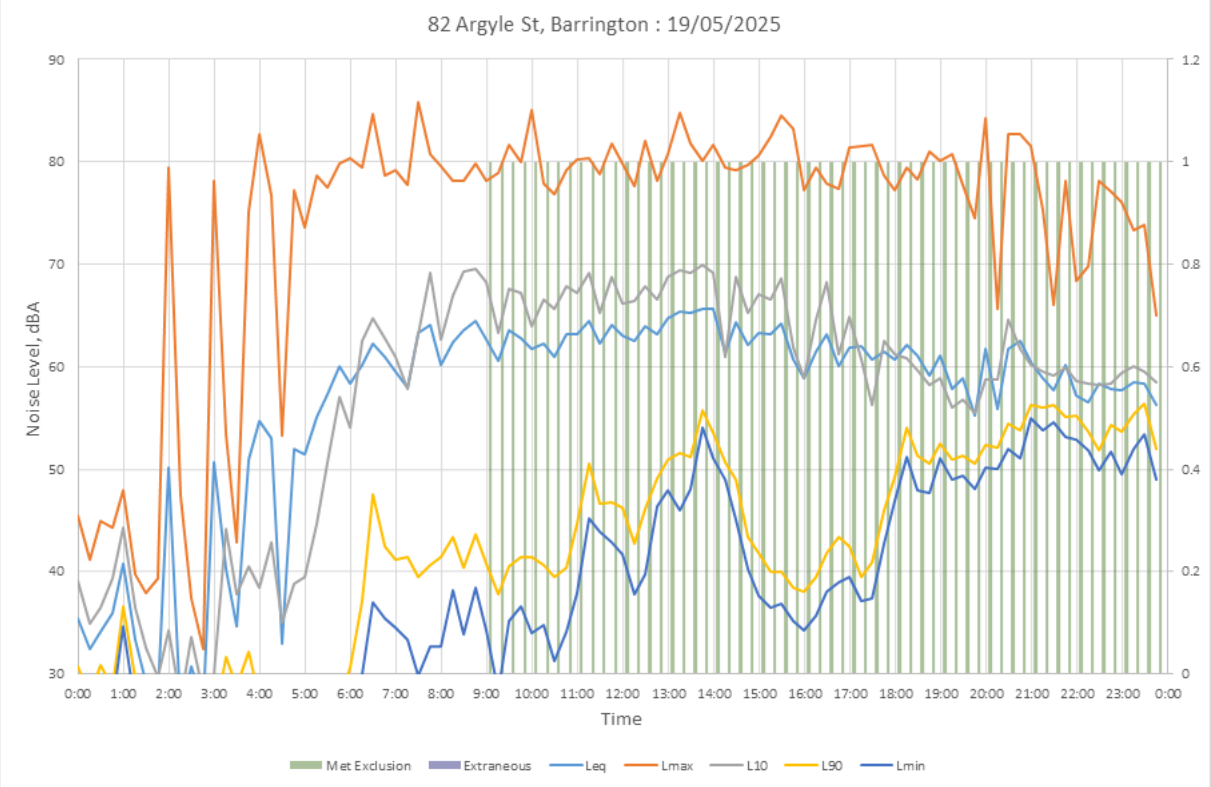
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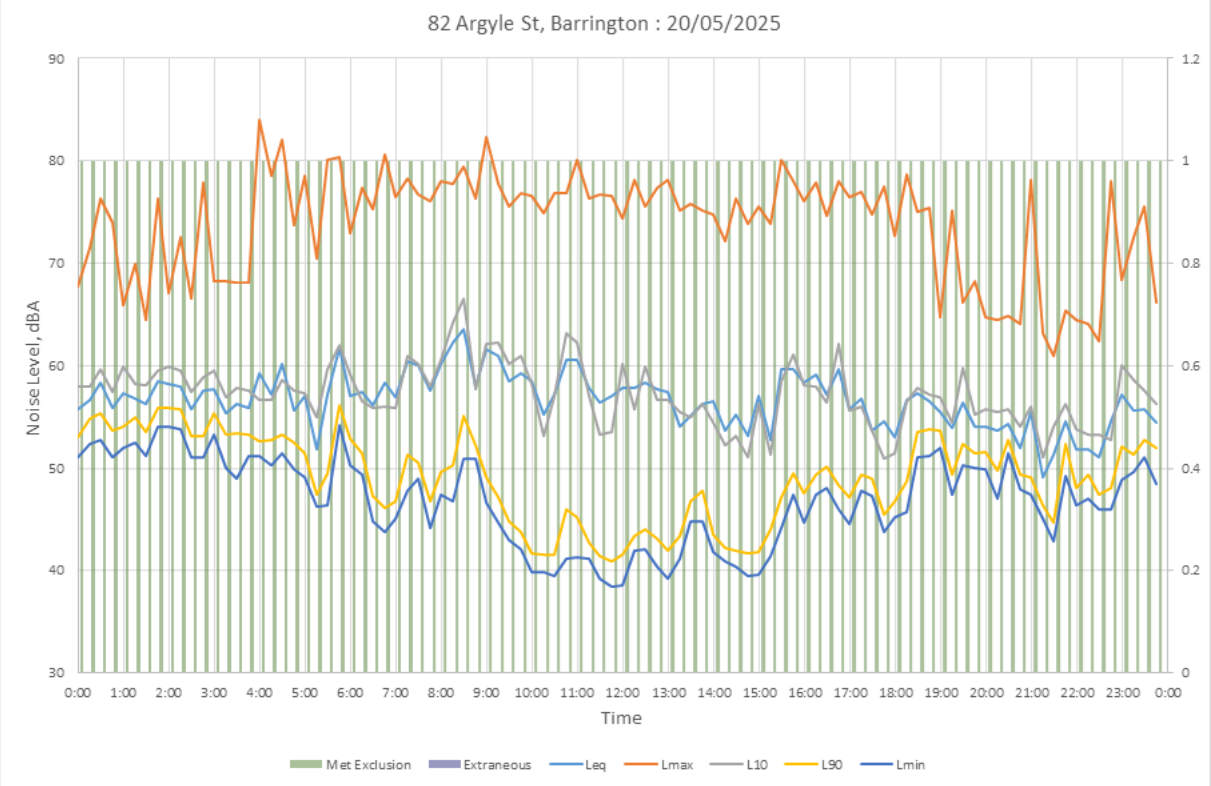
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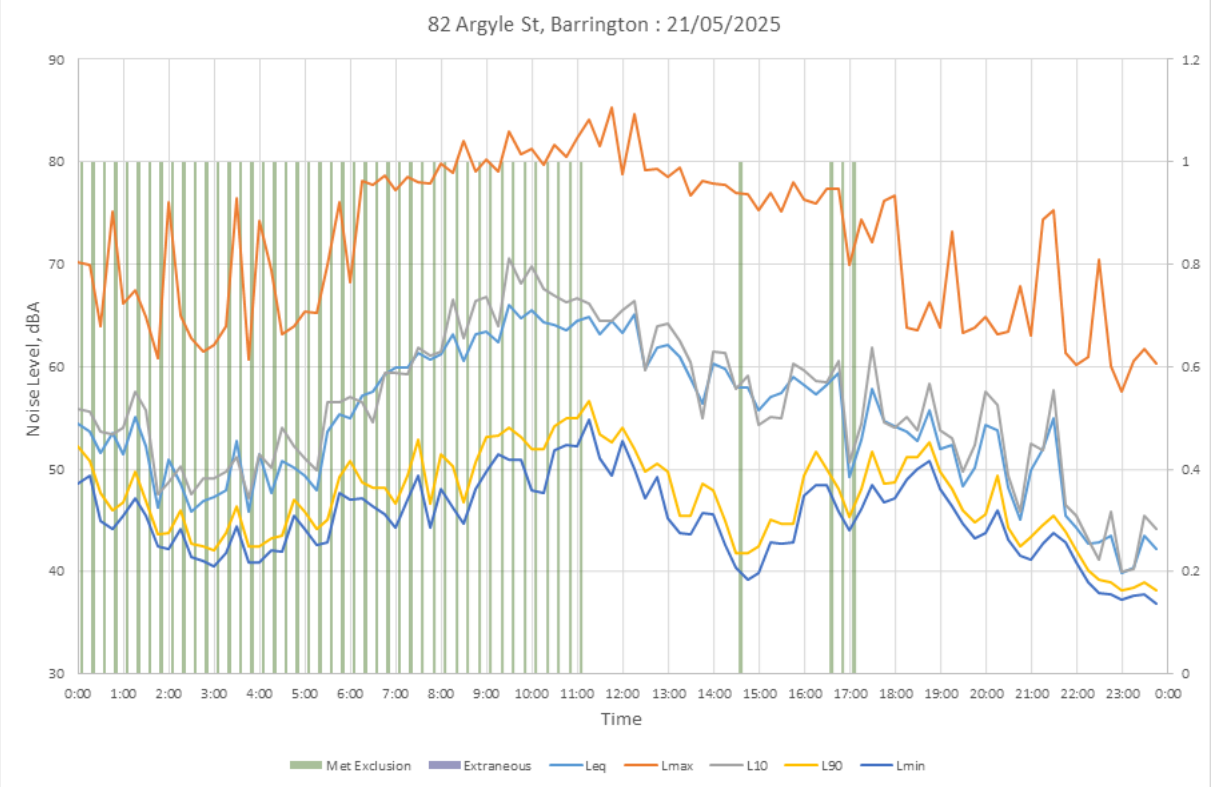
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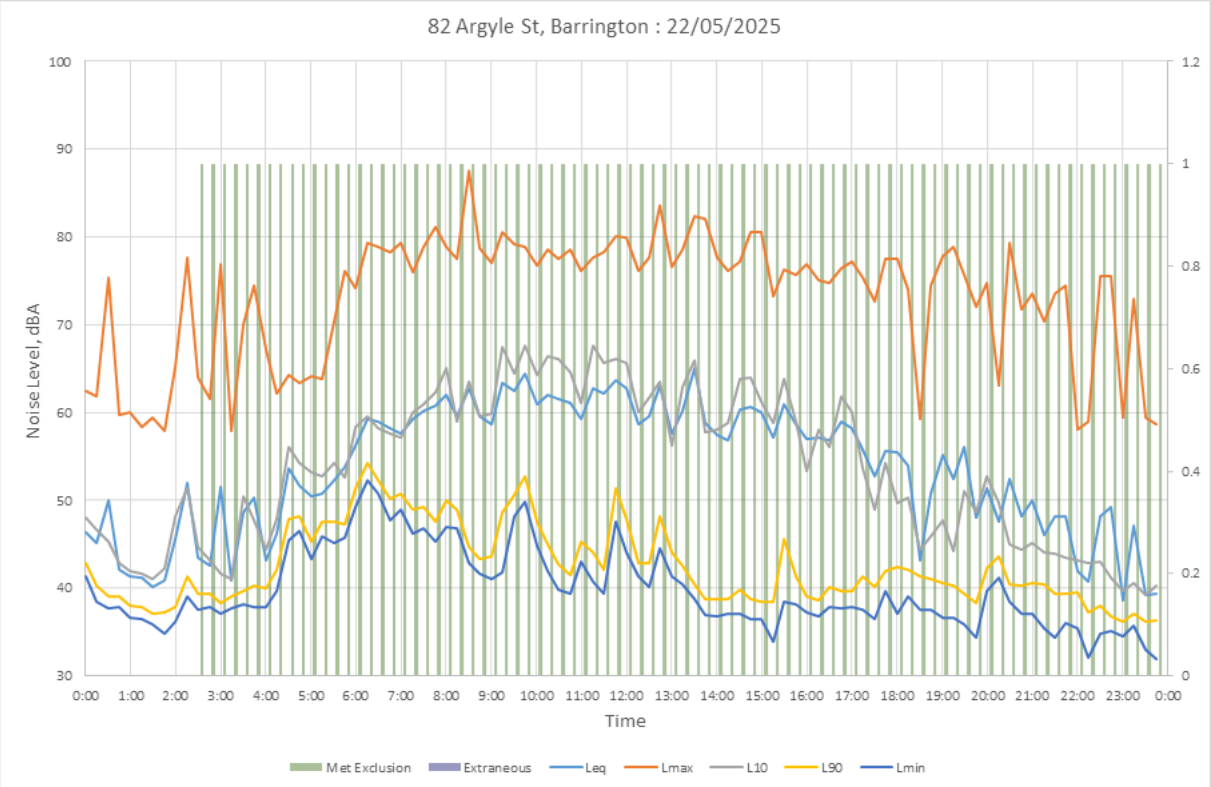
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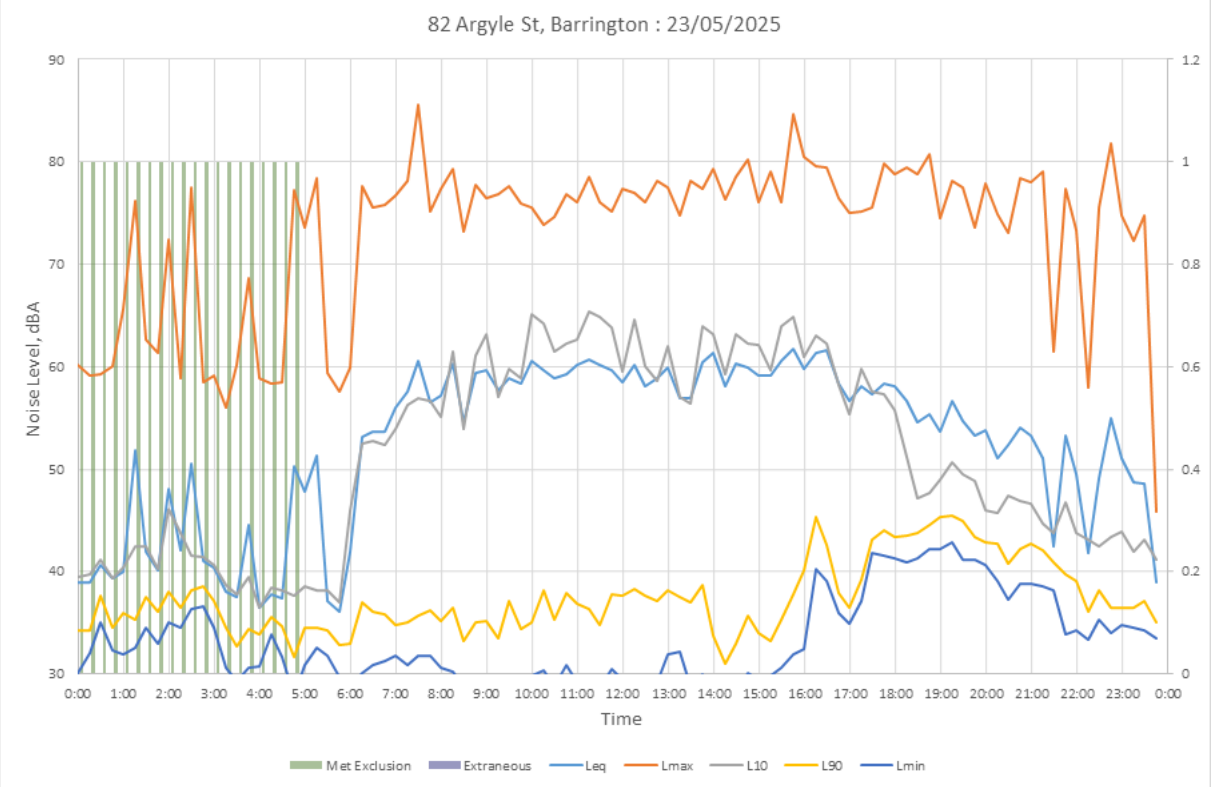
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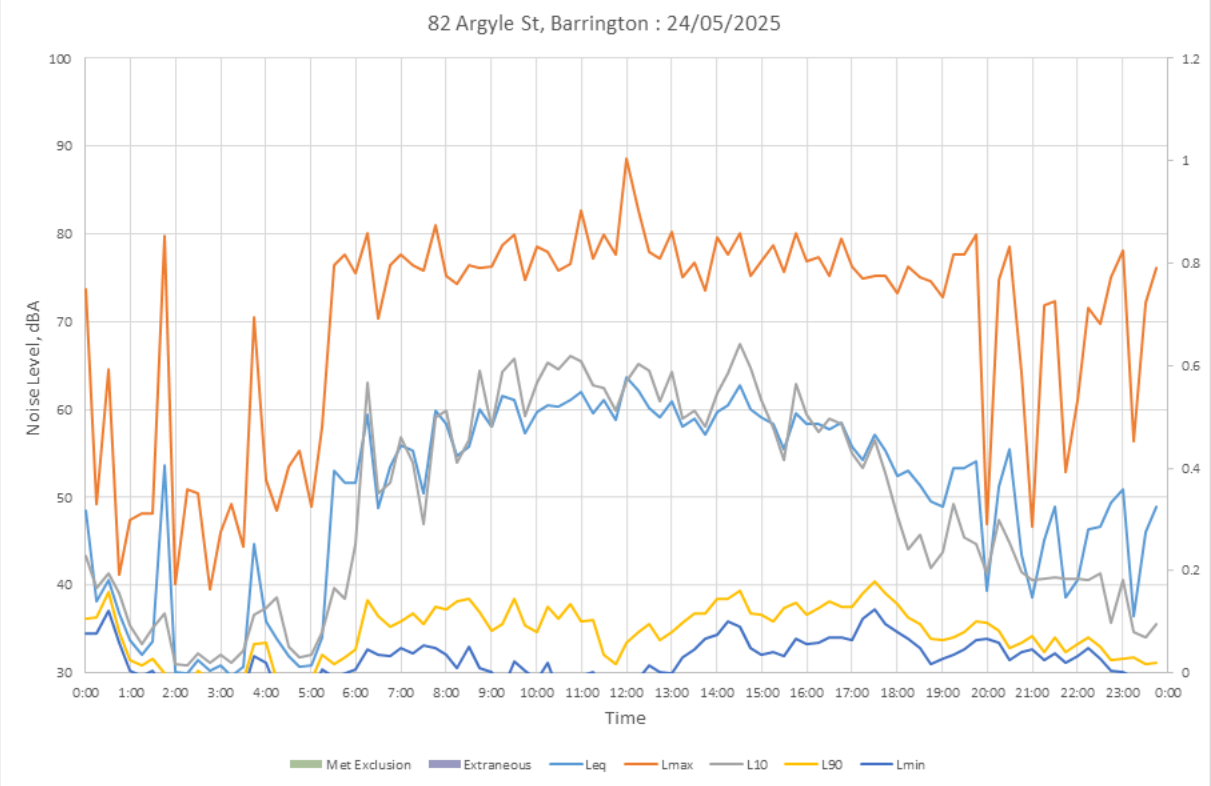
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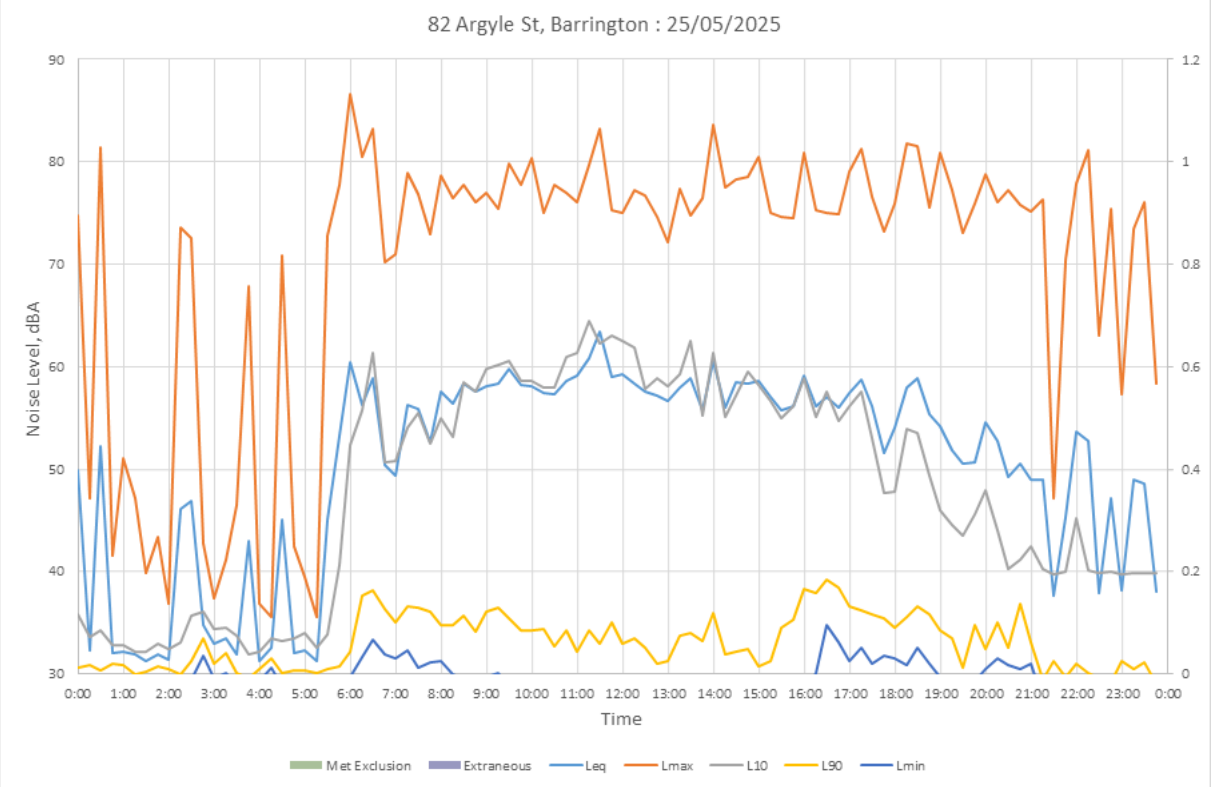
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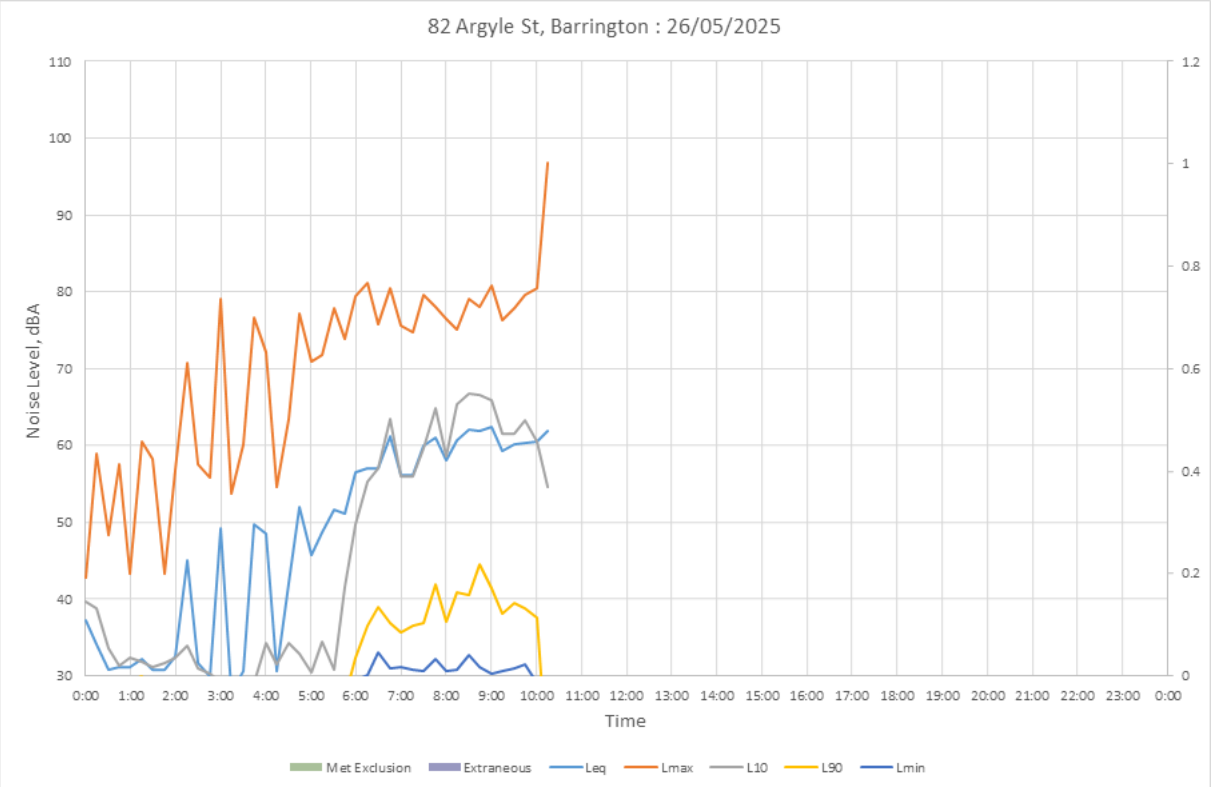
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