ENFIELD ACOUSTICS NOISE VIBRATION

66 & 72 MILLER STREET, PRESTON

Acoustic Report for Town Planning Application

For

BMPA PROPERTY NO 2 PTY LTD C/- THE ELLIS GROUP ARCHITECTS

DOC. REF: V1939-01-P ACOUSTIC REPORT (R0)
9 JULY 2024

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Project	66 & 72 Miller Street, Preston
Subject	Acoustic Report for Town Planning Application
Client	BMPA Property No 2 Pty Ltd c/- The Ellis Group Architects
Document Reference	V1939-01-P Acoustic Report (r0)
Date of Issue	9 July 2024

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1 Introduction

Enfield Acoustics has been engaged by BMPA Property No 2 Pty Ltd c/- The Ellis Group Architects to assess the proposed childcare centre at 66 & 72 Miller Street, Preston (Subject Land). This assessment has been conducted in response to Council RFI Item 17 for Planning Permit Application No. D/137/2024 dated 1 May 2024, as follows:

Acoustic Report

17. Acoustic Report prepared by a suitable qualified professional. Noise levels within the development (including the operation of plant, roller doors and the use of the car park) do not impact adversely on the amenity of dwellings within the development and neighbouring residential properties.

This report assesses potential noise impacts from the proposed childcare centre at proximate sensitive receivers surrounding the Subject Land.

Our assessment is based on Plans prepared by The Ellis Group Architects dated 19 June 2024 in accordance with the Association of Australasian Acoustical Consultants (AAAC) *Guideline for Childcare Centre Acoustic Assessment*.

2 Subject Land Use

It is understood that the Application seeks approval to develop the Subject Land for use as a childcare centre. The Application proposal is for:

- Up to 84 children;
- Dedicated ground floor and first floor play areas; and
- Carpark

Sensitive uses surrounding the Subject Land were identified as follows:

Tag	Location of Sensitive Use	Direction	Type
R1	27, 29, & 31 Gillingham Street	North	Single-storey
R2	62 Miller Street	East	Single-storey
R3	65, 69, & 71 Miller Street	South	Mix of Single-storey and Double-storey
R4	1A Devon Street & 74 Miller Street	West	Mix of Single-storey and Double-storey

Refer below for a site map showing locations of sensitive uses relative to the Subject Land:

Given that the sensitive uses identified above are the closest to the Subject Land, it is intrinsic that compliance at these locations would also result in compliance at all other possible sensitive uses proximate to the Subject Land.

3 Site Inspection

A site inspection was carried out by our office on 2 July 2024.

Background noise measurements were carried out with the following noise levels recorded:

Location	Background Noise Level
M1	42 dB(A), L_{90}
M2	36 dB(A), L_{90}

It was observed that the ambient noise environment was dominated by traffic on Miller Street, with low levels of road traffic volumes observed. Overall, the background noise environment surrounding the Subject Land is considered moderate and consistent with suburban residential areas.

Noise measurements were carried out between 1pm to 2pm as it is typical to find the lowest background noise throughout the middle of the day (between peak traffic periods). This results in a conservative noise assessment in comparison to the average daily measurements being considered, which would include peak traffic periods. This time is also representative of when the maximum number of children are most likely to be outdoors in play areas, subsequently representing the highest risk for noise impacts at adjacent residential premises with respect to background noise vs intrusive noise.

4 Assessment

4.1 Legislation

Two sources of noise associated with childcare centres (services plant and music noise) are subject to legislated noise limits of *Environment Protection Regulations 2021* and *EPA Publication 1826 – Noise Limit and Assessment Protocol for the Control of Noise from Commercial, Industrial and Trade Premises and Entertainment Venues* (Noise Protocol)

The Noise Protocol is enforceable under the *Environmental Protection Act 2017*. In practice, given the normal operating hours of childcare centres, these sources do not present any material risk where the permit conditions require compliance with the Noise Protocol. Regardless, childcare centres are required to comply with the Noise Protocol, and it is usually sufficient to approve a permit with the following conditions:

1. Plant equipment and music playback on the land shall comply with *EPA Publication 1826 – Noise Limit and Assessment Protocol for the Control of Noise from Commercial, Industrial and Trade Premises and Entertainment Venues* at all times.

4.2 Outdoor Play Areas

There are currently no guidelines or policies in Victoria, at the statutory level or within the planning scheme, for the assessment of noise emissions associated with outdoor play areas of childcare centres. In lieu of such guidelines or policies, it is appropriate to consider the *Guideline for Childcare Centre Acoustic Assessment, September 2020* published by the Association of Australasian Acoustic Consultants (the AAAC Guideline) and Victorian Civil and Administrative Tribunal (VCAT) precedents.

It is important to note that case history indicates that VCAT has not accepted the AAAC Guideline as being wholly appropriate for the assessment of reasonable amenity. These views are shared by acoustic experts and members of the AAAC and Australian Acoustical Society in Victoria. Generally, the AAAC Guideline is viewed as being aspirational but not reflective of reasonable expectations to minimise noise. Regardless, where an application can meet the upper noise targets of the AAAC Guideline (i.e. background noise +10dB), it is typically viewed as being an appropriate design response in minimising noise impacts.

To remain conservative, the AAAC noise target has been derived based on the lowest background noise levels measured on site, as follows:

Location	Noise Target
All sensitive uses	46 dB(A), L_{Aeq}

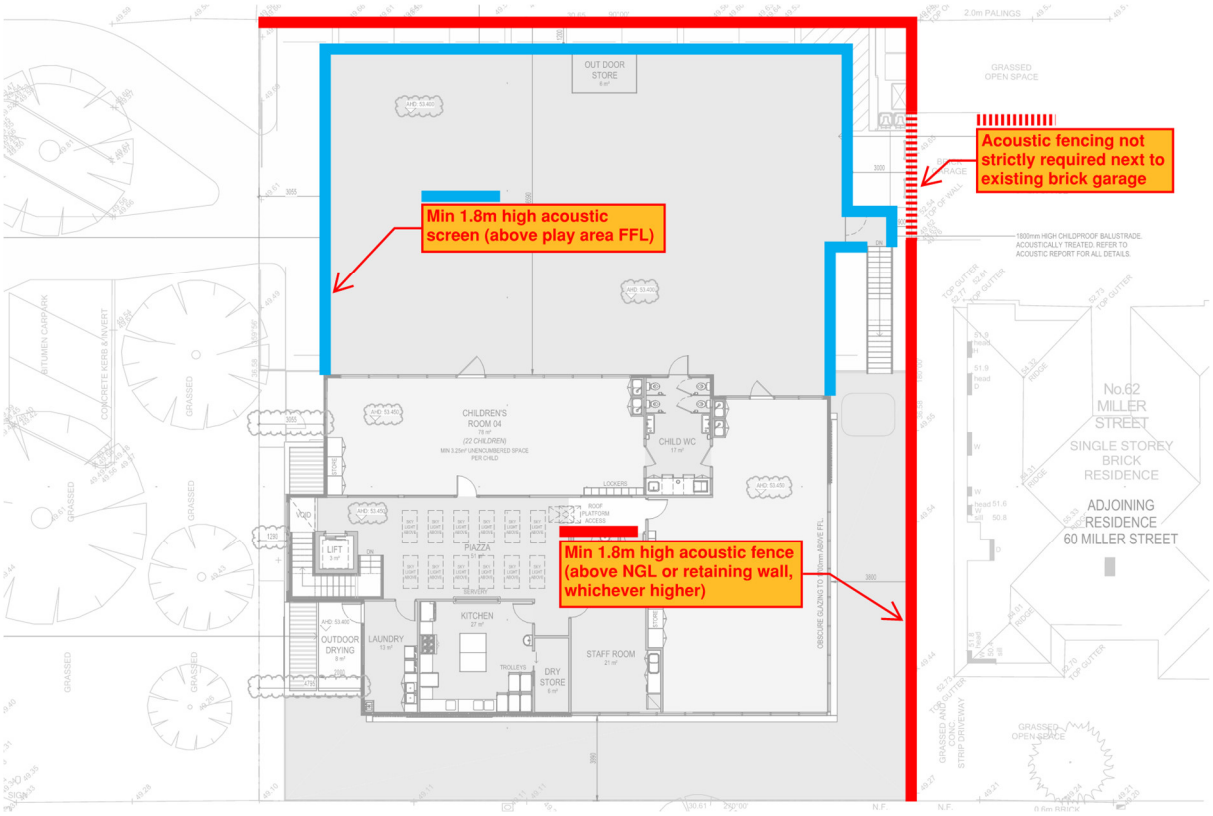
Our office has prepared 3D acoustic modelling based on the site conditions, proposed plans and number of placements, in accordance with the AAAC Guideline. The modelling assumes that all children would be located outside at the same time. In practice, this results in a conservative assessment given that pickup and drop-off times typically vary over a day and varying ages and group segregation often results in scattered play times and areas of use.

Our modelling assumes sound power levels of children playing outside in accordance with the AAAC Guideline, as follows:

Location	Number of Children	SWL
Outdoor play area 1 *Ground floor*	32 (ages 0-3)	88 dB(A)
Outdoor play area 2 *First floor*	52 (ages 3+)	94 dB(A)

The research paper *Carrying Out Noise Assessments for Proposed Childcare Facilities – Proceedings of Acoustics 2006* identified that typically only up to 35% of the number of children within outdoor play areas are expected to be vocal at a given time, noting that this has been considered in our acoustic model.

To assist in mitigating noise from the Subject Land, the following acoustic screening is recommended:



The acoustic screening shown above is in part to mitigate noise impacts from carpark use (discussed later).

Inclusive of the acoustic screening shown above, the results of our modelling indicate that outdoor play noise is expected to be **≤46dB(A) L_{eq}** at all identified receptors, demonstrating compliance with the AAAC guideline.

It is noted that the margin of compliance is likely greater at Receiver R2, noting that background noise levels (and resulting targets) along the interface with the play area are elevated due to road traffic on Miller Street.

A map of the noise model showing noise levels at all surrounding sensitive receptors can be referred to in Appendix A.

To this end, Enfield Acoustics is satisfied that the proposal will not result in adverse noise impacts at all identified sensitive uses, providing that the acoustic screening as shown above is installed.

4.3 Traffic Noise

The Plans indicate carparking to the north of the Subject Land.

The AAAC guideline recommends that noise from pickup and drop-offs do not exceed Background + 5dB(A), resulting in the following noise target:

Location	Noise Target
All identified sensitive uses	41 dB(A), L_{Aeq}

We have assumed that up to 60 vehicle movements could occur in a 60-minute period, with pick-up and drop-offs occurring at the proposed car park on the Subject Land. In our experience, this represents a worst-case scenario during pick-up and drop-off times but would need to consider the appropriate traffic engineering study.

The following sound power levels were used (based on AAAC Guideline):

Location	Sound Power Level
Carpark area 60 cars per hour	78 dB(A)

Inclusive of the acoustic screening shown in Section 4.2, the results of our modelling indicate that the use of the car park (including occasional delivery vans) is expected to be **≤41dB(A) L_{eq}** and would comply with AAAC guideline.

Results are shown in Appendix A.

4.4 Sleep Disturbance

It is typical for childcare centres to commence operation (drop-offs and staff arrival) before 7am, however outdoor play use is not expected to occur before 7am. As such, our assessment will consider sleep disturbance impacts from carpark use on the Subject Land.

No specific policy exists in assessing the risk of sleep disturbance of carparks, however 'Sleep Disturbance' criteria derived from the NSW Road Traffic Policy can be used as a method of assessing the likelihood of noise impacts for short duration or transient events.

The Sleep Disturbance assessment trigger of **L_{max} 65dB(A)** outside habitable room windows is often used to determine if noise emissions are likely to cause adverse impacts during the most sensitive 'Night' period (10pm to 7am). However, for very infrequent events of 1-2 during the 'Night' period, it is generally accepted that outdoor noise levels of up to 80dB(A), L_{max} do not impact on health and wellbeing.

Noise emissions from carpark use have been modelled with the following sound power levels:

Item	Sound Power Level
Car door slams	93dB(A), L_{Amax}

Inclusive of the acoustic screening shown in Section 4.2, the results of our modelling indicate that the use of the carpark is expected to be **≤58dB(A) L_{max}** and would comply with the sleep disturbance threshold by a reasonable margin.

Results are shown in Appendix A.

4.5 Mechanical Plant

Noise from mechanical plant and equipment must comply with the Noise Protocol, noting that this is a statutory requirement, regardless of planning controls.

Zoning levels and resulting noise limits at Subject Land have been calculated in accordance with the methodologies under the Noise Protocol, as follows:

Period	Zoning Level	Background noise level measured	Noise Limit
'Day' Period 7am to 6pm	51 dB(A)	36 dB(A) 'Low background'	**48 dB(A)**
'Evening' Period 6pm to 10pm	45 dB(A)	**Not operating during 'Evening' & 'Night'**	
'Night' Period 10pm to 7am	40 dB(A)		

The Plans do not specify the location of mechanical plant however, we have assumed several AC units around the building envelope, including above the roof as a sensitivity analysis. We have assumed a sound power level of 65dB(A) L_{eq} in accordance with the AAAC Guideline for single fan condenser units.

Based on the results of our noise modelling, noise emissions from air conditioning equipment are predicted to be **≤40dB(A) L_{eq}** at all identified sensitive uses and would comply with the 'Day' limit by a significant margin.

Results are shown in Appendix A.

This result is not surprising given that mechanical plant associated with childcare centres are usually domestically sized and do not generate material noise emissions.

With respect to other potential mechanical noise sources, smaller ventilation fans (e.g. toilet exhaust fans) do not generate material noise emissions and will likely be quieter than domestic air condensers.

Overall, we assess that noise from mechanical plant and equipment is unlikely to result in adverse noise impacts and non-compliance with the Noise Protocol and that no specific mitigation is required beyond the acoustic fencing recommended in Section 4.2.

4.6 Sliding Gate

The Plans indicate a sliding gate at the entrance of the carpark.

In effect, noise emissions from sliding gates are not materially different to other residential garage roller doors found in urban settings.

In our experience, sliding gates do not generate material off-site noise impacts. The highest risk of noise impacts would occur from poor maintenance, where poorly lubricated mechanisms may 'squeak' over time. This is ultimately a maintenance issue and can be easily resolved should complaints arise.

Further, the acoustic fencing recommended along the residential interface will assist in minimising any noise impacts from the sliding gate.

To that end, we are satisfied that the use of the carpark sliding gate is not expected to result in any adverse noise impacts to neighbouring residential properties.

5 Recommendations and Conclusion

The Application reviewed by our office is considered to be equivalent to many other approved childcare centres with respect to acoustic outcomes. The proposed use of the Subject Land as a childcare centre is expected to comply with the AAAC guideline with standardised controls (acoustic screening) approved at the majority of childcare centres in Victoria.

Enfield Acoustics is satisfied that a permit can be approved on this basis. It is recommended that the approved permit include the following conditions:

1. Noise emissions from the land shall comply with *EPA Publication 1826 – Noise Limit and Assessment Protocol for the Control of Noise from Commercial, Industrial and Trade Premises and Entertainment Venues* at all times.

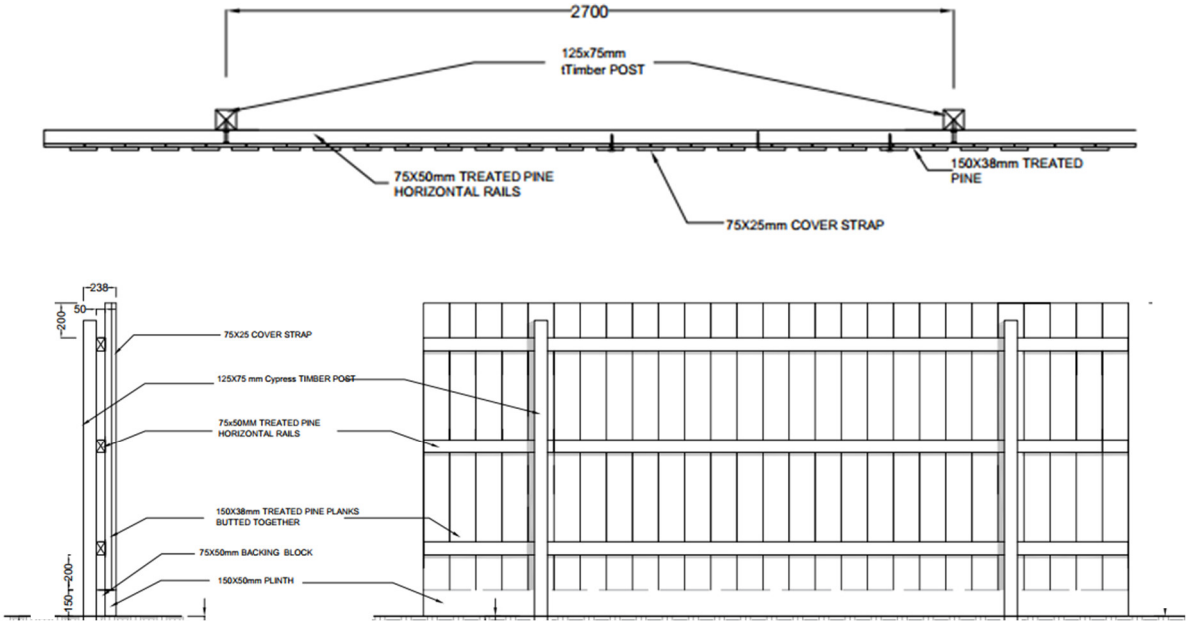
All acoustic fencing shall be constructed as follows:

Ground Floor Boundary Acoustic Fence

- To the specified heights and locations as shown in Section 4.2;
- Using fibre cement sheeting, treated timber, lightweight aerated concrete, transparent acrylic panels, glass and profiled sheet cladding as long the selected material (or combined skins) has a mass of at least 10kg/m^2;
- The fence shall have no gaps or holes in it, or the likelihood of such occurring through natural causes or deformations, thus allowing noise to pass through;
- The fence must be designed and built in an acceptable manner so that noise will not pass underneath it;
- Any butt joints shall be sealed with a fire-rated weather proof mastic or an overlapping piece of material meeting the mass requirements of 10kg/m^2 (minimum 35mm each side of the butt joint); and

- Where multiple cladding layers are used (e.g. FC sheeting over timber paling fence), joints in the cladding materials shall not coincide.

An example detail for an acoustic-grade timber paling fence is shown below:



First Floor Acoustic Screening

- To the specified heights and locations as shown in Section 4.2;
- Using transparent acrylic panels, glass or concrete as long as the selected material (or combined skins) has a mass of at least 10kg/m^2; and
- Balustrades shall be constructed to not form any gaps between glass panes or bead channels. Continuous silicone joints or channel beads covering glass pane joints are acceptable.

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Appendix A: Noise Modelling Results

Legend:

- Point Source
- Area Source
- Building
- Barrier
- 3D-Reflector
- Contour Line
- Receiver
- Building Evaluation

Scale: 1: 455 @ A3

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Noise emission levels from OUTDOOR PLAY

LAeq Noise Levels

Project No: V1939 Drawing No: MAP-01 Date: 09.07.2024

NOTES:

*Propagation in accordance with ISO9613

Legend:

- Point Source
- Area Source
- Building
- Barrier
- 3D-Reflector
- Contour Line
- Receiver
- Building Evaluation

Scale: 1: 455 @ A3

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Noise emission levels from CARPARK TRAFFIC

LAeq Noise Levels

Project No: V1939 Drawing No: MAP-02 Date: 09.07.2024

NOTES:

*Propagation in accordance with ISO9613

Legend:

- Point Source
- Area Source
- Building
- Barrier
- 3D-Reflector
- Contour Line
- Receiver
- Building Evaluation

Scale: 1: 455 @ A3

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Noise emission levels from CARPARK

LAmax Noise Levels

Sleep Disturbance Assessment

Project No: V1939 Drawing No: MAP-03 Date: 09.07.2024

NOTES:

*Propagation in accordance with ISO9613

Legend:

- Point Source
- Area Source
- Building
- Barrier
- 3D-Reflector
- Contour Line
- Receiver
- Building Evaluation

Scale: 1: 455 @ A3

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Noise emission levels from MECHANICAL PLANT

LAeq Noise Levels

Noise Protocol Assessment

Project No: V1939 Drawing No: MAP-04 Date: 09.07.2024

NOTES:

*Propagation in accordance with ISO9613