Noise and Sound Services

Peer Review of Acoustic Assessment Report Proposed Community School 1 Rosemead Road Hornsby NSW

By:
NG Child & Associates
Reference: 1 Rosemead Road – Acoustic Assessment Report (Version 5) – 060520.docx

July 2020

Report No. nss23239 – Final – Rev A

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C O N T E N T S

PEER REVIEW

NG Child & Associates has been engaged to undertake an acoustic assessment of a proposed Preschool & Primary School development at 1 Rosemead Road, Hornsby, NSW. They have prepared a report entitled *"Acoustic Assessment Report Proposed Preschool & Primary School 1 Rosemead Road Hornsby NSW"*, (Version 5) dated 6 May 2020 (The Report), on behalf of Blue Gum Community School. This report provides a peer view of The Report.

NG Child & Associates also prepared an acoustic report dated 5 December 2019 for Hornsby Council. Our peer review of that report is dated January 2020 and should be read in conjunction with this report.

1. BACKGROUND NOISE LEVELS

On page 24 of The Report (Section 48) it is stated that:

" Sound level measurements were recorded with a Brüel & Kjaer 2238E Type 1 (Class 1) integrating sound level meter".

However, on page 26 of The Report (Section 5.3.2 Instrumentation) it is stated that:

"the sound level measurements used in this assessment were recorded with a Brüel & Kjaer 2237A 'integrating sound level meter".

No serial numbers are stated as required by Australian Standard AS 1055, No details (make, model, serial number) of the on-site calibrator is given as required by Australian Standard AS 1055.

The Background Sound Level Measurement Results as given in column two of Table 5.1 are stated as the **mean** logarithmic L_{AF90} daytime (7:00am to 6:00pm). However, The Rating Background Level (RBL) for each period should be the **median** value of the Assessment Background Level (as correctly stated, but ignored, on page 16 of The Report). This leads to an error of the RBL by 2 dB.

2. POTENTIAL SOUND REDUCTION

The Report gives Table 6.10 – Sound Reduction due to Control Mechanisms as below.

Outdoor Play Area		Potential Sound Reduction
	Control Mechanism	
	Supervisory Control	5-10 dB
	Distance (assumes minimum average of 5-10 metres)	8-14 dB
	Landscaping Elements	3-5 dB
	Perimeter Double Lapped Timber Acoustic Fence	15-20 dB
	Aggregate Effect	**31 – 49 dB**

No explanation of how the 'close' supervisory control is going to be carried out or how is the 5 to 10 dB reduction is arrived at. All children at preschool facilities are always under 'close' supervisory control.

The distance assumes minimum average of 5-10 metres (i.e. 7.5 metres). However, the original data (from 6.3.1 Measured Sound Pressure Levels of Children at Play Data Measured in a Sydney CBD Childcare Centre at a time when children were permitted to play with supervision but without 'close' supervision) is at a distance of 2 to 5 metres (i.e. average 3.5 metres), hence the attenuation is **7 dB** from 20 $\log_{10}$ (7.5/3.5) and not 8 to 14 dB.

The landscaping elements are not explained. It is not stated if this is ground attenuation of the effect of trees and/or bushes. The attenuation of these elements can be found in the International Standard ISO 9613-2 (1996(E)) '*Acoustic – Attenuation of sound during propagation outdoors Part 2 General method of calculation*'. At distances below 50 metres the total attenuation from ground attenuation and the effect of trees and/or bushes is less than 0.3 dB. In any case, ground effects and cannot be included in addition to barrier effects.

The perimeter fence attenuation in The Report is based on the weighted sound reduction index (R_w) of the double lapped timber acoustic. However, in practice, the limiting factor for barriers (such as fences) is not the R_w but diffraction. The formula for calculating the barrier attenuation is also found in the International Standard ISO 9613-2 (1996(E)). This is based on the following data: 'source to barrier distance', 'receiver to barrier distance', screen height, source height, receiver height and barrier width. In this situation, this gives attenuations of 7 dB for a 1.8 metre high fence and 9 dB for 2.1 metre high fence, limited by diffraction.

Hence, a more realistic sound reduction assessment is given in the table below:

Outdoor Play Area		Potential Sound Reduction
	Control Mechanism	
	Supervisory Control	0 - 5 dB
	Distance (assumes minimum average of 5-10 metres)	7 dB
	Landscaping Elements	0 dB
	Perimeter Double Lapped Timber Acoustic Fence	7 dB
	Aggregate Effect	**14 – 19 dB**

The allowable noise impact is the RBL plus 5 dBA, that is 37 + 5 = 42 dBA (not 44 dBA as given in The Report.

Outdoor area noise levels ($L_{Aeq,\ 15\ minute}$) at adjoining residential boundaries from the outdoor play areas are not as given in Table 6.11 of The Report but these will be more realistically **51 to 56 dBA** (from 70 to 75 dBA minus 19 dB).

Even without the 2 dB error in the RBL given in The Report this still exceeds the noise goal by 7 to 12 dB for a 1.8 metre high fence (from 51 – 44 and 56 – 44) and 5 to 10 dB for a 2.1 metre high fence.

3. CAR PARK NOISE ASSESSMENT

As stated in section 6.4 of our report dated January 2020, the predicted 15 minute average noise from one car parking and one car leaving is 49 dBA. For four cars parking and four cars leaving within a 15 minute time period the calculated noise level is 55 dBA without any barrier attenuation. With four cars within 2 metres of the proposed 1.8 metre high fence the calculated noise level ($L_{Aeq,\ 15\ minute}$) at the most affected residential property (i.e. 1A Rosemead Road) is 47 dBA which exceeds the 42 dBA noise goal by 5 dB. With a 2.1 metre high fence the exceedance is 3 dB.

4. TRAFFIC ON LOCAL ROADS

In section 6.2.4 Road Traffic & Car Park Noise of The Report, it is stated *"The measured LAeq RBL of 47 dBA"*. The RBL is given in terms of the descriptor L_{Aeq} rather than L_{A90}. This error shows a lack of understanding of the basic acoustical terms.

On Page 50 of The Report "Traffic on Local Roads" it is stated

"The traffic report prepared for the proposed development by Vargas Traffic Planning Pty Ltd indicates that the proposed school will result is a local road

traffic increase from 12 vehicles per hour to of 71 vehicles per hour during the morning peak period.

Chapter 5 of the AAAC (2013) guideline provides the following comment in relation to motor vehicle noise:
Traffic noise on local roads generated by vehicles associated with the childcare centre arriving and leaving the site (for example vehicles travelling on public roads) shall comply with Leq, 1-hour 50 dB(A) at the assessment location.

The acoustic assessment and projected outcomes presented in this report are consistent with the requirements of the AAAC (2013) guideline."

No calculations are given to demonstrate that the road traffic noise levels from these 71 vehicles will comply with the $L_{Aeq,\ 1\text{-hour}}$ of 50 dBA. Based on the Calculation of Road Traffic Noise (*Great Britain. Dept. of the Environment. London: Published by H.M.S.O., 1988)* with a speed of 40 km/hour the traffic noise on the local roads generated by vehicles associated with the preschool centre arriving and leaving the site will be **59 dBA**. This exceeds the stated AAAC noise goal by **9 dB.**

5. CONCLUSIONS

The proposed development will produce significant and unacceptable noise level non-compliance:

- Outdoor play areas will exceed the noise goal by at least 7 to 12 dB for a 1.8 metre high fence and 5 to 10 dB for a 2.1 metre high fence;
- The car park will exceed the noise goal by 5 dB for a 1.8 metre high fence and 3 dB for a 2.1 metre high fence; and
- On road traffic will exceed the noise goal by 9 dB.

Due to the many fundamental errors in The Report it is recommended that The Report is not accepted by Hornsby Council or the NSW Department of Planning. A revised report, by a member firm of the Association of Australasian Acoustical Consultants (AAAC) or by a member of the Australian Acoustical Society should be produced.

Date	**Prepared by:**	**Status**
8th July 2020	Ken Scannell MSc MAAS	Draft
Date	**Checked by:**	**Status**
9th July 2020	Mark Scannell BA MAAS	Final
Date	**Prepared by:**	**Status**
13th July 2020	Ken Scannell MSc MAAS	Final Rev A

Important Note. *All products and materials suggested by 'Noise and Sound Services' are selected for their acoustical properties only. All other properties such as air flows, chemical, corrosion, combustion, construction details, decomposition, expansion, fire rating, grout or tile cracking, loading, shrinkage, ventilation etc. are outside of 'Noise and Sound Services' field of expertise and* ***must be*** *checked with the supplier or suitably qualified specialist before purchase.*