

Noise and Vibration Consultants

Our Ref: 19-2469-L2

15 July 2022

Catholic Schools Office C/- CKDS Pty Ltd PO Box 958 NEWCASTLE NSW 2300

Attention: Ben Rapley

email: <u>brapley@ckds.com.au</u>

RE: - REQUEST FOR ADDITIONAL INFORMATION ST MICHAEL'S PRIMARY SCHOOL, NELSON BAY

This letter has been prepared in response to a request for additional information from Port Stephens City Council (PSC) for additions and alterations at St Michael's Primary School, 12 Sproule Street, Nelson Bay. This letter is to be read in conjunction with Reverb Acoustics Report 19-2469-R1, dated August 2020 (referred to as RA-R1 in this letter). Further information is presented below, based on updated information from our client:

COUNCIL REQUEST: The acoustic assessment has focused on potential noise generated from the childcare centre. However, the report has not provided analysis of the alterations and additions to the existing school facilities. In particular, the proposal includes two courtyards on the west and north west perimeter of the development, adjacent proposed Block C and E. It is noted that an acoustic fence is not proposed on these boundaries and given this area will likely be utilised by children during recess and lunch breaks, or other class based activities, there is the potential for noise impacts to affect the properties along this boundary. Noise sources from traffic movements and mechanical plant have also not been accounted for. To address this, the following information is requested:

- 1. Further analysis of likely nearest sensitive receivers along the western, southern and eastern boundaries either providing specific predicted noise levels at each receiving property or by providing noise contour mapping.
- 2. Provide detail of likely noise impact from vehicle movements to and from the childcare centre and associated carpark including drop off and pick up movements.
- 3. Provide detail of likely noise impacts on residential receivers along the Southern boundary from vehicle movements to within the new staff carpark area.
- 4. Provide detail of any additional noise barrier or acoustic fencing if determined required as a result of further analysis.
- 5. Mechanical plant equipment had not been selected at the time of the acoustic report. If mechanical plant selection and positioning is now known, it is requested that information be provided to support that the plant will achieve the recommended RBL at residential receivers. The location of the equipment should be indicated on the plans, however specific design details are not required.

Building Acoustics-Council/EPA Submissions-Modelling-Compliance-Certification

REVERB ACOUSTICS PTY LTD ABN 26 142 127 768 ACN 142 127 768 PO Box 252 BELMONT NSW 2280 Telephone: (02) 4947 9980 email: sbradyreverb@gmail.com **REVERB RESPONSE 1 (Block C & E COURTYARDS):** Courtyards are proposed at the rear of Blocks C and E. The FGL of both courtyards is below ground level, with retaining walls at the perimeter, providing barriers towards residences. Nonetheless, we recommend erecting an 1800mm high lapped and capped acoustic fence along the north west boundary between Blocks C and E and nearest residences.

The Courtyards will be used primarily for outdoor teaching, although on occasion children may play in these areas. A useful document to assess the impact from children playing can be sourced from the AAAC's document, *Technical Guideline. Child Care Centre Noise Assessment*, which specifies the following limits for impacts from outdoor play areas at residential locations, :

Up to 2 Hours (total) per day:

The Leq,15 minute noise level emitted from the outdoor play area shall not exceed the background noise level by more than 10dB at the assessment location. Based on a measured background noise level for day of 39dB(A),L90 the criterion is set at 49dB(A) ,Leq 15 minute.



Technical papers submitted to the Proceedings of Acoustics in relation to child care centres in NSW revealed that noise levels from children in outdoor play areas reduced by up to 9dB(A) when averaged over a 15 minute assessment period. Based on a total of 10-15 children and assuming 5+ age group occupy the areas, this equates to 78-80dB(A),Leq. To create our acoustic model, we have assumed a worst-case situation where all children are using the outdoor areas at the same time.

REVERB ACOUSTICS

Catholic Schools Office (CKDS Pty Ltd) Request for Additional Information St Michael's Primary School, Nelson Bay

The sources were placed randomly over the available areas and the resulting sound pressure level was propagated to nearest residences using an equation¹ giving the sound field due to an incoherent plane radiator. The following Table shows calculations to predict the noise impact from children in courtyards associated with Blocks C and E, propagated to nearest residences. All calculations make allowance for retaining walls at the perimeter of Courtyards and an 1800mm high lapped and capped acoustic fence on the property boundary.

Table 1: Noise Impact from Children in Blocks C and E Courtyards, dB(A),Leq. Propagated to Nearest Residences

Location/Activity	Receivers		
	Block C Courtyard	Block E Courtyard	
Average Lw dB(A)	80	80	
Barrier loss ¹	8	12	
Received	42	38	
Criteria (day)	49dB(A),Leq		
Impact	-	-	

1. Intervening retaining wall, acoustic fences on boundaries.

As can be seen by the results in the above Table, noise from children in Blocks C and E Courtyards is predicted to be compliant with the criteria at nearest receivers, providing a lapped and capped paling acoustic fence 1800mm above FGL is erected along the north west site boundary between the Courtyards and nearest residences.

REVERB RESPONSES 2 & 3 (CHILDCARE/STAFF CARPARKS VEHICLE MOVEMENTS):

Vehicles entering, leaving and manoeuvring on the site have the potential to impact on nearest residents. Peak vehicle numbers are expected in the morning or afternoon when parents drop off or pickup their children and also when staff arrive and depart. The Traffic report indicates that 59-68 vehicle movements may occur during a peak hourly period, which may be as high as 30 vehicle movements in the childcare carpark and 20 vehicle movements in the staff carpark during a 15-minute assessment period. The following Tables show calculations to predict the noise impact at nearest residential boundaries from vehicle movements in the carparks. All calculations are based on inclusion of an 1800mm high lapped and capped acoustic fence on the east site boundary between the carparks and nearest residences.

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Activity	Car Door	Car Engine (enter/leave)	Car Engine (parking)		
Lw dB(A),Leq	88	86	78		
Ave Dist to rec (m)	15	30	20		
Duration	0.25 sec	5 sec	10 sec		
No. of Events	60	30	30		
Barrier loss	6	8	8		
Rec dB(A),Leq	33	33	31		
Combined	37				
Crit (day)	44dB(A),Leq				
Impact	-				

Table 2: Noise Impact from Activities in Childcare Carpark - dB(A),Leq Propagated to Nearest Residences

1. Boundary fence.

¹ Equation (5.104), DA Bies and CH Hansen, <u>Engineering Noise Control</u>, E & FN Spon, 1996.

Table 3: Noise Impact from Activities in Staff Carpark - dB(A),Leq Propagated to Nearest Residences

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Activity	Car Door	Car Engine (enter/leave)	Car Engine (parking)		
Lw dB(A),Leq	88	86	78		
Ave Dist to rec (m)	15	30	20		
Duration	0.25 sec	5 sec	10 sec		
No. of Events	30	20	20		
Barrier loss	6	8	8		
Rec dB(A),Leq	30	31	29		
Combined	35				
Crit (day)	44dB(A),Leq				
Impact	-				

As can be seen by the above results, noise from vehicles entering, leaving and manoeuvring in the childcare and staff carparks during peak periods is predicted to be compliant with the criteria, providing an 1800mm high lapped and capped acoustic fence on the east site boundary between the carparks and nearest residences.

REVERB RESPONSES 4 (ACOUSTIC FENCE CONSTRUCTION):

An acoustic fence 1800mm above FGL must be erected at the following locations:

Location	Height above FGL (mm)
NW site bdry adjacent Blocks C & E Courtyards	1800
E site bdry adjacent child care outdoor play	2100
E site bdry adjacent Carparks	1800

Acceptable forms of construction include lapped and capped timber. No significant gaps should remain in the fence to allow the passage of sound below the recommended height. Other construction options are available if desired, providing the fence or wall is impervious and of equivalent or greater surface mass than the above construction options.

REVERB RESPONSES 5 (MECHANICAL PLANT):

Details of proposed mechanical plant selections have not been finalised at this stage. We therefore recommend that as a Construction Certificate requirement a detailed assessment is conducted for all new mechanical plant once finalised.

We assume this concludes our involvement in the project thus far. However, should you require further information, please contact the undersigned.

Steve Brady M.A.S.A. A.A.A.S. *Principal Consultant*