



DA ACOUSTIC REPORT – NOISE IMPACT ASSESSMENT

Champagnat Catholic College, Maroubra – Block B

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Prepared For: Sydney Catholic College

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This firm is a member of the Association of Australian Acoustical Consultants.

The work reported herein has been carried out in accordance with the terms of membership. We stress that the advice given herein is for acoustic purposes only, and that the relevant authorities should be consulted with regard to compliance with regulations governing areas other than acoustics.

1.0 INTRODUCTION

PKA has been engaged by Sydney Catholic Schools to conduct an acoustic assessment for the development at Champagnat Catholic College, Maroubra as part of the DA documentation to be submitted to the council/certifier.

This report will address the noise breakout to sensitive receivers and relevant acoustic treatment and management measures that will need to be incorporated to meet the relevant acoustic criteria from the proposed Block B Building which will include a resource centre, seminar spaces, General Learning Areas (GLAs) and other common student/teaching areas.

This report does not include internal partition sound insulation treatment which is outside the scope of standard DA requirements.

2.0 SUMMARY

An acoustic assessment has been conducted in accordance with the acoustic requirements of Randwick City Council and NSW EPA Noise Policy for Industry (2017) to assess the noise breakout for the proposed development and to set noise goals for future operation and mechanical plant.

Unattended noise measurements were conducted on site for a period of 7days to obtain background noise levels. Following the measurement results, the noise impact was calculated to the nearest sensitive receivers based on architectural and operational plans provided to PKA.

Based on the survey conducted and calculations performed, the proposed development will comply with the *Noise Policy for Industry* (2017) and Randwick City Council if the recommendations made in Section 7.0 of this report are implemented.

3.0 SITE DESCRIPTION

The proposed development is the new Block B building at Champagnat Catholic College, Maroubra as shown in the figure below. The site is bound by residential receivers to the north across Donovan Avenue and by the school premises on the remaining sides. The most sensitive residential receivers are identified in the figure below.

The site location is shown in Figure 3-1.

Figure 3-1 Site Location



Figure 3-2 Site Layout



OUSTIC

- The new proposed works are a new three storey building referred to in the above site layout figure (from the architectural plans) as Block B.
- The majority ground floor space will be used as a resource centre, group seminar halls and a canteen.
- The first and second floor areas are comprised of multiple GLAs, breakout spaces and common rooms.
- The proposed portable buildings will be located at the corner of Donovan and Walsh Avenue.

4.0 ACOUSTIC CRITERIA

NSW EPA Noise Policy for Industry (NPfI)

Noise generated from similar premises and from mechanical noise is generally assessed against the requirements of the NSW EPA *Noise Policy for Industry 2017 (NPfI)*.

The policy sets out two separate criteria to ensure environmental noise objectives are met. The first criterion considers intrusive noise to residential properties and the second is set to ensure the amenity of the land use is protected. The lower value of both criteria is considered to be the Project noise trigger level, which is the limit of the L_{Aeq 15min} noise level that must not be exceeded for the corresponding period of the day.

Amenity Criterion

To limit continuing increases in noise levels, the maximum ambient noise level within an area from commercial noise sources should not normally exceed the levels as specified in Table 2.2 of the policy for the specified time of the day. The NPfI recommends the following Amenity Noise Levels for various receiver premises.

Table 4-1 Noise Criteria - Amenity for receiver buildings

All values in dB(A)

Type of receiver	Time of day	Recommended Amenity Noise Level L _{Aeq (period)}
	Day	55 dB(A)
Residential (Suburban)	Evening	45 dB(A)
(casa bany	Night	40 dB(A)

To ensure that industrial noise levels (existing plus new) remain within the recommended amenity noise levels for an area, a project amenity noise level applies for each new source of industrial noise as follows:

Project amenity noise level for development = recommended amenity noise level minus 5 dB(A).

To standardise the time periods for the intrusiveness and amenity noise levels, this policy assumes that the Amenity $L_{Aeq, 15min}$ will be taken to be equal to the $L_{Aeq, period} + 3$ decibels (dB).

Intrusiveness Criterion

The intrusiveness of a stationary noise source may be considered acceptable if the average of the maximum A-weighted levels of noise, $L_{Aeq 15 minute}$ from the source do not exceed by more than 5dB the Rating Background Level (RBL) measured in the absence of the source. This applies during all times of the day and night. There also exists an adjustment factor to be applied as per the character of the noise source. This includes factors such as tonal, fluctuating, low frequency, impulsive, intermittent etc. qualities of noise. The RBL is determined in accordance with Section 2.3 of the NSW EPA NPfI. The intrusiveness criterion is $L_{Aeq 15 minute} < RBL+5$.

5.0 NOISE SURVEY

Unattended noise monitoring was conducted between 19^{th} and 26^{th} August 2019 to record the ambient noise levels. The monitors were programmed to store the L_n percentile noise levels for each 15-minute sampling period. Measurements were made of L_{min}, L_{max}, L₉₀, and L_{eq} and were later retrieved for analysis. The positions of noise monitors are shown in Figure 3-1. The results and summary of the noise monitoring are listed in graphical form in Appendix B of this report.

The position of the noise monitor is shown in Figure 3-1.

5.1 Instrumentation

Noise measurements were conducted using the following equipment:

- Sound analyser NTi XL2 Sound Level Meter, Serial number A2A-15295-E0.
- Sound calibrator B&K 4230, Serial number 11419.

The instruments were calibrated before and after the noise measurements and there were no adverse deviations between the two. The analysers are type 1 and comply with AS IEC 61672.2-2004. The instruments carry traceable calibration certificates.

5.2 Project Noise Criteria

Data from the noise monitors were processed to obtain the ambient noise levels and the noise goals. The tables below present the results of the ambient noise monitor measurements.

Ambient Noise Measurements

The noise criteria defined in the Noise Policy for Industry (NPfI) is listed below. The assessment periods are defined by the NSW NPfI are Daytime – 7am to 6pm, Evening – 6pm to 10pm and Night – 10pm to 7am.

The school premises are proposed to be used between 8am and 6pm. However, the additional criteria for outside school hours is being provided for information purposed that can be used in future development or mechanical plant if necessary.

Table 5-1 NPfI Project Noise Trigger Levels

All values in dB(A)

		Measured	Acceptable Noise	NSW Noise Po Cr	blicy for Industry iteria	Project Noise Trigger
Receiver Type	Period	(L _{A90})	Levels L _{Aeq(period)}	Amenity L _{Aeq15min}	Intrusiveness L _{Aeq15min}	Levels L _{Aeq15min}
	Day	46	55	53	51	51
Residential (Sub-Urban)	Evening	46	45	43	51	43
	Night	41	40	38	46	38

6.0 ASSESSMENT

Noise Impact from the use of Block B Building

Considering the potential for noise breakout from the proposed use of Block B to the nearby sensitive residential receivers, an assessment has been conducted to ensure compliance. The following details and assumptions have been considered in the calculations.

- The proposed Block B is to replace the existing school building that previously included administration, school reception, school library and classrooms.
- There is no proposed increase to the student capacity and the numbers will remain the same.
- There is currently no onsite car park area and children are dropped/picked up from school while using the available street parking on Donovan Avenue.
- There is no proposed car park and therefore the outdoor activity of students and parking remains the same and is not expected to change from before. As all unchanged activity is already approved and operational, this is not being calculated or assessed specifically in this report.
- The glazing is expected to remain open while the building is in operation to allow for the use of natural ventilation as much as possible. Therefore, all calculations are performed based on glazed elements being kept open to allow for the worst-case scenario with respect to noise breakout.
- Calculations are assuming all spaces of the building are being used simultaneously. Although this is the case, the noise impact contribution will be mostly dominated by the teaching spaces with the glazing along the northern façade.
- The following are the maximum student capacities of the various proposed spaces along the northern façade that will potentially affect the identified residential receivers.
 - 360 students in the resource centre.
 - 30 students in the ground floor seminar room (Seminar 3).
 - 30 students in each of the first and second floor GLAs.
- Calculations are based on sound pressure levels associated with the children noise derived from extensive measurements conducted by PKA in the past. For this assessment, PKA is considering a spatial sound pressure level of L_{Aeq15min} of 62 dB(A) within each GLA and seminar room. This will remain the same for larger areas such as the resource centres as the noise is usually evenly spread over the entire area and the spatial average typically remains the same. Although when measured in smaller periods, the noise may be more transient and louder. However, a 15-minute average is being considered as the criteria is based on this averaged time-frame.

The following table presents the results of the calculations showing the estimated noise impact from the use of the entire building (Block B) through the opened glazing of the resource centre, seminar halls and GLAs. The noise calculations consider effects of distance loss, attenuation from inside to outside and effects of directivity.

Combined Source Noise Level inside Block A (spatial average)	Period	NPfl Project Trigger Levels	Calculated noise impact at Residential Boundary across Donovan Avenue	Compliance (Y/N)
L _{Aeq-15min} 73dB(A)	Day 7am to 6nm	L _{Aeq-15min} 51 dB(A)	L _{Aeq-15min} 45 dB(A)	Yes

Table 6-1 Calculated Noise Impact at Residential Receivers from the Use of Block B

Noise Impact from the Proposed Portable GLAs

The maximum student capacity of the portable GLA space is 25 students. The nearest sensitive residential receivers are located across Walsh Avenue to the east. The following table presents the results of the calculations to estimate the noise impact from activity in the portable GLAs to the identified sensitive residential receivers.

Table 6-2 Calculated Noise Impact at Residential Receivers from the Portable GLAs.

Source Noise Level inside classroom	Period	Noise Criteria L _{Aeq-time} RBL + 5	Calculated Children SPL to Residential Boundary	Compliance (Y/N)
L _{Aeq-15min} 62dB(A)	Day 7am to 6pm	51 dB(A)	36 dB(A)	Y

7.0 RECOMMENDATIONS

Based on the architectural plans, operational activity proposed, and calculations performed by PKA, the proposed Block B development at Champagnat Catholic College, Maroubra complies with the established acoustic criteria. The following are recommendations to ensure that ongoing compliance is maintained.

Outdoor Plant and equipment

At the time of preparation of this report, a detailed mechanical specification/schedule was not available. However, it is noted that the mechanical plant is not proposed to be operated out of school hours. The selection of any future outdoor mechanical and plant equipment must be checked so that the rated sound power/pressure levels will comply at the boundary of the sensitive residences with the criteria listed in Table 5-1. The exact selection of the equipment, locations and acoustic treatment must be checked by an acoustic consultant prior to installation to ensure that the noise goals are met.

General recommendations:

If any complaints occur from other external residents/receivers during operation, section 11 tilted "Reviewing performance" of the *NSW Industrial Noise Policy (INP)* provides a method of complaint handling and management. Post negotiations, the following recommendations should be implemented (taken from the NSW INP).

Where residual noise impacts have been negotiated, it is recommended that the proponent run a complaints-monitoring system. Components of such a system could include:

- a complaint hotline to record receiver complaints regarding the development
- a system for logging complaints and dealing with them
- a database of complaints and the proponent's responses/actions. This should be readily accessible to the community and regulatory authorities
- a system for providing feedback to the community. (This could be in the form of regular meetings with affected residents, or a newsletter.)

Notes:

- 1. The acoustic recommendations made are ones that satisfies the acoustic requirements only. No representation is given that it is fit for any other purpose. The build-up must be checked and designed by others to verify that it complies with all necessary fire rating, structural, waterproofing, durability and any other non-acoustic requirements.
- 2. Any additional construction or fixtures must be acoustically detailed to seal to the room and ceiling construction without degrading the R_w ratings required in either instance.

APPENDIX A DRAWINGS USED TO PREPARE REPORT

This report was prepared using drawings provided by QOH Architects, Job Number 1912N for Champagnat College Stage 3.

No.	Rev.	Title	Date
SD 1000	F	Drawing Register and Location Plan	31-01-2020
SD 1100	C	Proposed Site Plan	31-01-2020
SD 1101	В	Site Analysis Plan	31-01-2020
SD 1500	С	Site Elevations	31-01-2020
SD 1550	F	Site Sections	31-01-2020
SD 2200	D	Ground Floor Demolition Plan Block B	31-01-2020
SD 2201	D	First Floor Demolition Plan Block B	31-01-2020
SD 2220	н	Ground Floor Plan Block B	31-01-2020
SD 2221	Н	First Floor Plan Block B	31-01-2020
SD 2222	н	Second Floor Plan Block B	31-01-2020
SD 2223	D	Roof Plan Block B	31-01-2020
SD 2300	D	North & South Elevation	31-01-2020
SD 2301	D	East & West Elevation	31-01-2020
SD 2350	D	Section 01	31-01-2020
SD 2900	C	Shadow Diagrams	31-01-2020
SD 2910	A	Portable Building Floor Plan	31-01-2020
SD 2950	D	Perspectives 01	31-01-2020
SD 2951	С	Perspectives 02	31-01-2020



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APPENDIX B NOISE MEASUREMENTS (GRAPHICAL)

101SCS Champagnat Catholic College, Maroubri

Project Address: 35 Donovan Ave, Maroubra

Logger Location: At a distance equal to the residnetial setback facing Donovan Rd

			Backgro	ound Noi	se Level	s L _{A90} dB	3
		Day	time	Eve	ning	Nigh	ttime
		07:00	- 18:00	18:00	- 22:00	22:00	- 07:00
		Measured	Corrected	Measured	Corrected	Measured	Corrected
Monday	19-08-19)				42.5	42.5
Tuesday	20-08-19	50.5	50.5	46.8	46.8	41.7	41.7
Wednesday	21-08-19	48.9	48.8	47.8	47.8	42.0	42.0
Thursday	22-08-19	48.8	51.5	42.1	40.7	39.4	39.3
Friday	23-08-19	45.8	45.8	45.7	45.7	42.2	42.2
Saturday	24-08-19	46.2	46.2	47.0	47.0	40.1	40.1
Sunday	25-08-19	40.2	40.2	37.7	37.7	33.3	33.3
Monday	26-08-19	42.4	42.4	40.4	40.4	37.8	37.8
Tuesday	27-08-19)					
ating Backgrour	nd Level (RBL)	46	46	46	46	41	41

Rating





















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