



DA ACOUSTIC REPORT

Arise Christian College, Metford

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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 to conduct an acoustic assessment for the proposed development at Arise Christian College, Metford located at 75 – 81 Chelmsford Drive, Metford as part of the DA documentation to be submitted to the council/certifier.

Arise Christian College is specifically designed to meet the needs of Primary and Secondary aged students with “intellectual, physical and behavioural needs”.

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 Special Learning Centre.

2.0 SUMMARY

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

Due to the COVID-19 social distancing requirements, fewer vehicular activity and suspension of the use of school premises, the current ambient levels are expected to be significantly lower. Any measurements conducted at this stage will not be representative of the typical ambient quality. Therefore, the acoustic criteria were established based on the NPfI Amenity criteria.

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 Maitland City Council if the recommendations made in Section 7.0 of this report are implemented.

3.0 SITE DESCRIPTION

The proposed Special Learning Centre is part of the development works at the existing Arise Christian College located at 75 – 81 Chelmsford Drive, Metford. The site is located within the existing playground premises located in the south west area of the college. The Special Learning Centre site is bound by residential properties to the north (nearest located approximately 20m away) and the existing college and playground premises on the remaining sides.

The site location is shown in Figure 3-1.

Figure 3-1 Site Location



Figure 3-2 Site Plan



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 $L_{Aeq, (period)}$
Residential (Suburban)	Day	55 dB(A)
	Evening	45 dB(A)
	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, $L_{Aeq, 15\text{ minute}}$ 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 $L_{Aeq, 15\text{ minute}} < RBL + 5$.

5.0 PROJECT NOISE CRITERIA

Typically, to assess the NPfl intrusiveness criteria, background noise monitoring is conducted for 7 days to measure the existing background noise. However, currently due to the COVID-19 social distancing requirements, fewer vehicular activity and suspension of the use of school premises, the current ambient levels are expected to be significantly lower. Any measurements conducted at this stage will not be representative of the typical ambient quality.

Due to this, intrusiveness criterion could not be established, and the amenity noise criteria was considered to be the Project Trigger Noise levels.

As a guide, the noise criteria defined in the *Noise Policy for Industry* (NPfl) is listed below. The assessment periods are defined by the NSW NPfl are as follows:

- Daytime: 7 am to 6 pm
- Evening: 6 pm to 10 pm
- Night: 10 pm to 7 am

Table 5-1 NPfl Project Noise Trigger Levels

All values in dB(A)

Receiver Type	Period	Acceptable Noise Levels L_{Aeq} (period)	Noise Criteria
			NPfl Amenity $L_{Aeq15min}$
Residential (Suburban)	Day	55	53
	Evening	45	43
	Night	40	38

6.0 DISCUSSION

6.1 Operational Details and Assumptions

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

- The centre will operate during the same hours of the college, between 8:30am and 3:15pm on school days.
- The centre will accommodate 50 students.
- The majority of the student’s activities will be indoors however outdoor spaces will be used during recess, lunch and for supervised activities such as nature play.
- Car park planning and activity will remain unchanged with the arrivals for the school and the special teaching facility will be via the existing arrangements in Chelmsford Drive. Therefore, this component will not be assessed further.
- Calculations are based on sound pressure levels associated with the noise source levels 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) the indoor areas. 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 timeframe.
- Although the noise level from the total number of students will be more than the assumed level, the students and noise are usually evenly spread between the rooms and the spatial average typically remains the same. Therefore, the source sound pressure level of $L_{Aeq15min}$ of 62 dB(A) will be applicable for the internal areas.

6.2 Calculations

6.2.1 Noise from Children’s Activities

The following table presents the results of the calculations showing the estimated noise impact from the use of the outdoor areas and the indoor areas of the learning centre through the opened glazing.

The noise calculations below consider effects of distance loss, attenuation from inside to outside and effects of directivity.

Table 6-1 Calculated Noise Impact at Residential Receivers from Indoor Areas of Learning Centre

Combined Source Noise Level inside Learning Centre (spatial average)	Period	NPfl Project Trigger Levels	Calculated noise impact at nearest identified Residential Boundary	Compliance (Y/N)
$L_{Aeq-15min}$ 62dB(A)	Day 7am to 6pm	$L_{Aeq-15min}$ 53 dB(A)	$L_{Aeq-15min}$ <30 dB(A)	Yes

The current existing area is currently being used as a playground and any proposed supervised outdoor activity is not expected to increase the noise level when compared to the existing activity. The following table presents the results of calculations of the estimated noise impact from the outdoor areas. The calculations consider effects of distance loss, barrier effects and directivity.

Table 6-2 Calculated Noise Impact at Residential Receivers from Outdoor Play Areas

Combined Source from 15 students in the outdoor play area – based on loud male speech levels	Period	NPfl Project Trigger Levels	Calculated noise impact at nearest identified Residential Boundary	Compliance (Y/N)
L _{Aeq-15min} 63dB(A)	Day 7am to 6pm	L _{Aeq-15min} 53 dB(A)	L _{Aeq-15min} 39 dB(A)	Yes

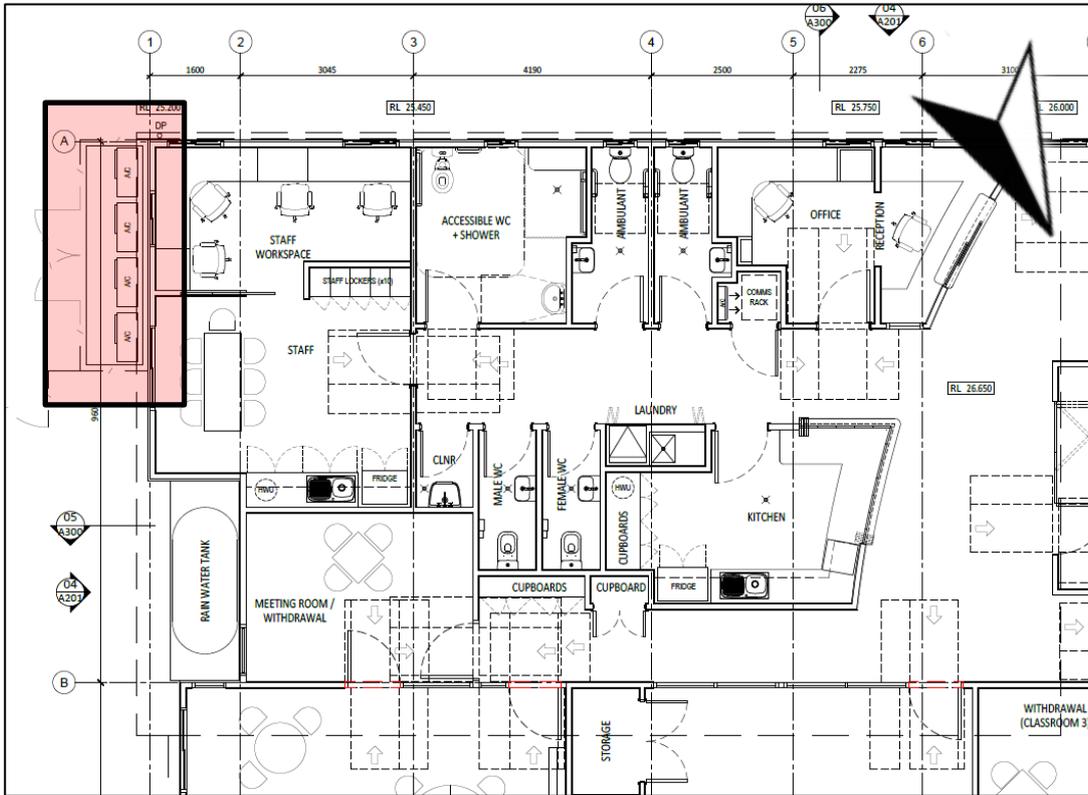
The results of the calculations show that acoustic compliance is readily achieved for the use of the indoor and outdoor play areas. No additional mitigation measures will be necessary.

6.2.2 Plant Noise & Equipment

A detailed mechanical schedule is usually unavailable at the DA stage and is only typically available during the later stage of the development. For the purpose of the assessment, PKA was provided interim noise rating levels based on the expected outdoor condenser equipment.

The following figure shows the location of the condenser units as shown in the architectural plans.

Figure 6-1 Location of Proposed Condenser Units



Based on the provided Sound Pressure rating levels of 54dB(A) at 1m for cooling and 55 dB(A) at 1m for heating, PKA performed calculations to estimate the noise impact including the effects of the enclosure shown in the architectural plans. The results show that compliance is achieved. Depending on the final selections, additional treatment may be required to achieve strict compliance.

The exact selection of the final equipment (make, model and quantity), their rated noise levels, locations and acoustic treatment must be checked by an acoustic consultant prior to installation to ensure that the noise goals listed in Table 5-1 are met.

7.0 RECOMMENDATIONS

Based on the architectural plans, operational activity proposed, and calculations performed by PKA, the proposed Special Learning Centre complies with the established acoustic criteria. The following are recommendations to ensure that ongoing compliance is maintained.

Outdoor Plant and equipment

The selection of the final 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. (as the site is only proposed to be used between 8:30am and 3:15pm, only daytime acoustic criteria is relevant).

General recommendations:

If any complaints occur from other external residents/receivers during operation, section 11 titled "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 Paynter Dixon, Project No. MCS0102.

No.	Rev.	Title	Date
A001	A	Overall Site Plan	15/07/2020
A002	A	Proposed Site Plan	16/07/2020
A003	A	Site Analysis Plan	16/07/2020
A004	A	Existing Survey	16/07/2020
A100	A	Proposed Floor Plan – Stage 1	21/07/2020
A101	A	Proposed Floor Plan – Stage 2	21/07/2020
A102	A	Proposed Roof Plan	21/07/2020
A200	A	Proposed Elevations Sheet 1	21/07/2020
A201	A	Proposed Elevations Sheet 2	21/07/2020
A300	A	Proposed Sections	21/07/2020
A400	A	3D Concept Images (Completed Stage 2)	16/07/2020



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