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# **ACOUSTICAL REPORT**

# **PROPOSED COMMUNITY CENTRE**

# **21 VEGA STREET, REVESBY NSW**

Date: 18 March 2025 File Reference: 6544R20250220hw21VegaStreetRevesby\_DA.docx

#### **DOCUMENT CONTROL**

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### **ACOUSTICAL REPORT**

#### **PROPOSED COMMUNITY CENTRE**

# **21 VEGA STREET, REVESBY NSW**

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### 1.0 INTRODUCTION

Koikas Acoustics Pty Ltd was commissioned to conduct a noise impact assessment of the proposed development at 21 Vega Street, Revesby seeking approval for the alterations and additions of a single-storey dwelling, secondary dwelling and garage into a proposed culturally diverse women's and children's community centre.

For this DA, the acoustical adequacy of the proposed design must be assessed in terms of standard planning guidelines issued by the City of Canterbury-Bankstown Council in their Local Environment Plan (LEP), Development Control Plan (DCP), and other standard planning guidelines related to common sources of noise.

As per the Council guidelines and other standard planning instruments, Koikas Acoustics has determined the following acoustical components require an assessment at the current DA stage:

- Operational noise emission from the proposed development to neighbouring dwellings (indicative assessment conducted at DA stage).
- Mechanical plant and equipment noise emission from the proposed development to neighbouring dwellings.

This report presents the results and findings of an acoustical assessment for the subject proposal. In-principle acoustic treatments and noise control measures detailed within this report are deemed necessary for the development to comply with the nominated acoustical planning levels/project noise objectives.



### 2.0 THE PROPOSED DEVELOPMENT

The development is proposed to occupy the site at 21 Vega Street, Revesby.

This location is situated in a primarily suburban residential area classified as R2 'Low-Density Residential' as per relevant land zoning maps included in the city of Canterbury-Bankstown Council Local Environment Plan 2021. Surrounding properties are also predominantly residential in classification, also located within R2 'Low-Density Residential' Zoning.

The subject site and surrounding properties are identified in the aerial photograph in Figure 1.



Figure 1. Aerial photo of the subject site and surrounding area – Image from SixMaps

Prevailing ambient noise conditions on-site and in the local area are generally the result of typical environmental noise such as distant traffic and localised domestic noise sources.





This acoustic report and any associated recommendations are based solely on the architectural design and drawings prepared by Construct Design and Building Group (Project No. 24-021, dated 19/02/2025). Any changes to the design may impact the findings of this report and associated noise control recommendations.

As per the architectural drawings, the proposed development will include:

- A new outdoor pergola area
- A new outdoor barbeque area
- A new outdoor children's play area
- Alterations to the existing structures



Figure 2. Proposed floor plan extracted from Architectural drawings.

Koikas Acoustics has been advised the community facility will allow for up to 10 people with the proposed hours of operation of 9 am and 5 pm on Monday to Friday.



#### 3.0 NOISE SURVEYS

#### 3.1 UNATTENDED AMBIENT NOISE SURVEY

An unattended noise logging survey was conducted in the rear yard of 21 Vega Street between 24 February 2025 and 04 March 2025. The measurement microphone was set at a height of 1.5 metres above the ground and was clear of any sound-reflective surfaces (excl. the ground) by at least 3.5 metres. This satisfies the requirements for a free-field measurement under AS1055-2018 and Fact Sheet B of the NSW EPA Noise Policy for Industry.



**Figure 3.** Noise logging location – Image from SixMaps

A Type 1 Svantek 977 noise logger was used for this noise survey. The instrument was set up to measure sound pressure levels as 'A' frequency weighting and 'Fast' time response. Noise levels were saved on the quarter-hour within the logger memory.



A NATA-calibrated and certified Larson Davis CAL200 precision acoustic calibrator was used to field calibrate the sound level meter before and after the noise survey. No system drift was observed for this sound level meter.

A review of the weather records from the Bureau of Meteorology shows that adverse weather conditions did not influence the noise environment during the measurement period. Observable short-duration extraneous noise events were removed from the survey data.

Table 1. Summary of noise logger results [dB]						
Location		Ambient noise level   Rating background level     Period, T <sup>1</sup> LAeq		Traffic noise level <sup>2</sup> L <sub>Aeq, Period</sub>		
		Day	48	35	40	
21 Vega Street, Revesby		Evening	48	37	48	
,		Night	48	34	48	
Notes 1. 2.	The NSW EPA Noise Policy for Industry (NPfI) refers to:       Daytime:     7 am - 6 pm Monday to Saturday and 8 am to 6 pm Sunday and public holidays.       Evening:     6 pm - 10 pm Monday to Sunday       Night:     10 pm - 7 am Monday to Saturday and 10 pm to 8 am Sunday and public holidays.       The EPA/RMS/NSW DoP refers to:     Daytime:       7 am - 10 pm seven days per week.     Night:       10 pm - 7 am seven days per week					

A summary of the noise survey data is presented below.

Daily logger graphs are attached in **Appendix B**.

# 3.2 ATTENDED ENVIRONMENTAL NOISE MONITORING

Attended noise surveys were conducted for representative periods to determine the difference in the ambient noise levels at the front and rear of the subject site. The measurement microphone was set at a height of 1.5 metres above the ground and was clear of any sound-reflective surfaces (excl. the ground) by at least 3.5 metres. This satisfies the requirements for a free-field measurement under AS1055-2018 and Fact Sheet B of the NSW EPA Noise Policy for Industry.

Noise level measurements were taken with a NATA-calibrated Type 1 NTi XL2 sound level meter. The instrument was set up to measure sound pressure levels as 'A' frequency weighting and 'Fast' time response.

Sound level measurements were taken for durations deemed sufficient to represent the underlying ambient and background noise environment without the influence of extraneous noise or noise from the subject's development.

Noise surveys were conducted in areas surrounding the proposed development such that the ambient noise levels could be quantified (See Figure 2):

- 21 Vega Street, Revesby Site Location 1
- 21 Vega Street, Revesby Site Location 2

A summary of the noise survey results is provided in Table 2.

Table 2.       Summary of measured environmental noise levels [dB]						
Location	Date	Measurement period	EPA assessment period	L <sub>A90</sub>	L <sub>Aeq</sub>	
Logger Location 1	24.02.2025	12.00 pm – 12.30 pm	Daytime	36	44	
Attended Location 2	24.02.2025	12.00 pm – 12.30 pm	Daytime	39	53	

#### 4.0 ACOUSTIC CRITERIA

#### 4.1 CANTERBURY-BANKSTOWN DCP

The city of Canterbury-Bankstown Council have listed criteria in their development control plan relating to non-residential development within residential areas. The following extract provides controls relating to noise emission from vehicles and nuisance caused by noise.

#### Explanation

This section applies to non-residential development not including health consulting rooms, neighbourhood shops and serviced apartments.

#### Objectives

- **01** To ensure non-residential development is compatible with the prevailing suburban character and amenity of the residential areas.
- O2 To ensure non-residential development does not adversely impact on the amenity of neighbouring sites.

#### Development controls

- 5.1 In determining applications that relate to land within Zone R2 Low Density Residential, Zone R3 Medium Density Residential and Zone R4 High Density Residential, Council must take into consideration the following matters:
  - whether any proposed building is compatible with the height, scale, siting and character of existing residential development within the adjoining residential zone;
  - (b) whether any goods, plant, equipment and other material used in carrying out the proposed development will be stored or suitably screened from residential development;
  - whether the proposed development will maintain reasonable solar access to residential development between the hours of 8.00am and 4.00pm at the midwinter solstice;
  - (d) whether noise generation from fixed sources or motor vehicles associated with the proposed development will be effectively insulated or otherwise minimised;
  - (e) whether the proposed development will otherwise cause nuisance to residents, by way of hours of operation, traffic movement, parking, headlight glare, security lighting, fumes, gases, smoke, dust or odours, or the like; and
  - (f) whether any windows or balconies facing residential areas will be treated to avoid overlooking of private yard space or windows in residences.
- 5.2 The non-residential component of buildings that adjoin residential zones in the former Canterbury Local Government Area should comply with the Building Height Plane as shown in Figure 5a.



#### 4.2 EPA NOISE POLICY FOR INDUSTRY

Noise emission design targets have been referenced from the NSW Environmental Protection Authority (EPA) Noise Policy for Industry (NPfI).

The NPfI is designed to assess environmental noise impacts associated with scheduled activities prescribed within the Protection of the *Environment Operations Act 1997*, Schedule 1. It is also used as a reference tool for establishing suitable planning levels for noise generated by mechanical plant and equipment and noise emission from commercial operations.

For residential receivers, the guideline applies limits on the short-term intrusive nature of a noise or noise-generating development (<u>project intrusive noise level</u>), as well as applying an upper limit on cumulative industrial noise emissions from all surrounding development/industry (<u>project amenity</u> <u>noise level</u>).

The most stringent of the project intrusive noise level and project amenity noise level is applied as the **project noise trigger level (PNTL)**. To determine which of the intrusive and amenity noise criteria is more stringent, the underlying noise metrics must be the same.

As the <u>intrusive noise level</u> is defined in terms of an  $L_{Aeq, 15 \text{ minutes}}$  and the <u>amenity noise level</u> is defined in terms of an  $L_{Aeq, Period}$ , a +3 dB correction is applied to the project amenity noise level to equate the  $L_{Aeq, Period}$  to  $L_{Aeq, 15 \text{ minutes}}$ .

Where noise is measured or predicted below the project noise trigger level, the noise outcome is deemed acceptable. Above the project noise trigger level, management responses such as applying reasonable and feasible noise mitigation measures are to be recommended, along with assessing any residual noise impacts once noise mitigation has been considered.

The policy is designed in such a way that the assessing authority would consider the project noise trigger levels, reasonable and feasible mitigation measures, and any residual noise impacts when deciding on acceptable noise outcomes.

The site-specific project noise trigger levels need only be considered for the hours under which the noise or activity occurs, which is limited to daytime and evening hours.

Table 3.	ble 3. NPfI planning levels – L <sub>Aeq, 15 minutes</sub> [dB]							
Period,T	Int	rusive		Amenity				
(Note 1)	RBL	RBL + 5	Area classification	Recommended amenity noise level	High traffic area	<sup>2</sup> Project amenity noise level	+3dB correction	Project noise trigger level
Front	38	43	Suburban	55	No	50	53	43
Rear	35	40	Suburban	Suburban 55 No 50 53 40				
Notes: 1. 2.	EPA defines the following periods:       Day:     7 am to 6 pm Mon to Sat and 8 am to 6 pm Sun and public holidays,       Evening:     6 pm to 10 pm Mon to Sun,       Night:     10 pm to 7 am Mon to Sat and 10 pm to 8 am Sun and public holidays.       Project noise amenity level = recommended noise amenity level - 5 dB, except where specific circumstances are met, such as high traffic.							

#### 5.0 OPERATIONAL NOISE ASSESSMENT

#### 5.1 CADNA-A

Assessing noise emitted by the building's mechanical plant & equipment is based on predictive modelling conducted using CadnaA. Similarly, existing environmental noise such as from major roads and/or rail corridors has been reviewed around the proposed building facades by way of using the results of the noise survey to calibrate a noise model of the local area and road/rail corridor.

The program predicts noise levels to receiver points and provides a graphical representation of noise level contours for a defined area of interest. The input parameters to this model include the source sound power levels, ground contours, ground absorption/reflections, and the presence of any acoustic shielding objects.

Noise propagation calculations are determined under *ISO 9613 Acoustics – Attenuation of sound during propagation outdoors*. The sound propagation algorithms adopted in the ISO standard result in the calculation of a downwind sound pressure level which constitutes an assessment of noise-enhancing weather conditions.

#### 5.2 MECHANICAL PLANT NOISE ASSESSMENT

#### 5.2.1 ASSESSMENT SCENARIOS

The following design scenarios are assessed. Assumptions included in the design are also noted for reference.

Table 4.	Design scenarios and assumptions				
Scenario	Description Design assumptions				
1	Operational noise – daytime hours (outdoor areas occupied)	4 x AC condenser units 8 x adults talking with normal vocal effort (50% talking) in the outdoor barbeque area 2 x children aged 3-5 yo in the outdoor play area			



#### 5.3 EQUIPMENT AND ASSOCIATED SOUND LEVELS

Mechanical plant and equipment have not yet been selected at the DA stage of the project and thus Koikas Acoustics have conducted an indicative assessment based on the existing mechanical plant and equipment to represent the operational noise emission from the building's use. Newer mechanical plant are expected to be lower, however, should be verified prior to construction.

Residential toilet exhaust fans have not been included in the calculations due to their low inherent noise level and limited acoustic impact related to their intermittent nature of use.

For reference, the effective sound power levels for children in outdoor play areas have been taken from the AAAC guidelines.

Breakout noise from indoor areas are expected to be negligible and is consistent with the surrounding residential premises, as such, Koikas Acoustics has considered all adults and kids outdoors as a worst-case scenario.

Table 5.       Schedule of equipment and noise levels					
Item	Descriptor	Noise level [dBA]	Location		
AC Condenser Unit (Samsung – AR24AXHQAWKXSA)	Laweq	63	Front of primary dwelling		
AC Condenser Unit (Samsung – AR18AXHQAWKXSA)	Laweq	63	Rear of primary dwelling		
AC Condenser Unit (Akai AK-T70R32)	Laweq	70	Rear of garage		
Car Engine Ignition	LAWeq,15mins	53	In Driveway		
Car door opening/closing	L <sub>AWeq,15mins</sub>	55	In Driveway		
Car traversing at 10 km/hr (measured as moving point source)	Laweq	82	In Driveway		
1 x adult talking with normal vocal effort	LAWeq,15mins	68	Outdoor Barbeque area		
1 x child aged 3-5 years old	LAWeq,15mins	78	Outdoor Play Area		

### 5.4 CALCULATED RECEIVER LEVELS

Mechanical plant noise levels have been predicted for nearby residential receivers by way of preparing an acoustic model and conducting point-to-point calculations based on standard sound propagation algorithms. All calculations consider the equipment as selected in the mechanical services plans, the associated sound levels and corresponding attenuators.



Reference should also be made to additional noise control recommendations included within Section 5.5 of this report, which also govern the calculated receiver noise levels.

Due to the size of the development, several potentially affected receiver locations must be assessed in terms of their respective noise exposure from the mechanical plant & equipment associated with the development. The most noise-sensitive receiver locations are summarised below and are shown in Figure 4.

Table 6.	Assessment locations	
ID	Receiver type and address	Assessment location
R1	Residential / 23 Vega Street, Revesby	Ground-level – nearest boundary
R2	Residential / 23 Vega Street, Revesby	Ground-level – nearest boundary
R3	Residential / 24 Hydrae Street, Revesby	Ground-level – nearest boundary
R4	Residential / 24 Hydrae Street, Revesby	Ground-level – nearest boundary
R5	Residential / 24 Hydrae Street, Revesby	First-floor - window
R6	Residential / 24 Hydrae Street, Revesby	First-floor - window
R7	Residential / 18 Hydrae Street, Revesby	Ground-level – nearest boundary
R8	Residential / 19 Vega Street, Revesby	Ground-level – nearest boundary
R9	Residential / 19 Vega Street, Revesby	Ground-level – nearest boundary
R10	Residential / 22 Vega Street, Revesby	Ground-level – nearest boundary
R11	Residential / 24 Vega Street, Revesby	Ground-level – nearest boundary
R12	Residential / 26 Vega Street, Revesby	Ground-level – nearest boundary



Figure 4.

**Receiver locations and Identifications** 



The predicted operational noise levels are shown in Tables 7 :

Table 7.     Calculated receiver noise levels [dB] - Scenario 1					
Receiver location	Calculated Noise Level	Project noise criteria	Compliance Achieved?		
R1:	36	43	Yes		
R2:	38	40	Yes		
R3:	32	40	Yes		
R4:	39	40	Yes		
R5:	40	40	Yes		
R6:	32	40	Yes		
R7:	40	40	Yes		
R8:	38	40	Yes		
R9:	42	43	Yes		
R10:	32	43	Yes		
R11:	31	43	Yes		
R12:	29	43	Yes		

Operational noise levels have been assessed to comply with the limiting NPfI criteria, pending the inclusion of noise control measures as detailed in the following section of this report.



#### 5.5 RECOMMENDATIONS

#### 5.5.1 MECHANICAL RECOMMENDATIONS

- The AC condenser unit located on the south-eastern area of the secondary building will need to be relocated to the northern façade of the secondary building. All other condenser units are expected to comply where they are currently installed.
- A detailed assessment should be undertaken for the subject development before construction once details of the mechanical plant are known.

#### 5.5.2 PHYSICAL RECOMMENDATIONS

- The proposed pergola above the children's play area, seating area and barbeque will need to be enclosed on the southern side from the floor the awning cover.
- The proposed pergola along the western side of the garage should be enclosed on the northern side to mitigate noise transfer to the neighbouring dwelling.
- The noise barriers on the architectural drawings and those specified by Koikas Acoustics are to be constructed of either:
  - a. 9 mm fibre cement sheeting fixed to a suitable framing structure
  - b. Masonry (70 mm thick or above)
  - c. Transparent materials such as 10.38 mm laminated glass or 15 mm thick Perspex panels
  - d. Proprietary noise wall solutions such as SlimWall by Modular Walls or similar
  - e. Double-lapped and capped timber

Furthermore, it is reasonable to expect that not all plant & equipment will be operating at full capacity at the same time. Receiver noise levels are anticipated to be lower than predicted in this report. Any changes in equipment selection from the above should be verified by a qualified acoustical consultant before construction.



#### 6.0 CONCLUSION

Koikas Acoustics was requested to conduct an acoustical assessment and prepare a report for the proposed alterations and additions to the existing residential dwelling at 21 Vega Street, Revesby. The acoustical report is to accompany a development application to be submitted to Canterbury Bankstown Council.

The assessment considers potential noise impacts on future occupants of the development, and surrounding residents such that acceptable acoustic amenity is maintained.

Acoustic planning levels have been referenced from current EPA and acoustic planning guidelines and requirements.

The included recommendations are based on designs prepared by the Construct Design and Building group.

The conclusions reached in this acoustical report should assist the Council in making their determination of the proposal. A further detailed acoustical report may be required for the CC submission should the building design be amended, or as required by Council.

Of the assessed components of noise, the following conclusions have been reached:

 Based on an indicative assessment, the operational and mechanical plant noise were found to be within the adopted criteria, provided the recommendations in this report are implemented. A detailed assessment should be undertaken for the subject development before construction.

In our professional opinion, there is sufficient scope within the proposed building design to achieve the applied acoustic planning guidelines.



# APPENDIX A

A P P E N D I X

Α

# APPENDIX A

































# APPENDIX B

# APPENDIX B

