



# SMALL BAR 1/36 CHURCH STREET, MUDGEE NOISE ASSESSMENT

Report 11.00542-01

prepared on 07/05/2024



## REPORT PREPARED BY

**Acoustics Consultants Australia**  
**ABN 81 646 523 953**  
**U6, 31-33 Hume Street ▶ Crows Nest, NSW 2065**  
PHONE (02) 9159 9859  
EMAIL [sydney@acousticsconsultants.com.au](mailto:sydney@acousticsconsultants.com.au)

## BASIS OF REPORT

This report has been prepared by **Acoustics Consultants Australia (ACA)** with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with the Client. Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from ACA. ACA disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

## DOCUMENT CONTROL

REFERENCE	DATE	PREPARED	REVIEWED	AUTHORISED
11.00524-01	25/03/2024	SF	MdIM	SF
11.00524-01	02/04/2024	SF	MdIM	SF
11.00524-01	16/04/2024	SF		SF
11.00524-01	21/04/2024	SF		SF
11.00524-01	07/05/2024	SF		SF

## CONTENTS

<b>REPORT 11.00542-01 .....</b>	<b>4</b>
<b>1. INTRODUCTION .....</b>	<b>4</b>
<b>2. SITE AND SURROUNDING AREA .....</b>	<b>5</b>
<b>3. EXISTING ACOUSTIC ENVIRONMENT.....</b>	<b>11</b>
<b>4. ACOUSTIC CRITERIA .....</b>	<b>12</b>
<b>5. ASSESSMENT .....</b>	<b>17</b>
<b>6. RECOMMENDATIONS.....</b>	<b>22</b>
<b>APPENDICES .....</b>	<b>24</b>
<b>APPENDIX A: GLOSSARY OF ACOUSTIC TERMS .....</b>	<b>25</b>

## Report 11.00542-01

### 1. INTRODUCTION

This report presents the findings of a noise assessment conducted by Acoustics Consultants Australia (ACA) for the proposed change of use to the premises located at 1/36 Church Street, Mudgee.

The proposed development involves the change of use from an existing shop to a food and drink premises (small bar) and associated fit out and signage. No structural works are proposed.

It is proposed to use the existing kitchen to provide food and drink to patrons.

The proposed hours of operation are

- Monday to Thursday: 7:00 am to 11:00 pm
- Friday: 7:00 am to 12:00 am (midnight)
- Saturday: 8:00 am to 12:00 am (midnight)
- Sunday: 8:00 am to 10:00 pm.

The requirement for a noise assessment has been identified by the Mid-Western Regional Council. This assessment has been prepared based on advice from the applicant regarding the proposed use and fit-out and with consideration to the Mid-Western Regional Council Pre-Lodgement Meeting Minutes, dated 7 December 2023.

The objectives of this assessment are:

- to identify the main sources of noise from the proposal and the nearest noise sensitive receivers;
- to conduct an objective noise assessment based on a 3D noise model of the site assuming busy operations; and
- to provide noise control recommendations to minimise potential for negative noise impact on noise sensitive premises.

The methodology and Standards used to conduct the assessment, as well as the numeric assessment results are presented in the following sections of this report.

Acoustic terms used in this report are defined in the Glossary of **Appendix A**.

## 2. SITE AND SURROUNDING AREA

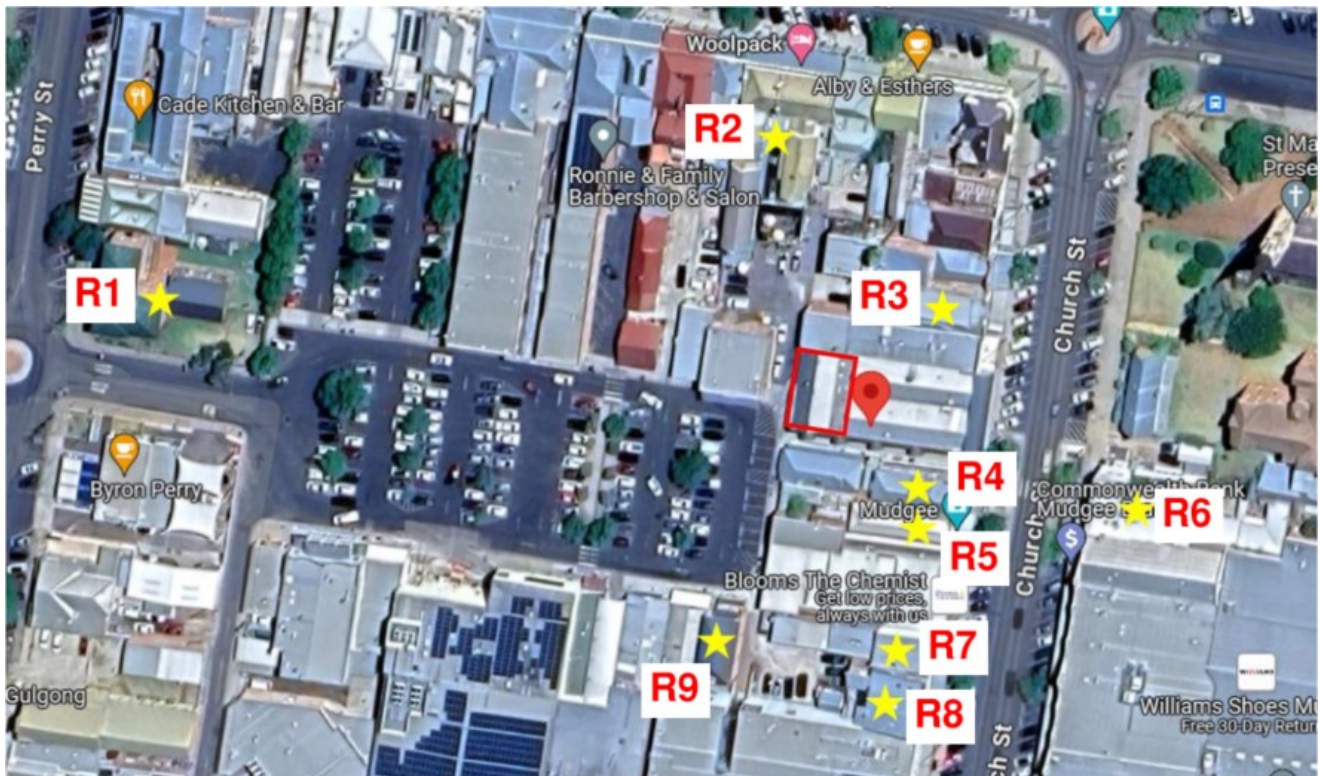
**Figure 2.1** shows an aerial view of the site which identifies the location of the proposed small bar at 1/36 Church Street, situated immediately to the north-east of the Byron Place public car park.

A street view photograph of the existing building is shown in **Figure 2.2**.

The proposed small bar tenancy occupies Unit 1 of the single storey double brick building. Unit 1 is adjoined by other commercial uses - an embroidery shop to the east and to the north a storage space for a hairdresser and clothing store which have store fronts on Church Street.

The subject site and surrounding properties are located within the E2 – Commercial Centre zone under the Mid-Western Regional Council LEP 2012.

**Figure 2.1** Site Location and Nearest Noise Sensitive Receivers





**Figure 2.2** Street View of Site



### Proposed Development

It is proposed to undertake minor alterations (fit-out works). An indicative floorplan is shown in **Figure 2.3**.

The proposed food and drink premises would provide internal seating for approximately 50 patrons and this would be the typical maximum number of patrons anticipated. However, to allow for rare higher capacity events approval is sought for up to 120 patrons.

The premise has no external areas that would be occupied by patrons and foreground amplified music is not proposed. Only background low level music within the building is proposed. The music level would be managed by staff to ensure it is low enough to allow for patrons to hold comfortable conversations and for music not be audible off-site.

It is understood the proposed kitchen would generally be used for low intensity cooking, however a mechanical ventilation / air extraction system is proposed for occasional use.

An existing single split-system air-conditioning system would be used for the bar area, which includes an external unit located on the rooftop of the building facing towards the laneway.



The proposed hours of operation are

- Monday to Thursday: 7:00 am to 11:00 pm
- Friday: 7:00 am to 12:00 am (midnight)
- Saturday: 8:00 am to 12:00 am (midnight)
- Sunday: 8:00 am to 10:00 pm.

The fitout would include:

- a front bar including seating for approximately 40 patrons plus a number of pinball and arcade machines.
- a bar/service area accommodating fridges, storage, bar area and associated service areas within the front bar area.
- the existing utility/kitchen area adjoining the bar/service area.
- a rear room including seating for approximately 10 patrons plus a range of arcade machines.
- the existing primary entry to the premises shall be retained.
- the existing bathrooms (common to the adjoining commercial uses) shall be available for patron's use.
- The existing windows and doors will be retained.
- The existing ceiling comprising 15 mm plasterboard tiles on a suspended grid shall also be retained.

The common walls with the adjoining commercial uses are double cavity brick. However, the eastern wall is not constructed to full height. To maintain the acoustic separation provided by the intertenancy brick wall it is proposed to provide some acoustic treatment within the ceiling cavity above the existing ceiling tiles and above the wall, as follows:

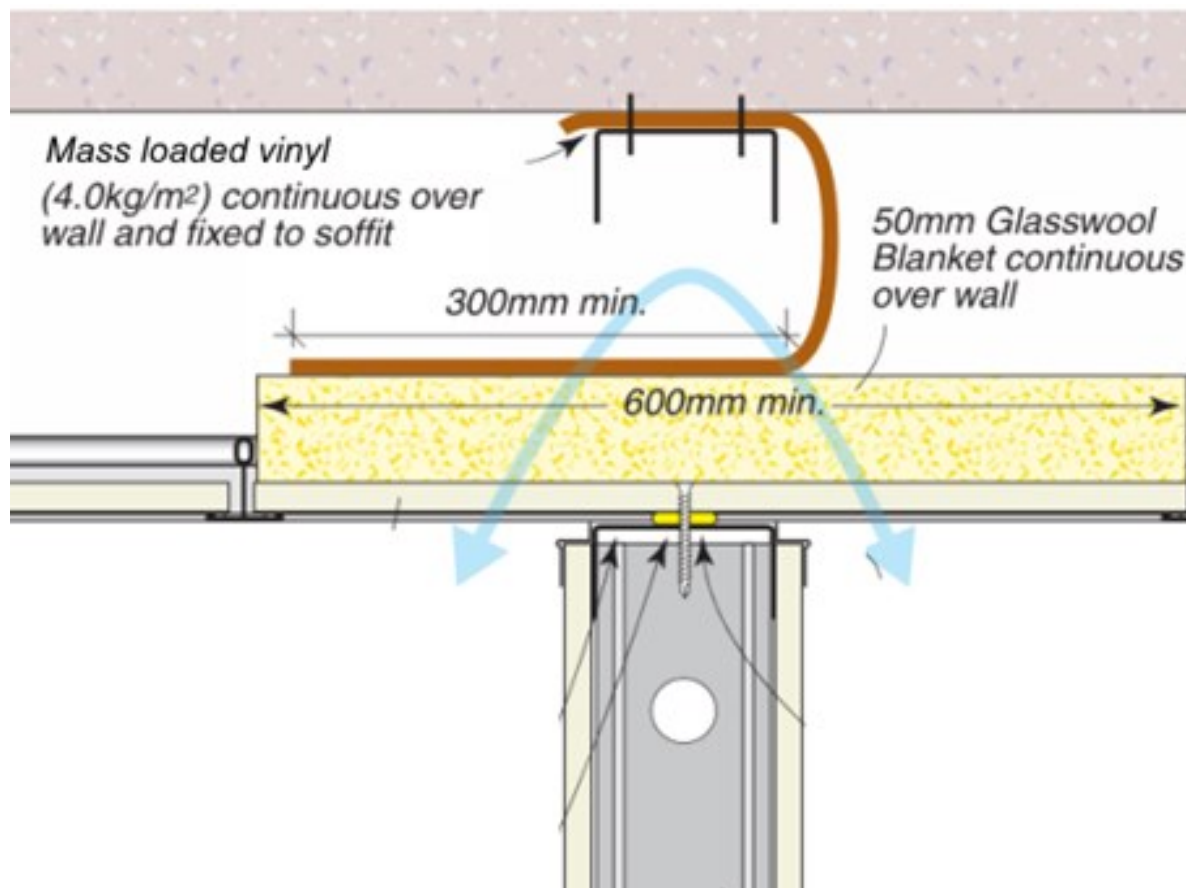
- All ceilings throughout the tenancy to be reviewed and all penetrations in the ceiling to be closed.
- Within the ceiling void over the intertenancy wall, the space will be treated with a mass loaded vinyl curtain (e.g. Pyrotek Wavebar) with a surface mass of no less than 4kg/m<sup>2</sup>. The highest surface mass vinyl that can be practicably installed shall be selected to form a barrier within the ceiling void above the intertenancy walls. The material can be overlapped, taped and draped to ensure all gaps are closed and sealed.



- The mass loaded vinyl barrier must be installed in full accordance with manufacturer's instructions with attention to detail. All gaps shall be closed and sealed to ensure effective acoustic performance.

The schematic below shows indicatively how the material can be fixed and draped.

**Figure 2.2** Mass Loaded Vinyl Barrier Installation Example



Note: Consult Manufacturer for Project Specific Installation Instructions.

## Noise Sensitive Receivers

The closest potentially affected residential receivers detailed in **Table 2.1** and shown in **Figure 2.1** have been considered by this assessment.

**Table 2-1 Sensitive Receivers Considered**

ID	Address	Land Use / Description	Approximate Distance from Entry Door
R1	11 Perry Street	Residential - Multilevel	130 m
R2	Wool Pack Hotel	Temporary / Tourist Accommodation	40 m
R3	26 Church Street	Residential – Shop Top	35 m
R4	38 Church Street	Residential – Shop Top (Unoccupied)	18 m
R5	42 Church Street	Residential – Shop Top	20 m
R6	17 Church Street	Residential – Shop Top	65 m
R7	52 Church Street	Residential – Shop Top	55 m
R8	56 Church Street	Residential – Shop Top	60 m
R9	26 Byron Place	Residential – Shop Top	45 m

### 3. EXISTING ACOUSTIC ENVIRONMENT

For the purpose of this assessment, the guideline background noise levels identified by Australian Standard *AS 1055:2018 - Acoustics (Part 2)* have been considered. In accordance with *AS 1055*, for 'residential areas with low density transportation, the following guideline background noise levels have been adopted by this assessment:

- $L_{A90}$  45 dBA during the daytime (7.00am - 6.00pm);
- $L_{A90}$  40 dBA during the evening (6.00pm - 10.00pm); and
- $L_{A90}$  35 dBA during the night (10.00pm - 7.00am).

## 4. ACOUSTIC CRITERIA

### NSW Noise Policy for Industry

For the purpose of assessing the potential impact of airborne noise emissions, reference is made to the guidance set out in the NSW Environment Protection Authority documents:

- Noise Guide for Local Government (NGLG); and
- Noise Policy for Industry (NPfI).

The *NPfI* provides a framework and process for deriving noise criteria for consents and licences that enable the EPA and others to regulate premises that are scheduled under the Protection of the Environment Operations Act 1997. Whilst specifically aimed at assessment and control of noise from industrial premises, the approaches documented can be used to provide guidance for the assessment of noise from other continuous or semi-continuous operational sources.

The *NPfI* criteria for industrial noise sources have two components:

- Controlling the intrusive noise impacts for residents in the short term; and
- Maintaining noise level amenity for particular land uses for residents and sensitive receivers in other land uses.

### Intrusiveness Criterion

The intrusiveness criterion is summarised as follows:

- $L_{Aeq,15\text{ minute}} \leq \text{Rating Background Noise Level (RBL, } L_{A90}) + 5 \text{ dB}$

$L_{Aeq,15\text{ minute}}$  represents the equivalent continuous A-weighted sound pressure level of the source over 15 minutes, unless other descriptors are specified as more appropriate to characterise the source. (See Glossary of Terms for full definitions).

It should be noted that intrusive noise levels are only applied to residential receivers (residences).

Adjustments apply in accordance with EPA guidelines for tonality, frequency weighting, impulsive characteristics, fluctuations and temporal content, where relevant.

Based on the adopted background noise levels described in **Section 3**, the applicable intrusiveness noise levels considered by this assessment are as follows:

- $L_{Aeq}$  50 dBA during the daytime (7.00am - 6.00pm);
- $L_{Aeq}$  45 dBA during the evening (6.00pm - 10.00pm); and
- $L_{Aeq}$  40 dBA during the night (10.00pm - 7.00am).

Given the proposed hours of operation, the night  $L_{Aeq}$  40 dBA criterion is considered the most stringent intrusiveness criterion for determining compliance.

### Amenity Criterion

The amenity criteria set limits on the total noise level from all industrial noise sources affecting a receiver. Different amenity criteria apply for different types of receiver (e.g. residential, commercial, industrial) and different areas (e.g. urban, suburban, rural).

The locality is recognised as an urban area, in terms of the receiver classifications identified by the *NPfI*. Notably, the *NPfI* recognises an urban area as an area with an acoustical environment that:

- is dominated by ‘urban hum’ or industrial source noise;
- has through traffic with characteristically heavy and continuous traffic flows during peak periods;
- is near commercial districts or industrial districts; or
- has any combination of the above.

It should be noted that an urban area in terms of this definition may be located in either a rural, rural-residential or residential zone as defined on an LEP or other planning instrument, and also includes mixed land-use zones such as mixed commercial and residential uses.

**Table 4.1** sets out the amenity noise levels recommended by the *NPfI*, applicable to the surrounding receivers. The recommended amenity noise levels refer only to noise from industrial sources. However, they refer to noise from all such sources at the receiver location, and not only noise due to a specific project under consideration.

**Table 4.1** *NPfI* Amenity Noise Levels

Type of Receiver	Indicative Noise Amenity Area	Time of Day	Recommended Amenity Noise Level $L_{Aeq,Period}$ dBA	Project Amenity Noise Level $L_{Aeq,Period}$ dBA
Residences	Urban	Day	60	55
		Evening	50	45
		Night	45	40
Commercial	All	When in use	65	60
Industrial	All	When in use	70	65

Note 1: Daytime 7.00am–6.00pm; Evening 6.00pm–10.00pm; Night 10.00pm–7.00am.



### Project Noise Trigger Levels (PNTLs)

The *PNTLs* reflect the most stringent noise level requirement from the criteria derived from both the intrusiveness and project amenity noise levels to ensure that intrusive noise is limited, and amenity is protected.

The  $L_{Aeq}$  descriptor is used for both the intrusiveness noise level and the amenity noise level. This descriptor represents the level of average noise energy over the relevant period of measurement and takes account of peak noise levels as well as the degree of noise fluctuation.

The  $L_{Aeq}$  is determined over a 15-minute period for the project intrusiveness noise level and over the day/evening/night period for the project amenity noise level. This leads to the situation where, because of the different averaging periods, the same numerical value does not necessarily represent the same average noise energy. To standardise the time periods for the intrusiveness and amenity noise levels, for most situations, the *NPfI* recommends that the  $L_{Aeq,15min}$  will be taken to be equal to the  $L_{Aeq,Period} + 3$  dB. This conversion factor has been adopted by this assessment.

The *PNTLs* considered applicable to the operation of the Project are identified in bold font in **Table 4.2**.

In assessing noise levels at residences or commercial receivers, the noise level is to be assessed at the most affected point on or within the property boundary, however, the commercial *PNTLs* are applicable only when such sites are in use (i.e. generally during business hours).

**Table 4.2 Project Noise Trigger Levels for Operational Noise Emissions, dBA**

Type of Receiver	Area Classification	Period <sup>1</sup>	RBL <sup>2</sup> $L_{A90}(15min)$	Intrusiveness <sup>3</sup> $L_{Aeq}(15min)$	Project Amenity $L_{Aeq} (Period)$
Residences	Urban	Day	50	<b>50</b>	58
		Evening	45	<b>45</b>	50
		Night	40	<b>40</b>	43
Commercial	All	When in use	-	-	<b>63</b>
Industrial	All	When in use	-	-	<b>68</b>

Note 1: Daytime: 7.00am–6.00pm; Evening: 6.00pm–10.00pm; Night-time: 10.00pm–7.00am.

Note 2: RBL = Rating Background Level.

Note 3: Intrusive criterion only applicable to residential receivers.

Note 4: Given the proposed operating hours of the site, daytime, evening and night levels are applicable to this assessment.

To comply with the *NPfI*, cumulative operational noise levels from the subject site should not exceed the criteria set out in **Table 4.2** at the closest residential and neighbouring commercial sites during the relevant operating periods.

## Liquor and Gaming Noise Criteria

The NSW Independent Liquor, Gaming and Racing Authority (ILGA) applies licenced premises noise criteria as follows:

*The  $L_{A10}$  noise level emitted from the licensed premises shall not exceed the background noise level in any Octave Band Centre Frequency (31.5Hz–8kHz inclusive) by more than 5 dB between 7:00 am and 12:00 midnight at the boundary of any affected residence.*

*The  $L_{A10}$  noise level emitted from the licensed premises shall not exceed the background noise level in any Octave Band Centre Frequency (31.5Hz–8kHz inclusive) between 12:00 midnight and 7:00 am at the boundary of any affected residence.*

*Notwithstanding compliance with the above, the noise from the licensed premises shall not be audible within any habitable room in any residential premises between the hours of 12:00 midnight and 7:00 am.*

Given the proposed operational hours, the post-midnight ILGA are not relevant to the application.

ACA notes that the ILGA octave band assessment is primarily aimed at ensuring amplified music noise emissions are satisfactorily controlled. Given the proposal does not include the use of foreground amplified music it would be expected that compliance with the NPfl criteria would be sufficient.

Notwithstanding this, for the purposes of undertaking an ILGA screening assessment, ACA has considered octave band background noise level measurements undertaken in a semi-rural residential area with negligible local transportation noise, normalised to the broadband noise levels identified by AS 1055.

**Table 4.3** sets out the adopted  $L_{90}$  octave band background noise levels and resultant  $L_{10}$  criteria considered for the assessment of music and patron noise.

In assessing noise levels at residences, the noise level is to be assessed externally at the most affected point on or within the property boundary.

It is considered that by maintaining noise levels below the identified  $L_{10}$  criteria externally to residences during the relevant operating periods, satisfactory acoustic outcomes and compliance with ILGA requirements may be achieved.

**Table 4.3 Adopted Octave Band L<sub>90</sub> Background Noise Levels and L<sub>10</sub> Octave Band Criteria**

Time	Octave Band Levels									A-Weighted Broadband Levels	
	Frequency (Hz)									L <sub>A90,15min</sub> (dBA)	L <sub>A10,15min</sub> (dBA)
	32	63	125	250	500	1K	2K	4K	8K		
Daytime (L <sub>90</sub> Spectra)	54	55	50	44	43	41	33	29	28	45	-
Daytime (L <sub>10</sub> Criteria)	59	60	55	49	48	46	38	34	33	-	50
Evening (L <sub>90</sub> Spectra)	49	49	45	38	39	35	28	27	26	40	-
Evening (L <sub>10</sub> Criteria)	54	54	50	43	44	40	33	32	31	-	45
Night (L <sub>90</sub> Spectra)	44	45	40	34	33	29	23	23	23	35	-
Night (L <sub>10</sub> Criteria)	49	50	45	39	38	34	28	28	28	-	40

Notes: Daytime 7.00am–6.00pm; Evening 6.00pm–10.00pm; Night 10.00pm–7.00am. The L<sub>10</sub> octave band criteria are based on the background L<sub>90</sub> levels + 5dB. The octave band background noise levels are based on measurements undertaken in a semi-rural residential area with negligible local transportation noise, normalised to the broadband noise levels identified by AS 1055.

## 5. ASSESSMENT

### Operations and Noise Sources

The key noise sources associated with the proposal are expected to be:

- Patrons within the proposed small bar/ restaurant, up to 120 persons.
- Low level background music played within the proposed small bar/ restaurant.
- Low level noise from arcade machines within the proposed small bar/ restaurant.
- Reverse cycle split-system air-conditioning unit, externally located on the rooftop of the building.

Additionally, noise may be generated by the delivery of goods to the site and waste disposal, however these activities would be confined to the least sensitive daytime hours. In particular, the noise generated by the sorting/disposal of empty bottles would be managed by undertaking this activity within the building.

Given the substantial double brick building envelope, noise breakout from the building would be expected to be primarily via the acoustically weakest components of the building, being the entry door, principally when the door is open and to a lesser degree through the windows and roof. Notably, the windows are fixed (inoperable) types with 6 mm glass nominal thickness.

### Noise Source Levels

Guidance set out in the Association of Australasian Acoustical Consultants' (AAAC) '*Licensed Premises Noise Assessment Technical Guideline (Version 2.0)*' has been used to estimate patron noise emissions from the proposed small bar. Additionally, background music levels identified by the AAAC guideline have been considered – the guideline notes internal average sound pressure levels in the range  $L_{Aeq}$  67-74 dB are typical for background music that allows conversations at normal vocal efforts.

The background music level shall be managed by staff to ensure music is not audible off-site.

Additionally, the audio levels from the arcade machines shall be adjusted, as necessary, to ensure arcade machine noise is not audible off-site.

Mechanical plant noise levels have been extracted from ACA's internal noise source library, based on manufacturers data.

**Table 5.1** below summarises the noise data used in the assessment.

**Table 5.1 Noise Source Levels**

1/3 Octave Band Sound Level – dB									
Metric	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dBA
<b>Patron Noise</b>									
Patron Noise (70 patrons in front bar, raised voice, group numbers = 3) – typical reverberant Sound Pressure Levels									
<b>L<sub>eq</sub></b>	-	72	78	81	77	71	65	56	<b>82</b>
Patron Noise (50 patrons in rear room, raised voice, group numbers = 3) – typical reverberant Sound Pressure Levels									
<b>L<sub>eq</sub></b>	-	70	76	80	76	69	63	55	<b>80</b>
<b>Mechanical Plant</b>									
Air conditioning unit – typical Sound Power Levels									
<b>L<sub>w</sub></b>	61	61	58	58	62	59	48	39	<b>65</b>
Kitchen Extraction Fan – typical Sound Power Levels									
<b>L<sub>w</sub></b>	64	72	73	67	62	62	60	58	<b>70</b>

Note: The kitchen exhaust fan would not operate during the night period (after 10.00pm) and would be specified during detailed design to ensure compliance with the identified noise criteria.

## Noise Modelling

A three-dimensional noise model of the site and surrounds has been developed using the SoundPLAN V8.2 environmental noise prediction software. An adaptation of the algorithm contained within ISO 9613:1996 *Acoustics – Attenuation of sound during propagation outdoors* has been applied.

Factors that are addressed in the noise modelling are:

- Patron and mechanical plant noise level emissions and locations
- Shielding/reflection effects from structures
- Receiver locations
- Ground topography
- Noise attenuation due to geometric spreading
- Ground absorption
- Atmospheric absorption and
- Influence of meteorology, per ISO 9613 methodologies.

The modelling has considered a 'worst-case' scenario, based on the maximum capacity (120 patrons, assuming 70 patrons in the front bar and 50 in the rear room). As this situation would be expected to rarely occur, typical noise emissions from the premises would be expected to be less than predicted by this assessment.



The following assumptions have been applied:

- 120 patrons in small bar area (70 front bar, 50 rear room).
- 30% of the patrons actively talking (based on conservative common practice).
- Patrons speaking with “raised” vocal effort with random directivity (i.e. not all the patrons will be facing the same direction).
- The small bar has been assumed to be relatively reverberant (Reverberation Time, RT60 = 0.8 s).
- Background music would not significantly contribute to the noise emissions in comparison to crowd noise (i.e. >5 dB below the levels generated by people). Music level to be closely monitored by staff to ensure music is not audible off-site.
- Arcade machines would not significantly contribute to the noise emissions in comparison to crowd noise (i.e. >5 dB below the levels generated by people). Machine noise levels to be closely monitored by staff to ensure machines are not audible off-site.
- Windows in the bar are nominal 6 mm glass, fully sealed with no gaps. Window are fixed types and therefore will not be open.
- Entry door is commercial glazed type (nominal 6 mm glass). The door shall be normally closed and only opened intermittently for access. Modelling assumes the door would be open for no more than 2 minutes during a 15-minute assessment period.
- Air-conditioning plant running continuously.
- The kitchen exhaust fan would not operate during the night period (after 10.00pm) and would be specified during detailed design to ensure compliance with the identified noise criteria.

Based on these assumptions the predicted noise levels indicate the small bar may comply with the NPfl and ILGA criteria.

The predicted noise levels that may be expected to arise external to the identified receivers are set out in **Tables 5.2** and **5.3**.

**Table 5.2 Evening Predicted Noise Levels External to Residential Receivers**

Receiver / Address	Predicted Noise Levels										Compliance
	L <sub>Aeq,15min</sub> (dBA)	L <sub>10,15min</sub> (dB)									
		31	63	125	250	500	1k	2k	4k	8k	
R1 - 11 Perry Street	<30	<30	<30	29	24	18	15	12	<10	<10	Complies
R2 - Wool Pack Hotel	35	<30	<30	41	36	30	29	27	22	18	Complies
R3 - 26 Church Street	33	<30	<30	41	36	28	22	24	22	19	Complies
R4 - 38 Church Street	38	<30	<30	44	40	35	30	28	24	21	Complies
R5 - 42 Church Street	36	<30	<30	42	38	33	28	26	23	19	Complies
R6 - 17 Church Street	<30	<30	<30	34	30	24	19	17	14	<10	Complies
R7 - 52 Church Street	<30	<30	<30	36	32	27	22	19	16	12	Complies
R8 - 56 Church Street	<30	<30	<30	35	31	25	20	18	15	<10	Complies
R9 - 26 Byron Place	31	<30	<30	37	33	28	24	22	17	12	Complies
Evening Broadband Noise Criteria L <sub>Aeq,15min</sub> (dBA)	45	-	-	-	-	-	-	-	-	-	-
Evening Octave Band Noise Criteria L <sub>10,15min</sub> (dB)	-	54	54	50	43	44	40	33	32	31	-

**Table 5.3 Night Predicted Noise Levels External to Residential Receivers**

Receiver / Address	Predicted Noise Levels										Compliance
	L <sub>Aeq,15min</sub> (dBA)	L <sub>10,15min</sub> (dB)									
		31	63	125	250	500	1k	2k	4k	8k	
R1 - 11 Perry Street	<30	<30	<30	28	23	16	15	11	<10	<10	Complies
R2 - Wool Pack Hotel	33	<30	<30	40	35	28	28	25	14	<10	Complies
R3 - 26 Church Street	<30	<30	<30	41	35	24	13	<10	<10	<10	Complies
R4 - 38 Church Street	36	<30	<30	43	39	35	29	23	17	<10	Complies
R5 - 42 Church Street	34	<30	<30	42	37	33	27	21	15	<10	Complies
R6 - 17 Church Street	<30	<30	<30	33	29	23	17	10	<10	<10	Complies
R7 - 52 Church Street	<30	<30	<30	35	31	26	20	13	<10	<10	Complies
R8 - 56 Church Street	<30	<30	<30	34	30	24	18	12	<10	<10	Complies
R9 - 26 Byron Place	<30	<30	<30	36	32	27	24	19	<10	<10	Complies
Night Broadband Noise Criteria L <sub>Aeq,15min</sub> (dBA)	40	-	-	-	-	-	-	-	-	-	-
Night Octave Band Noise Criteria L <sub>10,15min</sub> (dB)	-	49	50	45	39	38	34	28	28	28	-

The adjoining shop tenancy (2/36 Church Street) operates between 8.30 am and 5.00 pm and therefore its most noise sensitive times would not be expected to overlap with the busiest times for the small bar.

For small retail stores *Australian Standard AS/NZS 2107:2016 Acoustics – Recommended Design Sound Levels and Reverberation Times for Building Interiors* recommends noise levels from external sources do not exceed L<sub>Aeq</sub> 50 dBA and in the case of speciality shops (where detailed discussion is necessary in transactions) the Standard recommends noise levels from external sources do not exceed L<sub>Aeq</sub> 45 dBA.

Provided that the identified ceiling void treatments are effectively implemented, it is anticipated that for maximum capacity small bar events noise levels would not typically exceed L<sub>Aeq</sub> 45 dBA within the adjoining premises. Considering the typically lower patron capacity during the daytime, it would be expected that noise levels from the bar would typically remain below approximately L<sub>Aeq</sub> 35-40 dBA within the adjoining premises, which is considered acceptable.

## 6. RECOMMENDATIONS

**Table 6.1** outlines noise mitigation recommendations to manage potential noise impacts on residents and businesses from operations at the proposed small bar. The table is divided in 3 sections:

- **Treating the source:** This refers to ways of reducing emissions directly at the source of sound generation (i.e. sound system, speakers, mechanical plant).
- **Treating the path:** This refers to treatment to the medium that is physically in between the source and the receivers (i.e. air paths, buildings, reflective surfaces, supporting structures).
- **Management:** This refers to measures that will be required by the bar management to minimise noise from operations.

**Table 6.1 Noise Mitigation Options**

Item #	Recommendation	Reasoning
<b>Treating the Source</b>		
1	Music to be played at background levels only. Indicatively, not over $L_{Aeq}$ 67-74 dB at listeners' locations. Subwoofers shall not be used. Loudspeakers with a frequency response below 100 Hz shall be limited or equalised to reduce all frequencies below 125 Hz.	To avoid music as a conditional dominant source.
2	Patrons to be limited to no more than 120 persons at any time.	To limit internal noise levels within the bar and reduce noise breakout.
3	Externally located air-conditioning unit not to exceed sound power level rating of 65 dBA under relevant load conditions. Kitchen extraction unit not to operate after 10.00pm.	To minimise mechanical services noise emissions.
<b>Treating the Path</b>		
4	Windows to remain inoperable at all times. The windows will be inspected to ensure no gaps. Any gaps to be sealed with silicon.	To reduce noise breakout from the bar.
5	Entry door to remain normally closed. Door is commercial glazed type, assumed to be acoustically rated at $R_w$ 30 or greater.	To reduce noise breakout from the bar.

Item #	Recommendation	Reasoning
6	<p>The common walls with the adjoining commercial uses are double cavity brick. However, the eastern wall is not constructed to full height. To maintain the acoustic separation provided by the intertenancy brick wall it is recommended to provide some acoustic treatment within the ceiling cavity above the existing ceiling tiles and above the wall, as follows:</p> <ul style="list-style-type: none"> <li>- All ceilings throughout the tenancy to reviewed and all penetrations in the ceiling throughout the tenancy to be closed.</li> <li>- Within the ceiling void over the intertenancy wall the space will be treated with a mass loaded vinyl curtain (e.g. Pyrotek Wavebar) with a surface mass of no less than 4kg/m<sup>2</sup>. The highest surface mass vinyl that can be practicably installed shall be selected to form a barrier within the ceiling void above the intertenancy walls. The material can be overlapped, taped and draped to ensure all gaps are closed and sealed.</li> <li>- The mass loaded vinyl barrier must be Installed in full accordance with manufacturer's instructions with attention to detail. All gaps shall be closed and sealed to ensure effective acoustic performance.</li> </ul>	
<b>Management</b>		
7	Staff to proactively manage noise within the small bar and adhere to Responsible Service of Alcohol principles thus reducing the likelihood of patrons causing noise and participating in anti-social activities.	To limit internal noise levels within the bar and reduce noise breakout.
8	Deliveries of goods to site to occur between the hours of 8.00 am and 6.00 pm only.	To minimise site noise emissions.
9	Waste disposal to occur between the hours of 8.00 am and 6.00 pm only and noise generated by the sorting / disposal of empty bottles to be managed by undertaking this activity within the building.	To minimise site noise emissions.
10	Signage to be installed to remind patrons to limit noise when leaving the premises.	Management of off-site noise emissions.
11	Recommendations of this report to be included in the Plan of Management. In the event of any noise related issues arising, management to take immediate action to rectify any issues as soon as possible.	To pro-actively plan for effective noise control

It is expected that with the implementation of the noise mitigation measures set out above, noise levels at sensitive receivers would be controlled to within an acceptable compliance margin of the NSW NPfI and ILGA noise criteria.



## APPENDICES

## APPENDIX A: Glossary of Acoustic Terms

## 1 Sound Level or Noise Level

Sound consists of minute fluctuations in atmospheric pressure capable of evoking the sense of hearing. Noise is often used to refer to unwanted sound.

The human ear responds to changes in sound pressure over a very wide range. The loudest sound pressure to which the human ear responds is ten million times greater than the softest. The decibel (abbreviated as dB) scale reduces this ratio to a more manageable range by using logarithms.

The symbols SPL, L or  $L_p$  are commonly used to represent Sound Pressure Level.

The symbol  $L_A$  represents A-weighted Sound Pressure Level. The standard reference unit for Sound Pressure Levels expressed in decibels is  $2 \times 10^{-5}$  Pa.

## 2 “A” Weighted Sound Levels

The overall level of a sound is usually expressed in terms of dB(A), which is measured using a sound level meter with an “A-weighting” filter. This is an electronic filter with a frequency response corresponding approximately to that of human hearing.

People’s hearing is most sensitive to sounds at mid frequencies (500 Hz to 4000 Hz), and less sensitive at lower and higher frequencies. Thus, the level of a sound in dB(A) is a good measure of the loudness of that sound. Different sources having the same dB(A) level generally sound about equally loud.

A change of 1 dB or 2 dB in the level of a sound is difficult for most people to detect, whilst a 3 dB to 5 dB change corresponds to a small but noticeable change in loudness. A 10 dB(A) change corresponds to an approximate doubling or halving in loudness. The table below lists examples of typical noise levels:

### Typical noise levels and subjective scale

Sound Pressure Level dB(A)	Noise Source	Subjective Evaluation
130	Threshold of pain	Intolerable
120	Heavy rock concert	Extremely loud
110	Grinding on steel	
100	Loud car horn at 3 m	
90	Construction site with pneumatic hammering	Very loud
80	Kerbside of busy street	
70	Loud radio or television	
60	Department store	Moderate to quiet
50	General Office	
40	Inside private office	
30	Inside bedroom	Quiet to very quiet
20	Recording studio	
		Almost silent

Other weightings (e.g. B, C and D) are less commonly used than A-weighting in environmental acoustics. Sound Levels measured without any weighting are referred to as “linear” and the units are expressed as dB(Lin) or dB.

SMALL BAR  
1/36 CHURCH STREET, MUDGEE  
NOISE ASSESSMENT

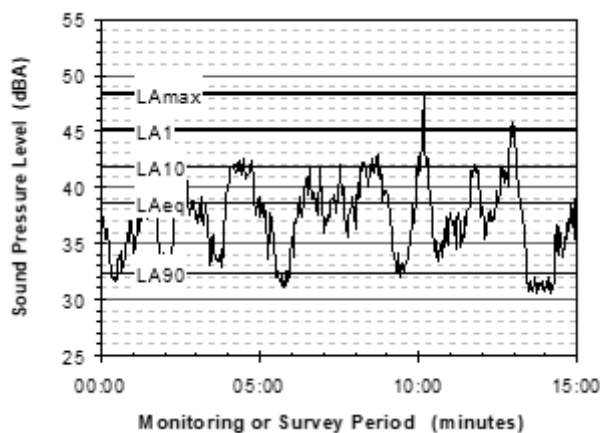
### 3 Sound Power Level

The Sound Power of a source is the rate at which it emits acoustic energy. As with Sound Pressure Levels, Sound Power Levels are expressed in decibel units, and these may be identified by the symbols SWL or  $L_w$ . The Sound Power definitions expressed in dB are typically referenced to the acoustic energy unit  $10^{-12}$  W.

### 4 Statistical Noise Levels

Sounds that vary in level over time, such as road traffic noise and most community noise, are commonly described in terms of the statistical exceedance levels  $L_{AN}$ , where  $L_{AN}$  is the A-weighted sound pressure level exceeded for N% of a given measurement period. For example, the  $L_{A1}$  is the noise level exceeded for 1% of the time,  $L_{A10}$  the noise exceeded for 10% of the time.

The following figure presents a hypothetical 15-minute noise survey, illustrating various common statistical indices of interest.



Of particular relevance, are:

- $L_{A1}$  The noise level exceeded for 1% of the 15 minute interval.
- $L_{A10}$  The noise level exceeded for 10% of the 15 minute interval. This is commonly referred to as the average maximum noise level.
- $L_{A90}$  The noise level exceeded for 90% of the sample period. This noise level is described as the average minimum background sound level (in the absence of the source under consideration), or simply the background level.
- $L_{Aeq}$  The A-weighted equivalent noise level (basically the average noise level). It is defined as the steady sound level that contains the same amount of acoustical energy as the corresponding time-varying sound.

When dealing with numerous days of statistical noise data, it is sometimes necessary to define the typical noise levels at a given monitoring location for a particular time of day. Standardised methods are available for determining these representative levels. Different jurisdictions would choose to define their own preferred Standard.