

Lloyd George Acoustics

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Nunzio Mondia Centre Stage Promotions 9 Baker Avenue Perth WA 6000

Nunzio:

Introduction

This letter provides an assessment of noise emissions from the Centre Stage Concert Club in Perth, located at 9 Baker Avenue, based on measurements undertaken on 04 June 2019. The venue has an indoor performance area which is intended to hold small acoustic performances for up to a 100 people audience. It is our understanding that Centre Stage management wants to ensure noise emissions are controlled at all times.

The purpose of this assessment is to establish a relationship between noise levels from amplified music inside the venue and measured L_{A10} noise levels at the nearest noise sensitive receivers' façades. The nearest noise sensitive receivers are:

- 7 Baker Avenue (1-storey residential house adjacent to No.9);
- 8 Lane Street (1-storey residential house separated from No.9 by Astone Lane); and
- 11 Baker Avenue (1-storey residential house adjacent to No.9).

Conclusion

Noise emitted from music inside the Centre Stage Concert Club's performance area is unlikely to be audible at the subject receivers provided the three following conditions are fulfilled:

- 1. Noise levels inside the venue are kept at values no more than indicated in Table 4; and
- 2. Low frequency (bass) sound is kept to a minimum as much as practicable; and
- 3. External doors and windows are kept closed as much as practicable.

Noise Criteria

Noise criteria at the nearest noise sensitive receivers have been determined in accordance with the *Environmental Protection (Noise) Regulations 1997* (the Noise Regulations). The Noise Regulations provide baseline assigned levels that are then increased depending on a receiver's surroundings. That is, if there are major roads or industrial areas, the allowable level is higher than in a purely rural area. The baseline assigned levels after 10pm (most critical time) are 35 dB L_{A10}, 45 dB L_{A1} and 55 dB L_{Amax}.

Within 100 metres of the residences are Brisbane Street, Baker Avenue, Astone Lane and Lane St. They are considered minor roads (traffic volumes less than 6,000 vehicles per day - based on MRWA traffic data ref.LM00141 02/2019 and LM00142 also 02/2019) by the Noise Regulations.

Within 450 metres lie Beaufort Street, Bulwer St and Williams Street which are considered secondary roads (traffic volumes between 6,000 and 15,000 vehicles per day based on MRWA traffic data ref.0605.2015, 0642.2016 and LM00142) rather than major roads. As such, none of these roads increases the baseline assigned noise levels. Some of the surrounding land is zoned commercial - estimated 100,000m² within 450 metres; 0m² within 100m - which increases the allowable noise level and in this case, has been determined to be an additional 0.8 dB (rounded to 1 dB).

Table 1 shows the assigned noise levels applicable at the receiving locations.

Premises Receiving		Assigned Level (dB)			
Noise	L _{A10}		L _{A1}	L _{Amax}	
Noise sensitive premises: highly sensitive area	0700 to 1900 hours Monday to Saturday (Day)	46	56	66	
	0900 to 1900 hours Sunday and public holidays (Sunday)	41	51	66	
	1900 to 2200 hours all days (Evening)	41	51	56	
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and public holidays (Night)	36	46	56	
Noise sensitive premises: any area other than highly sensitive area	All hours	60	75	80	

Table 1 Assigned Noise Levels

Which criterion is applicable depends on how long a noise is present. For instance, noise present for more than 10% of the time is assessed against the L_{A10} . Noise presents for more than 1% of the time but less than 10% of the time is assessed against the L_{A1} . In this case, music is expected to be present for more than 10% of the maximum permitted representative assessment period of 4 hours and therefore the L_{A10} parameter will dictate compliance or otherwise.

During the noise measurement, the noise was not audible as music at noise receivers - however it was found to be impulsive by definition of the Noise Regulations. As per regulation 7, a +10 dB penalty would be applicable. This +10 dB penalty attributable to impulsiveness has been taken into account when determining the indoor noise level limits for the venue (see *Table 4*).

Had the noise been tonal, a +5 dB penalty would have been applicable. Had it been both tonal and impulsive, a +15 dB penalty would have been applicable.

During the test, assessed noise levels were not determined to be tonal at the receivers nor audible as music.

Noise Measurements

Noise data was recorded on 04 June 2019 between 01:05am and 01:45am. The following instrumentation was used:

• The sound level meter used was a Brüel and Kjær type 2250 (S/N: 3011946) with a type 4189 microphone, setup to record L_{A10} noise levels at locations 2 and 3 at 1.4 m above local ground level. The microphone was fitted with an approved wind shield.

- Noise measurements were also carried out inside the venue at the centre of the room (location 1) with a type 1 Rion NA28 sound level meter (S/N: 1807003).
- Both sound level meters were field calibrated before and after the survey using an approved type 1 Brüel and Kjær 4231 calibrator (S/N: 2588648) and no drift above 0.5 dB was detected.

Shown in *Figure 1* are the general locations of the sound level meters. The venue's performance area is double height with high level windows facing South, noting measurements were undertaken on the ground floor.



Figure 1 Sound Level Meter Locations

Measurement Summary

No tonality was audible or measurable at Location 2 and 3 and the noise levels measured on the night from amplified music and drum kit (deemed to be a worst case scenario) are summarised in *Table 2*. Noise levels have been extrapolated to the windows of the nearest receivers, which were not accessible on the day. Noise levels were deliberately set to a much higher level than a typical acoustic event, in order to overcome background noise levels at measurement locations.

Measured Inside Venue		Measured Outside Venue					
Location	L _{Ceq}	L _{Aeq}	Loc.	L _{A1}	L _{A10}	L _{Apk}	L _{Amax}
1	90.4	82.9	2	40.7	39.0	56.1	40.9
1	88.4	85.0	3	38.0	37.5	52.9	38.0

Table 2 Noise Measurement Assessment Summary, dB(A)

Noise measurements outside the venue have been extrapolated, accounting for distance to the façade:

- 11 metres between location 2 and No.8 Lane Street facade,
- 11 metres between location 3 and 7 Baker Street,
- 8 metres between nearest venue window and No.11 Baker Avenue facade.

The results are presented in Table 3.

Extrapolated Noise Level at Receivers				
Location	L _{A1}	L _{A10}	L _{Amax}	
8 Lane Street	25.9	24.2	26.1	
7 Baker Avenue	23.1	22.7	23.1	
11 Baker Avenue	28.7	26.9	28.8	

Table 3 Noise Assessment Summary, dB(A)

The least difference in levels between inside the venue and at the receivers is $L_{Ceq(inside)}-L_{A10(extrapolated)} = 53.5$ dB and $L_{Aeq(inside)}-L_{A10(extrapolated)} = 48.0$, taking into account the +10 dB penalty attributable to impulsiveness.

Based on this relationship between outdoor L_{A10} and indoor $L_{Aeq,1min}$ and $L_{Ceq,1min}$, it is assessed that the assigned noise levels will not be exceeded if the noise within the venue is contained within the limits listed in *Table 4*.

	Inside Venue		
Noise Limit	L _{Ceq}	L _{Aeq}	
Day - 07.00 to 19.00 hrs Monday to Saturday	99	94	
Evening - 19.00 to 22.00 hrs All days	94	89	
Night - 22.00 to 07.00 hours all days	89	84	

Table 4 Noise limits, dB(A)

We trust this information is acceptable and should you have any queries, please do not hesitate to contact me.

Regards,



Benjamin Hillion

Music Studio: Acoustic Report

[Supporting Arts and Culture in Vincent]



Further to your request for an Acoustic report, we have completed all necessary performance testing and have a final report prepared for council consideration. Lloyd George Acoustics were employed to conduct the field testing and then prepare a final report. Please see the attached report document.

Testing focused on the most important concern - noise transmission from inside the studio environment to the external noise receivers, with particular attention on noise impact to the immediate surroundings. Extreme testing included measuring noise transmission performance of continuously played (looped), heavily amplified pop music which included the following elements: drums, electric bass, electric guitars and electronically synthesized sounds (wide frequency spectrum) with live drums (hit hard) playing at the same time. The result was a continuous internal decibal reading of 88.4 - 90.4 db range. Tests were conducted at 1.30am on Tuesday 4th June. This extreme volume is for testing purposes only and does not reflect the intended volumes, which are much lower in intensity.

In conclusion, the performance results were very pleasing, demonstrating that noise emitted from inside the intended centrestage concert club performance area is unlikely to be audible at the receivers immediately outside the venue walls. The extreme volume testing clearly demonstrated that noise was neither audible or tonal at the outside noise receiver positions (see formal report document).

The facility contextual considerations

(Refer back to the prepared 'Studio Venue Application Rationale' booklet for more details): Phone: 0414 647 599 E-mail: nunziomondia@gmail.com