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# Unit 2, 1 Sydenham Road Brookvale

Noise Impact Assessment

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# **1** INTRODUCTION

This report presents our assessment of likely noise impacts from operational activities associated with the proposed licenced premise at Unit 2/1 Sydenham Road Brookvale, Sydney.

This report will:

- Identify relevant noise emission criteria applicable to the project site.
- Identify nearby noise sensitive receivers and any project site noise sources with the potential to adversely impact nearby developments.
- Predict noise emissions and assess them against established acoustic criteria.
- If necessary, determine building and/or management controls necessary to ensure ongoing compliance with noise emission goals.

The following documents have been used in accordance with this assessment:

- NSW Liquor and Gaming.
- NSW EPA's 'Noise Policy for Industry' (NPfl) 2017.

This assessment is undertaken using architectural layouts prepared by Luke Miller (dated 17/03/21) and mechanical services layouts prepared by Ace Ventilation (dated 19/03/21).

# 2 SITE DESCRIPTION AND PROPOSED WORKS

The proposed 'Pocket Pizza' is a licenced venue located within Unit 2 of the existing 1 Sydenham Road shop-top development.

The site is primarily bounded by commercial and industrial premises with a suspended car park directly above. Unit 2 is on ground floor, set back from Sydenham Road (to the rear of site).

Patron ingress and egress will be via entry roller door accessed at the end of the lot driveway and adjacent the carpark ramp.

The proposed patron capacity is 50 persons.

Operating hours are to be as follows:

- 7am to 11pm Monday to Saturday; and
- 8am to 10pm Sunday and Public Holidays

The nearest sensitive noise receiver to site is identified as level 1 residences within the same development site which are above and offset from the tenancy (closer to Sydenham Road).

Within this residence, bedrooms are located at the Sydenham Road façade whilst office areas are located at the rear.

Figure 1 details the site, receiver, and monitoring locations.



Figure 1 – Project site, surrounds and monitoring locations (taken from https://maps.six.nsw.gov.au/)

# **3 NOISE DESCRIPTORS**

Ambient noise constantly varies in level from moment to moment, so it is not possible to accurately determine prevailing noise conditions by measuring a single, instantaneous noise level.

To quantify ambient noise, a 15 minute measurement interval is typically utilised. Noise levels are monitored continuously during this period, and then statistical and integrating techniques are used to characterise the noise being measured.

The principal measurement parameters obtained from the data are:

 $L_{eq}$  - represents the average noise energy during a measurement period. This parameter is derived by integrating the noise levels measured over the measurement period.  $L_{eq}$  is important in the assessment of noise impact as it closely corresponds with how humans perceive the loudness of time-varying noise sources (such as traffic noise).

 $L_{90}$  – This is commonly used as a measure of the background noise level as it represents the noise level heard in the typical, quiet periods during the measurement interval. The L<sub>90</sub> parameter is used to set noise emission criteria for potentially intrusive noise sources since the disturbance caused by a noise source will depend on how audible it is above the pre-existing noise environment, particularly during quiet periods, as represented by the L<sub>90</sub> level.

 $L_{10}$  is used in some guidelines to measure noise produced by an intrusive noise source since it represents the average of the loudest noise levels produced at the source. Typically, this is used to assess noise from licenced venues.

 $L_{max}$  is the highest noise level produced during a noise event, and is typically used to assess sleep arousal impacts from short term noise events during the night. It is also used to assess internal noise levels resulting from aircraft and railway ground vibration induced noise.

 $L_1$  is sometimes used in place of  $L_{max}$  to represent a typical noise level from a number of high level, short term noise events.

# 4 BACKGROUND NOISE LEVELS

Background noise measurement data was obtained from long-term unattended noise monitors in order to characterise the existing noise environment.

Equipment used for unattended measurements consisted of an Acoustic Research Laboratories Pty Ltd noise logger. The logger was programmed to store 15-minute statistical noise levels throughout the unattended monitoring period. The equipment was calibrated at the beginning and the end of the measurement using a Rion NC-73 calibrator; no significant drift was detected. All measurements were taken on A-weighted fast response mode.

Noise monitoring data was obtained during the period of 18<sup>th</sup> August to 25<sup>th</sup> August 2020 with the noise monitor installed at the facade of the nearby residential receiver (refer Figure 1). Data available during this period is appended to this report.

The measured background noise levels have been corrected for meteorological conditions (excessive wind and/or rain), as required by section 3.4 of the EPA Industrial Noise Policy. Exceedances of the 5m/s average wind speed limit of the EPA were noted and corrected for in determining the background noise levels.

Summarised rating background noise levels are presented below.

	Rating Background Noise Level dB(A)L <sub>90(period)</sub>								
Noise Receiver	Daytime (7:00am to 6:00pm)	Evening (6:00pm – 10:00pm)	Night (10:00pm – 11:00am)	Late Night (11:00pm – 7:00am)					
M1 - Unattended Noise Monitor Location (refer to Figure 1)	55	50	45	39					

## Table 1 – Summary of Background Noise Levels

The background noise spectrum as obtained on site is provided below:

## **Table 2 - Background Noise Level Spectrums**

	31.5Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dB(A)
A1 Background Noise Spectrum	60	60	56	54	52	51	46	41	34	55

## 5 NOISE EMISSION CRITERIA

Noise emissions from the project site have been assessed for noise impacts associated with patron noise and other operational noise such as background music and mechanical plant.

The use of the site is assessed in accordance with requirements listed below:

#### 5.1 NSW EPA NOISE POLICY FOR INDUSTRY (NPFI) 2017

The Industrial Noise Policy has been superseded by NSW Environmental Protection Authority (EPA) document – *'Noise Policy for Industry (NPfI) 2017'* 

The NPfI provides guidelines for assessing noise impacts from developments. The recommended assessment objectives vary depending on the potentially affected receivers, the time of day, and the type of noise source. The NPfI has two requirements which must both be complied with, namely an amenity criterion and an intrusiveness criterion.

#### 5.1.1 Intrusiveness Criterion

The guideline is intended to limit the audibility of noise emissions at residential receivers and requires that noise emissions measured using the  $L_{eq}$  descriptor not exceed the background noise level by more than 5 dB(A).

Receiver	Time of day	Background Noise Level dB(A)L <sub>90(Period)</sub>	Intrusiveness Criteria (Background + 5dB(A)L <sub>eq(15minute)</sub> )
	Day (7:00am-6:00pm)	55	60
R1 Residential	Evening (6:00pm-10:00pm)	50	55
	Night (10:00pm-7:00am)	39	44

### Table 3 – NPfl Intrusiveness Criteria

#### 5.1.2 Amenity Criterion

The guideline is intended to limit the absolute noise level from all noise sources to a level that is consistent with the general environment.

The Noise Policy for industry sets out acceptable noise levels for various land uses. Table 2.2 on page 11 of the policy has four categories to distinguish different residential areas. They are rural, suburban, urban and urban/industrial interface.

For the purposes of this assessment, AL will assess noise emissions in accordance with the 'Urban' category.

Type of Receiver	Time of day	Recommended Project Acceptable Noise Level dB(A)L <sub>eq(15-minutes)</sub>
	Day (7:00am-6:00pm)	58
Residential (Urban)	Evening (6:00pm-10:00pm)	48
	Night (10:00pm-7:00am)	43

# Table 4 – NPfl Project Amenity Criteria

## 5.1.2.1 Sleep Disturbance (Maximum Noise Level Event Assessment)

The potential for sleep disturbance from maximum noise level events from premises during the night-time period must be considered as the proposed operation extends into night-time hours. Sleep disturbance is considered to be both awakenings and disturbance to sleep stages. Where the subject development night-time noise levels at a residential location exceed:

- Leq(15min) 40dB(A) or the prevailing RBL plus 5dB, whichever is greater, and/or
- LAF(max) 52dB(A) or the prevailing RBL plus 15dB, whichever is greater,

A detailed maximum noise level event assessment should be undertaken.

# Table 5 - Sleep Arousal Emergence Criteria (Night)

Location	Rating Background Noise Level Night (10:00pm – 7:00am) - dB(A)L <sub>90</sub>	Emergence Level
All Potentially Affected Residential Receivers	39	44 dB(A)L <sub>eq, 15min</sub> ; 54 dB(A)L <sub>max, F</sub>

The detailed assessment should cover the maximum noise level, the extent to which the maximum noise level exceeds the rating background noise level, and the number of times this happens during the night period.

#### 5.2 SUMMARISED NOISE EMISSION CRITERIA

Receiver	Time Period	Assessment Background Noise Level dB(A)L <sub>90</sub>	Project Amenity Criteria dB(A) L <sub>eq</sub>	Intrusiveness Criteria dB(A)L <sub>eq(15min)</sub>	Sleeping Disturbance
	Day (7:00am- 6:00pm)	55	58	60	N/A
R1 Residential (Urban)	Evening (6:00pm- 10:00pm)	50	48	55	N/A
	Night (10:00pm- 7:00am)	39	43	44	44 dB(A)L <sub>eq, 15min</sub> ; <b>54 dB(A)L<sub>max, F</sub></b>

## Table 5 – EPA NPfl Project Noise Emission Criteria

## 5.3 NSW LIQUOR AND GAMING

When assessing noise emissions from licensed premises, noise emissions must comply with the acoustic requirements generally imposed by the NSW LG. These guidelines relate to noise generated by patrons and by music. The requirements are set out below:

- The L<sub>10</sub> noise level emitted from the premises shall not exceed 5dB above the background L<sub>90</sub> sound level in any Octave Band Centre Frequency (31.5kHz to 8kHz inclusive) between the hours of 7.00am to 12.00 midnight when assessed at the boundary of the nearest affected residential premises.
- L<sub>10</sub> noise level emitted from the premises shall not exceed the background L<sub>90</sub> sound level in any Octave Band Centre Frequency (31.5kHz to 8kHz inclusive) after midnight when assessed at the boundary of the nearest affected residential premises.
- After midnight, noise emissions from the Place of Public Entertainment are to be inaudible within any habitable rooms in nearby residential properties.

The following assessment criterion has been determined based on measured noise levels. This applies when measured outside the open window of a residential facade.

The most sensitive period during operation will be between 10:00pm – 11:00am when ambient noise environment are lowest..

Time	31.5Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	A-wt
10:00pm to 11:00pm	56	56	52	49	47	46	42	37	30	50
BG+5	50	50	52	43	77	40	72	57	50	50

# Table 6 – Noise Emission Objectives Criterion (dB(A) L<sub>10,15min</sub>)

## 6 NOISE EMISSION ASSESSMENT

#### 6.1 PATRON AND MUSIC NOISE ASSESSMENT

Noise emissions from the use of the tenancy will be from a combination of music and patron noise activity.

Predicted noise levels are assessed under the following assumptions:

- Venue is at capacity of 50 patrons.
- Dining areas are fully occupied during the proposed hours (7:00am-11:00pm).
- Entry roller door is assumed fully open up to 10pm and closed from 10pm.
- After 10pm, venue access will be via adjacent hinged door. This is to remain closed excepting patron ingress/egress.
- The average sound power per patron is 77dB(A)L<sub>10</sub>, with 1 in 2 patrons speaking concurrently (raised voice).
- A typical sound spectrum of a patron as follows:

## Table 7 – Patron Noise Sound Level Spectrum (dB(A) L<sub>10,15min</sub>)

Noise Source	31.5Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	A-wt
Raised Voice	62	62	70	70	76	73	68	59	47	77

- A house music system plays background music at 70dB(A)L<sub>10</sub> up to 11:00pm
- A typical music sound spectrum is as follows:

# Table 8 - Music Noise Sound Level Spectrum (dB(A) L<sub>10,15min</sub>)

Noise Source	31.5Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	A- wt
Music – Background	75	75	77	71	66	63	62	58	57	70

#### 6.1.1 Predicted Noise Emissions to Residential Receivers

Noise levels are predicted to outside nearest residential bedroom window during the quietest times of operation. Satisfactory noise levels achieved here will also comply at all other affected residential locations.

Noise level predictions below assume treatments and management controls outlined in section 7 of this report have been implemented.

Location	31.5Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	A-wt
Predicted Noise Levels dB L <sub>10</sub>	45	45	48	46	48	49	44	36	28	52
Criteria dB L <sub>10</sub>	60	60	56	54	52	51	46	41	34	55
Compliance	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A

## Table 5 - Predicted Noise Emission –Receiver 1 (R1) –6:00pm-10:00pm (Roller Door Open)

# Table 5 - Predicted Noise Emission –Receiver 1 (R1) –10:00pm-11:00pm (Roller Door Closed)

Location	31.5Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	A-wt
Predicted Noise Levels dB L <sub>10</sub>	45	45	39	44	40	34	25	14	45	44
Criteria dB L <sub>10</sub>	56	56	52	49	47	46	42	37	30	50
Compliance	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A

## 6.2 MECHANICAL PLANT NOISE EMISSION ASSESSMENT

Newly proposed plant consists of a single kitchen exhaust fan. This is to be installed to the rear of the project site in location indicated by Figure 1.

Figure 2 below provides a sectional detail which shows the exhaust fan will be installed at a maximum height of 1.5m above car park level, below the height of the bounding parapet.



#### Figure 2 – KEF Location (taken from Ace Ventilation mechanical services layouts)

Plant noise data provided to us specifies a sound pressure level of 55dB(A) when measured at 3m.

Based on the above, no additional treatments are required to satisfy NPfl requirements during operational hours.

If additional mechanical plant is proposed at a later stage, an acoustic assessment is to be undertaken prior to installation to maintain compliance with requirements outlined in section 5.

# 7 MANAGEMENT CONTROLS

The following management controls are provided to ensure compliance with the requirements of NSW Liquor and Gaming as well as NSW Environmental Protection Authority (EPA) document – '*Noise Policy for Industry (NPfl)* 2017' noise emission criteria.

- Venue capacity of 50 patrons is not to be exceeded.
- Venue not to operate outside of approved hours (i.e. after 11pm).
- Entry roller door is to remain closed after 10pm.
- Management to ensure that patrons depart the premises in a prompt and orderly manner at closing times.

Music sound pressure levels within general restaurant areas are to be controlled as follows:

• Up to 70dB(A) L<sub>10</sub> uniform sound pressure level during operational hours.

# 8 CONCLUSION

Acoustic Logic has assessed noise impacts from the proposed operation of Pocket Pizza at Unit 2, 1 Sydenham Road, Brookvale.

Provided that the recommendations in section 7of this report are adopted, noise emissions will comply with the requirements of Liquor and Gaming for licenced venues, as well as NSW EPA document Noise Policy for Industry 2017.

We trust this information is satisfactory. Please contact us should you have any further queries.

Yours faithfully,

Acoustic Logic Pty Ltd Hyde Deng

**APPENDIX A – UNATTENDED NOISE MONITORING DATA** 











