PENINSULAR
ACOUSTICS

The Swan Clitheroe Limited

THE SWAN INN, CLITHEROE

Noise Impact Assessment

Swan & Royal

PUBLIC

The Swan Clitheroe Limited

THE SWAN INN, CLITHEROE

Noise Impact Assessment

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1. Introduction

1.1. Purpose

Peninsular Acoustics Limited has been commissioned by The Swan Clitheroe Limited [the Client], to provide a Noise Impact Assessment to consider the impact from a new restaurant and bar proposed within the existing premises at The Swan Inn, Clitheroe [the Site].

This report is necessarily technical in nature and to assist the reader, an acoustic glossary is provided in Appendix A.

1.2. Site Description

Existing Site

The Site is bound to the north by the existing pub courtyard, to the immediate east by existing dwellings (no. 52a and 54a Lowergate, Clitheroe), to the south by the Lowergate car park and is adjoined to existing pub buildings to the west.

Figure 1: Site Plan

The nearest noise-sensitive receptors are 52a and 54a Lowergate, Clitheroe. There are other residential properties nearby, but they are likely to be less affected by any noise produced by the proposed use.

Development Proposals

It is proposed to refurbish the pub to provide a revised internal layout, extend to the south side to enclose what was a side path and small side garden, to incorporate a covered seated / smoking area.

The premises is proposed to be open 12pm till midnight, although the outdoor seating area will only be used up till 11pm. It is proposed to install 2 no. new extract fans for the male and female toilets, which exhaust to the south façade. It is proposed to cover the seating area, with a material to be defined based on this assessment.

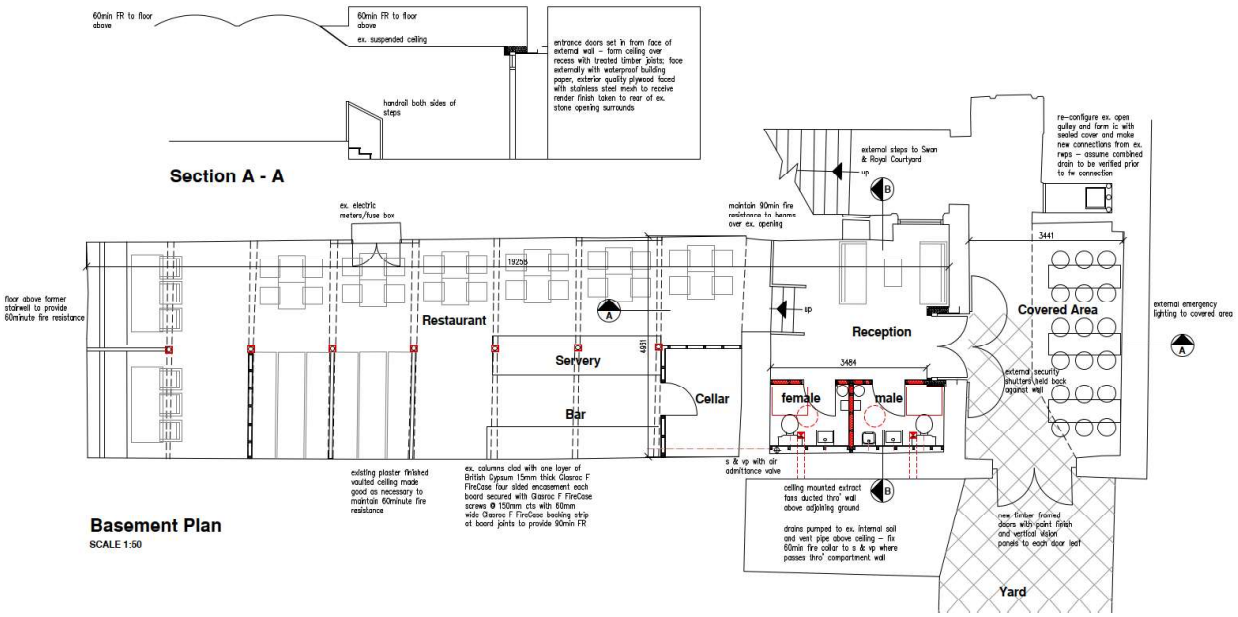


Figure 2: Proposed Layout

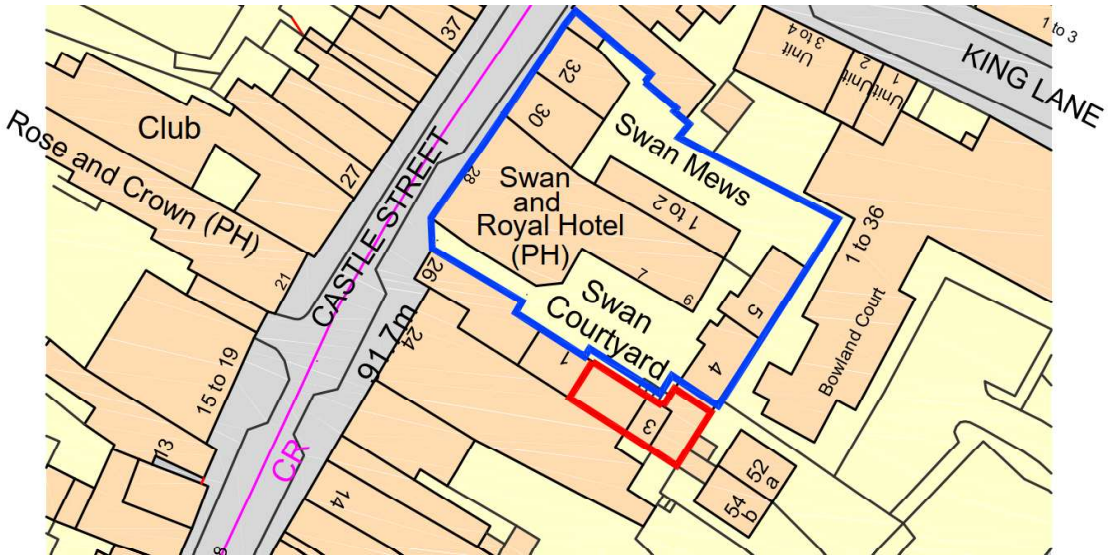


Figure 3: Location Plan

1.3. Scope of Works

The alterations are not expected to change the car park activity from those prevalent previously.

It is proposed to incorporate low-level ambient music inside the restaurant. Live music is not proposed and there are no proposals for outdoor loudspeakers.

The following scope of works has been undertaken:

- Undertake a noise survey to establish prevailing conditions;
- Consider the impact from internal music noise
- Consider the impact from use of the outdoor smoking / seating area
- Advise on mitigation
- Provide a technical report

2. Standards and Guidance Documents

In 2005, the Department for Environment, Food and Rural Affairs (DEFRA) commissioned a report which considered noise from pubs and clubs. In summary, the paper reviewed the IOA Guide[1], BS 4142[2], the Noise Council Code of Practice[3] guide, subjective criterion through the concept of 'inaudibility', Noise Rating (NR) curve criteria and low-frequency research provided by Moorhouse et al[4]. In summary, the document confirms there is not one perfect assessment protocol for understanding potential impacts from entertainment noise and that a combination of all of the above might be suitable with a holistic approach applied to decision making.

2.1. The IOA Guide

'The IOA Guide' is a document produced by an IOA working group formed in the late 1990's to produce guidance on the control of noise from pubs and clubs. Unfortunately, the group was unable to agree on objective criteria. However, suggested criteria from the working group was published in the acoustics bulletin in 2003 and is replicated in

Operations	Suggested Criteria	Outcome if Criteria Met
Entertainment < 30 times per year	$L_{Aeq,15min}$ (EN) should not exceed $L_{A90,T}$ (WEN) by more than 5 dB.	EN will generally be audibly but not overly intrusive **inside** the noise sensitive property.
Entertainment > 30 times per year and finishes before 23:00	$L_{Aeq,15min}$ (EN) should not exceed $L_{A90,T}$ (WEN) by more than 5 dB; and $L_{10,15min}$ (EN) should not exceed $L_{90,T}$ (WEN) by more than 5 dB in any 1/3rd octave band between 40 Hz and 160 Hz	EN will generally be audible but not overlly intrusive **outside** the noise sensitive property.
Entertainment > 30 times per year and continues beyond 23:00	$L_{Aeq,15min}$ (EN) should not exceed $L_{A90,T}$ (WEN); and $L_{10,15min}$ (EN) should not exceed $L_{90,T}$ (WEN) in any 1/3rd octave band between 40 Hz and 160 Hz	EN will be virtually inaudible inside the noise sensitive property.
EN: Entertainment noise level; WEN: Representative background noise level without entertainment noise.		

Table 1: IOA Guide Criteria

[1] The Institute of Acoustics Good Practice Guide on Noise from Pubs and Clubs
[2] BS 4142:2014 +A1:2019 *'Methods for rating and assessing industrial and commercial sound.'*
[3] *'Code of Practice on Environmental Noise Control at Concerts'*, The Noise Council, 1995.
[4] Waddington, David & Adams, Mags & Moorhouse, Andy. (2005). *Proposed criteria for the assessment of low frequency noise disturbance.*

Often the L_{10} exceeds the L_{90} even without entertainment noise and therefore, this comparison is often not accurate or representative of potential disturbance from entertainment events.

Additionally, in the DEFRA report, the IOA 1/3rd octave exceedance criteria were considered alongside other metrics and were found to have a low correlation with subjective response, with Absolute $L_{Aeq,5m}$ and the IOA relative ($L_{Aeq,T} - L_{A90,T}$) having far greater correlation.

For further reference, the noise metric judged in the DEFRA research to have greatest correlation with subjective response was the internal absolute $L_{Aeq,T}$, with the resultant typical impact presented as a scale below (Table 4 of the DEFRA document):

Table 4 - Semantic descriptor and associated value of acceptability

Semantic descriptor	Score	Absolute $L_{Aeq,5\ minutes}$
Clearly acceptable	1	17.0
	2	20.4
	3	23.8
	4	27.2
Just acceptable	5	30.6
Just unacceptable	6	34.0
	7	37.4
	8	40.8
	9	44.2
Clearly unacceptable	10	47.5

From this evidence (and the additional information in the report), an absolute level of <25 dB $L_{Aeq,5min}$ from entertainment sound is considered most likely to represent acceptable conditions.

However, as stated by Manchester City Council (MCC):

> *When considering the potential impact of a proposal for an entertainment venue, consultants should consider the overall noise level (LAeq) and the 63 Hz and 125 Hz octave band noise levels (Leq). Music noise in the 63 Hz and 125 Hz octave bands, often described as 'bass noise', is particularly difficult to contain and the impulsive and non-steady character of low frequency music noise is particularly disturbing for local residents exposed to it.*

The noise guidance by MCC references the Moorhouse reference curve (NANR45) between 10 and 160 Hz, and correctly identifies that sound insulation performance data over these frequencies is not common. For the assessment of low frequency music noise, it is more practical to consider the 63 Hz and 125 Hz octave bands. The Noise Council's Code of Practice (1995) on 'Environmental Noise Control at Concerts' suggests limits on both these octave bands.

It is therefore proposed to satisfy the IOA Guide Criteria by basing the assessment using the 63 Hz and 125 Hz octave bands in place of the IOA Guide requirement between 10 Hz and 160 Hz.

3. Environmental Noise Survey

3.1. Methodology

An unattended noise survey of the current prevailing conditions was undertaken at the rear of the Site between Friday 26th June and Monday 29th June 2026.

A sound level meter (SLM) was installed within the internal courtyard of the Swan pub at a height of 4m above ground and 1m from the façade, as shown below.

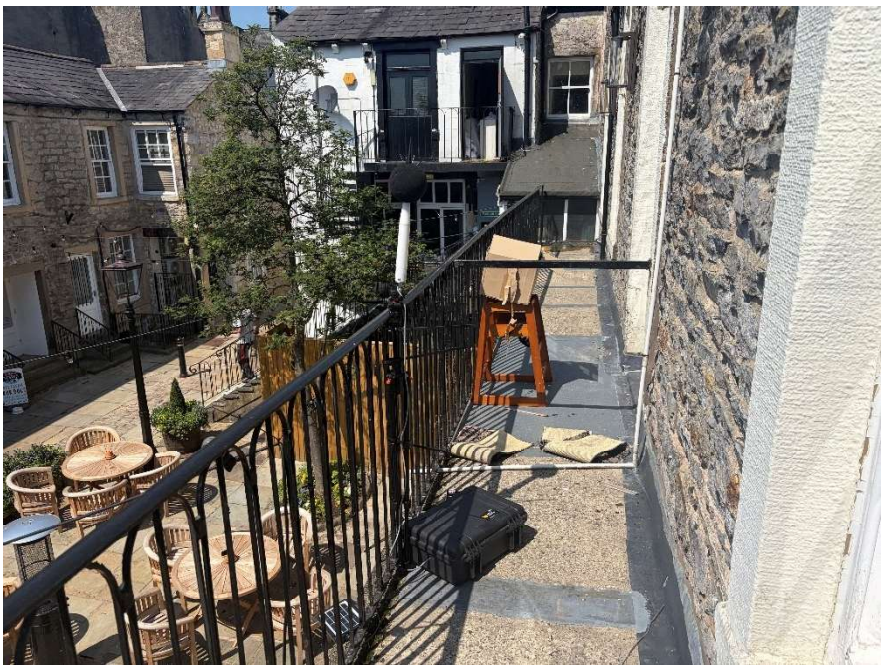


Photo 1: Showing Sound Level Meter Position

The above measurement position is marked as LT1 on Figure 1.

3.2. Equipment

Sound levels were measured using Class 1 SLMs housed in environmental protection apparatus. Each SLM was field calibrated before and after the survey using a Class 1 calibrator, with no significant drift in calibration levels recorded (> ± 0.5dB).

Full details of the noise measurement equipment used are available upon request but have been calibrated to traceable standards within the 12 – 24 months prior to the survey being undertaken.

3.3. Observations

3.3.1. Meteorological Conditions

During the survey, weather conditions were monitored which showed steady state wind speeds of less than 5 m/s. Additionally, there was no precipitation during the full length of the survey meaning all results are suitable for assessment purposes.

3.3.2. Site Survey Notes

Sounds audible on installation and collection comprised occasional road traffic and general pedestrian sounds. Additionally, existing plant was noted to be contributing to the acoustic environment, including a kitchen extract fan serving the Swan pub and an air conditioning unit on the end of the balcony on which the sound level meter was located. The location of these plant items are shown below.

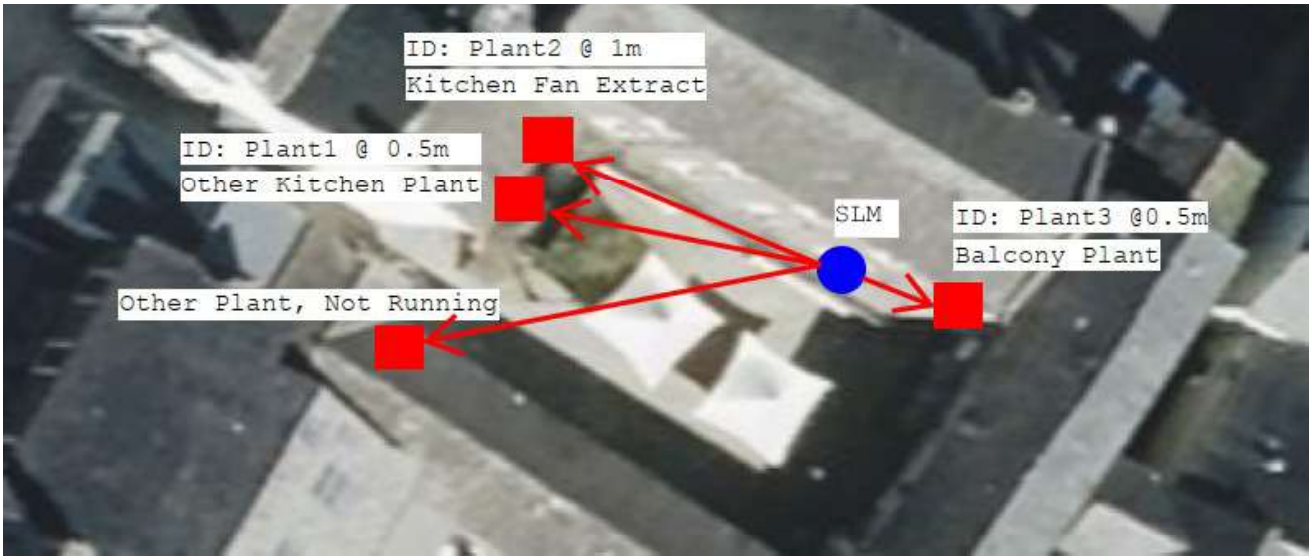


Figure 4: Identified Existing Plant

3.4. Results

The typical measured noise levels across the survey are provided in Table 2, corrected to free-field sound levels by subtraction of 3 dB.

Position	Daytime 07 :00 – 23 :00 (dB)				Night-time 23 :00 – 07 :00 (dB)			
	$L_{Aeq,\ 16hr}$	$L_{A90,16hr}$	$L_{90,16hr}$ @ 63 Hz	$L_{90,16hr}$ @ 125 Hz	$L_{Aeq,\ 8hr}$	$L_{A90,8hr}$	$L_{90,8hr}$ @ 63 Hz	$L_{90,8hr}$ @ 125 Hz
LT1	60	51	55	56	50	47	50	52

Table 2: Summary of Measured Sound Levels, LT1

Time histories are provided in Appendix C.

Despite the effect from existing plant, the measurements are considered to be broadly representative of conditions at the rear (north-west) facades of the nearest receptors.

4. Impact Assessment

4.1. Assessment Assumptions

Predictions have been undertaken both internal restaurant sound emanating from the façade and of patron use in the covered outdoor seating area. The calculations assume the following:

- No significant sound breakout will occur via the solid masonry façade
- The only sound breakout will be via the doors / covered area
- Based on the proposed used of the outdoor seating area and hours of operation for the restaurant, only daytime noise (till 23:00 hours) has been considered

The following internal noise levels have been used to represent typical low-level music noise levels inside a restaurant, taken from Peninsular Acoustics library data.

Source	Sound Pressure Level (dB) at Octave band Centre Frequency (Hz)								$L_{Aeq,T}$ (dB)
	63	125	250	500	1k	2k	4k	8k	
Inside Restaurant	72	74	71	75	74	69	61	52	77

Table 3: Restaurant Noise Levels

For noise in the covered outdoor seating area, findings of research[5] undertaken in 2011 have been used to predict the sound levels. There are 18 seats and as a worst case it has been assumed all people are talking at the same time.

4.2. Entertainment Noise

Prediction of the breakout of internal noise to the receptor has been based on the methodology outlined in BS EN 12354-4[6]. Sound emanating from within the restaurant has to first travel into the reception area then via the covered seating area and consequently will be subject to considerable sound reduction (3dB lower in the reception and a further 20 dB lower via the seating area).

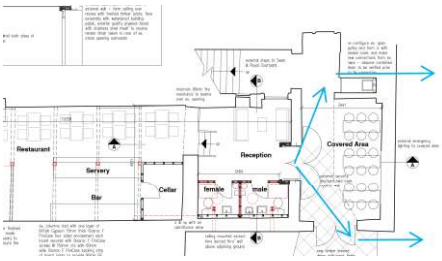


Figure 5: Restaurant Noise Transmission Path

[5] *Prediction of Noise from Small to Medium Sized Crowds*, M. J. Hayne, J. C. Taylor, R. H. Rumble and D. J. Mee, Paper No. 133, Proceedings of Acoustics 2011, Australia
[6] BS EN 12354-4: 2017 'Building acoustics – Estimation of acoustic performance of buildings from the performance of elements. Part 4: Transmission of indoor sound to the outside'

The predicted restaurant noise levels with music and with the door open and door closed are shown below.

			63	125	250	500	1000	2000	4000	8000	dB(A)	NR
Sound pressure level inside restaurant		dB	72	74	71	75	74	69	61	52	77	
Sound pressure level in reception area, Lp,in		dB	69	71	68	72	71	66	58	49	74	
Via Door												
			63	125	250	500	1000	2000	4000	8000	dB(A)	NR
Diffusivity term for the inside sound field, Cd	-3	dB	-3	-3	-3	-3	-3	-3	-3	-3		
Sound reduction of the segment, R'	**Door open**	dB	0	0	0	0	0	0	0	0		
Width of segment	1.5 m											
Height of segment	2 m											
Area of the segment	3 m2		5	5	5	5	5	5	5	5		
Sound power level of the substitute point source, Lw			71	73	70	74	73	68	60	51		
Directivity correction in the direction of the receptor, Dc	3		3	3	3	3	3	3	3	3		
Distance to receptor	10 m											
Acoustic screening		dB	-6	-7	-8	-10	-13	-15	-18	-21		
Total attenuation from building element to receptor			19	18	17	15	12	10	7	4		
Sound pressure level at receptor, Lp			55	58	56	62	63	61	56	50	65	

Figure 6: Calculation to R1 with Doors Open

			63	125	250	500	1000	2000	4000	8000	dB(A)	NR
Sound pressure level inside restaurant		dB	72	74	71	75	74	69	61	52	77	
Sound pressure level in reception area, Lp,in		dB	69	71	68	72	71	66	58	49	74	
Via Door												
			63	125	250	500	1000	2000	4000	8000	dB(A)	NR
Diffusivity term for the inside sound field, Cd	-3	dB	-3	-3	-3	-3	-3	-3	-3	-3		
Sound reduction of the segment, R'	**solid core wood door with no seals**	dB	12	19	22	26	24	23	20	15		
Width of segment	1.5 m											
Height of segment	2 m											
Area of the segment	3 m2		5	5	5	5	5	5	5	5		
Sound power level of the substitute point source, Lw			59	54	48	48	49	45	40	36		
Directivity correction in the direction of the receptor, Dc	3		3	3	3	3	3	3	3	3		
Distance to receptor	10 m											
Acoustic screening		dB	-6	-7	-8	-10	-13	-15	-18	-21		
Total attenuation from building element to receptor			19	18	17	15	12	10	7	4		
Sound pressure level at receptor, Lp			43	39	34	36	39	38	36	35	43	

Figure 7: Calculation to R1 with Doors Closed

Provided the doors are fitted with automatic closures, the predictions based on doors closed would represent the normal situation. The predictions are compared below, against the adopted criteria.

	Existing Daytime WEN 07:00 – 23:00 (dB)			Proposed Daytime EN 07:00 – 23:00 (dB)		
Position	$L_{A90,T}$	$L_{90,T}$ @ 63 Hz	$L_{90,T}$ @ 125 Hz	$L_{Aeq,15min}$	$L_{90,8hr}$ @ 63 Hz	$L_{90,8hr}$ @ 125 Hz
R1	51	55	56	43 (-8)	43 (-12)	39 (-17)
EN : Entertainment Noise; WEN : Without Entertainment Noise						

Table 4: Entertainment Noise Impact Summary

The predictions provide good confidence of compliance with the IOA Pubs and Clubs criteria and suggest that EN may be virtually inaudible inside the noise sensitive property, provided the following measures are implemented:

- The proposed solid core timber entrance door is closed except when people are entering or exiting; and
- The cover over the outdoor seating area has a minimum mass per unit area 15 kg/m^2.

4.3. Covered Outdoor Seating Area

The windows of the identified noise-sensitive receptor is approximately 5m east of the façade and 7m from the nearest opening into the seating area.

Sound levels with 18 people talking are predicted to be circa. 75 dB $L_{Aeq,15min}$.

With the sound reduction afforded by the built form of the seating area, including the covered roof, noise from the outdoor seating area is predicted to be circa. 38 dB $L_{Aeq,15min}$.

This is significantly lower than the existing daytime $L_{A90,T}$ background sound levels and, therefore, normal use of the covered seating area is not expected to cause any significant noise impact.

5. Noise Management Plan

5.1. Entrance Door Operation

The entrance door to the restaurant shall be fitted with an automatic closure device to manage noise from within the restaurant.

5.2. Outdoor Area Cover

The cover over the outdoor seating area shall comprise a minimum mass per unit area 15 kg/m^2, e.g. two layers 18mm plywood.

5.3. General Noise Management

To ensure that any potential disturbance is appropriately managed, a noise management plan has been developed as shown below:

- **Signage:** Clear and visible signs will be placed at access points to the external area, reminding patrons to be considerate of nearby residents and to keep noise to a minimum.
- **Time Restrictions:** Use of the external area will be restricted so that it is not occupied after 23:00 hours, avoiding night-time periods when background noise levels are lower.
- **Staff Oversight:** During operating hours, staff should monitor the external area to ensure patrons are behaving responsibly and noise levels remain reasonable.
- **Capacity Control:** The number of patrons allowed in the covered outdoor seating area at any one time may be limited to reduce cumulative noise impact.
- **No Amplified Sound:** No amplified music will be permitted in the external area.
- **External Doors:** Doors should remain closed with self-closing devices installed to limit the door opening time and eliminate door slams.
- **Periodic Review:** The effectiveness of these measures will be reviewed regularly, and adjustments made as necessary to ensure continued safeguarding of residential amenity.

Given the infrequent use and small occupant numbers in the outdoor area, coupled with judicious management of external noise, the noise impact is not deemed significant, and any potential adverse impacts have been mitigated and minimised.

6. Conclusions

Peninsular Acoustics Limited has been commissioned by The Swan Clitheroe Limited, to provide a Noise Impact Assessment to consider the impact from a new restaurant and bar proposed within the existing premises at The Swan Inn, Clitheroe.

External noise breakout has been deemed to not exceed criteria.

A noise management plan has been developed in Section 5, outlining operational controls and mitigation measures, such as, signage, time restrictions, and staff oversight to minimise potential disturbance and ensure responsible use of the external area as well as consideration of a canopy.

The report demonstrates that the proposed criteria has been achieved for good acoustic performance, provided the detailed noise management measures are maintained.

Limitations applicable to this report are contained within Appendix C.

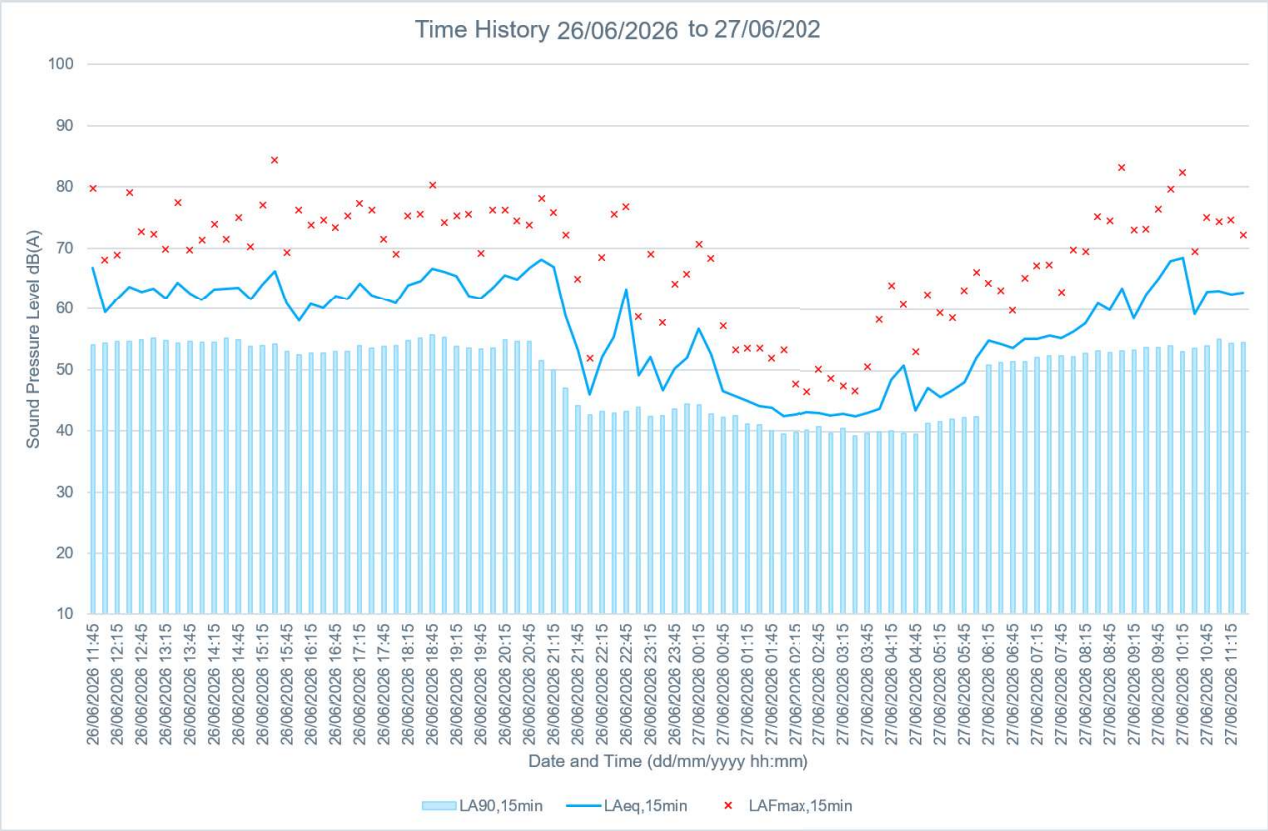
Appendix A

TECHNICAL TERMINOLOGY

Noise	Typically defined as unwanted, unpleasant or disturbing sound
Frequency (Hz)	The number of oscillations in acoustic pressure per second. It represents the 'tone' of the sound. Often determined in octave bands
Equivalent continuous sound pressure level ($L_{eq,T}$)	The average of the total sound energy over a specified time period (T). L_{eq} represents the equivalent sound level that a fluctuating source would have compared to a steady source with the same total sound energy over a specific time period. Commonly used as a descriptor of human perception of sound over time.
'A' weighting	Frequency-dependent weighting based on the response of the human auditory system which has been found to correlate well with the subjective response to sound. Denoted by the use of the letter 'A'. For example, dBA denotes an 'A' weighted sound level in decibels, or L_{Amax} denotes an 'A' weighted maximum sound pressure level.
Internal Ambient Noise Level (IANL)	The noise level within a room or enclosed space. Usually determined as an equivalent continuous sound pressure level over a specific time period ($L_{Aeq,T}$, dB)
Façade level	The sound pressure level measured close to a building façade that includes contribution from both the incident sound and the sound reflected from the façade. Normally taken to be 3dB higher than the equivalent free-field level, when located at 1 metre from a façade.
Free-field level	A measured sound pressure level that is independent of any contributions due to reflections from nearby surfaces and is therefore representative of the direct path only.
R / R_w	The laboratory tested airborne sound insulation of a building element
Sound insulation	The capacity of a structure to prevent sound from reaching a receiving location. Sound energy is not necessarily absorbed; impedance mismatch, or reflection back toward the source, is often the principal mechanism

Appendix B

TIME HISTORIES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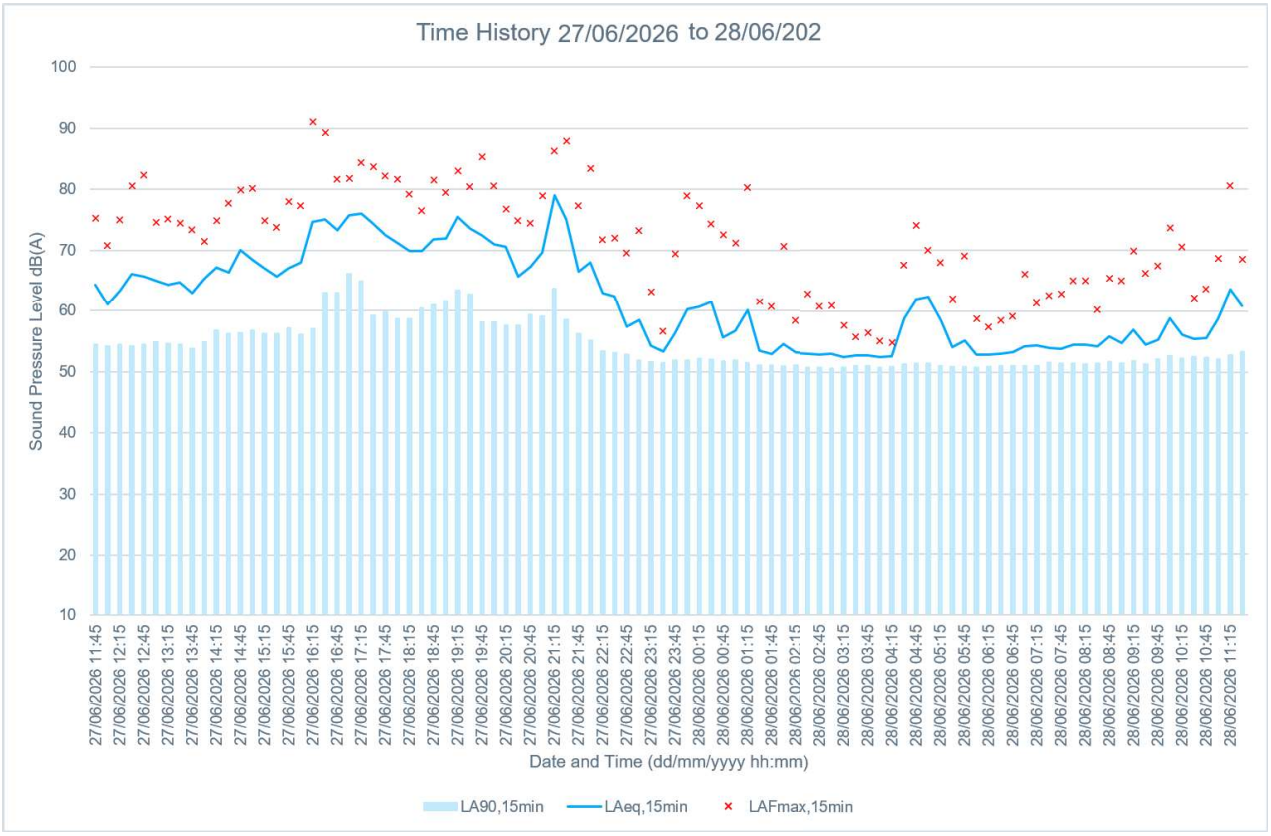
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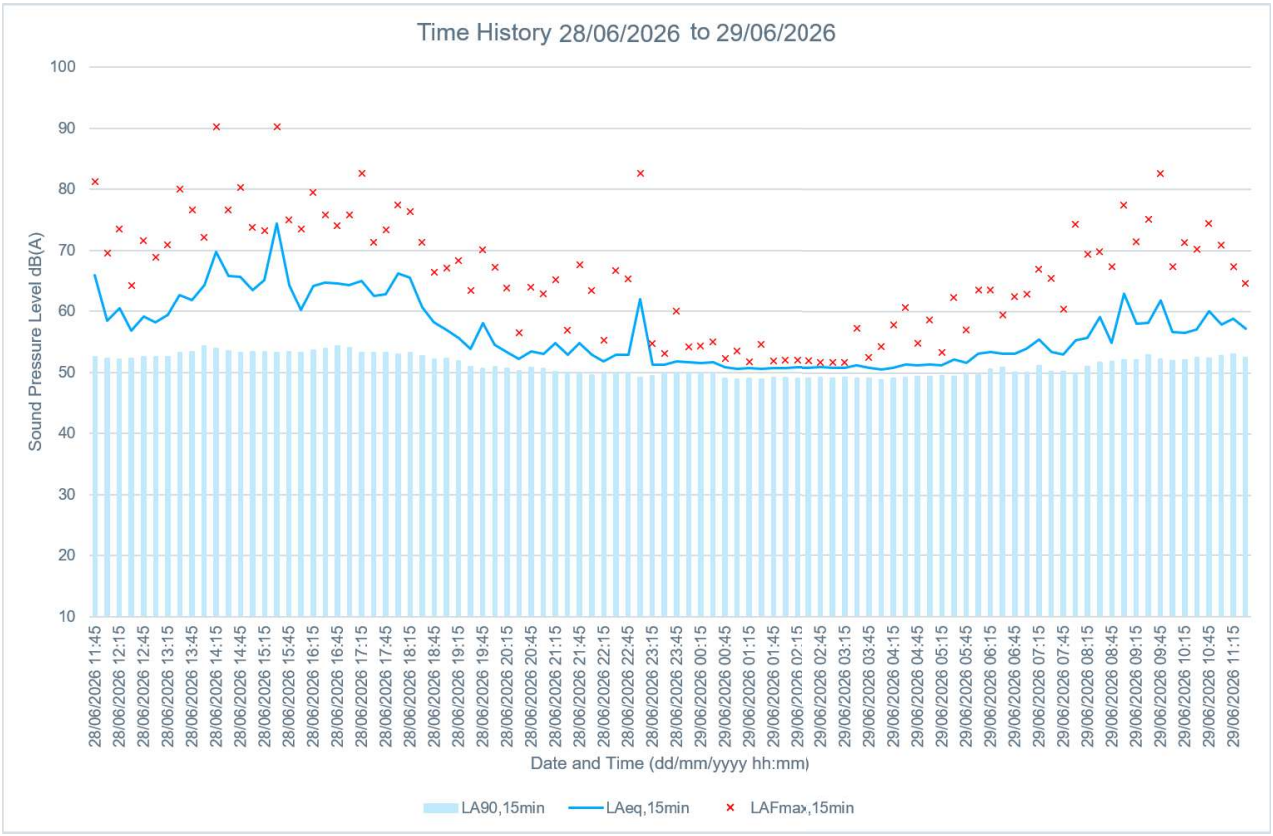
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29/06/2026 03:15
29/06/2026 03:45
29/06/2026 04:15
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29/06/2026 05:45
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29/06/2026 07:45
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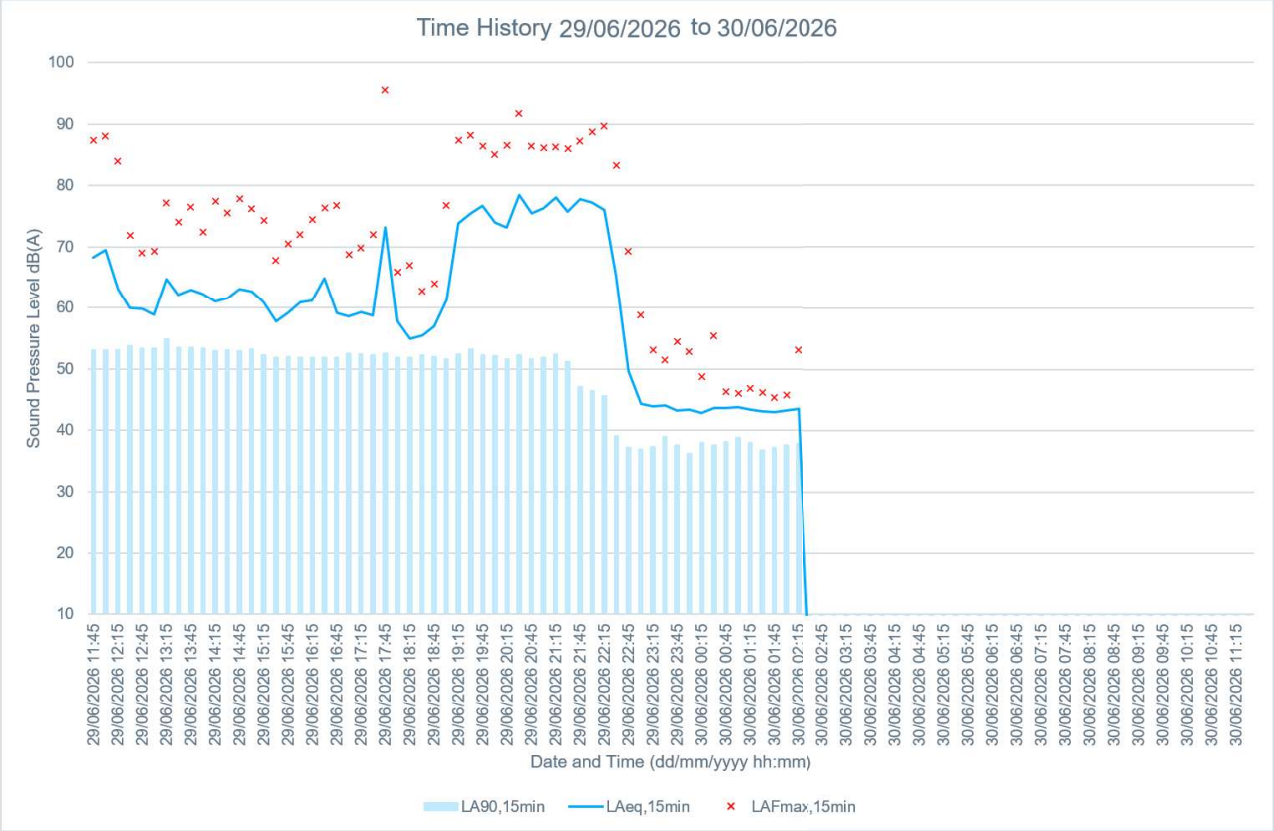
29/06/2026 09:15
29/06/2026 09:45
29/06/2026 10:15
29/06/2026 10:45
29/06/2026 11:15
Date and Time (dd/mm/yyyy hh:mm)
LA90,15min
LAeq,15min
LAFmax,15min


Time History 29/06/2026 to 30/06/2026
Sound Pressure Level dB(A)
100
90
80
70
60
50
40
30
20
10
29/06/2026 11:45
29/06/2026 12:15
29/06/2026 12:45
29/06/2026 13:15
29/06/2026 13:45
29/06/2026 14:15
29/06/2026 14:45
29/06/2026 15:15
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30/06/2026 08:45
30/06/2026 09:15
30/06/2026 09:45
30/06/2026 10:15
30/06/2026 10:45
30/06/2026 11:15
Date and Time (dd/mm/yyyy hh:mm)
LA90,15min
LAeq,15min
LAFmax,15min

Appendix C

REPORT LIMITATIONS

This report has been prepared for the titled project or named part thereof and should not be used in whole or part and relied upon for any other project without the written authorisation of Peninsular Acoustics Limited. Peninsular Acoustics Limited accept no responsibility or liability for the consequences of this document if it is used for a purpose other than that for which it was commissioned. Persons wishing to use or rely upon this report for other purposes must seek written authority to do so from the owner of this report and/ or Peninsular Acoustics Limited and agree to indemnify Peninsular Acoustics Limited for any and all loss or damage resulting therefrom. Peninsular Acoustics Limited accepts no responsibility or liability for this document to any other party other than the person by whom it was commissioned.

The findings and opinions expressed are relevant to the dates of the site works and design drawings/specifications and should not be relied upon to represent conditions at substantially later dates. Opinions included therein are based on information gathered during the study and from our experience. If additional information becomes available which may affect our comments, conclusions or recommendations Peninsular Acoustics Limited reserve the right to review the information, reassess any new potential concerns and modify our opinions accordingly.

Swan & Royal

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