

NOISE IMPACT ASSESSMENT
OF REAR FUNCTION ROOM
AND ROOF TERRACE AT
THE SUNNY HILL PUB,
VICTORIA ROAD
WHITEHAVEN,
CA28 6AB

23rd September 2026

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1.0 Introduction

- 1.0.1 This report has been commissioned to determine the noise impact of the addition of a function room and rooftop terrace in the existing beer garden area at The Sunny Hill Pub, Victoria Rd, Whitehaven CA28 6AB.
- 1.0.2 The assessment has been conducted in line with the IOA Good Practice Guide on the Control of Noise from Pubs and Clubs 2003 as the most appropriate assessment methodology.

2.0 Site Details

- 2.0.1 The site is located in a triangular section of land between Victoria Road and the Loop Road South in Whitehaven, Cumbria.
- 2.0.2 The pub has been in existence in its current form since 2009 when the current owners became custodians of the building and added indoor play areas and the beer garden to the rear. It has been noted that environmental health state in their assessment of the application that "Environmental Health has not received any complaints recently about this premises and, as such, do not object to this proposed development."
- 2.0.3 The area is surrounded by residential properties. The closest Noise Sensitive Receptors (NSRs) have been identified on the map shown in figure 3. Each of these are a similar distance from the proposed noise source and will be assessed as part of this report.
- 2.0.4 A background noise assessment was conducted on site to ascertain the existing noise climate for the surrounding residential properties.

2.1 Location of Monitors

- 2.1.1 The noise location was chosen based on the proximity to the closest NSR. This

Figure 1a & 1b – Front Area



Figure 2 – Rear/Beer

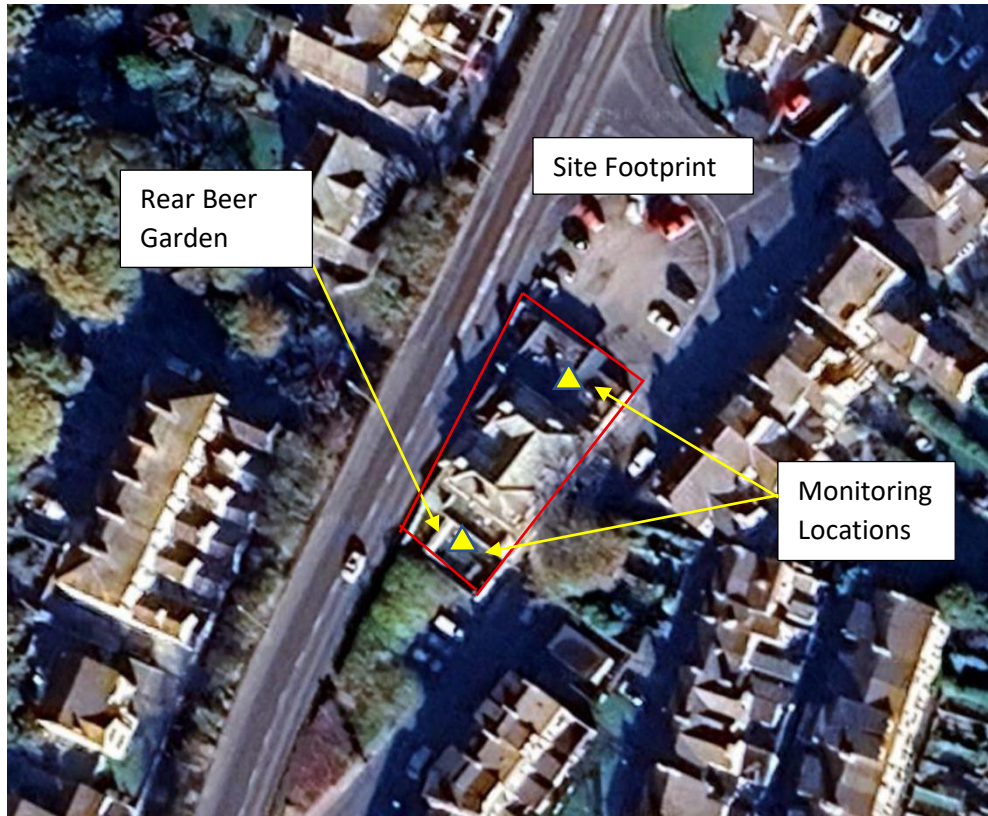


Garden/Rooft Terrace

- 2.1.2 Measurements were made in 5 minute periods, on 1 second averaging, to allow for the removal of anomalies and increased accuracy. The data was averaged into L_{Aeq1hr} daytime and $L_{Aeq15min}$ night-time with data also recorded for L_{Amax} in both day and night periods for the BS4142:2014 and the IOA Good Practice Guide on the Control of Noise from Pubs and Clubs 2003.
- 2.1.3 The monitoring was conducted using 2 x Type 1 NTi XL2 sound level meters with batteries and outdoor microphone protection.
- 2.1.4 All measurements were taken after a field calibration was undertaken to ensure accuracy and repeatability of measurements. Drift was also checked at the end of the measurements for validation purposes.
- 2.1.5 Further data such as wind speed, wind direction, rainfall intensity, temperature and cloud cover were all recorded at the beginning and end of the assessment at the monitoring location.
- 2.1.6 Any anomalies (such as noise by the engineer during setup and collection of the kit) were removed from the survey for a true reflection of the ambient levels in the vicinity. This was done by recording audio throughout the survey at each location and listening back through the files during the analysis process to confirm what was recorded manually during the survey.

2.2 Plan Views of Site with Designated Work Areas

Figure 3



3.0 Legislation

3.0.1 The National Planning Policy Framework (NPPF) sets out the Government's economic, environmental and social planning policies for England and "these policies articulate the Government's vision of sustainable development." In respect of noise, Paragraph 174 of the NPPF states the following:

"Planning policies and decisions should contribute to and enhance the natural and local environment by:

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution...."

Paragraph 185 goes on to mention:

"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living

conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

- a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;
- b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason;"

3.0.2 The NPPF reinforces the March 2010 DEFRA publication, "Noise Policy Statement for England" (NPSE), which states three policy aims, as follows:

"Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- avoid significant adverse impacts on health and quality of life;
- mitigate and minimise adverse impacts on health and quality of life;
- and where possible, contribute to the improvement of health and quality of life."

3.0.3 Together, the first two aims require that no significant adverse impact should occur and that, where a noise level which falls between a level which represents the lowest observable adverse effect and a level which represents a significant observed adverse effect, then according to the explanatory notes in the statement:

"... all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life whilst also taking into consideration the guiding principles of sustainable development. This does not mean that such effects cannot occur."

3.0.4. It is possible to apply objective standards to the assessment of noise and the effect produced by the introduction of a certain noise source may be determined by several methods, as follows:

- The effect may be determined by reference to guideline noise values. British Standard (BS) 8233:2014 and World Health Organisation (WHO) "Guidelines for Community Noise" contain such guidelines.
- Another method is to compare the resultant noise level against the background noise level (LA90) of the area. This is the method employed by BS 4142:2014 to determine the likelihood of

complaint from noise of an industrial nature. It is best suited to the assessment of steady or pseudo-steady noise.

3.0.5 British Standard 8233:2014 is principally intended to assist in the design of new dwellings; however, the Standard does state that it may be used in the assessment of noise from new sources being brought to existing dwellings.

3.0.6 The WHO guideline values are appropriate to what are termed "critical health effects". This means that the limits are at the lowest noise level that would result in any psychological or physiological effect.

The WHO Community Noise guideline noise values are summarised in the following table:

Table 1

Guidance Document	L _{AeqT}	L _{AMax}	Outcome
World Health Organisation "Community Noise 2000"	55dB		Serious annoyance, daytime and evening. (Continuous noise, outdoor living areas)
	50dB		Moderate annoyance, daytime and evening. (Continuous noise, outdoor living areas).
	35dB		Moderate annoyance, daytime and evening. (Continuous noise, dwellings, indoors)
	30dB		Sleep disturbance, night-time (indoors)
	45dB		Sleep disturbance at night, windows open (Outside Bedrooms)
		60dB	Sleep disturbance, windows open at night. (Noise peaks outside bedrooms, external level).
		45dB	Sleep disturbance at night (Noise peaks inside bedrooms, internal level)

3.1 Local Authority Criteria

3.1.1 Some local councils provide specific details on assessments of this nature. For example, The Planning Noise Advisory Document: Sussex 2021 illustrates the main points and aspirations for planning applications in relation to noise from both a noise sensitive development perspective

and a noise generating source point of view. "The document seeks to complement the Noise Policy Aims set out in the Noise Policy Statement for England (2010) (NPSE). The NPSE aims are to:

- *avoid significant adverse impacts on health and quality of life*
- *mitigate and minimise adverse impacts on health and quality of life, and*
- *where possible, contribute to the improvement of health and quality of life."*

3.1.2 Table 1 of the PNA document 2021 also states the developments that should be subjected to noise reports. The extract below shows that a noise report should have been commissioned for the erection of the neighbouring care home, Amelia Court, in 2009. This would have been expected to consider all noise generating sources around the proposed development including the existing bar/grill.

Table 2

Hotels, guest houses, etc	Maybe	Hotels, guest houses and residential institutions can present a new noise source or receivers. Consequently, a noise report may be required if close to a noise sensitive receptor or a noise source.
Residential institutions: for example care homes, hospitals, nursing homes, residential colleges, secure residential institutions including prisons, secure hospitals etc.	Yes	
		It is the responsibility of the developer to ensure hotel rooms meet appropriate noise standards. However, if the hotel/guest house includes permanent residential accommodation for staff, a noise report is likely to be required.

3.1.3 Section 2 covers the areas referring to the need for and the types of noise report that should be generated:

"2.5.1. For a new noise sensitive development near an existing source of transport noise (road, rail, ports or aircraft) the LAeq (16hr day and 8hr night), should be measured. In addition, suitable shorter term LAeq, LA90, LA10 and LAfmax would be expected in order to give a clearer picture of the existing noise environment.

2.5.2. Where the external LAfmax sound levels are likely to exceed 60 dB during the night period, overnight monitoring will be necessary. A specific LAfmax, 1 minute risk assessment shall be provided for the whole night period. This could also apply to extensions/ alterations to existing development."

3.1.4 Section 4 of the document covers the guidance for entertainment premises. Section 4.3.1 covers the areas that are under most scrutiny when it comes to noise from pubs/clubs/bars etc

- Entertainment noise, for example music

- Patrons accessing (including queuing), using (both internal and external spaces) and leaving the premises. Designated smoking areas can also give rise to noise
 - Fixed plant, for example air conditioning or extraction units
 - Servicing the premises (deliveries and waste management)
- "Sound should be contained within the building structure. The premises should be designed and constructed with an adequate level of insulation so that the noise from music or patrons does not materially impact on the amenity of those living in the surrounding properties."*

- 3.1.5 Section 6.6.2 also refers to an important part of the national guidelines. This is the 'Agent of change' principle that appears in the NPPF 2021. This effectively states that it is important that the new noise sensitive development is properly constructed and design so that noise complaints do not arise from the existing noise generating sources where no change in audibility has occurred.

"Where it is apparent to the LPA that existing noise from an existing industrial, commercial, entertainment premises, places of worship, sports clubs, airfields, airports and sea ports is likely to cause unreasonable or adverse effects to new residents, the development is unlikely to be supported unless the applicant (or 'agent of change') provides clear evidence that adequate noise attenuation to the existing noise sources can and will be provided. The applicant (or 'agent of change') will be required to provide a detailed noise mitigation plan with their acoustic assessment."

3.2 BS4142:2014 +A1 (2019)

- 3.2.1 Noise effects on residential properties due to the current operational hours and extended hours have been assessed according to the guidance in BS 4142:2014. This standard primarily provides a numerical method by which to determine the significance of sound of an industrial nature (i.e. the 'specific sound' from the proposed development) at residential sensitive receptors.
- 3.2.2 The specific sound level may then be corrected for the character of the sound (e.g. perceptibility of tones and/or impulses), if appropriate, and it is then termed the 'rating level', whether or not a rating penalty is applied. The 'residual sound' is defined as the ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound.
- 3.2.3 According to BS 4142:2014, the background sound levels adopted for the assessment should be representative of the periods being assessed. The standard recommends that the background sound level should be collected from continuous measurements of normally not less than 15-

minute intervals. However, the Standard states that there is no 'single' background sound level that can be derived from such measurements. It is particularly difficult to determine what is 'representative' of the night-time period because it can be subject to a wide variation in background sound levels between the shoulder night periods.

- 3.2.4 The method chosen for this section of the report is to use the data collected at the nearest NSR for the day and night periods to provide the ambient and background noise levels. The mode $L_{Aeq_1hr(Day)}$ and $L_{Aeq_15min(Night)}$ value will then be used for each time period over the course of the measurement as the most appropriate way of creating a representative value.
- 3.2.5 The specific sound levels have been determined separately in terms of the L_{Aeq1hr} during the daytime $L_{Aeq15min}$ during the night-time. Daytime is typically between 07:00 and 23:00 hours and night-time is typically between 23:00 and 07:00 hours, so these periods have been adopted for this assessment.
- 3.2.6 At each of the most likely sensitive receptor locations, the rating level has been determined from the predicted specific sound level. Where it has considered it to be appropriate, a rating penalty has been applied for tonality, impulsivity and/or intermittent specific sounds as described in the commentary to paragraph 9.2 of BS4142:2014. This has been applied with consideration for the main sound sources from site that contribute to the level of specific sound at the receptor location.
- 3.2.7 As per the requirements of the standard, an initial estimate of the impact of the specific sound has been obtained by subtracting the measured background sound level from the rating level of the specific sound. Table 3 provides the initial evaluation of impact following this method.

Table 3

Magnitude	Difference Between rating Level and Background Level	Comments
High	+10dB	Significant Adverse impact Likely
Medium	+5 to +10dB	Adverse impact Likely
Low	0 to +5 dB	Adverse impact unlikely
Negligible	Less than 0dB	Adverse impact unlikely
No Change	-10 dB	No adverse impact

3.2.8 Following the initial evaluation of impact, the context of the sound has also been considered, which is a key requirement of the Standard. In evaluation of the context, the following factors have been considered:

- the absolute level of the sound;
- the character and level of the residual sound compared to the character and level of the specific sound and
- the sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions.

3.2.9 Despite the fact that section 1.3 of BS4142:2014 states that entertainment noise is not an intended use for the standard, it is still one of the best methods of assessing this type of noise due to the options of tonality, impulsive and character penalties that can be applied to influence the rating level.

3.3 IOA Good Practice Guide on the Control of Noise from Pubs and Clubs 2003

3.3.1 In the absence on an official standard for the control of noise from Pubs and clubs there have been various studies conducted. One of these was published by the IOA in 2003 and gives general guidelines and advice on measurements, assessment and control of pub noise.

3.3.2 DEFRA also published Phase 1 & 2 reports which form the basis for most current assessments of entertainment noise from pub and clubs with recommendations as to which measure to use for assessments of entertainment noise. This includes specifying that outdoor crowd noise of small gatherings with no music is likely to produce L_{Aeq} values of 65-70dBA.

3.3.3 The IOA Good Practice Guidelines produced a table and assessment methodology to help with assessments of pubs/clubs. This is shown in table 4 below:

Table 4

Event Frequency	Suggested Regulations	Outcome if Criteria Met
Entertainment < 30times/ year	L _{Aeq} , 15mins (EN) should not exceed L _{A90} (WEN) by more than 5dB.	EN will generally be audible but not overly obtrusive inside noise sensitive properties
Entertainment > 30 times/year	L _{Aeq} (EN) should not exceed L _{A90} (WEN) by more than 5dB and the L ₁₀ (EN) should not exceed L ₉₀ (WEN) by more than 5dB in any 1/3 octave band between 40 and 160Hz.	EN will generally be audible but not overly obtrusive inside noise sensitive properties
Entertainment > once/week or continues beyond 2300hrs	L _{Aeq} (EN) should not exceed L ₉₀ (WEN) and L ₁₀ (EN) should not exceed L ₉₀ (WEN) in any 1/3 octave band between 40 and 160Hz	EN will be virtually inaudible inside noise sensitive properties.

EN = Entertainment noise level

WEN – Representative background noise level without entertainment noise

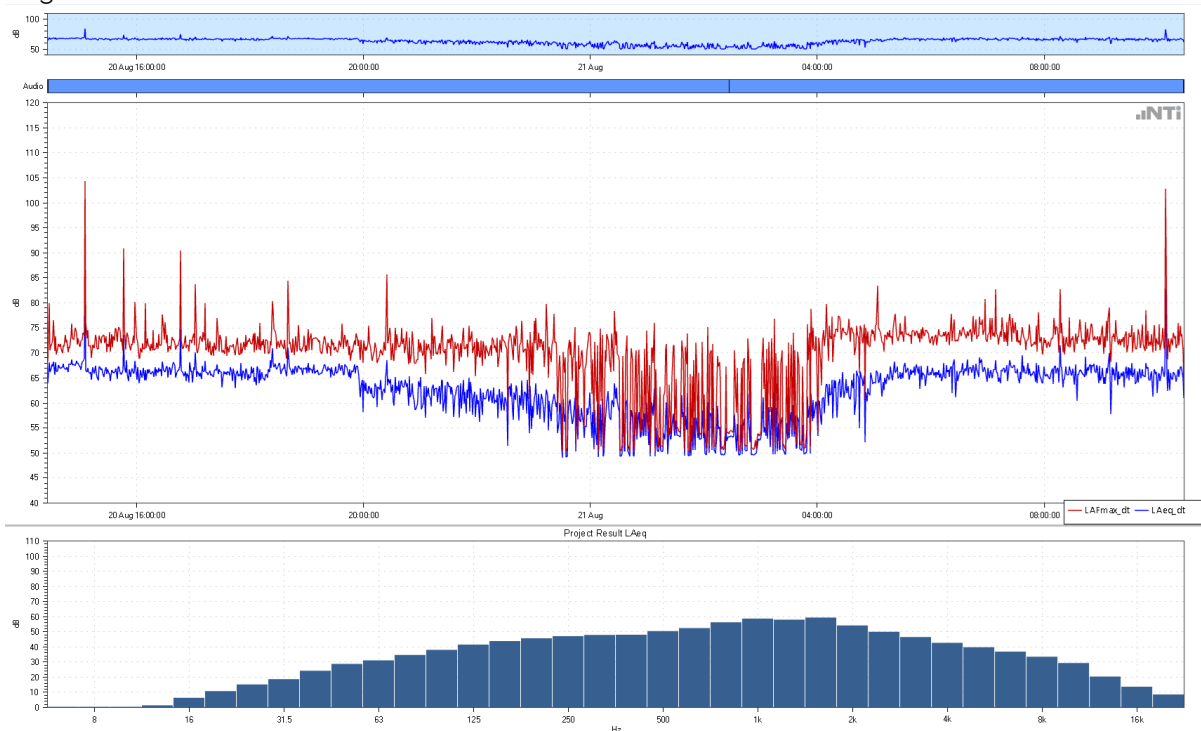
4.0 Results

4.1 – North/Front of Building 14.26pm 20/08/26 – 10.27am 21/08/26

Table 5

Time Period	L _{Amax} (Mode)	L _{Aeq1hr} (Mode)	L _{Aeq15min} (Mode)	L _{A90}
Day (0700-2300)	78.5dBA	65.9dBA		57.9dBA
Night (2300-0700)	75.7dBA		59.6dBA	51.1dBA

Figure 4



Comments

Dominated by traffic noise. Some seagull noise causing spikes close to the microphone

*based on Appendix C

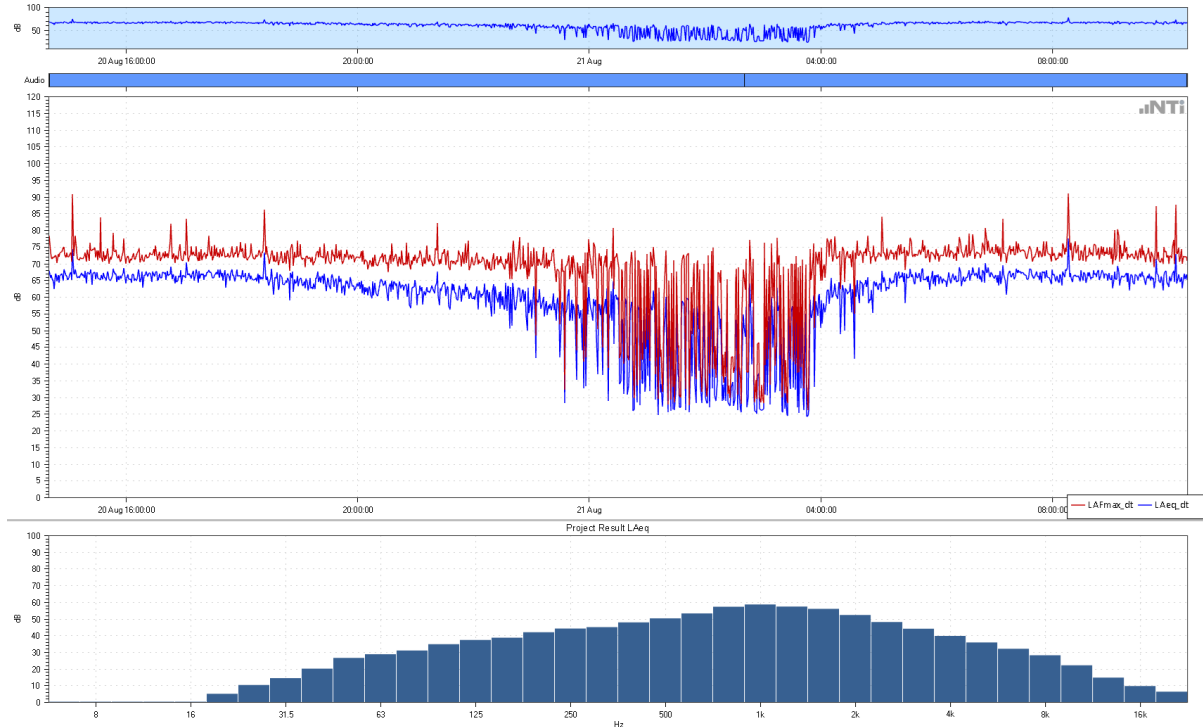
Cloud Cover	Temperature (Celcius)	Presence of fog/snow/ice	Wind Speed (m/s)	Wind Direction
2	23	No	3.1	NE
4	19	No	1.5	ENE

4.2 – Rear/Beer Garden/Function Room 14.40pm 20/08/26 – 10.19am 21/08/26

Table 6

Time Period	L _{Amax} (Mode)	L _{Aeq1hr} (Mode)	L _{Aeq15min} (Mode)	L _{A90}
Day (0700-2300)	78.5dBA	65.3dBA		50.8dBA
Night (2300-0700)	75.7dBA		56.9dBA	33.1dBA

Figure 5



Comments

Dominated by traffic noise. Some seagull noise causing spikes close to the microphone. Very low background levels 1am-5am.

*based on Appendix C

Cloud Cover	Temperature (Celcius)	Presence of fog/snow/ice	Wind Speed (m/s)	Wind Direction
2	23	No	2.5	NE
4	20	No	0.8	ENE

5.0 Analysis of Results

5.1 Data Assessment

- 5.1.1 The main noise levels likely to be introduced to the area is patron noise from the raised balcony/roof terrace area and also any break-out noise from the function room if it is used for weddings, birthday parties, live events etc at any point in the future. Assumptions have been made as to the build of the function room and the likely attenuation from it. The glazing element is still likely to be the weakest area and therefore these are the concentrated areas for noise emission post construction.
- 5.1.2 Assumptions have also been made based on the noise levels likely to be generated within the building. Typical events (DJs, live music etc) where noise levels are at the extreme are likely to generate 85-90dBA internally. This is based on values deference in the DEFRA guidance for internal noise levels. The assumption has been made that modern double-glazing will be installed within the building. Typically this has an attenuation value of Rw 25-30dB. These figures have been used and then entered into a Cadna Noise Modelling assessment map to predict the noise impact on the surrounding Noise Sensitive Receptor (NSR) locations.
- 5.1.3 The secondary part of the assessment is the patron noise from the balcony/roof terrace. As the beer garden is currently in use this shouldn't be too much of a change from the existing weekend noise levels for the area. However, for a robust assessment, the background noise levels were taken mid-week so noise from the beer garden would not be present. The DEFRA noise levels for gatherings of people has then been used on the area as a representative figure for a full beer garden during summer months in particular. The DEFRA report I on pubs and bars stated that small crowds in a venue would be assumed to have a LAeq value of 65-70dB. This figure can then be used to compare to the WHO guidelines for community noise to get a better perspective on the likelihood of noise nuisance being generated. This has been entered into the CadnaA noise model for the balcony area and then the noise levels predicted on the surrounding NSRs.
- 5.1.4 Figure 6 shows the 2D map of the area with the predicted noise impact levels on the surrounding NSRs. This is based on a function breakout noise through the glazing area of 60dB (assuming 85dBA internally with double-glazed windows and ventilation performing to at least Rw25. Figure 7 then shows the 3D modelled view of the area.

Figure 6 – 2D Noise impact map showing highest façade levels

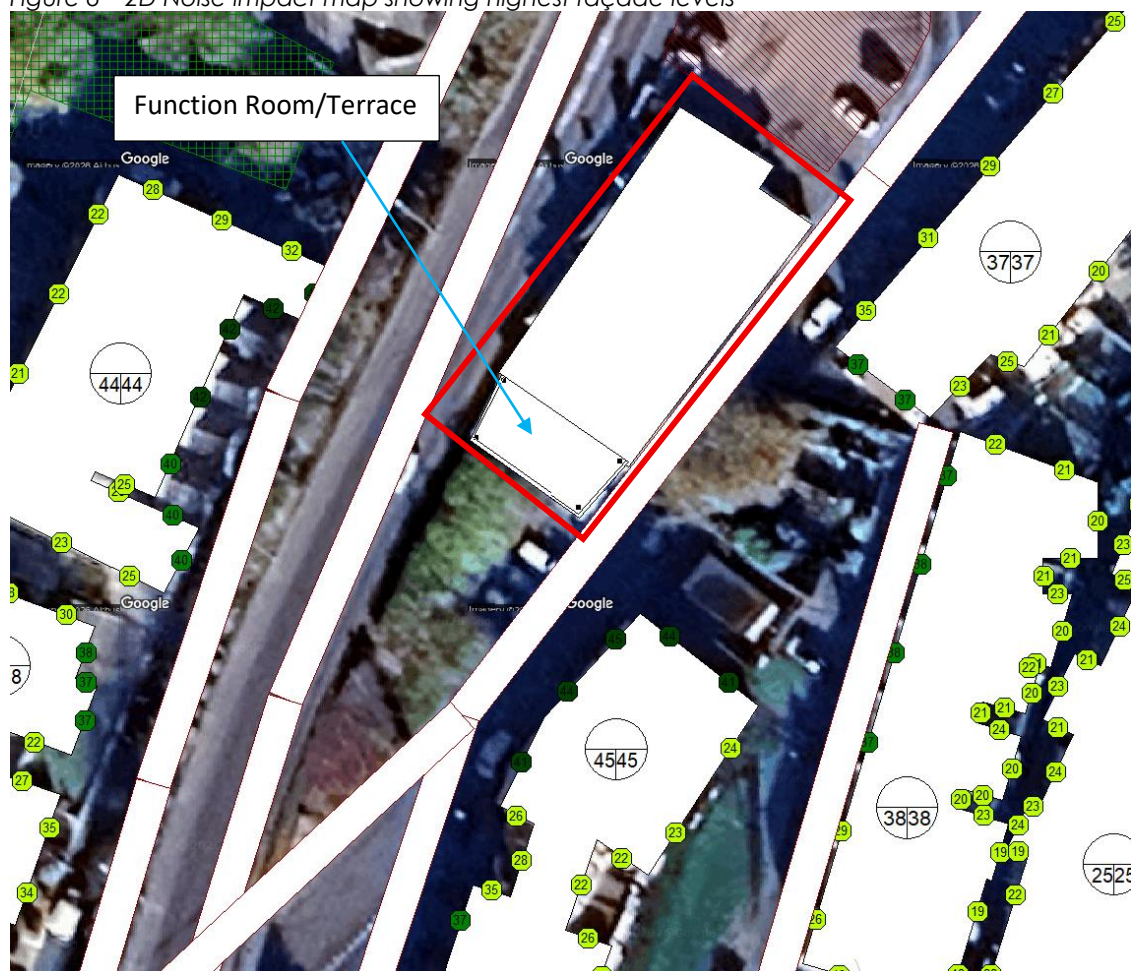
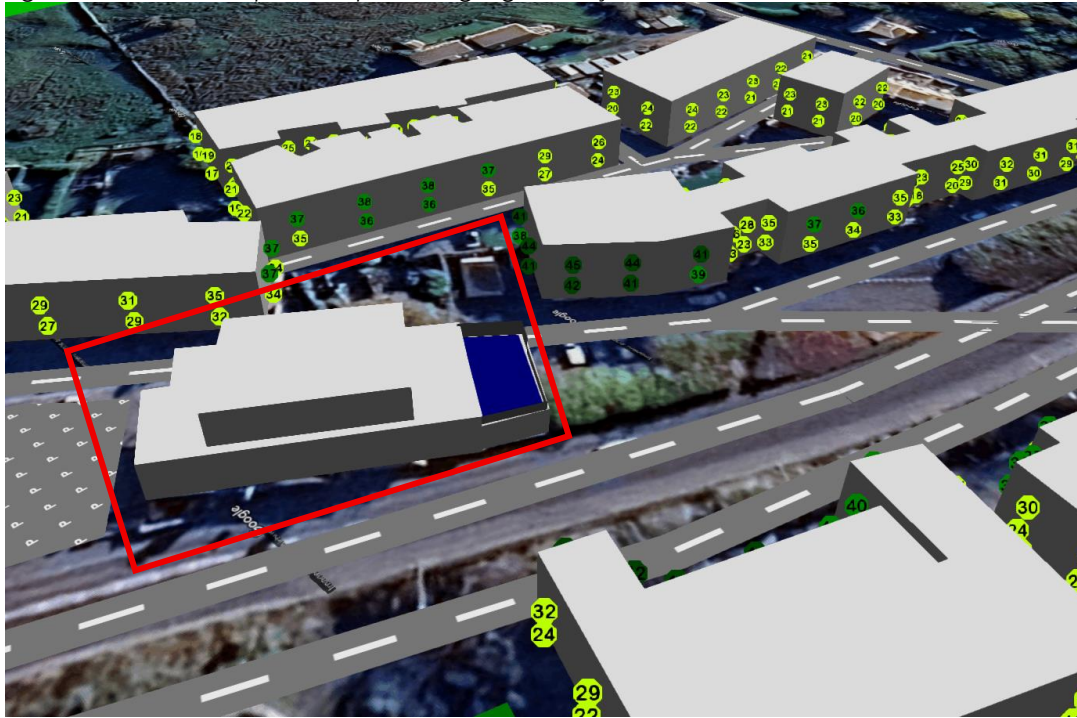


Figure 7 – 3D Noise impact map showing highest façade levels



- 5.1.5 Based on the above calculation the specific noise level for the new function room and terrace would be 45dBA at the nearest noise sensitive receptor window.

Table 7

Measurement Type	Parameter	Result	Comment
Day			
Ambient sound	L _{Aeq}	65dBA	Measured at NSR, source not present
Residual sound level	L _{Aeq1hr}	65dBA	Measured at NSR, source not present
Background sound level	L _{A901hr}	51dBA	Measured at NSR, source not present
Specific Sound Level	L _{Aeq1hr}	41dBA	Modelled
Acoustic Feature	dBA	+0dBA	Broadband
Correction			
Rating Level	dBA	41dBA	
Difference of	dBA	-10dB	
Background vs Rating level			
Likelihood of complaints			No Adverse impact
Night			
Ambient sound	L _{Aeq}	57dBA	Measured at NSR- Source not present
Residual sound level	L _{Aeq15mins}	57dBA	Measured at NSR, source not present
Background sound level	L _{A9015mins}	33dBA	Measured at NSR, source not present
Specific Sound Level	L _{Aeq15mins}	41dBA	Modelled
Acoustic Feature	dBA	+0dBA	Broadband
Correction			
Rating Level	dBA	41dBA	
Difference of	dBA	+8dB	
Background vs Rating level			
Likelihood of complaints			Adverse impact likely

5.1.6 The results from table 7 show that the function room and terrace will be below background noise levels during the daytime but significantly above the background noise levels during the night-time. This means the external terrace are should not be used beyond 11pm. The council has already requested that the external roof terrace is not used beyond 9.30pm. This would seem a safe option to avoid any adverse impact on the surrounding NSR locations.

5.1.7 As the BS4142:2104 is not strictly applicable to pub/club noise the report will also examine the figures against the IOA guidelines for Pubs & Clubs. The extract in Table 4 earlier in this document shows that for venues that continue beyond 11pm “ L_{Aeq} (EN) should not exceed L_{90} (WEN) and L_{10} (EN) should not exceed L_{90} (WEN) in any 1/3 octave band between 40 and 160Hz”. In this case there may be occasional events in the function room that run until closing time, which is midnight each day. The 1/3 octave bands have been taken from a combination of speech (z-weighted) and entertainment music based on previous assessment of DJ boths and wedding venues.

Table 9

Parameter	Frequency (Hz)						
	40	50	63	80	100	125	160
L_{Aeq} (EN)	43.2	47.7	40.3	44.1	39.6	41.8	37.5
L_{10} (EN)	45.7	48.7	42.7	46.8	35.7	41.7	35.7
L_{90} (WEN)	52	52	48	47	44.1	42.1	43

EN = Entertainment noise level

WEN – Representative background noise level without entertainment noise

5.1.8 Table 9 above shows the comparison between when entertainment noise is present and when it is not. In accordance with the IOA Guidelines for Pubs and Bars the venue meets the criteria for there to be a low chance of adverse impact on residents in the area

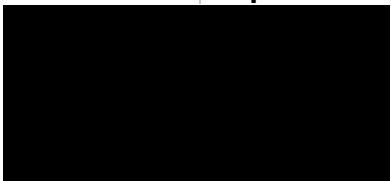
5.1.9 If the patron noise is also then compared against the WHO guidelines for community noise it can be seen that noise nuisance is unlikely to occur. This based on the external value outside of bedrooms for sleep disturbance with windows open being set at 45dB. This value is equal to the predicted impact from the patron noise from the function room and roof terrace.

6.0 Conclusion and Further Comments

6.1 Discussion of Levels

- 6.1.1 The specific noise level of any music generated by the function room and the gathering of people on the roof terrace is below both the BS4142:2014 and IOA guidelines to expect adverse comment during the day, and unlikely to cause adverse comment during the night period. This is based on the function room area having noise levels of 85-90dBA internally with double-glazed windows at a specification of at least Rw25.
- 6.1.2 Patron noise has also been considered in this report to look at the noise impact of having customers in the rear garden area; either as seated restaurant guests, or during later hours as a social area for smoking or conversation away from the noise inside the main pub and function room. The levels details in the DEFRA pubs and clubs phase I report indicate values of 65-70dB for small crowds. This figure would result in levels below those stated in the WHO guidelines for community noise. Therefore patron noise is also not expected to be classed as a noise nuisance risk. This will be further confirmed by the 9.30pm curfew that the council wishes to impose. Based on the night-time levels (past 11pm) exceeding the limits by 8dB this would seem a viable move for the site.
- 6.1.3 Noise complaints are not always due to the levels of noise that are being created. In some cases the ability to view a person or people making noise increases the likelihood of complaints. This is discussed in the consideration of the context of the perceived noise as part of the BS4142:2014 assessment procedure. Statistically complaints for noise occur more frequently when the noise source can either be identified or viewed. The erection of the 1.8m wall/screen will help reduce the chance of this type of complaint. However, any further means to obstruct the view of the area – such as foliage, pergola etc will all improve the likelihood of there being no complaints from surrounding NSRs once construction is complete.
- 6.1.4 The 'agent of change' principle is also an important consideration here. The pub is long established with an existing beer garden and therefore should be allowed to function in the same manner as it currently does at least. This report has not found any reason for external areas to be used as intended during daytime hours.
- 6.1.5 The assessment has been done with the assumption that there is no ambient or live music being played externally in the balcony/rood terrace area. If music is to be played in this area it must not exceed 70dBA at 1m otherwise this will cause the noise levels to increase both as a dominant source, but also increasing the volume at which people are talking in the area which will in turn increase the overall noise levels beyond the background noise levels stated in this report.

7.0 Credentials

Name	Title	Credentials
James Flitton BSc AMIOA	Acoustic Consultant	CSCS Professionally Qualified person
		Associate Member Institute of Acoustics
		Affiliate Member of IDE
		18yrs Industry Experience
Signed		

Appendix A – Acoustic Terminology

Parameter	Description
Ambient Noise Level	The totally encompassing sound in a given situation at a given time, usually composed of a sound from many sources both distant and near ($L_{Aeq,T}$).
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s_1 and s_2 is given by $20 \log_{10} (s_1/s_2)$. The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is $20\mu\text{Pa}$. The threshold of normal hearing is in the region of 0 dB and 140 dB is the threshold of pain. A change of 1 dB is only perceptible under controlled conditions.
dB(A), L_{Ax}	Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB(A) broadly agree with people's assessment of loudness. A change of 3 dB(A) is the minimum perceptible under normal conditions, and a change of 10 dB(A) corresponds roughly to halving or doubling the loudness of a sound. The background noise in a living room may be about 30 dB(A); normal conversation about 60 dB(A) at 1 metre; heavy road traffic about 80 dB(A) at 10 metres; the level near a pneumatic drill about 100 dB(A).
Fast Time Weighting	Setting on sound level meter, denoted by a subscript F, that determines the speed at which the instrument responds to changes in the amplitude of any measured signal. The fast time weighting can lead to higher values than the slow time weighting when rapidly changing signals are measured. The average time constant for the fast response setting is 0.125 (1/8) seconds.
Free-field	Sound pressure level measured outside, far away from reflecting surfaces (except the ground), usually taken to mean at least 3.5 metres
Façade	Sound pressure level measured at a distance of 1 metre in front of a large sound reflecting object such as a building façade.
$L_{Aeq,T}$	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
$L_{max,T}$	A noise level index defined as the maximum noise level recorded during a noise event with a period T. L_{max} is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
$L_{10,T}$	A noise level index. The noise level exceeded for 10% of the time over the period T. L_{10} can be considered to be the "average maximum" noise level. Generally used to describe road traffic noise. $L_{A10,18h}$ is the A-weighted arithmetic average of the 18 hourly $L_{A10,1h}$ values from 06:00-24:00.
$L_{90,T}$	A noise level index. The noise level exceeded for 90% of the time over the period T. Generally used to describe background noise level.

Appendix B – Survey Instrumentation

Type	Manufacturer	Model	Serial Number	Last Cal	Cal Due
SLM	NTi	XL2-TA	A2A-26993-E1	16/04/2026	15/04/2028
Pre-amp	NTi	MA220	16030	16/04/2026	15/04/2028
Microphone	NTi	MC230A	A33529	16/04/2026	15/04/2028
SLM	NTi	XL2-TA	A2A-27072-E1	16/04/2026	15/04/2028
Pre-amp	NTi	MA220	16034	16/04/2026	15/04/2028
Microphone	NTi	MC230A	A33533	16/04/2026	15/04/2028
Calibrator	NTi	CAL200	10393	1/14/2026	1/14/2027

Appendix C – Weather Conditions Chart Used

(Blank)

Weather Conditions				
Measurement Location	Date/Time	Description	Beginning of Survey	End of Survey
		Temperature:		
Cloud Cover Symbol Scale in oktas (eighths)  0 Sky completely clear  1  2  3  4 Sky half cloudy  5  6  7  8 Sky completely cloudy  (9) Sky obstructed from view		Precipitation:		
		Cloud cover (oktas - see guide)		
		Presence of fog/snow/ice		
		Presence of damp roads/wet ground		
		Wind Speed (m/s)		
		Wind Direction		
		Conditions that may cause temperature inversion (i.e. calm nights with no cloud)		

Appendix D – CadnaA Calculations

Receiver

Name: NSR1
ID:
X: 30462529.89 m
Y: 6045337.84 m
Z: 0.00 m

Area Source, ISO 9613, Name: "Patron Noise", ID: ""																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	I/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
1	30462528.63	6045352.85	3.00	0	DEN	500	69.8	11.2	0.0	0.0	0.0	34.6	0.0	0.1	0.0	0.0	11.9	0.0	0.0	34.4
2	30462525.65	6045352.93	3.00	0	DEN	500	69.8	11.1	0.0	0.0	0.0	34.9	0.0	0.1	0.0	0.0	8.7	0.0	0.0	37.1
3	30462523.99	6045353.57	3.00	0	DEN	500	69.8	-6.0	0.0	0.0	0.0	35.5	0.0	0.1	0.0	0.0	12.3	0.0	0.0	16.0
4	30462523.71	6045353.68	3.00	0	DEN	500	69.8	1.9	0.0	0.0	0.0	35.6	0.0	0.1	0.0	0.0	8.7	0.0	0.0	27.3
5	30462521.53	6045354.60	3.00	0	DEN	500	69.8	9.5	0.0	0.0	0.0	36.5	0.0	0.1	0.0	0.0	9.5	0.0	0.0	33.2
6	30462520.18	6045357.95	3.00	0	DEN	500	69.8	11.8	0.0	0.0	0.0	38.0	0.0	0.1	0.0	0.0	6.6	0.0	0.0	36.9
7	30462521.46	6045358.92	3.00	0	DEN	500	69.8	-0.7	0.0	0.0	0.0	38.1	0.0	0.1	0.0	0.0	6.0	0.0	0.0	24.9
8	30462521.76	6045358.83	3.00	0	DEN	500	69.8	4.1	0.0	0.0	0.0	38.1	0.0	0.1	0.0	0.0	6.0	0.0	0.0	29.8
9	30462522.08	6045358.66	3.00	0	DEN	500	69.8	-2.9	0.0	0.0	0.0	38.0	0.0	0.1	0.0	0.0	9.1	0.0	0.0	19.7
10	30462523.57	6045358.26	3.00	0	DEN	500	69.8	10.7	0.0	0.0	0.0	37.6	0.0	0.1	0.0	0.0	9.0	0.0	0.0	33.7
11	30462527.11	6045355.79	3.00	0	DEN	500	69.8	10.7	0.0	0.0	0.0	36.2	0.0	0.1	0.0	0.0	8.9	0.0	0.0	35.4

vert. Area Source, ISO 9613, Name: "", ID: ""																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	I/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
12	30462524.77	6045350.58	1.47	0	DEN	500	65.0	-0.7	0.0	3.0	0.0	33.9	0.0	1.2	0.0	0.0	0.0	0.0	0.0	32.1

vert. Area Source, ISO 9613, Name: "", ID: ""																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	I/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
13	30462530.80	6045351.90	1.49	0	DEN	500	65.0	-0.7	0.0	3.0	0.0	34.1	0.0	1.2	0.0	0.0	0.0	0.0	0.0	31.9

vert. Area Source, ISO 9613, Name: "", ID: ""																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	I/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
14	30462521.37	6045353.01	1.43	0	DEN	500	65.0	-0.7	0.0	3.0	0.0	35.9	0.0	1.6	0.0	0.0	0.0	0.0	0.0	29.7