The Project, 1 Lon-Y-Twyn, Caerphilly

Noise Assessment of Tap House Roof Terrace

19th February 2025

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1. INTRODUCTION

1.1. Overview

inacoustic has been commissioned to assess the impact of potential noise arising from proposed alterations to the micro-brewery and tap house premises, known as The Project, at 1 Lon-Y-Twyn, Caerphilly, operated by the local Brew Monster company.

The following technical noise assessment has been produced to accompany a Planning Application to Caerphilly County Borough Council for the conversion of a flat-roofed area of the building to a roof terrace for patrons, and is based upon environmental noise measurements undertaken at the site and a subsequent noise modelling exercise.

This noise assessment is necessarily technical in nature; therefore a glossary of terms is included in Appendix A to assist the reader.

1.2. Scope and Objectives

The scope of the noise assessment can be summarised as follows:

- A sound monitoring survey was undertaken at a discrete location adjacent to the closest noise-sensitive receptors to the Site;
- A 3-dimensional noise modelling exercise, in accordance with ISO9613 [1] prediction methodology to predict sound levels at the closest noise-sensitive receptors to the Site;
- An assessment of potential noise impacts with respect to the prevailing acoustic conditions at existing off-site receptors; and
- Recommendation of mitigation measures, where necessary, to comply with the relevant guidance.

[1] International Standards Organisation. ISO 9613-2:1996: Acoustics - Attenuation of sound during propagation outdoors - Part 1: Calculation of the absorption of sound by the atmosphere.

2. ASSESSMENT CRITERIA

2.1. Relative Change in Ambient Noise Level

In circumstances where a noise environment may be altered by addition or removal of a noise source, considered to be largely anonymous or within the prevailing acoustic character of an area, for example, changes to traffic quantum or patterns, it is normal to consider the relative change in ambient noise level. The assessment, therefore, focuses primarily on this phenomenon.

The impact scale adopted in this assessment is shown in Table 1, below, which relates to established human responses to noise.

TABLE 1: IMPACT SCALE FOR COMPARISON OF FUTURE NOISE AGAINST EXISTING NOISE

Noise Level Change dB(A)	Subjective Response	Significance
0	No Change	No Effect
0.1 – 2.9	Barely Perceptible	Negligible
3.0 – 5.9	Noticeable	Minor
6.0 – 9.9	Up to a doubling or halving of loudness	Moderate
10.0 or more	More than a doubling or halving of loudness	Major

The criteria above reflect the key benchmarks that relate to human perception of sound. A change of 3 dB(A) is generally considered to be the smallest change in environmental noise that is perceptible to the human ear. A 10 dB(A) change in noise represents a doubling or halving of the subjective loudness. The difference between the minimum perceptible change and the doubling or halving of loudness is split to provide greater definition to the assessment of changes in noise level.

It is considered that the criteria specified in Table 1 provide a good indication as to the likely significance of changes in noise levels in this case and have been used to assess the impact of noise from the proposed development.

2.2. IOA Good Practice Guide on the Control of Noise from Pubs and Clubs

The IOA Good Practice Guide on the Control of Noise from Pubs and Clubs (2003)[2] provides guidance for the assessment and control of noise affecting noise-sensitive properties, from the public and private use of public houses, clubs, hotels, discotheques, restaurants, cafes, community or village halls and other similar premises. The main sources of noise considered are music; singing; public address (PA) systems; children's play areas; beer gardens; people in general; car parks and access roads; deliveries; collections; materials handling; plant and machinery; and skittle alleys.

It should be noted that much of this guidance does not apply to the Application considered within this assessment, as entertainment is not proposed beyond the provision of low-level background music and maybe a television.

The guide goes on to suggest that music, singing and speech, both amplified and non-amplified, are common sources of noise disturbance arising from the types of premises mentioned above and, that noise from such sources is a common cause of complaints, the majority of which arise because music and associated noise is audible in nearby or adjoining noise-sensitive property, gardens and amenity areas.

The guide goes on to suggest that some of the reasons why disturbance arises from these sources are as follows:

- Music and associated noise usually occurs from mid-evening until either late evening or early morning when residents in adjacent properties may be attempting to go to sleep or are sleeping;
- Music and associated noise levels generally increase as an event progresses, whilst ambient noise levels fall, particularly in the evening and night. This can make the noise more noticeable and hence increase the likelihood of complaint;
- Music sources frequently contain a significant low frequency (bass) component that is less well attenuated by building structures than the higher frequency components. This can result in disturbing bass beat effects in or at nearby noise-sensitive properties, particularly if they are structurally attached;
- Noise problems associated with these sources can be exacerbated in the summer when windows and doors may be open for ventilation purposes, or when residents are outside, enjoying their gardens or amenity areas; and
- Noise problems can also occur when music events are held in acoustically weak structures.

As such, it is suggested that appropriate, objective noise criteria should be developed to ensure the following:

- Within premises where entertainment takes place on a regular basis, music and associated sources should not be audible inside noise-sensitive properties at any time.
- Within premises where entertainment takes place less frequently, music and associated sources should not be audible inside noise-sensitive property between 23:00 and 07:00 hours. For other times, appropriate criteria need to be developed which balance the rights of those seeking and providing entertainment, with those who may be disturbed by noise.

The guide goes on to suggest that noise may be considered inaudible when it is at a low enough level, such that it is not recognisable as emanating from the source in question and, it does not alter the perception of the ambient noise environment that would prevail in the absence of the source in question.

The guide also suggests that appropriate planning and good management can minimise the potential for noise disturbance and complaint, thereby reducing the likelihood of neighbour conflict and

[2] Good Practice Guide on the Control of Noise from Pubs and Clubs. Institute of Acoustics. 2003

avoiding licensing problems. It also suggests that those having management responsibility for a business have a statutory duty to prevent excessive noise and, failure to do so can lead to prosecution.

Further to the above, it is also suggested that the implementation of procedures for noise control should be an essential part of the business management and, that it will generally be of benefit to hold discussions with the local authority on these matters, particularly in relation to enforcement policies.

The guide also suggests that at the design stage, when planning the refurbishment of existing premises, or when noise disturbance is occurring from existing premises, the following measures should be considered:

- The determination of an appropriate level of sound insulation, based on realistic source and reception levels;
- The construction of cavity masonry walls or the addition of sound insulating, independent wall linings to enhance the containment and attenuation of sound;
- The provision of lobbies with automatic door-closers for building entrances and exits. Where possible, the distance between the inner and outer doors should be sufficient to ensure that one door set is normally closed as people pass through the lobby;
- The provision of well-sealed acoustic doors on emergency exits;
- The provision of acoustically insulated glazing;
- The provision of mechanical ventilation or air conditioning systems that will enable windows and doors to be kept closed, hence reducing noise breakout.
- The installation of visual, manual or audible alarms, to alert staff that doors or windows which should be kept closed, are open.
- The control of music noise at source, either by reducing the overall sound level of the music, or by reducing the sound level at individual frequencies which are causing, or have the potential to cause, disturbance;
- The playing of more calming types of music towards the end of an event.
- The use of an approval system for DJs and other performers;
- The installation of sound level regulatory devices (noise limiters), connected to all permanent music and public address equipment and all available mains power sockets within the area around a stage, within a performance area, or near to a control desk. However, in very noise-sensitive situations, it may be found that such devices have to be set to low that music events are not viable; and
- Alterations to the number and mounting of loudspeakers, so that internal music levels can be kept as low as possible and the transmission of structure-borne noise is minimised.

3. SITE DESCRIPTION

3.1. Site and Surrounding Area

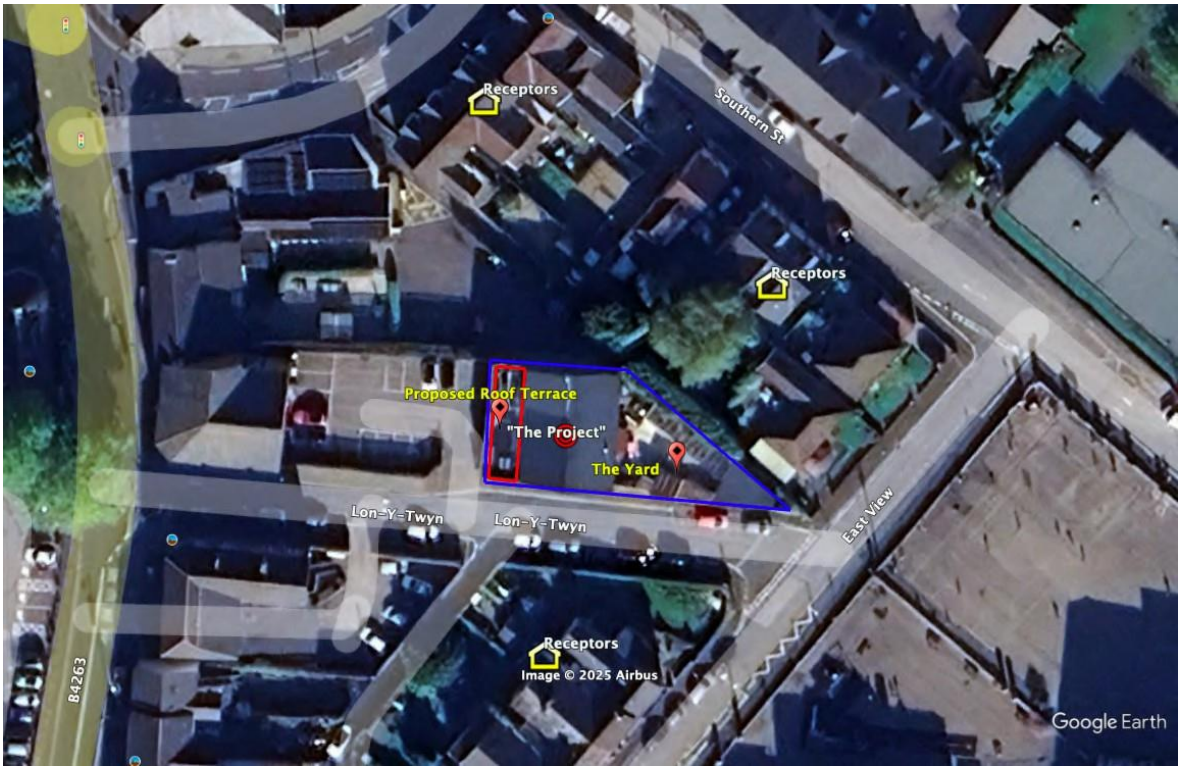
The Proposed Development comprises the flat roofed area of the western end of the micro-brewery and tap house premises known as "The Project", at 1 Lon-y-Twyn, Caerphilly.

The application area can be seen in Figure 1, below, outlined in red, with the full premises extent shown in blue.

The ambient sound environment throughout the surrounding area was dominated by distant road traffic noise contributions from the nearby roads and contributions arising from general local activity. The area sits on the edge of the urban centre of Caerphilly, which includes several commercial and public house premises, alongside residential and educational site uses.

The closest noise sensitive receptors to the Application Area comprise the residential dwellings to the north-west, north-east and south-east, as shown on Figure 1.

FIGURE 1: PROPOSED DEVELOPMENT SITE AND SURROUNDING AREA



3.2. Proposed Development Overview

The proposed development comprises the change of use of the existing flat roof on the western side of the building to an external roof terrace, to accommodate up to ~30 seated patrons, as shown on Figure 2.

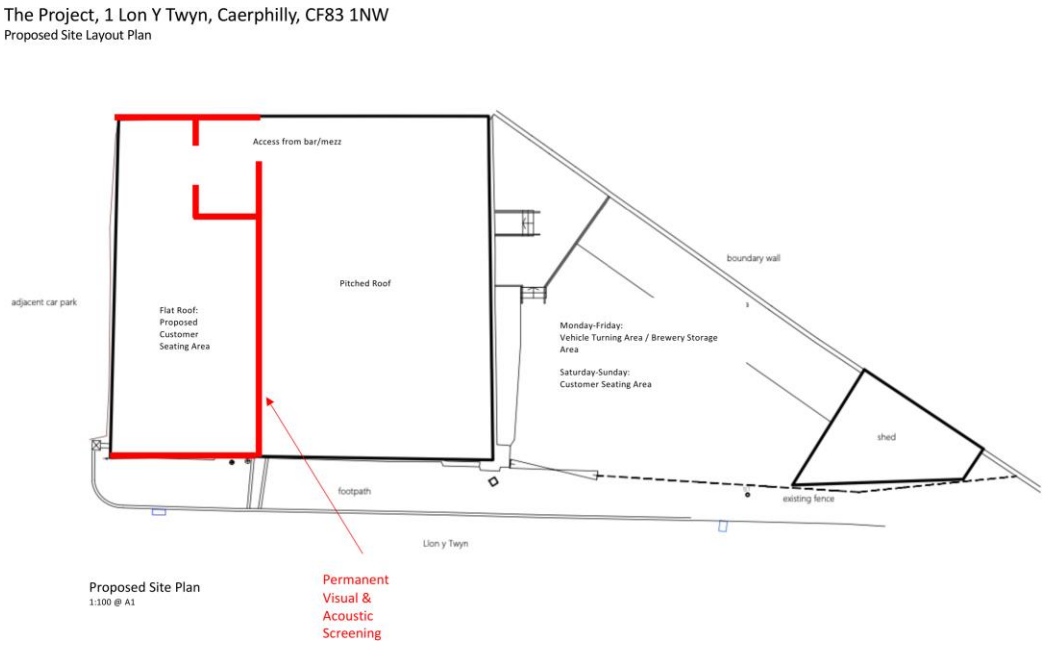
The terrace will be accessed from the tap room / bar via an airlock porch, of a similar design ethos to that incorporated on the main entrance to the tap room, which minimises noise breakout by ensuring that one door is always shut, when patrons access and egress the space.

This phase of development follows on from the successful conversion of The Yard area of the site for 50 to 60 seated patrons, which was granted permission during 2024; completed and used throughout the latter part of summer 2024. The Yard is enclosed by full-height (circa 2.6m) boundary screening, with covered over pergola roofing on both sides, to effectively contain sound from patron activity.

A similar approach will be adopted along the north and south sides of the roof terrace, with full-height (circa 2.6m) vertical screening also included along the boundary with the pitched roof, with covered over pergola roofing on both short sides (extending to a horizontal distance of 2 metres from the vertical element), such that sound propagation is minimised in the direction of the closest receptor areas.

The Yard is open for patron use until 21:00; however, it is proposed to operate the roof terrace for patron use until 22:30. As is the case with The Yard area, no amplified music or entertainment is proposed for the roof terrace.

FIGURE 2: PROPOSED DEVELOPMENT LAYOUT



4. MEASUREMENT METHODOLOGY

4.1. General

The prevailing noise conditions in the area have been determined by an environmental noise survey conducted during both daytime and night-time periods between Friday 14th and Monday 17th February 2025.

4.2. Measurement Details

All noise measurements were undertaken by a consultant certified as competent in environmental noise monitoring, and, in accordance with the principles of BS 7445[3].

All acoustic measurement equipment used during the noise survey conformed to Type 1 specification of British Standard 61672[4]. A full inventory of this equipment is shown in Table 2 below.

TABLE 2: INVENTORY OF SOUND MEASUREMENT EQUIPMENT

Measurement Position	Make, Model & Description	Serial Number
MP1	Rion NL-32 Sound Level Meter	01161955
	Rion NH-21 Preamplifier	21990
	Rion UC-53A Microphone	311064
	Cirrus CR:515 Acoustic Calibrator	72886

The sound measurement equipment used during the survey was field calibrated at the start and end of the measurement period. A calibration laboratory has calibrated the field calibrator used within the twelve months preceding the measurements. A drift of less than 0.2 dB in the field calibration was found to have occurred on the sound level meter.

The weather conditions during the survey were mixed, with some light rain during the morning and early afternoon of Saturday 15th February and winds, which were locally light (below 5ms^{-1}) from an easterly / north-easterly direction.

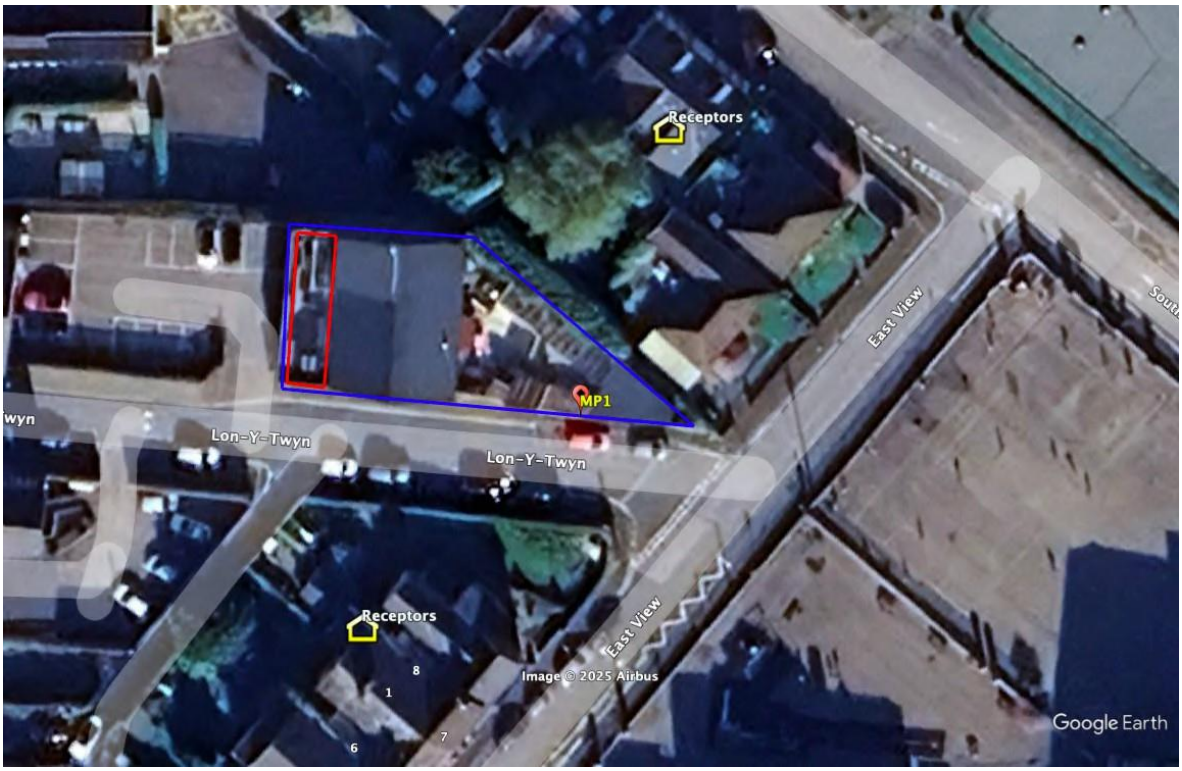
The microphone was fitted with a protective windshield for the measurement, which is described in Table 3, with an aerial photograph indicating its location shown in Figure 3. A photograph of the microphone position is included under Appendix C.

[3] British Standard 7445: 2003: *Description and measurement of environmental noise*. BSI.
[4] British Standard 61672: 2013: *Electroacoustics. Sound level meters*. Part 1 *Specifications*. BSI.

TABLE 3: SOUND MEASUREMENT POSITION DESCRIPTION

Measurement Position	Description
MP1	A largely unattended daytime and night-time measurement of sound under free-field conditions, at a height of 3.0 metres above local ground level, on land connected to the proposed development, but representative of acoustic conditions at the closest residential receptors in the area. The sound environment at this location was dominated by distant road traffic noise contributions from the nearby roads and contributions arising from general local activity, including playground use at the nearby school. Importantly, due to the time of year during which the survey was undertaken i.e. winter, The Yard was not open for patron use during the weekend of the survey.

FIGURE 3: BACKGROUND SOUND MEASUREMENT POSITION



4.3. Results Summary

The summarised results of the environmental noise measurements are presented in Table 4, with a full measured time history and statistical analyses presented under Appendix B.

TABLE 4: SUMMARY OF NOISE MEASUREMENT RESULTS

Date	Period	Noise Level, dB		
		$L_{Aeq,T}$	*L_{A90}	L_{Amax}
Friday Day	12:00-17:00	59	45	78
Friday Early Evening	17:00-19:30	48	43	64
Friday Evening	19:30-22:30	46	41	68
Saturday Day	12:00-17:00	46	41	68
Saturday Early Evening	17:00-19:30	46	40	68
Saturday Evening	19:30-22:30	44	40	66
Sunday Day	12:00-17:00	45	41	63
Sunday Early Evening	17:00-19:30	45	40	62
Sunday Evening	19:30-22:30	42	37	59
**denotes that statistic has been derived on the basis of a modal distribution analysis of 5-minute L_{A90} data*				

5. Operational Noise Assessment

5.1. Assessment Methodology & Approach

The methodology adopted for this assessment has been based on determining a representative baseline noise climate for the nearest noise-sensitive receptors to the Proposed Development and assessing the impact of the Proposed Development on those receptors, according to the proposed use of the external seating areas.

The assessment for the Proposed Development has assumed a potential level of activity noise, comprising people speaking normally and simultaneously at an occupation level of 30 patrons on the external roof terrace.

The predictions have been carried out using the Cadna/A computer noise-modelling package, which employs the ISO9613 prediction methodology. In addition to the source noise levels used in the predictions, the prediction also considers the effects of acoustic screening from the 3-metre high side and rear screens (north, south and east) and 1.1-metre high solid balustrade, to the western elevation.

5.2. Predicted Levels

To determine whether the noise emissions from the Proposed Development fall within acceptable limits, it is necessary to predict the noise levels that are likely as a result of the anticipated use of the Proposed Development.

Source data, relating to noise generation from people speaking normally has been taken from our accumulated archive and is set out below:

Table 5: Source Data

Z-Weighted Octave Band Sound Power Level, L_{Zeq} (dB)								A-weighted Broadband Sound Power Level, L_{WA} (dB)
63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	
60	70	74	72	65	60	57	52	72

The sound power level used for each assessed user of the external area has been factored assuming a probable worst case, comprising speaking at a normal level continuously. Our assessment has therefore been based on a reasonable worst-case.

Noise levels from such developments are likely to be highly variable. This dataset is viewed as a robust basis for the assessment, providing reasonable worst-case noise generation statistics, which are repeatable.

Predictions of received noise levels have been undertaken at the closest receptor points, namely the upper floors of the closest dwellings on North View Terrace, to the north-west (R1); Southern Street, to the north-east (R2); and East View, to the south (R3).

5.2.1. Specific Sound Level Map

The sound map showing the likely specific sound level emissions from the Proposed Development, can be seen in Figure 4.

FIGURE 4: SPECIFIC SOUND LEVEL MAP – PROPOSED DEVELOPMENT

The result of the predictive exercise is set out in Table 6, below.

TABLE 6: PREDICTED NOISE LEVELS AT RECEPTORS

Receptors	Predicted Specific Sound Level from Patron Activity (dB)
R1 – North View Tce	38.5
R2 – Southern St	31.9
R3 – East View	35.0

5.3. Assessment

5.3.1. Relative Change in Ambient Noise from Proposed Development

An assessment of the likely relative change in noise levels has been undertaken in accordance with standard good acoustic practice, based on the predicted levels set out in Table 6 and the measured ambient baseline noise levels set out in Table 4.

Table 7 presents the assessment of potential relative changes in noise arising from peak use of the proposed external roof terrace at the closest receptors.

TABLE 7: PREDICTED CHANGE IN EVENING AMBIENT SOUND LEVEL AT RECEPTOR

Receptor	Specific Noise Level – L_{Aeq} dB	Prevailing Ambient Sound Level $L_{Aeq,T}$ - dB	Future Ambient Sound Level $L_{Aeq,T}$ - dB	Change in Ambient Sound Level - dB
Daytime: 12:00-17:00				
R1	38.5	45	45.9	+0.9
R2	31.9		45.2	+0.2
R3	35.0		45.4	+0.4
Early Evening: 17:00-19:30				
R1	38.5	45	45.9	+0.9
R2	31.9		45.2	+0.2
R3	35.0		45.4	+0.4
Evening: 19:30-22:30				
R1	38.5	42	43.6	+1.6
R2	31.9		42.4	+0.4
R3	35.0		42.7	+0.7

The assessment detailed in Table 7 above identifies that under probable peak use conditions, noise impacts from the operation of the Proposed Development are within the barely perceptible, negligible impact range.

Consequently, no further mitigation measures are considered necessary, with regard to noise associated with the Proposed Development, other than those already incorporated into the design, as outlined in Section 3.2.

6. CONCLUSION

inacoustic has been commissioned to assess the impact of potential noise arising from proposed alterations to the micro-brewery and tap house premises, known as The Project, at 1 Lon-Y-Twyn, Caerphilly, operated by the local Brew Monster company.

This technical noise assessment has been produced to accompany a Planning Application to Caerphilly County Borough Council for the conversion of a flat-roofed area of the building to a roof terrace for patrons, and is based upon environmental noise measurements undertaken at the site and a subsequent noise modelling exercise.

The assessment considers the potential noise emissions arising from peak usage of the proposed external roof terrace area. On the basis of this worst-case scenario assessment, the predicted sound impacts have been identified to be in the range of barely perceptible and negligible.

Consequently, no specific acoustic mitigation measures, beyond those described within this report are considered necessary in relation to the operation of the Proposed Development.

In light of the above, which demonstrates that the site is predicted to meet the requirements of the relevant planning guidance, it is considered that noise does not present a constraint to the granting of planning permission for the Proposed Development.

7. APPENDICES

7.1. Appendix A – Definition of Terms

Sound Pressure	Sound, or sound pressure, is a fluctuation in air pressure over the static ambient pressure.
Sound Pressure Level (Sound Level)	The sound level is the sound pressure relative to a standard reference pressure of 20µPa (20x10^{-6} Pascals) on a decibel scale.
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s1 and s2 is given by 20 log10 (s1 / s2). 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 20µPa.
A-weighting, dB(A)	The unit of sound level, weighted according to the A-scale, which takes into account the increased sensitivity of the human ear at some frequencies.
Noise Level Indices	Noise levels usually fluctuate over time, so it is often necessary to consider an average or statistical noise level. This can be done in several ways, so a number of different noise indices have been defined, according to how the averaging or statistics are carried out.
$L_{eq,T}$	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 during the 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.
$L_{90,T}$	A noise level index. The noise level exceeded for 90% of the time over the period T. L_{90} can be considered to be the "average minimum" noise level and is often used to describe the background noise.
$L_{10,T}$	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.
Free-Field	Far from the presence of sound reflecting objects (except the ground), usually taken to mean at least 3.5m
Facade	At a distance of 1m in front of a large sound reflecting object such as a building façade.
Fast Time Weighting	An averaging time used in sound level meters. Defined in BS 5969.

In order to assist the understanding of acoustic terminology and the relative change in noise, the following background information is provided.

The human ear can detect a very wide range of pressure fluctuations, which are perceived as sound. In order to express these fluctuations in a manageable way, a logarithmic scale called the decibel, or dB scale is used. The decibel scale typically ranges from 0 dB (the threshold of hearing) to over 120 dB. An indication of the range of sound levels commonly found in the environment is given in the following table.

TABLE 8: TYPICAL SOUND LEVELS FOUND IN THE ENVIRONMENT

Sound Level	Location
0dB(A)	Threshold of hearing
20 to 30dB(A)	Quiet bedroom at night
30 to 40dB(A)	Living room during the day
40 to 50dB(A)	Typical office
50 to 60dB(A)	Inside a car
60 to 70dB(A)	Typical high street
70 to 90dB(A)	Inside factory
100 to 110dB(A)	Burglar alarm at 1m away
110 to 130dB(A)	Jet aircraft on take off
140dB(A)	Threshold of Pain

The ear is less sensitive to some frequencies than to others. The A-weighting scale is used to approximate the frequency response of the ear. Levels weighted using this scale are commonly identified by the notation dB(A).

In accordance with logarithmic addition, combining two sources with equal noise levels would result in an increase of 3 dB(A) in the noise level from a single source.

A change of 3 dB(A) is generally regarded as the smallest change in broadband continuous noise which the human ear can detect (although in certain controlled circumstances a change of 1 dB(A) is just perceptible). Therefore, a 2 dB(A) increase would not be normally be perceptible. A 10 dB(A) increase in noise represents a subjective doubling of loudness.

A noise impact on a community is deemed to occur when a new noise is introduced that is out of character with the area, or when a significant increase above the pre-existing ambient noise level occurs.

For levels of noise that vary with time, it is necessary to employ a statistical index that allows for this variation. These statistical indices are expressed as the sound level that is exceeded for a percentage of the time period of interest. In the UK, traffic noise is measured as the L_{A10}, the noise level exceeded for 10% of the measurement period. The L_{A90} is the level exceeded for 90% of the time and has been adopted to represent the background noise level in the absence of discrete events. An alternative way of assessing the time varying noise levels is to use the equivalent continuous sound level, L_{Aeq}.

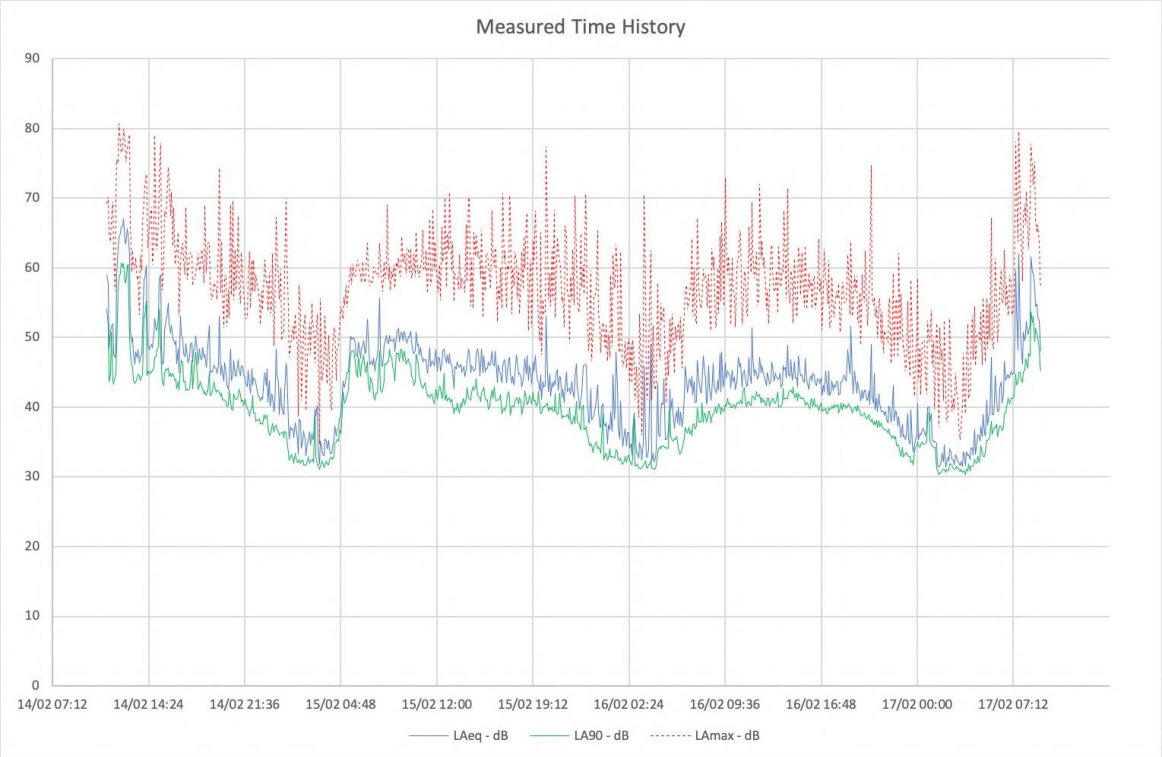
This is a notional steady level that would, over a given period of time, deliver the same sound energy as the actual fluctuating sound.

To put these quantities into context, where a receiver is predominantly affected by continuous flows of road traffic, a doubling or halving of the flows would result in a just perceptible change of 3 dB, while an increase of more than 25%, or a decrease of more than 20%, in traffic flows represent changes of 1 dB in traffic noise levels (assuming no alteration in the mix of traffic or flow speeds).

Note that the time constant and the period of the noise measurement should be specified. For example, BS 4142 specifies background noise measurement periods of 1 hour during the day and 15 minutes during the night. The noise levels are commonly symbolised as $L_{A90,1hour}$ dB and $L_{A90,15mins}$ dB. The noise measurement should be recorded using a 'FAST' time response equivalent to 0.125 ms.

7.2. Appendix B – Full Measurement Results

FIGURE 5: MEASURED TIME HISTORY – MP1



7.3. Appendix C – Measurement Position

FIGURE 6: PHOTOGRAPH OF MP1