



Shooters Bar, New Street, Neath

External Plant Noise Assessment

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1. INTRODUCTION

1.1. Overview

inacoustic has been commissioned to prepare a Noise Assessment for noise arising from external air handling units (AHUs) associated with Shooters Bar, New Street, Neath, SA11 1RT, in order to support a retrospective planning application for their installation to Neath Port Talbot County Borough Council.

The assessment considers the noise generation from the existing and operational AHUs, with respect to existing sound levels in the area. The assessment methodology contained in British Standard 4142:2014+A1:2019 *Method for rating and assessing industrial and commercial sound* has been used.

Accordingly, the following technical noise assessment has been produced and is based upon environmental noise measurements undertaken at the site.

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 report is summarised as follows:

- A sound monitoring survey was undertaken at close proximity to the plant and at discrete locations representative of the most exposed noise-sensitive receptors; and
- An assessment of potential noise impacts in accordance with BS4142:2014+A1:2019, with respect to the prevailing acoustic conditions at existing off-site receptors.

2. ASSESSMENT FRAMEWORK

The development proposals for the Site are guided by the following legislation, policy directives and guidance:

2.1. Legislation

2.1.1. Well-being of Future Generations (Wales) Act 2015

The Well-being of Future Generations (Wales) Act 2015 has a number of wellbeing goals to achieve through implementing sustainable development. Changes in noise levels can have an impact on the health of habitat and humans, as such the goals to create 'a resilient Wales' and 'a healthier Wales' are applicable.

2.2. National Policy

2.2.1. Future Wales: The National Plan 2040

The National Plan states the following under the heading Developing infrastructure responsibly:

When proposing new transport infrastructure or new development, average population exposure to air and noise pollution should be reduced and soundscapes improved where it is practical and feasible to do so. At the very least, exposure to pollution should be minimised. This will include taking into account the long-term effects of current and predicted levels of air and noise pollution on individuals, society and the environment arising as a result of proposals for transport infrastructure or development.

2.2.2. Planning Policy Wales

The Government's planning policies for Wales are contained in Planning Policy Wales (Edition 12, February 2024). The policy provides overarching requirements for developments to adequately control noise pollution, to provide appropriate soundscapes and to incorporate good acoustic design.

The policy is supplemented by the Noise and Soundscape Plan 2023-2028, which provides more detailed guidance on planning for a new development, but does not set out specific assessment methods or criteria. The guidance in this document has been used to inform a qualitative assessment of the effect the proposed development could have on the local soundscape.

2.2.3. Technical Advice Note (Wales) 11

This note provides advice on how the planning system in Wales can be used to minimise the adverse impact of noise without placing unreasonable restrictions on development or adding unduly to the costs and administrative burdens of business.

It outlines some of the main considerations which local planning authorities should take into account in drawing-up development plan policies and when determining planning applications for development which will either generate noise or be exposed to existing noise sources.

2.3. Assessment Criteria

2.3.1. BS4142:2014+A1:2019

BS4142:2014+A1:2019 sets out a method to assess the likely effect of sound from factories, industrial premises or fixed installations and sources of an industrial nature in commercial premises, on people who might be inside or outside a dwelling or premises used for residential purposes in the vicinity.

The procedure contained in BS4142:2014+A1:2019 for assessing the effect of sound on residential receptors is to compare the measured or predicted sound level from the source in question, the $L_{Aeq,T}$ 'specific sound level', immediately outside the dwelling with the $L_{A90,T}$ background sound level.

Where the sound contains a tonality, impulsivity, intermittency and other sound characteristics, then a correction depending on the grade of the aforementioned characteristics of the sound is added to the specific sound level to obtain the $L_{Ar,Tr}$ 'rating sound level'. A correction to include the consideration of a level of uncertainty in sound measurements, data and calculations can also be applied when necessary.

BS4142:2014+A1:2019 states: *"The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs"*. An estimation of the impact of the specific sound can be obtained by the difference of the rating sound level and the background sound level and considering the following:

- *"Typically, the greater this difference, the greater the magnitude of the impact."*
- *"A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context."*
- *"A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context."*
- *"The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context."*

The periods associated with day or night, for the purposes of the Standard, are considered to be 07.00 to 23.00 and 23.00 to 07.00, respectively.

2.4. Other Guidance

2.4.1. 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, considers this phenomenon to add context.

The impact scale adopted in this assessment is shown in below, which relates to established human responses to noise, in line with 'Table 7-12 Effect Descriptors' of the IEMA Guidelines.

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

Noise Level Change dB(A)	Subjective Response	Significance
Less than 1.0	Not perceptible	Negligible
1.0 – 2.9	Barely perceptible	Minor impact
3.0 – 4.9	Noticeable	Moderate impact
5.0 – 9.9	Up to a doubling or halving of loudness	Substantial impact
10.0 or more	More than a doubling or halving of loudness	Major impact

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 perception of loudness. The difference between the minimum perceptible change and the doubling or halving of the 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 can be used to inform the context in which the sound occurs in order to assess the impact of noise from the proposed development.

3. SITE DESCRIPTION

3.1. Site and Surrounding Area

The assessed mechanical ventilation plant is associated with Shooters Sports Bar, New Street, Neath, SA11 1RT.

Shooters Sports Bar is located within the basement of the building at No. 2 Green Street, currently occupied by the Holland & Barrett retail unit at ground floor level and a dance studio at 1st floor level.

The mechanical plant is situated within a partially enclosed alleyway to the north-west side of the building, accessed by a mesh gate from New Street.

The closest residential receptors to the plant are the apartments located on Wind Street and Church Place, located approximately 45m to the east, with no direct line of sight to the plant area.

The sound environment in the area is influenced by cars passing through the town centre, general town centre activity, and occasional sound breakout from the dance studio. No plant noise was audible beyond the alley where the plant is located.

The plant area and receptors, in the context of the surrounding area can be seen in Figure 1.

FIGURE 1: SITE AND SURROUNDING AREA



3.2. Operations Overview

The assessed operational mechanical air handling plant associated with the Shooters Sports Bar is detailed in Table 2 below

TABLE 2: MECHANICAL VENTILATION / EXTRACT PLANT

Model Number	Manufacturer	Type	Number of Units
Airstage R32	Fujitsu	Split Type Outdoor Unit (Air Conditioner)	3

These units are rated at a sound pressure level of 45 dB(A) at 1m from the source.

When operated at full load, the units were noted to be largely inaudible, with the only audible plant noise within the alley area arising from a historic air extract flue, associated with damp management, which we're informed was installed by the landlord prior to the premises being occupied by Shooters Sports Bar.

The existing plant installation is shown in Figure 2 below. Note the presence of the extract flue and 3 other AHUs, which serve other premises. The application units are those at ground level, closest to the camera.

FIGURE 2: INSTALLED PLANT INCLUDING 3X APPLICATION UNITS



4. MEASUREMENT METHODOLOGY

4.1. Overview

The sound conditions in the area have been determined by a fully attended environmental noise survey conducted during evening of Monday 11th May 2026.

For the purposes of the assessment, the 3x AHU plant items forming the subject of the assessment were operated under forced peak load conditions between 19:00 and 20:00hrs.

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 7445¹.

All acoustic measurement equipment used during the noise survey conformed to Type 1 specification of British Standard 61672². A full inventory of this equipment is shown in Table 3 below.

TABLE 3: INVENTORY OF SOUND MEASUREMENT EQUIPMENT

Position	Make, Model & Description	Serial Number	Calibration Certificate Number	Calibration Expiry Date
MP1	Rion NL-31 Sound Level Meter	00110040	1176252	12/02/2027
	Rion NH-21 Preamplifier	00142		
	Rion UC-53A Microphone	306449		
MP2	Rion NL-32 Sound Level Meter	01161955	1176253	12/02/2027
	Rion NH-21 Preamplifier	21990		
	Rion UC-53A Microphone	311064		
Both	Cirrus CR:515 Acoustic Calibrator	72886	1197760	17/03/2027

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 0.1 dB in the field calibration was found to have occurred on the sound level meter.

The weather conditions during the survey were conducive to environmental noise measurement; it being dry, 10 to 12°C, with wind speeds of up to 4 ms⁻¹ from the north-west, as measured with a hand-held anemometer

¹ British Standard 7445: 2003: Description and measurement of environmental noise. BSI

² British Standard 61672: 2013: Electroacoustics. Sound level meters. Part 1 Specifications. BSI.

The microphones were fitted with protective windshields for the measurements, which are described in Table 4, with an aerial photograph indicating their locations shown in Figure 3. Measured time histories from both positions are presented in Appendix B.

TABLE 4: MEASUREMENT POSITIONS DESCRIPTION

Measurement Position	Description
MP1	An attended control measurement of sound at a distance of 1-metre from the closest AHU to the gate of the alleyway, at a height of 1.5m above ground and under façade-field, reflective conditions. During orchestrated full operation of the AHUs, the AHUs were virtually inaudible, with the historic air extract flue being acoustically dominant, but not at a high level. There was no audible difference between the sound environment in this area with the AHUs on or off.
MP2	An attended measurement of sound at the corner of New Street and Wind Street, in front of the former Thomas Cook unit, at a height of 1.7m above ground and under façade-field, reflective conditions, with a direct line of sight to the gateway to the plant area. The sound environment in this area was influenced by local vehicle movements, general town centre activity, and occasional sound breakout from the dance studio. No plant noise was audible under any operational scenario.

FIGURE 3: MEASUREMENT POSITIONS



4.3. Sound Survey Results

4.3.1. Source Sound Levels

The summarised results of the source measurements, at 1m from the eastern end of the bank of AHUs, can be seen below in Table 5.

TABLE 5: SOURCE SOUND MEASUREMENT RESULTS

Measurement Position	Period	L _{Aeq,T} (dB)	L _{AF90,T} (dB)
MP1 – 1 m From AHU – Plant Operational	19:05 – 20:00	51.9	50.7
MP1 – 1 m From AHU – Plant Off	20:00 – 20:09	50.3	49.1

4.3.2. Ambient Sound Levels

The summarised results of the ambient sound levels measurement at the NSR Monitoring Position (MP2), during an operational period of the plant, can be seen below in Table 6.

TABLE 6: AMBIENT SOUND MEASUREMENT RESULTS (PLANT ON) AT NOISE SENSITIVE RECEPTOR

Measurement Position	Period	L _{Aeq,T} (dB)	L _{AF90,T} (dB)
MP2 – Proxy Receptor – Plant Operational	19:00 – 20:00	Mean: 51.0 Lowest 1-min: 45.0	Mean: 45.7 Lowest 1-min: 43.1

4.3.3. Residual Sound Levels

The summarised results of the residual sound level measurement at the NSR Monitoring Position (MP2), during a non-operational period of the plant, can be seen below in Table 7.

TABLE 7: RESIDUAL SOUND MEASUREMENT RESULTS (PLANT OFF) AT NOISE SENSITIVE RECEPTOR

Measurement Position	Period	L _{Aeq,T} (dB)	L _{AF90,T} (dB)
MP2 – Proxy Receptor – Plant Off	20:00 – 20:45	Mean: 53.0 Lowest 1-min: 44.4	Mean: 46.0 Lowest 1-min: 41.3

5. OPERATIONAL NOISE ASSESSMENT

5.1. Introduction

5.1.1. Discussion of Observations

The bank of 3 AHUs was forced to operate at maximum load between 19:00 and 20:00 and was observed to be virtually inaudible at the source location, but entirely inaudible beyond the confines of the alley where the equipment is located.

As mentioned in Section 3.2, the manufacturer states a maximum sound pressure level (at 1 metre) from the AHU units of 45 dB(A). Combined, this equates to a maximum sound pressure level at 1 metre of 49.8 dB(A), however, by subtracting the non-operational levels from the operational levels at MP1, this was found to be between 45.6 and 46.8 dB(A) at 1 metre from the easternmost unit.

The plant was noted to be entirely inaudible and immeasurable at the receptor position.

5.2. Assessment Parameters

5.2.1. Determination of the Specific Sound Level

BS4142:2014+A1:2019 states 'measure the ambient sound level, distinguishing the specific sound from the residual sound. Minimize the influence of sound from other sources by measuring at times and during intervals when the residual sound has subsided to typically low levels'. It carries on to say 'Measure the residual sound level in the absence of the specific sound and correct for the effect of the residual sound by using the following formula:

$$L_s = 10 \log(10^{L_a/10} - 10^{L_r/10})$$

where:

L_s is the specific sound level;

L_a is the ambient sound level; and

L_r is the residual sound level'.

In this instance, the above method is unsuitable, given the complete lack of acoustic influence of the source at the receptor position, but the method has been adopted to derive the source noise level, as set out in Section 5.1.

Under such circumstances, where the ambient-residual differential is less than 3 dB, BS4142 recommends supplementing the measured results with predictions. Consequently, a simple distance loss calculation, taking no account of any acoustic reductions for intervening screening, has been undertaken via the following formula:

$$L_s = 20 \log(D1/D2)$$

On this basis a worst-case specific noise level of between 10.2 and 11.4 dB(A) has been determined at the position of the closest receptors, not accounting for the substantial screening losses

introduced by the intervening buildings i.e. in reality, the levels at the residential façade locations would be substantially lower, due to having a completely obstructed line of sight to the source.

5.2.2. Background Sound Level Summary

The background sound level has been obtained from the residual/background measurement periods of the survey exercise. The background sound level to be used in the assessment is summarised in Table 8.

TABLE 8: DERIVATION OF BACKGROUND SOUND LEVEL – MP2

Adopted Background Sound Level $L_{A90,T}$ - dB
41

5.3. Assessment

5.3.1. Rating Penalty Principle

Section 9 of BS4142:2014+A1:2019 describes how the rating sound level should be derived from the specific sound level, by determining a rating penalty. BS4142:2014+A1:2019 states:

“Certain acoustic features can increase the significance of impact over that expected from a basic comparison between the specific sound level and the background sound level. Where such features are present at the assessment location, add a character correction to the specific sound level to obtain the rating level. This can be approached in three ways:

- a) subjective method;*
- b) objective method for tonality;*
- c) reference method.”*

The subjective method has been adopted to derive the rating sound level from the specific sound level, which is discussed in Section 9.2 of BS4142:2014+A1:2019, which states:

“Where appropriate, establish a rating penalty for sound based on a subjective assessment of its characteristics. This would also be appropriate where a new source cannot be measured because it is only proposed at that time, but the characteristics of similar sources can subjectively be assessed.

Correct the specific sound level if a tone, impulse or other characteristics occurs, or is expected to be present, for new or modified sound sources.”

BS4142:2014+A1:2019 defines four characteristics that should be considered when deriving a rating penalty, namely; tonality; impulsivity; intermittency; and other sound characteristics, which are defined as:

Tonality

A rating penalty of +2 dB is applicable for a tone which is *“just perceptible”*, +4 dB where a tone is *“clearly perceptible”*, and +6 dB where a tone is *“highly perceptible”*.

Impulsivity

A rating penalty of +3 dB is applicable for impulsivity which is “just perceptible”, +6 dB where it is “clearly perceptible”, and +9 dB where it is “highly perceptible”.

Other Sound Characteristics

BS4142:2014+A1:2019 states that where “the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distance against the residual acoustic environment, a penalty of +3 dB can be applied.”

Intermittency

BS4142:2014+A1:2019 states that when the “specific sound has identifiable on/off conditions, the specific sound level ought to be representative of the time period of length equal to the reference time interval which contains the greatest total amount of on time ... if the intermittency is readily distinctive against the residual acoustic environment, a penalty of +3 dB can be applied.”

5.3.2. Rating Penalty Assessment

Considering the content of Section 5.3.1, an assessment of the various sound sources associated with the Proposed Development, in terms of whether any rating penalties are applicable, and has been detailed in Table 9 below.

TABLE 9: RATING PENALTY ASSESSMENT

Source	Tonality	Impulsivity	Intermittency	Other Sound Characteristics	Discussion
AHUs	0 dB	0 dB	0 dB	0 dB	The operation of the AHUs gives rise to no audible effect at any off-site receptor position.

Consequently, no acoustic feature correction has been applied with the assessment.

5.3.3. Uncertainty in Calculations

BS4142:2014+A1:2019 requires that the level of uncertainty in the measured data and associated calculations is considered in the assessment. The Standard recommends that steps should be taken to reduce the level of uncertainty.

Measurement Uncertainty

BS4142:2014+A1:2019 states that measurement uncertainty depends on a number of factors, including the following, which are applicable to the Proposed Development:

- a) the complexity of the sound source and the level of variability in sound emission from the source;
- b) the complexity and level of variability of the residual acoustic environment;
- ...

- d) the location(s) selected for taking the measurements;
- ...
- g) the measurement time intervals;
- h) the range of times when the measurements have been taken;
- i) the range of suitable weather conditions during which measurements have been taken;
- ...
- k) the level of rounding of each measurement recorded; and
- l) the instrumentation used.

Each of the measurement uncertainty factors outlined above have been considered and discussed in Table 10 below.

TABLE 10: MEASUREMENT UNCERTAINTY FACTORS

Measurement Uncertainty Factor Reference	Level of Uncertainty	Discussion
a)	0 dB	The measurement period spanned a sufficiently robust period to cover the potential for variability of the source and enabled the derivation of peak specific noise levels.
b)	0 dB	Residual acoustic environment is relatively constant, hence no correction for a complex residual acoustic environment.
d)	0 dB	Measuring near the closest receptors has enabled the determination of robust background sound levels.
g)	0 dB	Measurement time intervals were set in accordance with BS4142:2014+A1:2019, hence no further correction needs to be made.
h)	0 dB	Measurements were undertaken over a fully attended period that included distinct operational and non-operational periods.
i)	±1 dB	No periods of significant wind or precipitation were noted.
k)	0 dB	Measured values were rounded to 0.1 dB, therefore rounding would not have had a significant impact on the overall typical background sound levels.
l)	0 dB	The acoustic measurement equipment accorded with Type 1 specification of British Standard 61672.

In summary, a ±1 dB uncertainty budget has been considered in the assessment, to account for measurement uncertainty.

5.3.4. BS4142:2014+A1:2019 Assessment

The rating sound level, as calculated from the calculated specific sound level, has been assessed in accordance with BS4142:2014+A1:2019, at the closest NSRs.

The BS4142:2014+A1:2019 assessment at the most affected NSR, during the late evening /early night-time period, can be seen in Table 11.

TABLE 11: BS4142 ASSESSMENT AT NSR1

Results	Sound Level (dB)	Notes
Specific Sound Level	11	As shown in Error! Reference source not found.
Rating Penalty	0	As discussed in Table 9
Rating Sound Level	11	-
Background Sound Level	41	As shown in Table 7
Excess of Rating over Background Sound Level	-30	Assessment indicates a “Low Impact.”.

It can be seen that the operation of the AHUs is deemed to have a ‘*Low Impact*’ at the closest NSR.

5.3.5. Discussion on Context

In addition to the Low Impact set out above, it was noted that the operation of the plant engendered absolutely no audible influence or measurable change in ambient sound level at the closest receptor positions, equating to No Change and No Effect.

6. CONCLUSION

inacoustic has been commissioned to prepare a Noise Assessment for noise arising from external air handling units (AHUs) associated with Shooters Bar, New Street, Neath, SA11 1RT, in order to support a retrospective planning application for their installation to Neath Port Talbot County Borough Council.

The assessment considers the noise generation from the existing and operational air handling units, with respect to existing sound levels in the area. The assessment methodology contained in British Standard 4142:2014+A1:2019 *Method for rating and assessing industrial and commercial sound* has been used.

The assessment identifies that the operation of the AHUs gives rise to a Low Impact in BS4142 terms, and no audible or measurable change in ambient sound level at any off-site noise-sensitive location, equating to No Change and No Effect.

Consequently, the operation of the AHUs is deemed to have no effect upon the acoustic amenity of nearby receptors, and noise is not considered to be a material factor with regard to the granting of retrospective planning permission for the units.

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 log ₁₀ (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 12: 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 $L_{A90,1\text{hour}}$ dB and $L_{A90,15\text{mins}}$ dB. The noise measurement should be recorded using a 'FAST' time response equivalent to 0.125 ms.

7.2. Appendix B – Measured Results

FIGURE 4: MEASURED TIME HISTORY – MP1 (SOURCE)

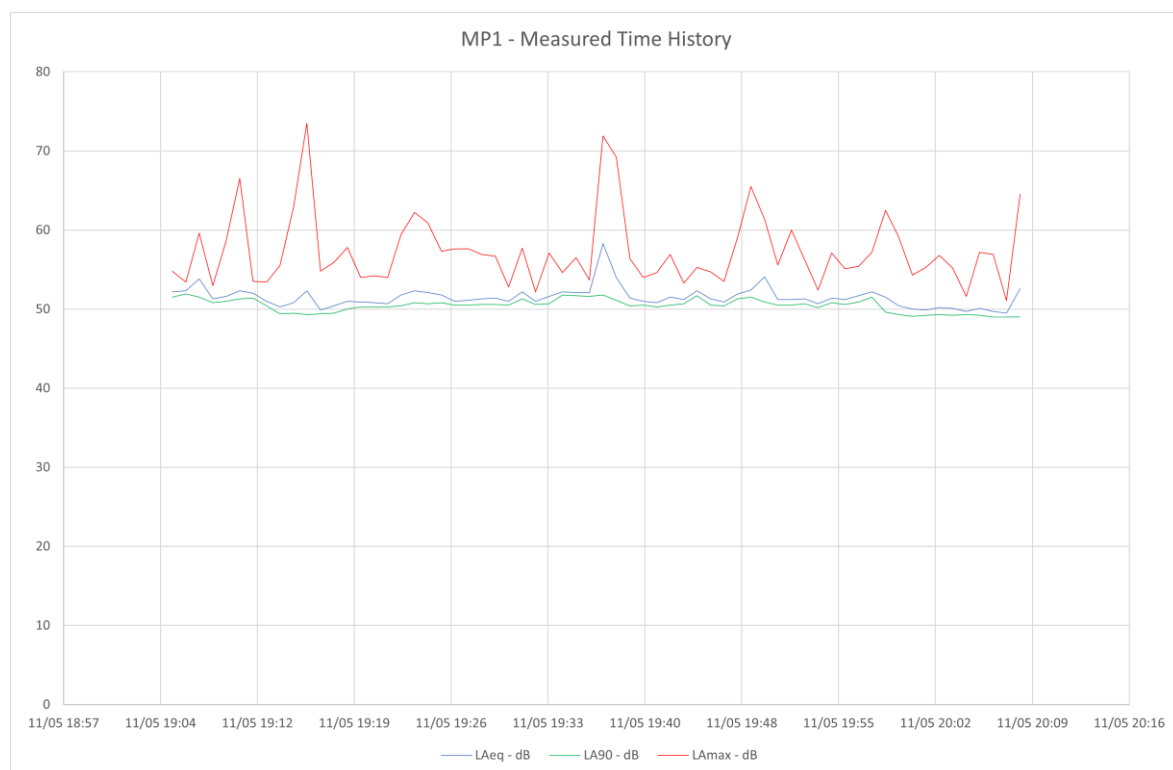
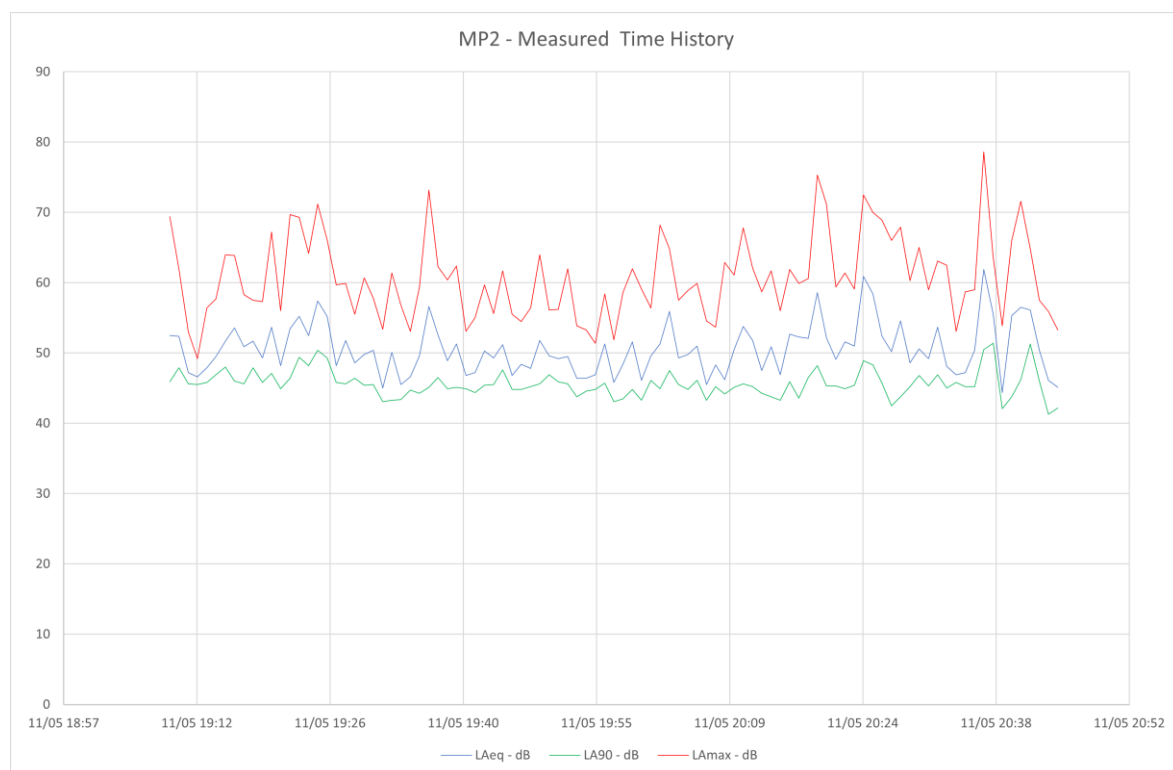


FIGURE 5: MEASURED TIME HISTORY – MP2 (RECEPTOR)



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