



**BARNS AT WINCH HILL FARM, WINCH HILL, WANDON END
PRIOR APPROVAL NOISE ASSESSMENT**

On behalf of:
Cube Metals Ltd



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1. INTRODUCTION

- 1.1 Hepworth Acoustics was commissioned by Cube Metals Ltd to carry out a noise assessment in connection with an application for prior approval seeking consent for change of use from existing agricultural designation, to general industrial (Use Class B2) plus storage and distribution (Use Class B8), for a site with two existing barns at Winch Hill Farm, Winch Hill, Wandon End.
- 1.2 The proposed site is located to the east of Winch Hill Lane as shown in **Figure 1**. The site includes two agricultural barn style buildings, for which the existing layouts and elevation drawings are shown in **Figure 2** and **Figure 3** respectively.
- 1.3 The proposals are for Building A to the north to change to Use Class B2 'general industrial' and for Building B to the south to change to Use Class B8 'storage and distribution'.
- 1.4 We have been informed that the proposals are for the site to operate between 07:00 and 18:00 Mondays to Fridays, with no operations taking place on weekends.
- 1.5 The nearest dwellings to the proposed site are Winch Hill House to the south and Old Winch Hill Cottage to the north-west as highlighted in **Figure 1**.
- 1.6 Luton Airport runway is located approximately 500m to the south-west, resulting in the existing baseline noise climate being dictated by aircraft noise.
- 1.7 The noise assessment has included:
 - An inspection of the site and environs;
 - Background noise monitoring;
 - Development of a computerised noise model of proposed site operations;
 - Assessment of the potential noise impact from proposed site operations; and,
 - Adoption of suitable plant noise design limits for any future fixed external plant installations.
- 1.8 The various acoustics indices referred to in this report are described in **Appendix A**. All noise levels in the text have been rounded to the nearest decibel as fractions of a decibel are imperceptible.

2. POLICY & GUIDANCE

National Planning Policy Framework 2024

- 2.1 The National Planning Policy Framework December 2024 (NPPF) includes the following relevant paragraphs with respect to noise and planning:

Paragraph 187

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 or land instability. ...

Paragraph 198

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;

Noise Policy Statement for England 2010

- 2.2 The Noise Policy Statement for England 2010 (NPSE) includes three aims:

- I. Avoid significant adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.*
- II. Mitigate and minimise adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.*
- III. Where possible, contribute to the improvement of health and quality of life through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.*

British Standard 4142:2014+A1:2019

- 2.3 British Standard 4142:2014+A1:2019, *Methods for rating and assessing industrial and commercial sound* (BS4142) is appropriate guidance for assessing the potential noise impact from new plant noise sources.
- 2.4 BS 4142 requires a Rating Level ($L_{A,r,T,r}$), which is calculated from the operation of the noise source, to be compared with the Background Sound Level ($L_{A90,T}$), which is measured in the absence of the noise source. This is evaluated over a 1-hour period for daytime operations and a 15-minute period for night-time operations.
- 2.5 The Rating Level ($L_{A,r,T,r}$) is based on the Specific Sound Level ($L_{Aeq,T,r}$) attributed to the operating noise source, with 'character corrections' added for noise sources where 'certain acoustic features can increase the significance of impact'.
- 2.6 The character correction applied to the Specific Sound Level in order to obtain the Rating Level can take into account tonality, intermittency, impulsivity and characteristics otherwise distinctive against the prevailing noise climate in the area.
- 2.7 An initial estimate of the potential noise impact from the operating noise source is determined by comparing the difference between the Rating Level and the Background Sound Level.
- 2.8 Regarding the outcome of the initial numerical estimate, BS 4142 states that:
- Typically, the greater this difference, the greater the magnitude of impact;
 - A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context;
 - A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context; and,
 - The lower the Rating Level is relative to the measured background level, the less likely it is that the operation will have an adverse impact or a significant adverse impact. Where the Rating Level is does not exceed the Background Sound Level, this is an indication of the specific sound source having low impact, depending on the context.
- 2.9 BS 4142 states that all pertinent factors must be taken into account regarding the context in which the noise occurs, including:
- The absolute level of sound.
 - The character and level of the residual sound compared to 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 ensure good internal and/or outdoor acoustic conditions such as acoustic screening.

3. BACKGROUND NOISE MONITORING

- 3.1 Noise monitoring was carried out to quantify the prevailing existing noise climate in the area, at a location representative of the nearest dwelling.
- 3.2 Automated noise monitoring was carried out at **Location A** shown in **Figure 1** between 07:00 and 18:00 Thursday 6 November 2025, which are the proposed site operating hours of interest.
- 3.3 Fully calibrated ‘Class 1’ sound level measurement instrumentation was used for the noise monitoring with associated outdoor noise monitoring kit and windshield. Full details of the measurement equipment used for the monitoring is provided in **Appendix B**.
- 3.4 The noise measurements were taken in 1-hour sample periods at a microphone height approximately 1.4m about local ground in line with BS 4142 guidance. Calibration checks were carried out both before and after the noise surveys with no variance in calibration level outside of normal drift tolerance ($\leq \pm 0.2$ dB).
- 3.5 Weather conditions during the noise monitoring were suitable for sound level measurements, being dry with low wind speeds. Full details of the weather conditions during the noise monitoring are provided in **Appendix B**.
- 3.6 The noise climate in the area was generally due to aircraft noise, with some distant road traffic noise and some prominent bird call noise during the morning between 07:12 and 07:18.
- 3.7 The full results of the noise monitoring are shown in **Appendix B** and a summary showing the range of measured sound levels during different periods, as well as the corresponding arithmetic ($L_{A90,T}$ and L_{Amax}) and logarithmic ($L_{Aeq,T}$) means is shown in **Table 1**.

Table 1: Summary of Noise Monitoring Results at Location A – Minimum-Maximum (Mean) [dB]

$L_{A90,1h}$	$L_{Aeq,1h}$	L_{Amax}
38-45 (41)	53-60 (57)	74-83 (77)

- 3.8 The results of the noise survey provide a baseline of the existing noise climate conditions in the area, which is used in the assessment of potential noise impacts from proposed site operations, shown in **Section 4**.

4. ASSESSMENT OF PROPOSED SITE OPERATIONS

Computerised Noise Model

- 4.1 A computerised noise model of the proposed site operations has been developed using DataKustik CadnaA 3D noise modelling software.
- 4.2 The following relevant CadnaA settings and standards were used in the noise model:
- Software Version: 2025 MR 1 (build: 211.5558).
 - Standards: ISO 9613:2024.
 - Source of topographical data: DEFRA LIDAR dataset.
 - Source of local building data: OS OpenMap - Local dataset.
 - Orders of reflection: 2.
 - Search radius: 2km.
 - Ground absorption: 0.8 mostly absorptive.
 - Temperature: 10°C.
 - Humidity: 70%.
- 4.3 Noise levels data for the proposed Cube Metals Ltd operations at the proposed site has been made available to us in the form of a former planning noise assessment prepared for them for their operations at their existing premises. The planning noise report reference is RP01-21568-R0 dated 4 January 2022, prepared by Cass Allen Associated Ltd. We have been told that the activities and noise level data provided in the Cass Allen report are still representative of Cube Metals Ltd current and proposed operations.
- 4.4 The Cass Allen noise levels were measurements of noise breakout from two separate buildings, one a sheet metal laser cutting workshop and the other a separate main workshop including various metal work machinery.
- 4.5 The Cass Allen report gives the laser cutting workshop noise levels as 67 dB L_{pA} at 5m from the opening and the main workshop level as 71 dB L_{pA} at 10m from the opening. For the proposed new site, the general industrial workshop operations will all be housed within Building A to the north of the site. Given that the laser workshop level is approximately 61 dB L_{pA} at 10m for direct comparison, the main workshop level would dictate the breakout from Building A, which has been modelled as a combined 71 dB L_{pA} at 10m from the opening. This translates to an internal reverberant level of 91 dB L_{pA} .
- 4.6 We have also been provided with a transport statement for the proposed site with report reference: VRP2078-01 produced by RKS Associated, dated 17 November 2025. The RKS report predicts up to four two-way vehicle trips over the course of a typical day for storage and distribution associated with the use of Building B. Spread over an 11-hour operating day should result in no more than one HGV trip during a 1-hour BS 4142 daytime assessment period.

- 4.7 As a robust approach we have modelled two HGV trips during the 1-hour assessment period as a moving point source using source noise data from BS 5228-1:2009+A1:2014 for a rigid road lorry (C.6.23) of 82 dB L_{pA} at 10m, which translates to approximately 92 dB L_{wA} and an on-site speed of 10 mph.
- 4.8 Forklift movements have been modelled assuming movements between an adopted HGV location near the site entrance and Building B. We have modelled a forklift route between this area moving back including 16 trips during the 1-hour assessment period as a moving point source using source noise data of forklift activity measured by Hepworth Acoustics at another distribution site of 78 dB L_{Amax} at 2m, which is approximately 92 dB L_{wA} .
- 4.9 Noise breakout from forklift activity within Building B with a 50% continuous on-time has also been calculated based on the existing profile metal cladding and open northern elevation. This translates to an internal reverberant level of 72 dB L_{pA} .
- 4.10 The combined noise emissions from the proposed site activities are shown in **Figure 4** with the Building A doors on the north-western elevation open, and **Figure 5** with the doors closed. The resulting Specific Sound Levels at the nearest dwellings are summarised in **Table 2**.

Table 2: Summary of Specific Sound Levels at the Nearest Dwellings [dB]

Condition	Winch Hill House (R1)	Old Winch Hill Cottage (R2)
Building A doors open	36	44
Building A doors closed	34	31

BS 4142 Assessment

Background Sound Levels

- 4.11 The distribution of Background Sound Levels measured during the proposed operating hours (07:00-18:00) gives both the arithmetic mean and the mode as 41 dB $L_{A90,1h}$, which has been adopted as the representative Background Sound Level for the assessment.

Character Corrections

- 4.12 The following considerations have been made with respect to acoustic character corrections in line with BS 4142 guidance:
- **Tonality:** There are no proposals at this stage that would indicate any noticeable tonal components to the operations noise, particularly when considered within the context of the residual noise climate at the assessment location. Forklift reversing alarms should be white noise alternatives.
 - **Intermittency:** There will be some inherent intermittency to the operations taking place on site, for which we have applied a +3dB character correction.

- **Impulsivity:** The Cass Allen report does mention some impulsive characteristics to the noise emissions from the Cube Metals Ltd operations. We have included a +3dB character correction to account for this, which given the low level of the predicted noise at the assessment location is considered suitable.
- 4.13 A summary of the BS 4142 numerical assessment is shown in **Table 3**, which includes the combined noise levels from all proposed site operations (Building A, Building B, HGV's and forklifts).

Table 3: Summary of BS 4142 Assessment [dB]

Description	Combined Noise with Building A Doors Open		Combined Noise with Building A Doors Closed	
	Winch Hill House (R1)	Old Winch Hill Cottage (R2)	Winch Hill House (R1)	Old Winch Hill Cottage (R2)
Specific Sound Level [dB $L_{Aeq,1h}$]	36	44	34	31
Character corrections [dB]	+6	+6	+6	+6
Rating Level [dB $L_{Ar,1h}$]	42	50	40	37
Background Sound Level [dB $L_{A90,1h}$]	41	41	41	41
Excess of Rating over Background [dB]	+1	+9	-1	-4
Likely impact	'Low'	'Significant Adverse'	'Low'	'Low'

Results & Conclusion

- 4.14 The results in **Table 3** show that the proposed site operations have the potential to result in a significant adverse noise impact if the site operations are carried out with the doors in the north-western elevation of Building A left open. However, with the doors to Building A kept closed the potential noise impact reduces to the 'low' category, with the predicted Rating Levels below the Background Sound Levels.
- 4.15 This demonstrates that with proper on site noise management, i.e. keeping doors closed during operations within Building A, the site is suitable for the proposed general industrial as well as storage and distribution use.

Design Limits for Any Fixed External Plant

- 4.16 We have been informed that at this stage there are no proposals for any fixed external plant, however if any fixed external plant is to be installed on the site in future, we recommend that the plant noise at the nearest dwellings does not exceed the existing representative Background Sound Level. The recommended plant noise design limit is 41 dB $L_{Ar,1h}$. This plant noise design limit is the Rating Level of sound; this means the Specific Sound Level will need to be lower where there are applicable character corrections.

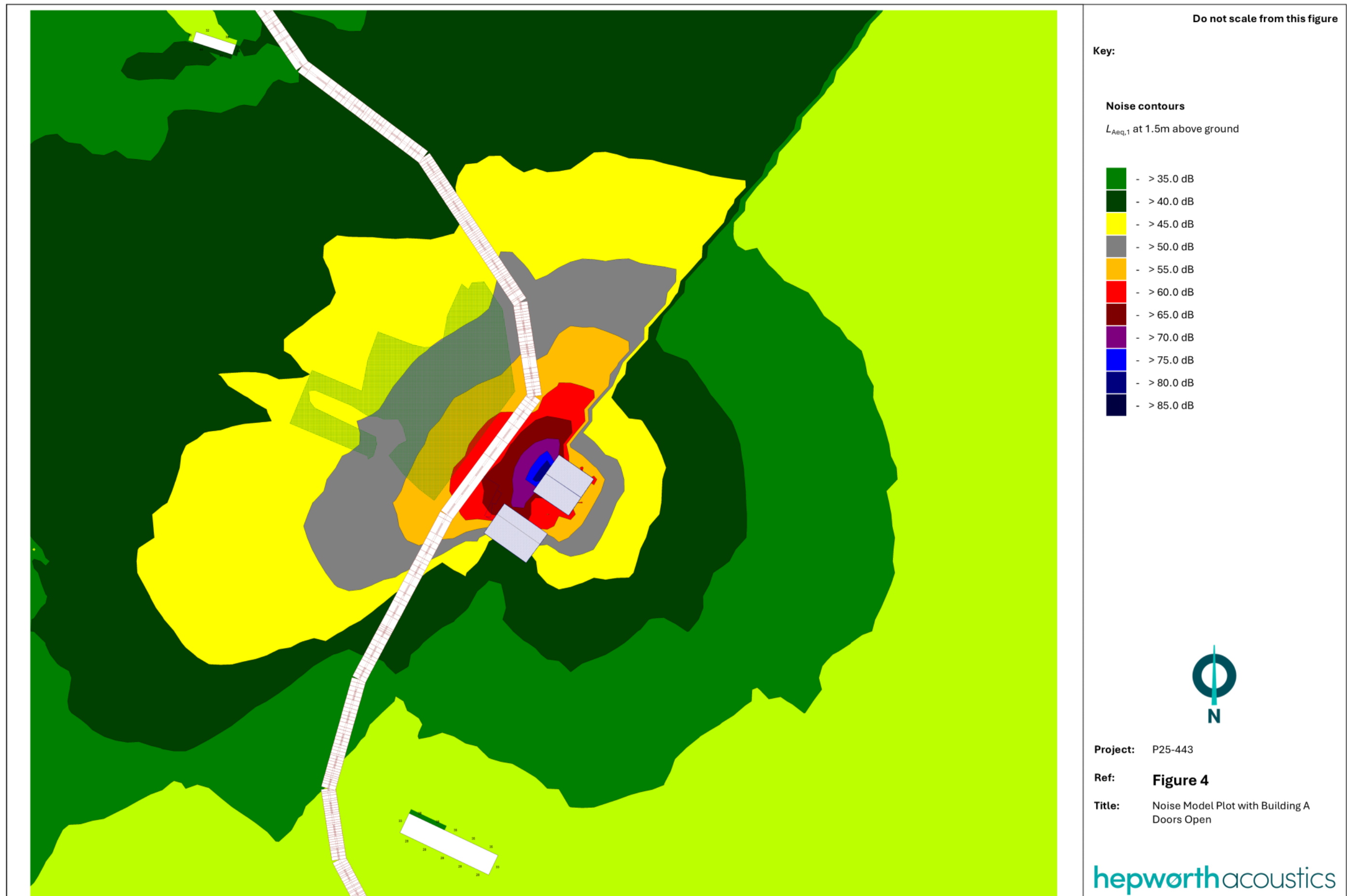
5. SUMMARY

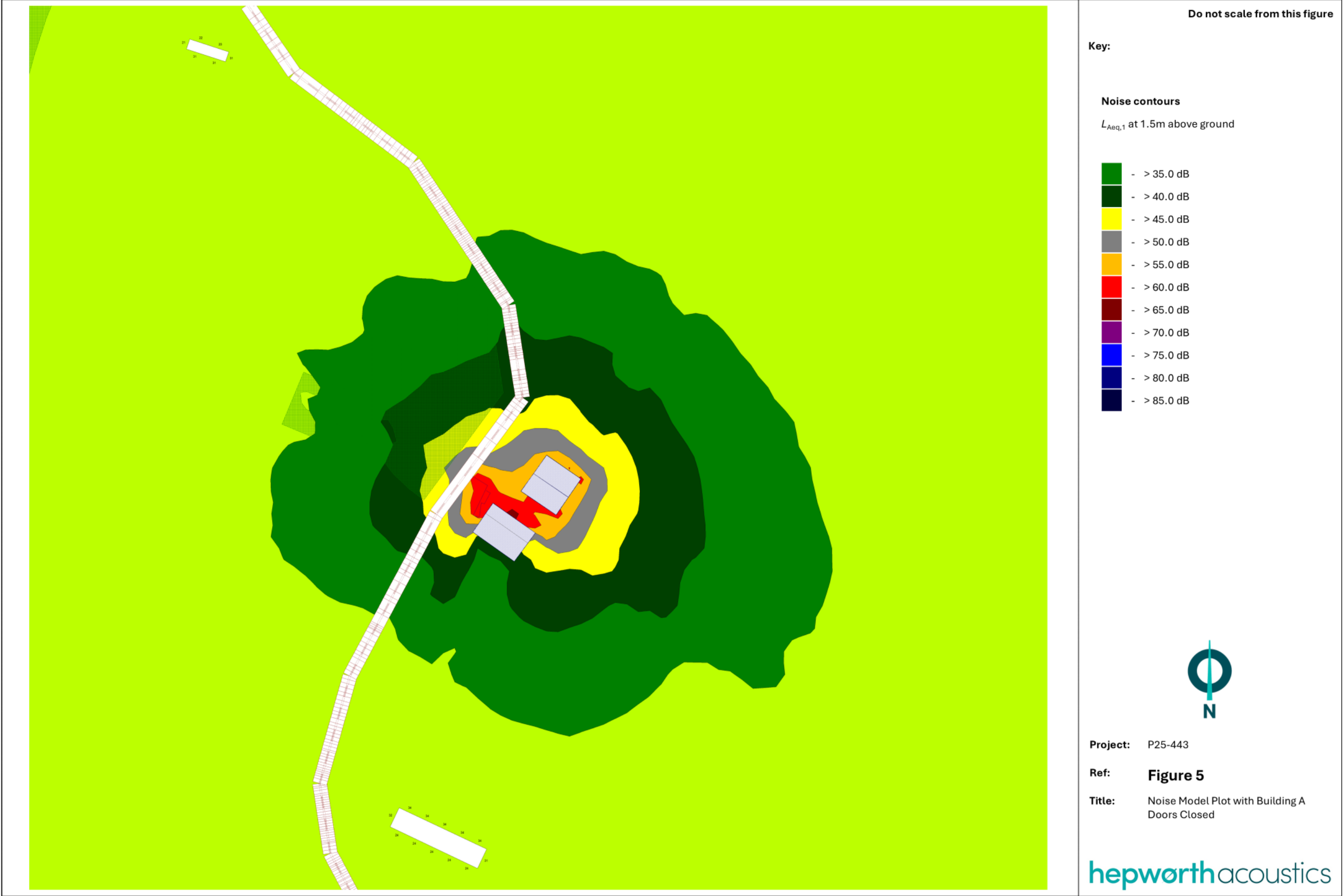
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- 5.2 Background noise monitoring was carried out to quantify the prevailing existing background noise climate in the area, during the proposed hours of site operations.
- 5.3 A computerised noise model was developed of the proposed site operations including calculations with the doors to Building A open and closed.
- 5.4 The results of the assessment indicate that the proposed site operations could result in a significant adverse noise impact if the operations are carried out with the doors to Building A left open, however the findings shown that there would be no risk of adverse noise impact if the doors to Building A are kept closed during site operations, which can be assured with good site management.











APPENDIX A: ACOUSTICS UNITS & INDICES

Sound and the decibel

A sound wave is a small fluctuation of atmospheric pressure. The human ear responds to these variations in pressure, producing the sensation of hearing. The ear can detect a very wide range of pressure variations. In order to cope with this wide range of pressure variations, a logarithmic scale is used to convert the values into manageable numbers. Although it might seem unusual to use a logarithmic scale to measure a physical phenomenon, it has been found that human hearing also responds to sound in an approximately logarithmic fashion. The dB (decibel) is the logarithmic unit used to describe sound (or noise) levels. The usual range of sound pressure levels is from 0 dB (threshold of hearing) to 120dB (threshold of pain).

Due to the logarithmic nature of decibels, when two noises of the same level are combined together, the total noise level is (under normal circumstances) 3 dB(A) higher than each of the individual noise levels e.g. 60 dB(A) plus 60 dB(A) = 63 dB(A). In terms of perceived ‘loudness’, a 3 dB(A) variation in noise level is a relatively small (but nevertheless just noticeable) change. An increase in noise level of 10 dB(A) generally corresponds to a doubling of perceived loudness. Likewise, a reduction in noise level of 10 dB(A) generally corresponds to a halving of perceived loudness.

The ear is not equally sensitive to sound at all frequencies. It is less sensitive to sound at low and very high frequencies, compared with the frequencies in between. Therefore, when measuring a sound made up of different frequencies, it is often useful to ‘weight’ each frequency appropriately, so that the measurement correlates better with what a person would actually hear. This is usually achieved by using an electronic filter called the ‘A’ weighting, which is built into sound level meters. Noise levels measured using the ‘A’ weighting are denoted dB(A) or dBA.

Frequency and Hertz (Hz)

As well as the loudness of a sound, the frequency content of a sound is also very important. Frequency is a measure of the rate of fluctuation of a sound wave. The unit used is cycles per second, or hertz (Hz). Sometimes large frequency values are written as kiloHertz (kHz), where 1 kHz = 1000 Hz.

Young people with normal hearing can hear frequencies in the range 20 Hz to 20 kHz. However, the upper frequency limit gradually reduces as a person gets older.

Glossary of Terms

When a noise level is constant and does not fluctuate, it can be described adequately by measuring the dB(A) level. However, when the noise level varies with time, the measured dB(A) level will vary as well. In this case it is therefore not possible to represent the noise climate with a simple dB(A) value. In order to describe noise where the level is continuously varying, a number of other indices can be used. There are also a number of ways to describe sound insulation performance.

The indices used in this report are described below.

L_p	Sound Pressure Level [dB re 2×10^{-5} Pa]: The sound pressure at a given position and moment in time, expressed as a logarithmic ratio with the reference sound pressure at the human threshold of hearing (2×10^{-5} Pa). Sound pressure is the change in equilibrium pressure caused by a sound wave at a given position, which also varies with time. Equilibrium pressure in the Earth’s atmosphere is typically 101,325 Pa.
L_{pA}	A-weighted Sound Pressure Level [dB re 2×10^{-5} Pa]: The Sound Pressure Level (L_p) with the frequency spectrum adjusted to account for the average human hearing response at different frequencies for a moderate sound pressure range.
L_w	Sound Power Level [dB re 10^{-12} W]: The sound power expressed as a logarithmic ratio with the reference sound power at the human threshold of hearing (10^{-12} W). The sound power is the rate at which sound energy is transferred.
L_{wA}	A-weighted Sound Power Level [dB re 10^{-12} W]: The Sound Power Level (L_w) adjusted to account for the average human hearing response at different frequencies for a moderate sound power range.
$L_{Aeq,T}$	A-weighted Equivalent Continuous Sound Level [dB re 2×10^{-5} Pa]: An average of the total sound pressure level measured over a specified time period (T). In other words, $L_{Aeq,T}$ is the level of a steady sound which has the same total A-weighted sound pressure level as the real fluctuating noise, measured over the same time period. It has become the preferred parameter for quantifying most forms of environmental noise.
L_{Amax}	Maximum A-weighted Sound Level with Fast Time-weighting [dB re 2×10^{-5} Pa]: The maximum A-weighted sound pressure level during the measurement period, using the Fast time-weighting of 125ms. L_{Amax} used in this report refers throughout to L_{AFmax} with the Fast time weighting, denoted L_{AFmax} or $L_{Amax,f}$ in other documents but L_{Amax} in BS 8233:2014 standard notation.
$L_{A90,T}$	A-weighted 90 Percentile Level [dB re 2×10^{-5} Pa]: The A-weighted sound level exceeded for 90% of a measurement time period (T). $L_{A90,T}$ is generally used as a measure of Background Sound Level, as is the case in BS 4142 assessments.
$L_{A,T,r}$	Rating Level [dB re 2×10^{-5} Pa]: An A-weighted value most commonly used in BS 4142 assessments, which is the sound level of the noise source under assessment, at the assessment location, evaluated over the reference assessment period (T_r) and includes numerical adjustments for the characteristic features of the sound. The reference period (T_r) is 1-hour for the daytime and 15-minutes for the night-time.

APPENDIX B: NOISE SURVEY RESULTS

Date(s)	Thursday 6 November 2025
Equipment	NTi Audio XL2-TA ‘Class 1’ sound analyser (SN: A2A-20259-E0) NTi Audio CAL200 ‘Class 1’ sound calibrator (SN: 19360) Kestrel 2500 portable weather meter (SN: 2556870) Associated windshield and environmental outdoor monitoring kit
Weather	Thursday, day: Dry, ~15°C, moderate cloud coverage and low SSE wind speeds <3 m/s

Location A: Noise Monitoring Results (51.88174° N, 0.34847° W)

Time (T) [hh:mm]		Sound Pressure Level [dB re 2x10 ⁻⁵]			Notes
Start	End	L _{A90,T}	L _{Aeq,T}	L _{Amax}	
07:00	08:00	44.1	60.3	83.4	Aircraft noise. Distant road traffic noise. Prominent morning bird calls.
08:00	09:00	44.8	58.2	79.1	Aircraft noise. Distant road traffic noise.
09:00	10:00	39.6	57.0	77.1	Aircraft noise. Distant road traffic noise.
10:00	11:00	40.8	55.3	75.0	Aircraft noise. Distant road traffic noise.
11:00	12:00	42.1	53.1	73.7	Aircraft noise. Distant road traffic noise.
12:00	13:00	37.7	55.3	76.9	Aircraft noise. Distant road traffic noise.
13:00	14:00	40.8	57.2	76.5	Aircraft noise. Distant road traffic noise.
14:00	15:00	40.9	57.7	80.9	Aircraft noise. Distant road traffic noise.
15:00	16:00	40.1	55.4	74.4	Aircraft noise. Distant road traffic noise.
16:00	17:00	37.6	56.1	77.0	Aircraft noise. Distant road traffic noise.
17:00	18:00	38.6	57.1	78.3	Aircraft noise. Distant road traffic noise.