This survey was done to replace the one done in Feb 2022 by Noise Solutions which was ambiguous as to the causes of any noise and failed to take into account That Winterfold House (nextdoor) was under construction at the time.

Anderson Acoustics

CONDITION 4 DISCHARGE NOISE ASSESSMENT

THE WORKSHOP, TANNERS FARM, MAYES LANE, HORSHAM

HEATHER BERWICK

JULY 2023

CONDITION 4 DISCHARGE NOISE ASSESSMENT
THE WORKSHOP, TANNERS FARM, MAYES LANE, HORSHAM

Our Ref: **6401_001R_1-0_GC**

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Date:	**18 July 2023**
Project No:	6401
Status:	**FINAL**

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REVISION HISTORY

Version	Comments	Changes made by	Approved by
1-0	First issue	GC	CW

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EXECUTIVE SUMMARY



The demolition of existing class B1(C) workshop building and construction of new dwellinghouse (Class C3) at Tanners Farm, Mayes Lane, Horsham, RH12 3SG has been granted prior approval (ref. DC/21/2026), subject to a number of conditions.

This report concerns **Condition 4**, which requires a scheme demonstrating that the internal sound levels will conform to the requirements of **BS 8233**. The full wording of the condition is given in **Section 1**.

This report presents the scheme, such as is required, with the details summarised below. It is based on a combination a week-long noise survey on the site, the drawings of the development, and the criteria in **BS 8233**.

The noise survey, undertaken in the middle of **June 2023**, determined that levels are sufficiently low to meet the noise criteria detailed in **BS 8233** (see **Section 3**) regardless of the glazing or means of ventilation and overheating control. Accordingly, no scheme of noise attenuation is required, with any specification of glazing being permissible acoustically.

Notwithstanding this, it is understood that a continuous mechanical supply and extract system with heat recovery (MVHR) is to be installed, which will negate the need for alternative background ventilation (such as via trickle vents or opening windows) and reduce the requirement to open windows for overheating control.

It is, therefore, considered that the details presented herein are sufficient for **Condition 4** to be discharged.

1 INTRODUCTION

Anderson Acoustics Ltd was commissioned by Heather Berwick to undertake a noise assessment to support the discharge of **Condition 4** of the prior approval (ref. DC/21/2026) for the demolition of existing class B1(C) workshop building and construction of a new dwellinghouse (Class C3) at Tanners Farm, Mayes Lane, Horsham.

The condition is as follows:

> **Pre-Commencement Condition:** Prior to the commencement of development hereby permitted, a scheme of noise and vibration attenuation and ventilation sufficient to prevent overheating and maintain thermal comfort shall be submitted to and approved in writing by the Local Planning Authority.
>
> The scheme including performance details and a glazing plan shall achieve the habitable and commercial room standards as detailed in BS8233:2014 with no relaxation for exceptional circumstances and appropriate consideration of LAmax with suitable measures to ensure the thermal comfort of occupiers. All work must be carried out by suitably qualified person.

This report, therefore, presents the "scheme" demonstrating that the internal sound levels will conform to the requirements of **Condition 4**, and is being submitted to Horsham District Council for approval.

Accordingly, a brief description of the site and consented development is given in **Section 2**. The relevant noise criteria are presented in **Section 3**. The noise survey details and results are summarised in **Section 4**, whilst the scheme demonstrating compliance with the criteria is presented in **Section 5**.

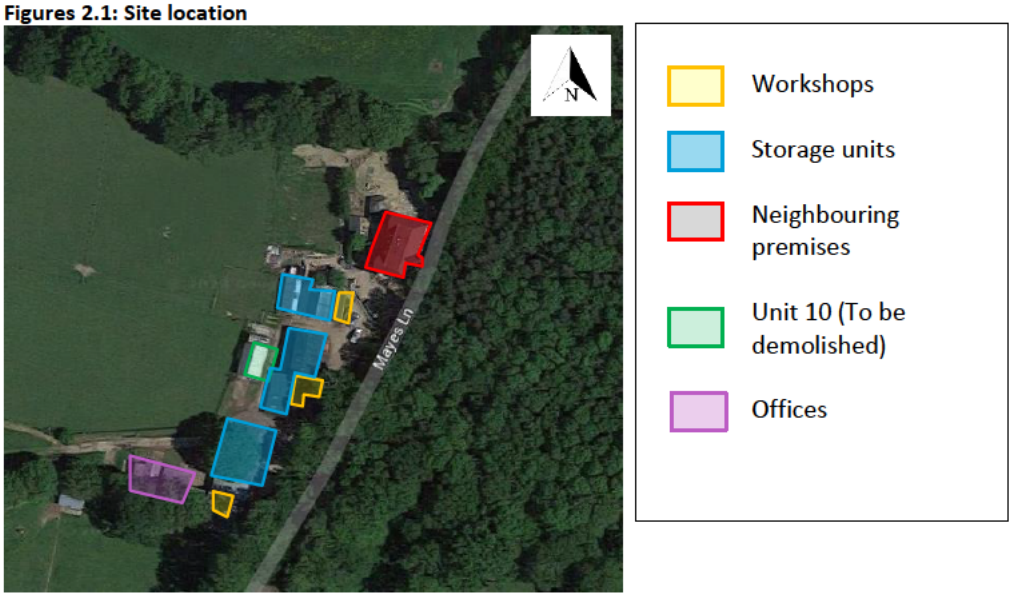
A glossary of the technical terms used in this report is presented as **Appendix A**.

2 SITE DESCRIPTION

2.1 The Application Site

The location of the site is shown in **Figure 2.1** below, with site photographs presented as **Figures 2.2 – 2.5**.

Figures 2.1: Site location



Source: Google Maps (Map data ©2022) (annotated by Anderson Acoustics)

Figure 2.2: View of unit 10's south and east sides



Figure 2.3: View of unit 10's south and west sides



Figure 2.4: View of site's northern end, looking NEN



Figure 2.5: View of unit 10's west side, looking south



The site contains various units, which, as indicated in **Figure 2.1**, are used for either offices, storage or workshops. The latter comprise units 3, 13 and 18, located to the south, east and north-east of the proposed dwelling, respectively. All three workshops are used for the likes of vehicle repairs, with typical working hours between 9am – 5pm during weekdays. It should be noted that they are not in constant use, and are visited on an ad-hoc basis. General works conducted are noted to be 'light' in nature, with the potential and rare use of mechanical machinery, such as lathes and grinders for sharpening tools.

The site is also neighboured by Winterfold House approximately 40m to the north-east.

The site was visited by Anderson Acoustics during the daytime on two occasions for the purpose of the baseline survey presented in **Section 3**. The noise environment was found to be dominated mostly by birdsong and foliage, along with distant road traffic and occasional, distant air traffic. It was deemed that a night visit wasn't warranted in the absence of any likely sources of commercial noise.

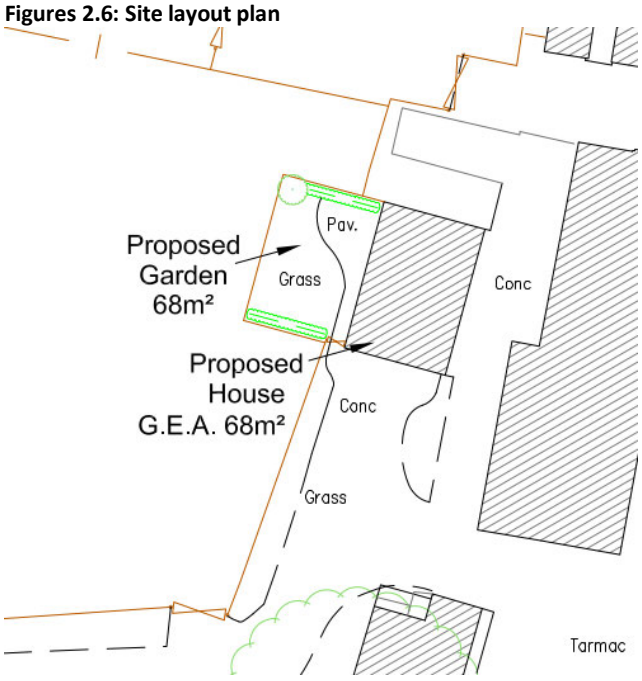
As stated above, the workshops units are not in constant use, whilst they are also away from the site of the consented dwelling. At the time of the site visits, when in proximity to the units in question, activities were noted to include light impact sounds related to vehicle repairs and short-term idling of vehicle engines, but which were not audible in the vicinity of unit 10. Access was gained to each unit to gauge the potential for any further noise of potential significance, but where none was found.

In total, around two hours was spent on site, whilst, together with conversations with the owner and occupiers present, it is considered that the operation of the site is sufficiently understood, and that it presents no risk to the consented residential development with respect to noise. Further to which, it was elected to undertake a prolonged baseline survey, whereby it is considered that sufficient data has been obtained to describe the conditions typically.

2.2 Consented Development

The development includes the demolition of the existing class B1(c) workshop building and the construction of a new 2no. bedroom dwellinghouse (Class C3). The new dwellinghouse will cover the same footprint as the previous workshop, as well as a garden to the west. It is shown in the following figures.

Figures 2.6: Site layout plan



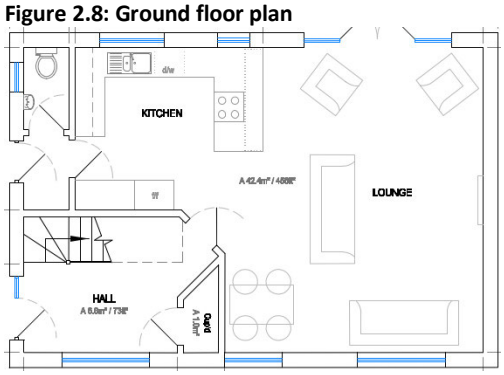
Source: Unknown

Figure 2.7: Building elevations



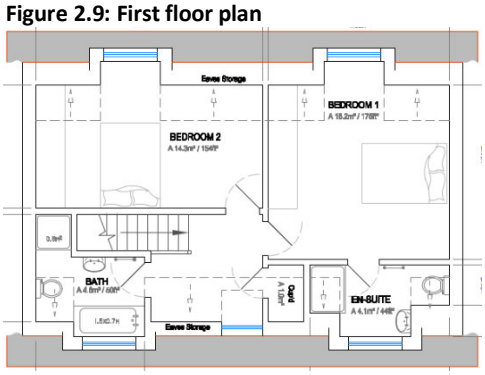
Source: "Unit 10 – Elevations & Section", ref. 10PFP4 – rev. G, dated October 2022

Figure 2.8: Ground floor plan



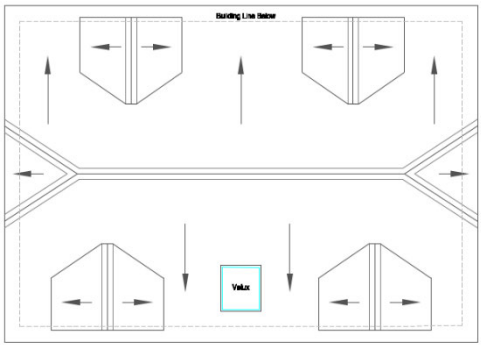
Source: "Unit 10 – Ground Floor", ref. 10PFP1 – rev. G, dated October 2022

Figure 2.9: First floor plan



Source: "Unit 10 – First Floor", ref. 10PFP2, rev. G, dated October 2022

Figure 2.10: Roof plan



Source: "Unit 10 – Roof Plan", ref. 10PFP4 – rev. G, dated October 2022.

It can be seen that there are two bedrooms at first floor level on the western side, with windows overlooking the proposed garden. The only windows, therefore, that have a view of the commercial units (i.e., to the north, south and east of the dwelling) are those of the lounge in the east elevation; and where the lounge can be seen to be dual aspect, with other windows (and doors) in the western elevation.

3 NOISE CRITERIA

3.1 Introduction

As is appropriate, **Condition 4** refers to **BS 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings** in terms of suitable internal noise criteria for the consented dwelling, which are presented below.

3.2 BS 8233 Indoor Ambient Noise Criteria

The criteria recommended in **BS 8233** for residential spaces are summarised in **Table 3.1**.

Table 3.1: Indoor ambient noise levels for dwellings (as per Table 4 of BS 8233)

Activity	Location	07-23 (Daytime)	23-07 (Night-time)
Resting	Living room	35 dB $L_{Aeq,16h}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16h}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16h}$	30 dB $L_{Aeq,8h}$

It is noted that **Condition 4** specifically refers to the sound level metric "LAmax". This is also mentioned in **BS 8233**, but where no criterion is given in the latest version. However, since this metric is referenced in terms of the night-time period and sleep disturbance, and where the noise source(s) in question here (i.e., any associated with the operation of the neighbouring commercial premises) are present during normal working hours only (see **Section 4**), this metric is not relevant in this instance.

Notwithstanding this, where the night-time period is of interest, then, based guidance within the World Health Organization (WHO) **Guidelines for Community Noise** (1999), an internal noise limit of 45 dB L_{Amax} is typically adopted, which is not to be exceeded more than 10-15 times per night.

In summary, therefore, and given the risk of any commercial noise is limited to the daytime period, the main criterion is 35 dB $L_{Aeq,16h}$ during the day, applicable to living rooms (i.e., the lounge in this instance) and bedrooms. Secondary to this are the criteria relevant to bedrooms at night, i.e., 30 dB $L_{Aeq,8h}$ and 45 dB L_{Amax} (not more than 10-15 times).

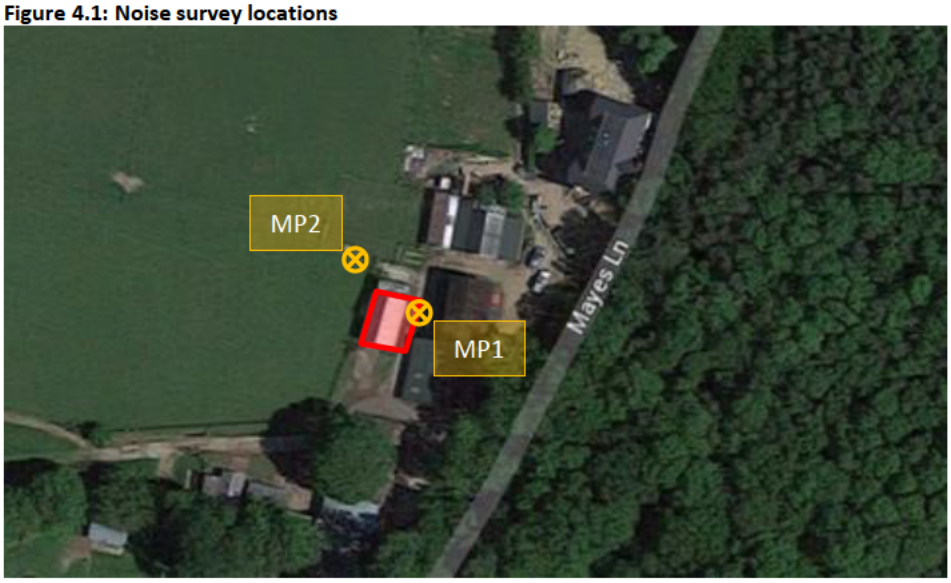
Furthermore, whilst **Condition 4** concerns internal conditions only, the equivalent guidance in **BS 8233** for outdoor amenity areas (i.e., the garden in this instance) has also been considered. **BS 8233** states that, "it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments…" As for the internal conditions, these thresholds are typically assessed of the 16-hour daytime period, whereby $L_{Aeq,16h}$ levels apply.

4 BASELINE NOISE CONDITIONS

4.1 Survey Details

To determine the baseline noise conditions on site, two sound level meters were installed between the **afternoon of Thursday 15th and the morning of Wednesday 19th June 2023**. The survey locations are shown in **Figures 4.1**, **4.2** and **4.3** below, whilst the equipment details are presented in **Section 4.2**. The microphones were mounted approximately 1.5m above ground level measuring façade and free-field levels to the east and west, respectively. The meter positioned to the east of site (MP1) operated for the entire 6/7-day period, but where the external battery at the west position (MP2) depleted on the Monday night, after 4/5 days' monitoring. However, more than enough data have been gathered for the purpose of a robust assessment, nonetheless.

Figure 4.1: Noise survey locations



Source: Google Maps (Imagery ©2023 Infoterra Ltd & Bluesky, The GeoInformation Group, Map data ©2023) (annotated by Anderson Acoustics)

Figure 4.2: East elevation noise survey location (MP1)

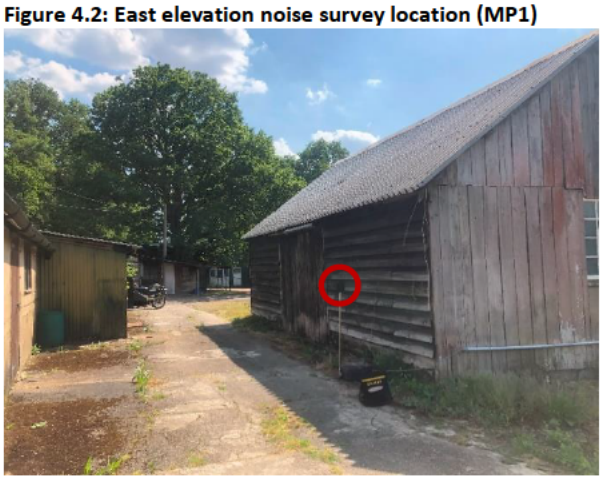
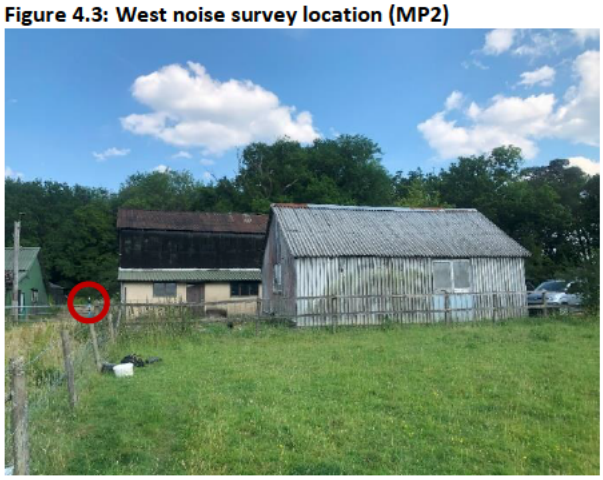


Figure 4.3: West noise survey location (MP2)



Sources: Anderson Acoustics (Images captured: June 2023)

The measurement chains were field-calibrated before the survey/measurements using an acoustic calibrator. The level was checked at the end of the survey/measurements, and no significant drift was observed. Both the sound level meters and calibrator have been calibrated by a UKAS accredited laboratory within the standard intervals of 24 and 12 months, respectively.

The meters were set to store the "A" weighted sound levels every 2 minutes (MP2/West) and 15 minutes (MP1/East), from which the period (16- and 8-hour) L_{Aeq} levels have been determined, together with the "Fast" time-weighted levels, from which the L_{Amax} levels have been determined. The results are presented in **Section 4.3** below and **Appendix B**. Frequency data was also obtained in the octave-bands between 16 Hz and 16 kHz.

As stated earlier, the sources audible at the times on site (i.e., during daytime hours) included birdsong and foliage, with distant road traffic and some air traffic movements. At night, it is anticipated the noise environment remains dominated by natural sounds, with, no doubt, notable dawn chorus, and some contribution from distant road traffic (the largest road in the area being the A24, some 900 m to the east). It is noted that the site is 10.5 km SWS of Gatwick Airport, well beyond the outer, 57 dB $L_{Aeq,16h}$ daytime noise contour.

The weather conditions were noted at the time of the site attendance, from the BBC website during the survey, and with notes made by the site owner. Periods of adverse weather (i.e., thunderstorms and heavy rain) affected parts of the survey at around 1-2pm on Saturday 17th, between 1 and 3am on the morning of Sunday 18th, and between 5 and 7am on Tuesday 20th (June). This is accounted for in the assessment. Otherwise, bearing in mind the survey occurred over a six-day period, conditions were generally dry with light winds, and thus conducive to the reliable measurement of sound.

4.2 Survey Equipment Details

Table 4.1: Survey equipment details

Equipment (ID) (Location)	Make & Model	Serial No.	Date Laboratory Calibrated	Calibration Certification Number [1]
Sound level meter (AA-SLM-21) (MP1)	Rion NL-52	01076327	17/01/2023[2]	TCRT23/1045
Sound level meter (AA-DUO-03) (MP2)	01dB DUO	10667	27/04/2023[2]	10585
Calibrator (AA-CAL-02 SV36)	Svantek SV36	112582	12/09/2022[3]	1503253-2

1 Certificates available on request.
2 Valid for two years.
3 Valid for one year.

4.3 Survey Results

The results are presented in chart form in **Appendix B**, with the period $L_{Aeq,T}$ levels and the night-time L_{AFmax} levels presented in **Table 4.2**. In keeping with best practice guidance, and to account for the requirement to consider the 10-15th highest L_{AFmax} levels, the data from MP2 (which was closest to the location of the consented bedroom windows in the western elevation) have been obtained and processed in terms of 2-minutely levels. The data from MP1 are not relevant in this regard given the absence of bedroom windows in the eastern elevation (likewise, the norther and southern elevations), but where the 90th percentile values based on the 15-minute levels have been presented for information only.

Since the levels at MP1 were obtained under "façade" conditions (i.e., 1 m from the western elevation of the existing building), the levels presented in **Table 4.2** include a correction of -3 dB to represent the equivalent free-field values for comparison with the internal noise criteria.

Table 4.2: Summary of measured/determined sound levels, dB (free-field[1])

Date (2022)	Daytime (07-23) $L_{Aeq,16h}$ [2]		Night-time (23-07)			
			$L_{Aeq,8h}$ [2]		90th Percentile / 10th highest L_{AFmax} [3]	
	MP1 (East)[1]	MP2 (West)	MP1 (East)[1]	MP2 (West)	MP1 (East)[1]	MP2 (West)
Thu 15 June	38[4]	39[4]	33	40	67	54
Fri 16 June	43	44	35	40	58	55
Sat 17 June	44	45	52[5]	50[5]	67[5]	65[5]
Sun 18 June	48[6]	46[6]	38	43	64	61
Mon 19 June	43	47	54[5]	-[7]	70[5]	-[7]
Tue 20 June[7]	45	-[7]	39	-[7]	64	-[7]
Average	**44[8]**	**44[8]**	**36[8]**	**41[8]**	**63[8]**	**57[8]**

1 The MP1 values include a correction of -3 dB to covert the façade-based values into free-field values.
2 Based on the logarithmic average of the $L_{Aeq,15min}$ levels.
3 The MP1 values are based on the 90th percentile of the 15-minute values, but where the MP2 values, of relevance to the assessment, are based on the 10th highest of the 2-minute values.
4 Part data from after the equipment was installed.
5 Periods of adverse weather.
6 On the Sunday, elevated levels occur at both positions at the time when the owner made a note of the sheep farmer arriving and parking next to MP1 to "check grass level". It is thus presumed, since both positions were latterly influence for the next two hours, that grass cutting took place. The elevated levels have been included within the overall average levels as worst case, but where they are not necessarily that high (as a daily average) in any case.
7 No data due to battery depletion.
8 Excluding part data and/or periods of adverse weather.

Overall, excluding of periods of adverse weather, and the first day's part-period levels, the results are generally consistent, indicating a robust data set, as well as relatively consistent noise conditions.

The daytime ambient/L_{Aeq} levels are generally low and similar between the two positions – the overall average for both coming out the same.

The night-time ambient/L_{Aeq} levels are also generally low, with the differences between the daytime and night-timer overall averages ranging from 3 to 8 dB. The range is anticipated to be due to MP2 being a more exposed position, whilst the relatively small difference between the day and night levels is considered due to a combination of a lack of sources during the day and the night-time levels influenced by the dawn chorus.

The night-time maximum/L_{AFmax} levels are also relatively low. It is not known why the levels at MP1 are higher than at MP2, but where this is of limited interest given the lack of bedroom windows in the eastern elevation.

The values are compared to the relevant criteria in the following section.

5 NOISE CONTROL AND VENTILATION SCHEME

Condition 4 requires that the internal sound levels conform to the standards identified by BS 8233. These are presented in **Table 3.1**, where a level of 35 dB $L_{Aeq,16h}$ applies to living rooms and bedrooms during the day, and a level of 30 dB $L_{Aeq,8h}$ applies to bedrooms at night. In addition to which, but not within BS 8233, a limit of 45 dB L_{AFmax} (not to be exceeded more than 10 times) is typically adopted for bedrooms at night.

The table below presents the difference between the average levels found in **Table 4.2** against the criteria. It should be borne in mind that, as stated in BS 8233, the thresholds are based on annual average data and do not have to be achieved in all circumstances.

Table 5.1: Comparison of survey data and noise criteria

Location(s)	Criterion	Average external level	Difference
Living room/bedrooms (day)	35 dB $L_{Aeq,16h}$ (internal)	44 dB $L_{Aeq,16h}$	9 dB
Bedrooms (night)	30 dB $L_{Aeq,8h}$ (internal)	41 dB $L_{Aeq,8h}$	11 dB
	45 dB L_{AFmax} (internal)	57 dB L_{AFmax}	12 dB
Garden (day)	50 $L_{Aeq,16h}$ (external)	44 dB $L_{Aeq,16h}$	-5 dB

In terms of the garden (see **Figure 2.6**), it can be seen that the measured level (44 dB) is below the lower target value given in BS 8233. Accordingly, no noise control is required in this regard.

In terms of the internal spaces, it can be seen that the differences between the external sound levels and the internal criteria are up to 12 dB. Accordingly, this is an indication of the sound insulation performance required by the building envelope, which will be dictated by the glazing and/or means of ventilation and overheating control.

As per guidance in BS 8233, it is often taken that a window open to provide background ventilation will provide around 15 dB attenuation (outside to inside), whilst the Acoustics Ventilation and Overheating Residential Design Guide (the AVO Guide, 2020) quotes 13 dB for a window open sufficient to provide ventilative cooling. With no evidence of atypically high sound levels at low frequencies, or at any other frequencies (with the excludable exception of during the dawn chorus), we have no reason to expect that such attenuation wouldn't be achieve in practice.

Accordingly, it can be concluded that opening windows can be relied upon in the usual way to provide both background ventilation and ventilative cooling, whilst sufficiently achieving the BS 8233 criteria, as required by Condition 4.

Acoustically, therefore, there is no constraint on the specification of glazing or the means of ventilation or overheating control, hence no scheme of noise (or vibration) attenuation is presented here.

Notwithstanding this, it should be noted that the relevant guidance, including BS 8233, allows for a relaxation in the default criteria at times, such as during overheating control, whilst no noise criteria would apply during any requirements for purge ventilation.

Furthermore, it is understood that a MVHR system is to be installed in any case, which will negate the need for alternative background ventilation (such as via trickle vents or opening windows) and reduce the requirement to open windows for overheating control.

It is, therefore, considered that the details presented are sufficient for Condition 4 to be discharged.

APPENDIX A

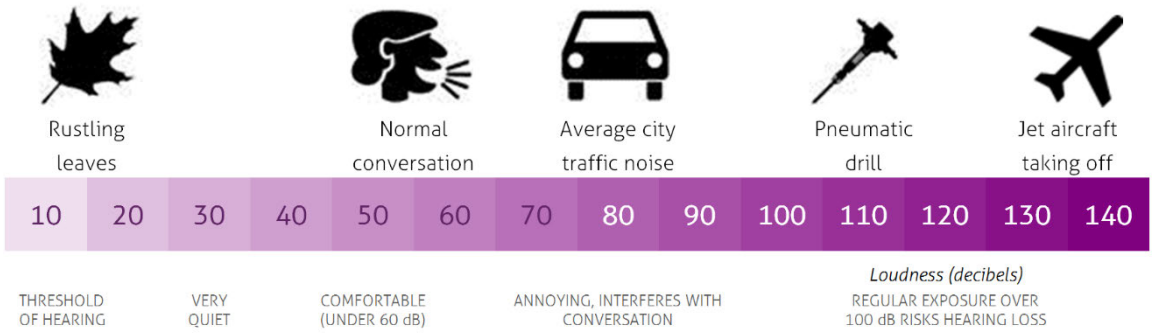
GLOSSARY OF TERMINOLOGY

There is a ten million to one ratio between the threshold of hearing and the highest tolerable sound pressure. Sound is therefore measured using a logarithmic scale, to account for this wide range, called the decibel (dB) scale. Noise is defined as unwanted sound and the range of audible sound varies from around 0 dB to 140 dB.

The human ear is capable of detecting sound over a range of frequencies from around 20 Hz to 20 kHz; however, its response varies depending on the frequency and is most sensitive to sounds in the mid frequency range of 1 kHz to 5 kHz. Instrumentation used to measure sound is therefore weighted across the frequency bands to represent the sensitivity of the ear. This is called 'A weighting' and is represented as dB(A), dBA or L_{Aeq} for example (see also below).

It is generally accepted that under normal conditions humans are capable of detecting changes in steady sound levels of 3 dB, whilst a change of 10 dB is perceived as a doubling or halving of the sound level. An indication of the range of sound levels commonly found in the environment is given below.

Figure A1: Typical sound levels



A number of different indices are used to describe the fluctuations in sound level over certain time periods. The main indices include:

$L_{A90,T}$ This is the sound level exceeded for 90% of the measurement period and provides a measurement of relatively continuous sounds that make up quieter 'lull' periods in between sound events. It is often referred to as the background sound level, and usually measured using the 'fast' time response (hence sometimes written $L_{AF90,T}$).

$L_{Aeq,T}$ This is the "equivalent continuous A weighted sound pressure level" and is the level of a notional steady sound which has the same acoustic energy as the fluctuating sound over a specified time period. It is often used for measuring all sources of sound in the environment, which can be referred to as the ambient sound.

$L_{Amax,F}$ This is the maximum sound pressure level measured in a given time period with the sound level meter set to 'fast' response. Also written $L_{Amax,fast}$ or L_{AFmax}.

Reference is often made to acoustic measurements being undertaken in 'free-field' or 'façade' locations. Free-field measurements represent a location away from vertical reflecting surfaces, normally by at least 3.5 m. A façade measurement is taken or calculated to a position 1 m from an external façade and a correction of up to 3 dB can be applied to account for the sound reflected from the façade. This latter position is often used when assessing the impact of external noise affecting residents inside properties.

In terms of the use of "sound" and "noise", strictly "sound" can be measured by a sound level meter or other measuring system, whilst "noise" is related to a human response, and is routinely described as unwanted sound, or sound that is considered undesirable or disruptive. Care has been taken in this document to use the most relevant of these terms; however, in most reference documents, and, indeed, generally, these terms are used interchangeably, with noise being used, in correctly, more often than sound, and so a mix is presented in this document. Consequently, just because the term noise is used, doesn't necessarily mean a negative effect exits or will occur, and the context of the accompanying text should be taken into account. Further definitions relating to this report are given overleaf.

Definitions

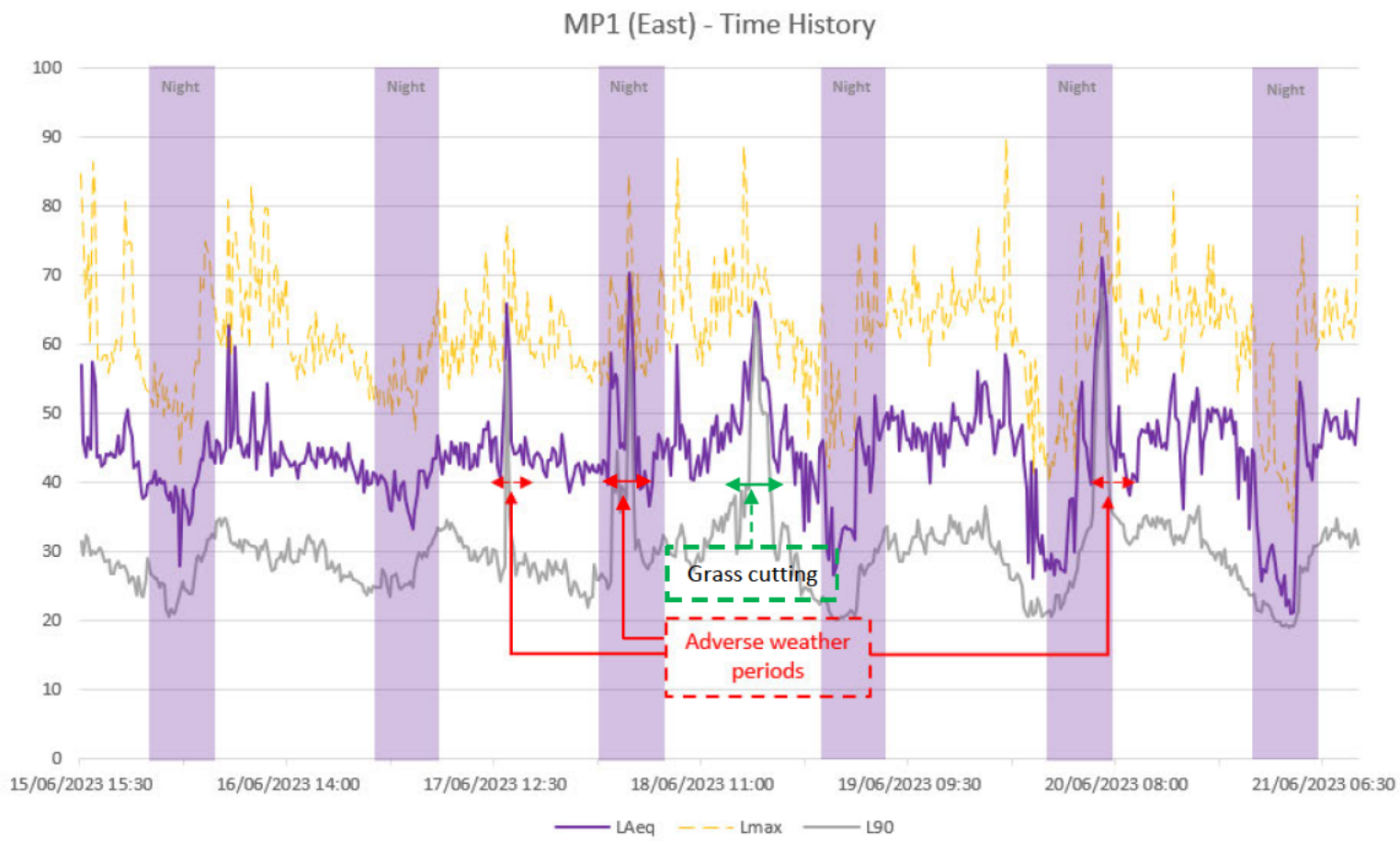
- Airborne Sound: Sound that reaches the point of interest by propagation through air.
- Ambient Sound: Totally encompassing sound in a given situation at a given time, usually composed of sound from many sources near and far.
- A-weighting, dB(A): The unit of sound level, weighted according to the A-scale, which takes into account the increased sensitivity of the human ear at some frequencies.
- Background sound: Underlying level of sound over a period, T, which might in part be an indication of relative quietness at a given location.
- Calibration: The measurement system/ chain should be periodically calibrated, within a laboratory, against traceable calibration instrumentation, to either National Standards or as UKAS-Accredited, as required. The calibration of the system should also be checked in the field using a portable calibrator before and after each short-term measurements, and periodically for longer term monitoring.
- C_{tr}: Correction/adaption term applied against the sound insulation single-number values (R_W, D_W, and $D_{nT,W}$) to provide a weighting for low frequency performance. The reference values used within the C_{tr} calculation are based on urban traffic sound.
- 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 20 µPa.
- Dwelling: A building used for living purposes. A mobile home used for permanent living should be included in an assessment. If calculations are being conducted for compensation purposes, then some mobile homes are dealt with under the Highways Noise Payments and Moveable Homes Regulations.
- Façade/ Façade Level: At a distance of 1 m in front of a large sound reflecting object such as a building façade. According to BS 8233:2014, "Façade level measurements of L_{pA} are typically 1 dB to 2 dB higher than corresponding free-field measurements because of the reflection from the façade." The Calculation of Road Traffic Noise (1988) uses 2.5 dB, whilst BS 5228-1:2009+A1:2014 recommends 3 dB. Owing to the latter examples, together with other historical documents, it is more usual to apply 3 dB.
- Fast time-weighting (F): Averaging time used in sound level meters. Defined in BS EN 61672-2:2013 *Electroacoustics. Sound level meters. Pattern evaluation tests*.
- Free-field/ Free-field Level: Far from the presence of sound reflecting objects (except the ground), usually taken to mean at least 3.5 m away.
- Hertz (Hz): The unit of Frequency or Pitch of a sound. One hertz equals one cycle per second. 1 kHz = 1000 Hz, 2 kHz = 2000 Hz, etc.
- IOA: The Institute of Acoustics is the UK's professional body for those working in acoustics, noise, and vibration. It was formed in 1974 from the amalgamation of the Acoustics Group of the Institute of Physics and the British Acoustical Society (a daughter society of the Institution of Mechanical Engineers). It is a nominated body of the Engineering Council, offering registration at Chartered and Incorporated Engineer levels. Our consultants/engineers are individual Members.
- $L_{AF10,T}$: The A-weighted sound pressure level exceeded for 10% of the time over the period, T, measured using fast time-weighting (F), see below. It can be considered to be the "average maximum" sound level, and is generally used to describe road traffic noise.
- $L_{AF90,T}$: The A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T, measured using time fast time-weighting (F). Generally used to describe the 'background' sound conditions.

- L_{AFmax}: The maximum A-weighted sound pressure level during a given time period. L_{max} is sometimes used for the assessment of occasional loud sounds, which June have little effect on the overall L_{eq} noise level, but could still affect the sound environment. Unless described otherwise, it is measured using the fast time-weighting (F).
- $L_{eq,T}$: A sound level index called the equivalent continuous sound 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. Where the value is A-weighted, it will be presented '$L_{Aeq,T}$' or 'dBA $L_{eq,T}$', otherwise is should be an un-weighted (or linear) value.
- L_p: See Sound Pressure Level.
- Octave/ octave band: Band of frequencies in which the upper limit of the band is twice the frequency of the lower limit. For example, the 1000 Hz (1 kHz) octave band contains noise energy at all frequencies from 707 to 1414 Hz.
- Percentile Level: The sound pressure level exceeded for *N*% of a specified time interval, see $L_{AF90,T}$ etc.
- R: See Sound Reduction Index.
- R_W: See Weighted Sound Reduction Index.
- Sound Level Metrics, Indices or Parameters: Sound levels usually fluctuate over time, so it is often necessary to consider an average or statistical sound level. This can be done in several ways, so a number of different metrics have been defined, according to how the averaging or statistics are carried out.
- Sound Pressure Level (Sound Level), L_p: The sound level is the sound pressure relative to a standard reference pressure of 20 µPa ($20x10^{-6}$ Pascals) on a decibel scale.
- Sound Pressure: Sound, or sound pressure, is a fluctuation in air pressure over the static ambient pressure.
- Sound reduction index (SRI), R: Laboratory measure of the sound insulating properties of a material or building element in a stated frequency band.
- Weighted sound reduction index (SRI), R_W: Single-number quantity which characterizes the airborne sound insulating properties of a material or building element over a range of frequencies as measured in a laboratory.

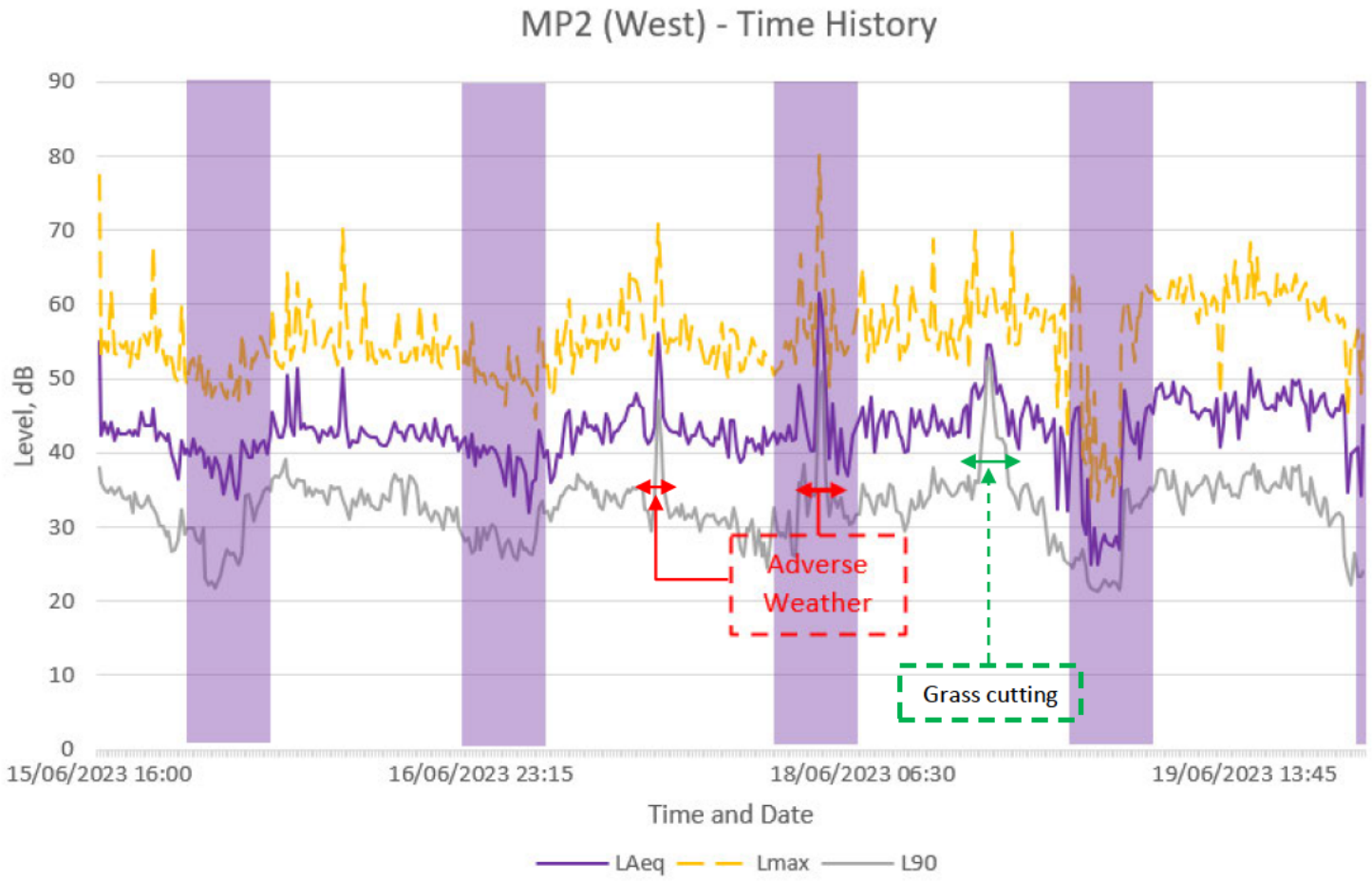
APPENDIX B

NOISE SURVEY DATA

NOISE SURVEY DATA FROM MP1 (EAST)
(APPROX. 1 M FROM EXISTING WORKSHOP FACADE, 1.5 M ABOVE THE GROUND, UNDER FAÇADE CONDITIONS)



NOISE SURVEY DATA FROM MP2 (WEST)
(APPROX. APPROXIMATE BOUNDARY OF PROPOSED GARDEN, UNDER FREE-FIELD CONDITIONS)



REPORT END