Noise Assessment

Twineham Court Farm

July 2024

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Document Control:

Project No.	Project
12765.S	Twineham Court Farm - Noise Assessment

Report No.	Ver/rev	Written By:	Checked By:	Authorised By:	Date:
12765A	V0 Draft	R. Peirce	M. Batchelor	J. Ferguson-Moore	04/03/2024
	V1				29/07/2024

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1. Introduction

Client & Project

1.1 Phlorum Limited have been commissioned by Telbridge Properties Limited to undertake a noise assessment for the development of Twineham Court Farm as an events venue.

1.2 Twineham Court Farm is a disused and redundant farm with a Grade II Listed farmhouse and ancillary buildings. The proposal is for the development of the site to create an events venue for both weddings and business events.

1.3 The noise climate at the site has been established by direct measurement and the suitability of the site for the proposed development considered against national and local planning policy, and guidelines on noise. Where necessary, mitigation measures have been recommended so that a noise climate suitable for the proposed development can be achieved.

1.4 Whilst reasonable efforts have been made to produce a report that is easy to understand, it is technical in nature. To assist the reader, an introduction to noise, and an explanation of the terminology used in this report are contained in Appendix A.

2. Site Description

Existing Site Conditions

2.1 Twineham Court Farm is a disused and redundant farm with a Grade II Listed farmhouse and ancillary buildings. The property is set back from Bob Lane, with a small row of terraced properties on the far side of the road from the entrance to Twineham Court Farm. There are also isolated residential properties located further along Bob Lane.

2.2 The Rampion electricity sub-station is located to the north and the Bolney sub-station to the north-west of Twineham Court Farm. Otherwise the site is surrounded by farmland.

2.3 The dominant noise source in the area was observed to be from local and distant road traffic, occasional farm related noise and aircraft noise.

2.4 A Site Plan is included as Figure 1.

Development Proposals

2.5 It is proposed that Twineham Court Farm will be converted to a wedding and business event venue consisting of a events barn, reception, kitchen, estates office, open barn adjacent to the Farmhouse and car parking as shown in the proposed site layout plan in Figure 2.

3. Guidance

National Planning Policy Framework

3.1 The Department for Communities and Local Government published the *National Planning Policy Framework* (NPPF) on 27th March 2012 and upon its publication, the majority of planning policy statements and guidance notes were withdrawn, including Planning Policy Guidance (PPG) 24 *Planning and Noise*, which until the emergence of the NPPF, set out the Government's position on how noise should be dealt with in the planning system.

3.2 The NPPF was revised on 24th July 2018, with the earlier 2012 version immediately withdrawn. The latest update was published in December 2023.

3.3 The general guiding principle in the NPPF is contained in Section 15 under the heading *Conserving and enhancing the natural environment*. Paragraph 180 states:

"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. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans;"*

3.4 The noise planning policy is contained in paragraph 191, which also appears in Section 15 of the NPPF:

"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

> *a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;*

b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; […]"

3.5 A footnote to paragraph 191 refers to the Explanatory Note of the Noise Policy Statement for England (Department for Environment, Food & Rural Affairs, 2010), which defines both *"significant adverse impacts on health and quality of life"* and *"adverse impacts on health and quality of life*".

Noise Policy Statement for England

3.6 The Department for Environment, Food and Rural Affairs published the *Noise Policy Statement for England* (NPSE) in March 2010. The explanatory note of the NPSE defines the terms used in the NPPF:

"2.20 There are two established concepts from toxicology that are currently being applied to noise impacts, for example, by the World Health Organisation. They are:

NOEL – No Observed Effect Level

This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.

LOAEL – Lowest Observed Adverse Effect Level

This is the level above which adverse effects on health and quality of life can be detected.

2.21 Extending these concepts for the purpose of this NPSE leads to the concept of a significant observed adverse effect level.

SOAEL – Significant Observed Adverse Effect Level

This is the level above which significant adverse effects on health and quality of life occur."

3.7 The NPSE does not define the SOAEL numerically, stating at paragraph 2.22:

"2.22 It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our

understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available."

3.8 There is no local or national guidance on how the three terms should be defined numerically.

3.9 There are three aims in the NPSE, two of which expand upon the first bullet point in paragraph 180 of the NPPF:

"The first aim of the Noise Policy Statement for England

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.

2.23 The first aim of the NPSE states that significant adverse effects on health and quality of life should be avoided while also taking into account the guiding principles of sustainable development (paragraph 1.8).

The second aim of the Noise Policy Statement for England

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.

2.24 The second aim of the NPSE refers to the situation where the impact lies somewhere between LOAEL and SOAEL. It requires that all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development (paragraph 1.8). This does not mean that such adverse effects cannot occur.

The third aim of the Noise Policy Statement for England

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.

2.25 This aim seeks, where possible, positively to improve health and quality of life through the pro-active management of noise while also taking into account the guiding principles of sustainable development (paragraph 1.8), recognising that there will be

opportunities for such measures to be taken and that they will deliver potential benefits to society. The protection of quiet places and quiet times as well as the enhancement of the acoustic environment will assist with delivering this aim."

Planning Practice Guidance

3.10 In March 2014, the Government released Planning Practice Guidance (PPG) on noise, entitled 'Noise'. This document sets out a number of principles in the form of questions and answers, and reinforces the guidance set out in the NPPF and the NPSE. The noise PPG was last updated in December 2014.

3.11 The noise PPG notes that:

"Noise needs to be considered when new development may create additional noise and when new developments would be sensitive to the prevailing acoustic environment."

3.12 It goes on to note that:

"Local planning authorities' plan-making and decision taking should take account of the acoustic environment and in doing so consider:

- *whether or not a significant adverse effect is occurring or likely to occur;*
- *whether or not an adverse effect is occurring or likely to occur; and*
- *whether or not a good standard of amenity can be achieved."*

3.13 The noise PPG broadly repeats the NPSE definitions of the NOEL, LOAEL and SOAEL and it provides a summary table to explain how the terms relate to each other and to typical human reactions to sound. The table is replicated below in Table 3.1.

Table 3.1 Planning Practice Guidance Summary of Noise Exposure Hierarchy

Perception	Examples of Outcomes	Increasing Effect Level	Action
Not noticeable	No effect	No observed effect	No specific measures required
Noticeable and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No observed adverse effect	No specific measures required
		Lowest observed adverse effect level	

Perception	Examples of Outcomes	Increasing Effect Level	Action
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed adverse effect	Mitigate and reduce to a minimum
		Significant observed adverse effect level	
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep the windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting back to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant observed adverse effect	Avoid
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable adverse effect	Prevent

3.14 It is noted that the text in paragraph 005 of the PPG for noise reiterates the point illustrated in Table 3.1, that there are degrees of adverse effect above the SOAEL. Table 3.1 defines two degrees of significant adverse effect: a significant observed adverse effect, which is deemed noticeable and disruptive, and an unacceptable adverse effect, which is deemed noticeable and very disruptive.

3.15 The distinction between these two degrees of significant adverse effect is expanded upon in the text in paragraph 005 of the PPG for noise:

"005 Increasing noise exposure will at some point cause the significant observed adverse effect level boundary to be crossed. Above this level the noise causes a material change in behaviour such as keeping windows closed for most of the time or avoiding certain activities during periods when the noise is present. If the exposure is above this level the planning process should be used to avoid this effect occurring, by use of appropriate mitigation such as by altering the design and layout. Such decisions must be made taking account of the economic and social benefit of the activity causing the noise, but it is undesirable for such exposure to be caused.

At the highest extreme, noise exposure would cause extensive and sustained changes in behaviour without an ability to mitigate the effect of noise. The impacts on health and quality of life are such that regardless of the benefits of the activity causing the noise, this situation should be prevented from occurring."

3.16 The PPG, which is the most recent manifestation of Government advice on how noise should be treated within the planning system, as opposed to a policy position as stated in the more recent NPPF, is clear that a significant adverse effect, which lies above the SOAEL but below an unacceptable adverse effect, can be addressed (or 'avoided' in the terms of the PPG) through the provision of mitigation, including noise insulation; it is not until an unacceptable adverse effect is reached that the cause of the effect should be prevented.

3.17 The noise PPG provides advice on how to mitigate the effects of noise, noting that there are options to reduce noise at source, to optimise site layouts, to use planning conditions, and provide insulation within affected properties.

3.18 The noise PPG also notes that:

"The noise impact may be partially offset if the residents of those dwellings have access to:

- *a relatively quiet façade (containing windows to habitable rooms) as part of their dwelling, and/or*
- *a relatively quiet external amenity space for their sole use, (e.g. a garden or balcony). Although the existence of a garden or balcony is generally desirable, the intended benefits will be reduced with increasing noise exposure and could be such that significant adverse effects occur, and/or*
- *a relatively quiet, protected, nearby external amenity space for sole use by a limited group of residents as part of the amenity of their dwellings, and/or*

- *a relatively quiet, protected, external publically accessible amenity space (e.g. a public park or a local green space designated because of its tranquillity) that is nearby (e.g. within a 5 minutes walking distance).”*

British Standard 8233

3.19 The scope of British Standard (BS) 8233: 2014 *Guidance on Sound Insulation and Noise Reduction for Buildings* is the provision of recommendations for the control of noise in and around buildings. It suggests appropriate criteria and limits for different situations, which are primarily intended to guide the design of new or refurbished buildings undergoing a change of use rather than to assess the effect of changes in the external noise climate.

3.20 BS8233: 2014 suggests suitable internal noise levels within different types of buildings, including residential dwellings, as shown in Table 3.2.

Table 3.2: BS8233 Recommended Internal Noise Levels, dB

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	35dB $L_{Aeq,16hour}$	-
Dining	Dining room/area	40dB $L_{Aeq,16hour}$	-
Sleeping (daytime resting)	Bedroom	35dB $L_{Aeq,16hour}$	30dB $L_{Aeq,8hour}$

3.21 BS8233 contains the following relevant guidance in footnotes to the above information:

“Note 4: Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or LAmax,F, depending on the character and number of events per night. Sporadic noise events could require separate values.

Note 5: If relying on closed windows to meet the guide values, there needs to be an appropriate alternative ventilation that does not compromise the façade insulation or the resulting noise level. […]

Note 7: Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved.”

3.22 Although Note 4 above refers to setting a guideline value for maximum noise levels, BS8233: 2014 does not provide any guidance on a suitable criterion.

3.23 Placing the BS8233: 2014 guidance into the context required by the NPPF and the NPSE, it is considered that where the internal noise levels meet the guideline values set out in Table 3.2, there is considered to be no observed effect.

3.24 Since BS8233: 2014 allows for a 5dB relaxation in the guideline values in Table 3.2 (Note 7 above), it is considered that internal noise levels up to 5dB above the guideline values in Table 3.2 may still be acceptable.

3.25 Section 7.7.3.2 of BS8233, titled Design criteria for external noise states:

"For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50dB LAeq,T, with an upper guideline value of 55dB LAeq,T which would be acceptable in noisier environments."

3.26 BS8233: 2014 goes on to note that the upper guideline value may be exceeded in certain circumstances:

"However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces but should not be prohibited."

3.27 Achieving the lowest practicable noise levels in gardens is deemed acceptable in BS8233: 2014 in circumstances where development is needed in areas where the upper 55dB limit cannot be achieved.

3.28 As BS8233: 2014 states that it is desirable that garden noise levels do not exceed 50dB $L_{Aeq,T}$, this implies some adverse effect above this level. Therefore, an external daytime noise level of 50dB $L_{Aeq,16hrs}$ can be defined as the LOAEL.

3.29 However, it would not be appropriate to equate the 55dB criterion with the SOAEL, since it is clear from BS8233: 2014 that 55dB is not a threshold that should never be exceeded. Equating the 55dB criterion to the SOAEL would mean that, in national policy terms, exceeding this threshold should be avoided, which is not what the standard requires.

World Health Organisation

3.30 The World Health Organisation (WHO) *Guidelines for Community Noise* (1999) also sets out guidance on suitable internal and external noise levels in and around residential properties. The guidance on internal and external noise levels is the same as set out in BS8233: 2014 in terms of L_{Aeq} values, but the WHO guidelines also provide guidance on night-time maximum noise levels, stating:

"For a good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45 dB LAFmax more than 10-15 times per night."

3.31 The WHO guidelines suggest the possibility of sleep disturbance if continuous noise in bedrooms exceeds 30dB $L_{Aeq.8hrs}$ during the night-time, and therefore internal noise levels above this value can be considered to be above the LOAEL. This internal value can be translated to an external value by the addition of 10dB, to account for the typical reduction through an open window. Therefore, external night-time noise levels of 40dB $L_{Aeq,8hrs}$ can be defined as the LOAEL.

3.32 The WHO published their *Night Noise Guidelines for Europe* in 2009. This document sets an external 'night noise guideline' (NNG) of 40dB. This is consistent with the LOAEL value determined above. The NNG also sets an interim target of 55dB in situation where the 40dB value cannot be met. Above 55dB the NNG notes that the situation is considered increasingly dangerous for public health. On the basis of the above, a free-field external value of 55dB $L_{Aeq,8hrs}$ is considered to be the night-time SOAEL.

Code of Practice on Environmental Noise Control at Concerts

3.33 The guidelines provided by the Code of Practice on Environmental Noise at Concerts, 1995 states in Note 5 of Table 1 that:

"For indoor venues used for up to about 30 events per calendar year a music noise level (MNL) not exceeding the existing background noise by more than 5 dB(A) over a 15 minute period is recommended for events finishing no later than 2300 hours."

3.34 The code also discusses low frequency noise and note 2 in paragraph 3.4 states that:

"A level of 70 dB in either of the 63Hz or 125Hz octave frequency band is satisfactory; a level of 80 dB in either of these octave frequency bands causes significant disturbance."

3.35 The Code also states that for events continuing between the hours of 23:00 and 09:00 hours the music noise should not be audible within noise sensitive premises with windows open in a typical manner for ventilation.

Noise from Pubs and Clubs

3.36 The Department for Environment Food and Rural Affairs (Defra) produced a report entitled Noise from Pubs and Clubs (Phase II) dated May 2006. The report concluded that the best indicator of correlation of noise levels with subjective response is an absolute L_{Aeq} value. The noise levels at which test subjects felt the noise was unacceptable was at 34 dB $L_{Aeq,5\ min}$.

3.37 This provides similar internal noise targets to those in BS 8233:2014 of 35 dB $L_{Aeq,16\ hr}$ in the daytime and 30 dB $L_{Aeq,8\ hr}$ at night.

BS4142:2014+A1:2019

3.38 Although BS 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound' is not applicable to recreational/music noise, it applies to any fixed mechanical plant associated with the development, such as ventilation systems and kitchen extracts. Noise from these should not increase the existing background noise level at nearby noise-sensitive receptors.

3.39 BS4142:2014+A1:2019 provides a methodology that determines the significance of adverse impact at dwellings potentially affected by noise of an industrial nature. BS 4142 refers specifically to sound from fixed installations which comprise mechanical and electrical plant and equipment; sound from the loading and unloading of goods and materials at industrial and/or commercial premises; and sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as that from forklift trucks, or that from train or ship movements on or around an industrial and/or commercial site.

3.40 The basis of the standard requires a comparison to be made between the 'background noise level' of the assessment area and the 'specific noise level' of the noise source under consideration. There are five key definitions relating to this relationship;

- Background Noise Level - LA90,T - this is defined in the Standard as 'the 'A' weighted sound pressure level of the residual noise at the assessment position which is exceeded for 90 % of the given time interval, T, measured using time weighting F and quoted to the nearest number of whole decibels.
- Specific Noise Level - LAeq,T - this is the equivalent continuous 'A' weighted sound pressure level over a given time interval.

- Residual Noise - this is defined as the ambient noise remaining in a given situation when the specific noise source is suppressed to a degree such that it does not contribute to the ambient noise.
- Ambient Noise - totally encompassing sound in a given situation at a given time usually composed of sound from many sources near and far.
- Rating Level - LAeq,T - the specific noise level plus any adjustment made for the characteristic features of the noise.

3.41 The background level, wherever possible should be determined at the location where the assessment is to be made. Situations will arise where, due to circumstances which influence this level unduly, for example the specific noise level is operating continuously and thus the residual noise cannot be measured at this point, the background level may be determined in other ways. This may be, for example, by measuring at a different location or a different time which are nevertheless representative of the assessment position.

3.42 A further acoustic correction to the specific noise level is made if the sound has tonal or impulsive characteristics.

3.43 Once all necessary adjustments have been made, the background and the specific noise levels are compared. The standard states that the greater this difference is, the greater is the magnitude of the 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.
- 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.

3.44 The assessment should consider the level of uncertainty in the data and associated calculations. Where the level of uncertainty could affect the conclusion, reasonable practicable steps should be taken to reduce the level of uncertainty.

IEMA Guidelines for Environmental Noise Impact Assessment

3.45 The noise assessment has considered the Institute of Environmental Management and Assessment (IEMA) 'Guidelines for Environmental Noise Impact Assessment' Version 1.2, Nov 2014. The IEMA guidelines state that they are applicable to '*all development proposals where noise effects are likely to occur*' and '*are relevant to all types of projects, regardless of size*'.

3.46 The guidelines provide a method of assessing the significance of an increase in the ambient sound level over a baseline level, as a result of a new (or modified) noise source. Table 3.3 below reproduces Table 7-14 of the IEMA guidelines. The impact is assessed by determining the pre-existing ambient sound level $L_{Aeq,T}$ and then logarithmically adding the predicted $L_{Aeq,T}$ noise emissions from the development.

Table 3.3: IEMA Guidelines, Impact from the Change in Sound Levels

Long-term Impact Classification	Short-term Impact Classification	Sound Level Change, LAeq,T dB (T = either 16hr day or 8hr night)
Negligible	Negligible	≥ 0 dB and < 1 dB
	Minor	≥ 1 dB and < 3 dB
Minor	Moderate	≥ 3 dB and < 5 dB
Moderate	Major	≥ 5 dB and < 10 dB
Major		≥ 10 dB

Road Traffic Noise

The impact of any changes in road traffic noise levels has been considered against the principles and guidance presented within the Design Manual for Roads and Bridges (DMRB) Part 7 HD213/11 Noise and Vibration, 2011. DMRB presents an impact significance matrix for assessing the magnitude of changes in noise level for the short and long term and can be used as criteria for assessing the impact of any changes in road traffic noise levels, as shown below.

Table 3.4: Semantic Descriptors for Traffic Noise in the Short Term

Change in Noise Level $L_{A10,18\ hr}$ dB	Magnitude of Impact
0	No Change
0.1 to 0.9	Negligible
1 to 2.9	Minor
3 to 4.9	Moderate
5+	Major

Table 3.5: Semantic Descriptors for Traffic Noise in the Long Term

Change in Noise Level $L_{A10,18\ hr}$ dB	Magnitude of Impact
0	No Change
0.1 to 2.9	Negligible
3 to 4.9	Minor
5 to 9.9	Moderate
10+	Major

3.47 Table 3.4 is concerned with the short-term difference, which would be considered during the six months following the completion of the construction, thereafter, Table 3.5 applies. The criteria in Table 3.5 above reflect key benchmarks of human response to changes in noise level. For example, a 3 dB change is generally taken to be the smallest change perceptible in the human ear and a 10 dB changes is heard as a doubling or halving of the loudness of a source. The 5 dB category has been included as it provides greater definition of the assessment of changes in noise level.

3.48 The prediction methodology for traffic noise is the Calculation of Road Traffic Noise (CRTN), 1988. This is an established prediction methodology and enables the change in noise levels to be considered whilst taking the number of Heavy Commercial Vehicles into account.

4. Environmental Surveys

Noise

4.1 A noise survey was undertaken to establish typical sound levels at the nearest residential properties to the site. The measurements were taken over a 2 to 3 day period starting at 13:30 hours on Friday 19th January 2024 to provide the day and night-time noise levels at the site over both a weekday and weekend period.

4.2 The survey methods and results are set out below.

Sound Survey Method

4.3 The equipment used during the survey is summarised in Appendix B. The sound level meters were field calibrated immediately before and after the measurements using the listed acoustic calibrator. No significant calibration drifts were found to have occurred.

4.4 The sound level meters had been laboratory-calibrated to a traceable standard within the two years preceding the survey. The acoustic calibrator had been laboratory-calibrated to a traceable standard within the year preceding the survey.

4.5 Noise measurements were carried out at two long-term locations. The measurement locations are described as follows:

- Position 1 - The microphone was located in a free-field location approx. 20m from the nearside kerb of Bob Lane. The mic was 2m above the road with a clear line of sight to the nearest residential properties on Bob Lane and Twineham Court Farm.
- Position 2 - The microphone was located in a free-field location approx. 6m from Bob Lane. The mic was 1.5m above the road and located at a similar distance to Bob Lane as the adjacent residential property.

Sound Survey Results

4.6 The weather during the early part of the survey (Friday 19th and Saturday 20th January) was suitable for noise measurements, it being dry with wind speeds of less than 5m/s. The noise measurements on Sunday 21st January 2024 were affected by wind speeds above 5m/s and have not been used in the noise assessment.

4.7 The dominant sound source was from local and distant road traffic. Other significant noise sources included aircraft, distant farm machinery noise and local birdsong.

4.8 The sound survey results are summarised in Table 4.1, aggregated across the daytime and night-time periods. The noise results on Sunday 21st January 2024 have not been included due to the high wind speeds. Full survey results are set out graphically in Appendix C.

Table 4.1 Summary of Daytime Measured Sound Levels, free-field dB

Measurement Location	Date	Period	Duration, T	$L_{Aeq,T}$	L_{AFmax}	$L_{A10,T}$	$L_{A90,T}$
1	Friday 19 Jan 24	13:30-23:00	9 hours, 30 mins	42.7	59.3	41.6	31.3
	Saturday 20 Jan 24	07:00-23:00	16 hours	46.2	62.9	46.0	37.0
2	Friday 19 Jan 24	13:45-23:00	9 hours, 15 mins	44.1	61.4	40.4	31.9
	Saturday 20 Jan 24	07:00-23:00	16 hours	45.9	65.2	44.6	35.7
	Monday 22 Jan 24	07:00-12:45	5 hours, 45 mins	48.4	67.2	49.1	38.7

Note: (1) – The $L_{A90,T}$, L_{Amax} and $L_{A10,T}$ and values are the arithmetic means of the $L_{A90,T}$, L_{Amax} and $L_{A10,T}$ measurements for each period.

4.9 If events continue past 23:00 hours, then baseline night-time noise will need to be considered. The noise levels measured on Friday night, 19/20 January 2024 are considered to represent the noise levels during acceptable weather conditions (no rain and wind speed below 5 m/s) and are shown in Table 4.2.

Table 4.2 Summary of Night-time Measured Sound Levels, free-field dB

Measurement Location	Date	Period	Duration , T	$L_{Aeq,T}$	L_{AFmax}	$L_{A10,T}$	$L_{A90,T}$
1	19/20 Jan 24	23:00-07:00	8 hours	32.4	40.6	33.7	30.0
2	19/20 Jan 24	23:00-07:00	8 hours	32.7	40.9	32.5	28.9

Note: (1) – The $L_{A90,T}$, L_{Amax} and $L_{A10,T}$ and values are the arithmetic means of the $L_{A90,T}$, L_{Amax} and $L_{A10,T}$ measurements for each period.

5. Assessment

5.1 The proposal is for the development of the site to create an events venue for both weddings and business events. The following noise sources have been considered in the noise assessment:

- Music noise within the venue; and
- Traffic and car parking noise.

5.2 It is assumed that business events will generally consist of conferences within the events barn and noise breakout from these events is likely to be negligible at the nearest residential properties. The main noise source from business events will be from traffic movements and these the noise effects of traffic are considered within this section of the report.

5.3 The noise assessment is based on events taking place within the 'events barn' and 53 parking spaces are proposed within the main parking area, plus an additional 13 along the existing driveway, as shown Figure 2.

Music Noise Predictions

5.4 During a wedding there will be various noise sources including speeches and patron noise but the dominant noise source is likely to be from music in the evening period. The assessment has assumed a source noise level of $L_{Aeq,T}$ 90 dB at 5m (centre of a dance floor). The doors and windows will be the acoustically weakest part of the events barn structure and the music noise levels have been predicted with both the doors and windows open and with them closed.

5.5 The noise calculations have assumed that closed windows and doors will provide R_w 25 dB sound insulation and that with doors and windows partially open, this will provide a worst case R_w 10 dB sound insulation (partially open windows are considered to provide between 10 to 15 dB sound attenuation).

5.6 The noise predictions have assumed that the ambient noise levels measured at R1 are also representative of the ambient noise levels at R3 and R4 where access for noise measurements was not available.

5.7 At this stage, details of the proposed building structure are not available and so the noise predictions aim to provide an indication of the likely noise effects of music in the events barn at the nearest residential properties. When further details of the proposed events barn are known, including the type of windows, doors, ventilation systems and building structure then detailed sound breakout calculations can be undertaken to verify these predicted noise levels.

5.8 The distance and screening between the venue and the nearest residential properties has been taken into account and the predicted music noise levels at the nearest residential receptors R1 to R4, as shown on Figure 1 are as follows:

Table 5.1 Predicted with Doors and Windows Closed

Receptor	Predicted Music Noise Level	Baseline Ambient Noise	Difference (music V's existing ambient)	Noise Increase
	$L_{Aeq,T}$ dB	$L_{Aeq,T}$ dB	dB	dB
Daytime				
R1	34	43	-9	0.5
R2	30	44	-14	0.2
R3	25	43	-18	0.1
R4	29	43	-14	0.2
Night-time				
R1	34	32	2	4.1
R2	30	33	-3	1.8
R3	25	32	-7	0.8
R4	29	32	-3	1.8

5.9 With partially open windows, the predicted music noise levels would be 15 dB higher than those shown in Table 5.1 based on the sound insulation assumptions.

Music Noise Assessment

Assess V's Baseline Noise

5.10 As shown in Table 5.1, with closed doors and windows in the Events barn, the noise increase at the nearest residential receptors due to music noise is predicted to be up to 0.5 dB in the daytime. The IEMA guidelines consider a noise increase of less than 1 dB to be negligible in both the short and long term.

5.11 If music is played after 23:00 hours, this is considered to be in the night-time period. The noise increase at night is predicted to be 4 dB at the nearest residential property on Bob Lane (R1), 2 dB at R2 and R4 and less than 1 dB at R3. The IEMA guidelines consider a noise increase at R1 to moderate in the short term and minor in the long term. At receptors R2 and R4, the IEMA guidelines consider the night-time noise impact to be minor in the short term and negligible in the long term and, at R3, the noise increase is negligible in both the short and long term.

5.12 With open windows and doors in the Events barn, the noise increase would be up to 7 dB in the daytime and 17 dB at night at R1 and the EIMA guidelines would consider the long term impact to be Moderate in the daytime and Major at night.

Assess V's Code of Practice

5.13 The Code of Practice on Environmental Noise at Concerts, 1995 provides a noise limit of the MNL not exceeding the existing background noise by more than 5 dB(A) over 15 min periods for up to 30 concerts per year. At noise measurement position 1, the lowest 15 min background noise level before 23:00 hours was $L_{A90,15min}$ 30 dB and, at noise measurement position 2, the lowest 15 min background noise level before 23:00 hours was $L_{A90,15min}$ 29 dB from music within the events barn, assuming all windows and doors are closed.

5.14 In the daytime, the predicted noise levels are 4 dB above the lowest existing background at R1 and 1 dB above the existing background at R2 and are therefore predicted to comply with the Code for up to 30 'music events' per year in the daytime period up to 23:00 hours.

5.15 At night (after 23:00 hours), it is possible that the music could be audible within noise sensitive premises with windows open in a typical manner for ventilation. On this basis, further noise mitigation measures may be required if events take place in the night-time period.

BS8233:2014

5.16 The predicted music noise levels at the nearest residential properties of up to $L_{Aeq,16hr}$ 34 dB are well below the lower 'desirable' target noise levels of 50dB $L_{Aeq,T}$ for gardens as provided by BS8233:2014. The predicted music noise levels from the events barn (with closed windows and doors) indicate that the internal BS8233:2014 noise targets of $L_{Aeq,16hr}$ 35 dB in the daytime and $L_{Aeq,8hr}$ 30 dB at night would also be achieved at all residential properties, even if the residential properties have partially open windows.

Planning Practice Guidance

5.17 The planning practice guidance indicates that if the noise can be heard but does not cause any change in behaviour or attitude and where the noise can slightly affect the acoustic character of the area, but not such that there is a perceived change in the quality of life, then there is 'no observed adverse effect' (NOAE).

5.18 It is considered that with doors and windows closed within the events barn that the music may just be perceptible at the nearest residential properties, but at a low level such that the target noise levels in the Code of Practice on Environmental Noise at Concerts for up to 30 events and the internal and external noise targets provided by BS8233:2014 are achieved. On this basis, it is considered that the noise impact in the daytime will be NOAE.

5.19 At night (after 23:00 hours), the internal noise target in BS8233:2014 is achieved, but it is possible that the music could be audible within noise sensitive premises with windows open in a typical manner for ventilation. On this basis, the night-time noise could be just above the LOAEL where residents may have to close windows for some of the time. On this basis that music noise at night may be just above the LOAEL, PPG recommends that the noise should be mitigated and reduced to a minimum.

Noise from Pubs and Clubs

5.20 The proposed internal noise target provided by the Defra Pubs and Clubs Report (May 2006) of 34 dB $L_{Aeq,5\ min}$ would be achieved with music being played and windows and doors closed in the events barn.

Traffic Noise

5.21 Traffic data for Bob Lane has been provided by GTA Civils & Transport and has considered the existing traffic flows on Bob Lane and a comparison with traffic data from other wedding venues.

5.22 Weddings are generally Friday/Saturday, and the capacity of the Twineham Court Farm venue is intended for up to 200 guests and 53 parking spaces are proposed within the main parking area, plus an additional 13 along the existing driveway with a 50 space car park. On occasions of slightly higher parking demand, an overspill area within the grounds will be available for temporary use (up to 13 spaces). It is understood that average car occupancies are often high, typically around 4 people per car on average, some via taxi or minibuses.

5.23 The transport consultants also consider that arrival and departure patterns tend to be spread over perhaps a few hours, particularly with people arriving and departing weddings and the receptions over a long time period. Furthermore, the transport consultants consider that cars do not all arrive/depart in concentrated periods.

5.24 Based on the traffic data in the Transport Report taken from wedding events, with a finish of 02:00 hours and allowing for staff/taxis, the two-way flow from 10:00 hours to 02:00 hours is 228 movements. The wedding used for the transport assessment generated 48 movements (15 in and 33 out) between 23:00-02:00 hours. As wedding events at Twineham Court Farm are proposed to end at 00:00 hours, the traffic movements between 23:00-00:00 hours are likely to be similar to those between 01:00-02:00 hours at the other wedding venue, which were 5 movements out.

5.25 A summary of the existing baseline 24-hour traffic count on Bob Lane is shown in Appendix D.

5.26 Based on the 24-hour traffic data provided for Bob Lane, the increase in noise level due to wedding event traffic is predicted to be 2.1 dB on a Friday and 2.9 dB on a Saturday. The 24-hour traffic flow data that has been provided would be very similar to the 18-hour data required for a DMRB noise assessment and when considered against the semantic descriptors for the magnitude of change of traffic noise, DMRB indicates a minor increase for properties located on Bob Lane when considered in the short term and a negligible increase in the long term.

5.27 It should be noted that the traffic flows on Bob Lane are considered to be very low and well below the level that can be reliably calculated by the Calculation of Road Traffic Noise (CRTN), 1988.

5.28 The noise from car parking for events at Twineham Court Farm is already present from car parking outside of the row of terraced properties on 3 to 6 Bob Lane, which represent the nearest properties to the site (R1). Clearly the proposed car park is significantly further from these properties (100m to nearside of carpark) than the cars parked on Bob Lane. On this basis, the noise from additional cars parking at Twineham Court Farm during events are considered to provide a negligible noise effect when compared to the existing car parking noise outside of 3 to 6 Bob Lane, which are the nearest residential properties to the venue.

5.29 Noise measurements of cars including car movements and parking, people departing cars and car doors opening and closing have been taken under controlled conditions to isolate the car noise from any other activity. The measurements provide source data for individual cars of $L_{Aeq,\ 10\ sec}$ 60 dB at 5m. The maximum noise level during the measurements was $L_{Amax,f}$ 74 dB at 5m.

5.30 Based on an estimated 'worst case' assumption that the car park has up to 50 arrivals/departures in any 1 hour, the predicted noise level at R1 is $L_{Aeq,\ 1\ hour}$ 25 dB. The maximum noise level at R1 is predicted to be $L_{Amax,f}$ 48 dB due to car park activities and this is well below the existing measured noise levels in the day and night-time periods, as shown graphically in Appendix C.

5.31 The predicted car park noise levels are well below the daytime baseline noise levels at NP1 of $L_{Aeq,T}$ 43 dB in the daytime and also below the baseline of $L_{Aeq,T}$ 32 dB at night and the noise impact is considered to be negligible.

Plant Noise

5.32 At this stage of the application details of mechanical services plant or ventilation systems associated with events at Twineham Court Farm are not known. It is considered that reasonable noise targets would be for any plant noise to be designed to be at least 5 dB below the existing background noise levels at the nearest residential properties and the noise target will be confirmed with the LPA at the design stage.

6. Mitigation

6.1 Further to the music noise assessment, the following noise mitigation measures must be implemented for events such as weddings at Twineham Court Farm that are proposed to have music. This is to ensure that the sound breakout at the nearest residential properties is within acceptable levels:

- Windows and doors at the venue must be closed when music is playing;
- The music noise levels up to 23:00 hours must be controlled such that they do not exceed $L_{Aeq,15\ min}$ 90 dB at a distance of 5m from the speakers or sound tests undertaken on the day of the event to determine an appropriate noise limit that takes the individual sound system and speaker orientation into account;
- The low frequency content (bass beat) must be controlled such that the noise does not exceed the guideline provided by the 'Code of Practice on Environmental Noise at Concerts' of a level of 70 dB in either of the 63Hz or 125Hz octave frequency band at the nearest residential properties;
- The music sound system should be orientated such that the speakers face away from the nearest residential properties;
- The building structure at Twineham Court Farm must have no acoustically weak elements such that the sound insulation provided by each building element (walls, ceilings, ventilation etc.) is equal or better than that provided by the closed windows and doors; and
- If music is played after 23:00 hours, the noise must be controlled such that music is not audible just outside of the nearest residential properties.

6.2 The noise from traffic and car parking, relating to events at Twineham Court Farm, is predicted to be negligible in the long term and no further noise mitigation measures are required.

6.3 It is recommended that when details of mechanical services plant or ventilation systems are available a further noise assessment is undertaken to ensure that the noise targets provided in BS4142: 2014+A1:2019 are achieved. It is considered that reasonable noise targets would be for any plant noise to be designed to be at least 5 dB below the existing background noise levels at the nearest residential properties and the noise target will be confirmed with the LPA at the design stage.

7. Conclusion

7.1 Phlorum Limited have been commissioned by Telbridge Properties Limited to undertake a noise assessment for the conversion and development of the site to create an events venue (business events and weddings) at Twineham Court Farm.

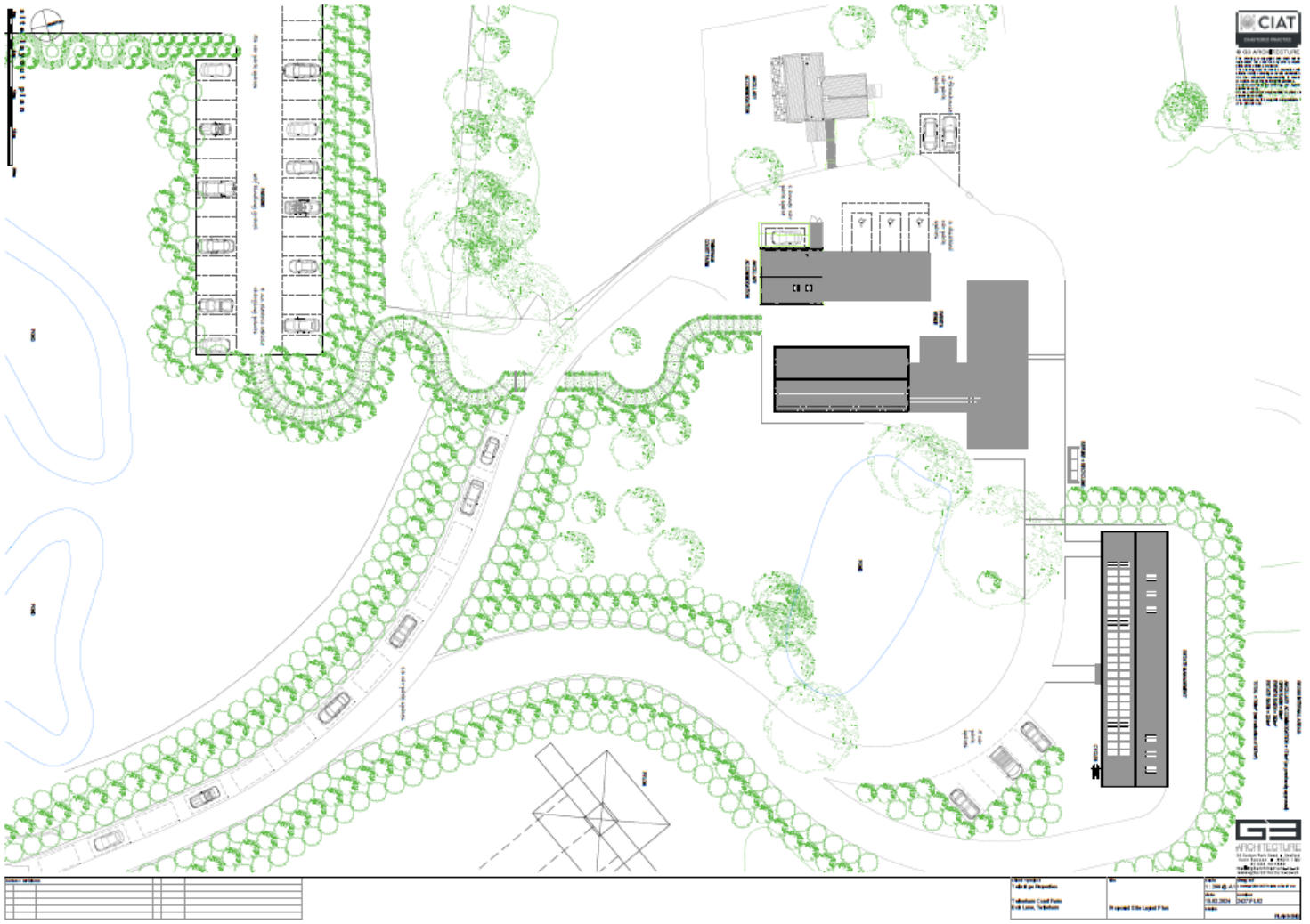
7.2 The noise assessment indicates that, with appropriate noise mitigation measures for any music noise within the events barn, the noise levels can be controlled to be within acceptable levels at the nearest residential properties.

7.3 The noise from traffic and car parking relating to events at Twineham Court Farm is predicted to be negligible in the long term at the nearest residential properties.

7.4 On the basis of this noise assessment, it is considered that noise does not pose a constraint to the proposed development.

Figures

phlorum	**Plan showing Noise Measurement and Prediction Locations**	**Job No. 12765A** **Figure No. 1**



phlorum	**Site Layout Plan**	**Job No. 12765A** **Figure No. 2**

Appendix A
Introduction to Noise & Glossary of Terminology

Noise is defined as unwanted sound. The human ear is able to respond to sound in the frequency range 18Hz (deep bass) to 18,000Hz (high treble) and over the audible range of 0dB (the threshold of perception) to 140dB (the onset of pain). The ear does not respond equally to different frequencies of the same magnitude, but is more responsive to mid-frequencies than to lower or higher frequencies. To quantify noise in a manner that approximates the response of the human ear, a weighting (filtering) mechanism is used. This reduces the importance of lower and higher frequencies, approximating the response of the human ear.

Furthermore, the perception of noise may be determined by a number of other factors, which may not necessarily be acoustic. Noise can be perceived to be louder or more noticeable if the source of the noise is observed; e.g. roads, trains, factories, building sites etc. In general, the impact of noise depends upon its level, the margin by which it exceeds the background level, its character and its variation over a given period of time. In some cases, the time of day and other acoustic features such as tonality may be important, as may the disposition of the affected individual. Any assessment of noise should give due consideration to all of these factors when assessing the significance of a noise source. Various noise indices have been derived to describe the fluctuation of noise levels that vary over time. Usually, these noise indices relate to specific types of noise, and as such different noise indices are used to describe road traffic noise, background noise, construction noise, etc.

The weighting mechanism that best corresponds to the response of the human ear is the 'A'-weighting scale. This is widely used for environmental noise measurement and the levels are denoted as dB(A) or L_{Aeq}, L_{A10}, etc, according to the parameter being measured.

Noise is measured on the decibel scale, which is logarithmic rather than linear. As a result of this, a 3dB increase in sound level represents a doubling of the sound energy present. Judgement of sound is subjective, but as a general guide a 10dB(A) increase can be taken to represent a doubling of loudness, whilst an increase in the order of 3dB(A) is generally regarded as the minimum difference needed to perceive a change. Table A.1 sets out examples of noise levels typically experienced during everyday activities. Table A.2 sets out an explanation of the terminology used in this report.

Table A1: Typical Sound Levels Found in the Environment.

Sound Level	Location
0 to 10dB(A)	Threshold of hearing
10 to 20dB(A)	Broadcasting studio
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 a factory or noisy pub
100 to 110dB(A)	Burglar Alarm at 1m
110 to 130dB(A)	Pneumatic drill at 1m away
140dB(A)	Threshold of Pain

Table A2: Terminology Relating to Noise

Term	Description
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 s_1 and s_2 is given by 20 $\log_{10}$ (s_1/s_2). The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is 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.
$L_{Aeq,T}$	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
$L_{max,T}$	A noise level index defined as the maximum noise level 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.
$L_{90,T}$ or Background Noise Level	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 3.5 metres
Façade	At a distance of 1 metre 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 EN 61672.

Appendix B
Monitoring Equipment

Table B1: Noise Monitoring Equipment

Position	Equipment	Serial Number	Calibration Date
1	LD824 Sound Analyser	A1420	20/10/2023
	Mic	37023	
	Preamp	1812	
2	LD820 Sound Meter	A1350	20/10/2023
	Mic	37024	
	Preamp	1568	
All positions	LD CAL200 Calibrator	3054	13/10/2024

Appendix C
Full Noise Survey Results

Figure C1: Measured noise levels at Position 1, free-field dB

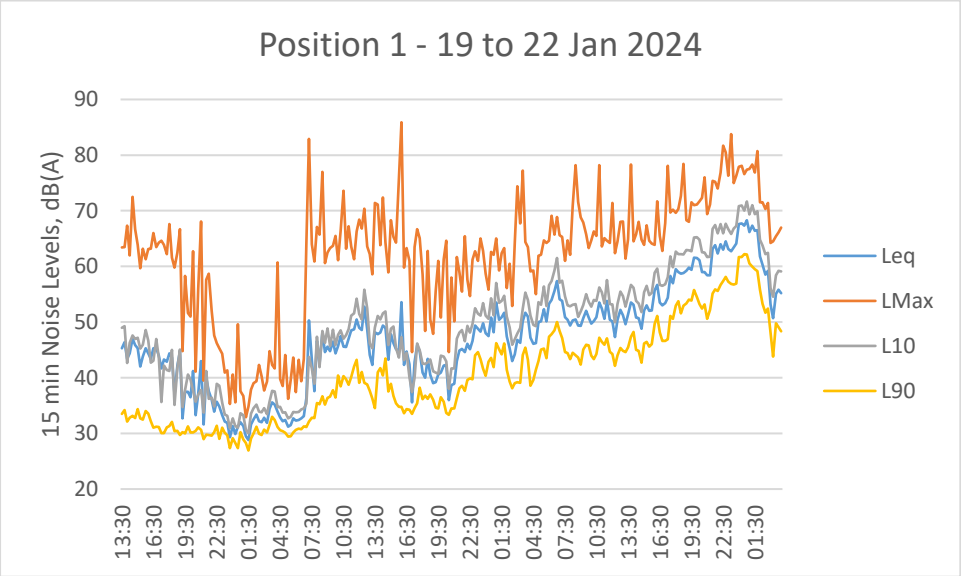
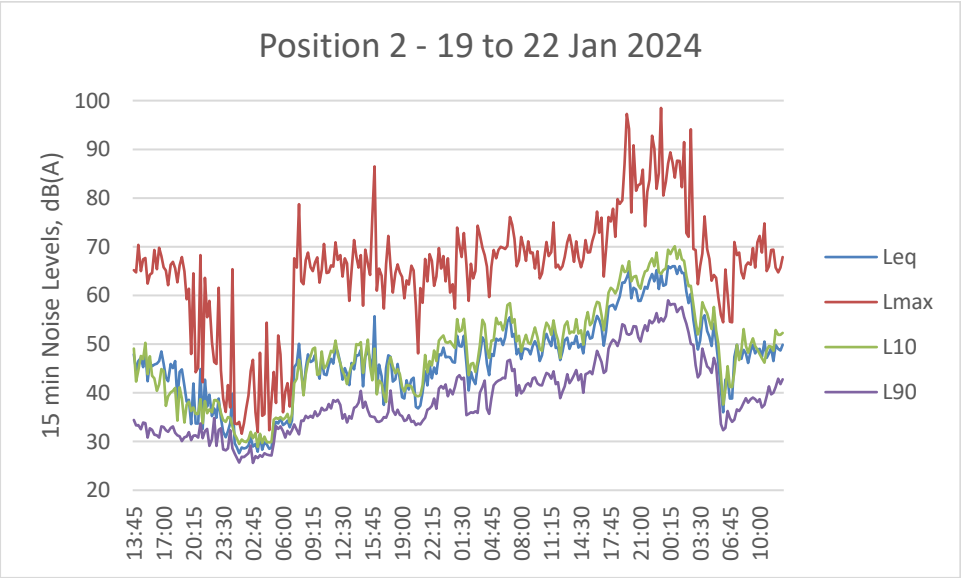


Figure C2: Measured noise levels at Position 2, free-field dB



Appendix D

Bob Lane Traffic Count Summary

Table D1: Traffic Flows on Bob Lane, 24 hour

			Direction 1			Direction 2		
		Summary	East Bound			West Bound		
			Total Vehicles	Mean Average	85%ile Speed	Total Vehicles	Mean Average	85%ile Speed
Day 1	Friday	26/01/2024	90	20	24	90	18	21
Day 2	Saturday	27/01/2024	54	22	25	65	20	23
Day 3	Sunday	28/01/2024	63	21	23	91	17	22
Day 4	Monday	29/01/2024	67	21	23	74	20	22
Day 5	Tuesday	30/01/2024	86	22	25	86	20	23
Day 6	Wednesday	31/01/2024	67	22	24	84	22	25
Day 7	Thursday	01/02/2024	88	22	25	84	21	24
		Week Total	**515**	**22**	**24**	**574**	**20**	**23**

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