

Acoustic Assessment at



Walnut Hill Nursery

Walnut Hill Road, Meopham

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Executive Summary

Ned Johnson Acoustic Consultants Limited has been appointed to undertake an acoustic assessment of the impact of change of use of part of the site from agricultural use to Class E.

The assessment takes account of the existing noise environment, which has been quantified using direct measurement to allow comparison of any sound emissions from the use of the site at the nearest residential property.

No noise control works are required as the impact of the operation is predicted to have a low impact.



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1. Introduction

- 1.1 Ned Johnson Acoustic Consultants Limited has been appointed to undertake an acoustic assessment of the proposed change of use of part of the site at Walnut Hill Nursery, Walnut Hill Road, Meopham.
- 1.2 The site is a former nursery and is now occupied by First4Drains, where the main building is an office. The application is for a change of use of part of the site where the office is now located from agricultural use to Class E.
- 1.3 The sound levels of the existing acoustic environment have been undertaken. Measurements encompassed a background acoustic survey over a time period representative of the proposed hours of use.
- 1.4 The sound levels from the office use at the nearest noise-affected property has been predicted and compared to the likely requirements of Graversham Borough Council using the methodology set-out in BS4142:2014+A1 2019. The likely requirement is that noise from the office shall be at least 10dB below the existing background levels when measured in accordance with BS4142, at the nearest or most noise affected residential window.

2. Site Description

- 2.1 The site is located on Walnut Hill Road, Meopham, which is a narrow road with predominantly residential houses and surrounded by agricultural land.
- 2.2 Figure 1 below shows the location of the nearest residential property. MP1 refers to the measurement point for background noise

Figure 1



- 2.3 The only noticeable sound sources in this location were a small amount of road traffic travelling along Walnut Hill Road and birdsong. The measurement point was chosen as it was sufficiently far away from the site road so as not to be effected by any vehicle movements and at the



same time be representative of the background sound pressure level at the receptor.

- 2.4 The nearest residential receptor to First4Drains is shown in Figure 1 and is 53 metres from the office building. The centre of the receptor's garden is 36 metres from the office building. There is also a 2.4 metre high close boarded fence on the boundary between the receptor and Walnut Hill Nursery which will provide sound attenuation and block any line of sight between Walnut Hill Nursery and the receptor.
- 2.5 The vehicle movements are staff cars arriving and leaving the site, which park in the car park next to the office and are no more noticeable than passing road traffic. The movement of office staff is only at the beginning and end of the working day.
- 2.6 There are no other noticeable sources of sound related to the office as the building itself attenuates any sound generated internally.
- 2.7 The former use of the site was a garden nursery which supplied both commercial businesses and the general public. The operations at the site would have involved daily deliveries using both HGVs and vans as well as private vehicles.



3. Reference Documents

National Planning Policy Framework

3.1 The Department of Housing, Communities and Local Government published the National Planning Policy Framework (NPPF) in December 2024.

3.2 Paragraphs 187 (e) 198(a), (b) and 200 refer to noise in terms of policy approach:

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. 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; and

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.

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

200. Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed.

Noise Policy Statement for England

- 3.3 The Department for Environment, Food and Rural Affairs published the *Noise Policy Statement for England* (NPSE) in March 2010. The explanatory note of 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.”

- 3.4 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.”

- 3.5 There is no local or national guidance on how the three terms should be defined numerically.
- 3.6 There are three aims in the NPSE, which match, and expand upon, the first two bullet points in paragraph 123 of the NPPF and add a third aim that relates to a wider improvement in health and quality of life (the bold text is in the NPSE):
- 3.7 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.
- 3.8 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. This does not mean that such adverse effects cannot occur.

- 3.9 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, 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.

British Standard 8233

- 3.10 The scope of British Standard 8233: 2014 *Sound insulation and noise reduction for buildings – Code of practice* 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.
- 3.11 The standard suggests suitable internal noise levels for residential dwellings, as shown in Table 1. Below

Table 1.

Activity	Location	07:00 - 23:00	23:00 - 07:00
		$L_{Aeq, 16 \text{ hour}}$	$L_{Aeq, 8 \text{ hour}}$
Resting	Living Rooms	35	-
Dining	Dining Area	40	-
Sleeping	Bedrooms	35	30

3.12 In terms of this development the internal noise levels have been compared to the internal noise levels in Table 1. It is suggested in this report that by meeting these noise levels the development would be classed as NOAEL.

British Standard 4142:2014+A1 2019

3.13 The scope of British Standard 4142: *Method for rating industrial noise affecting mixed residential and industrial areas* describes methods for determining, at the outside of a building:

a) noise levels from factories, or industrial premises, or fixed installations, or sources of an industrial nature in commercial premises; and

b) background noise level.

3.14 In particular BS4142 describes the “*use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.*” It sets out a methodology for assessing a noise Rating level which is a combination of absolute or ‘specific’ noise level (in terms of

L_{Aeq} average noise level over different durations; 1 hour for daytime and 15 minute at night); and then including penalties to account for character of a noise (i.e. tonality, impulsivity, intermittency and 'other').

- 3.15 BS4142 applies to new noise sensitive developments that are proposed near existing industrial sources, the following paragraph relates to such developments:

“Where a new noise-sensitive receptor is introduced and there is extant industrial and/or commercial sound, it ought to be recognized that the industrial and/or commercial sound forms a component of the acoustic environment. In such circumstances other guidance and criteria in addition to or alternative to this standard can also inform the appropriateness of both introducing a new noise-sensitive receptor and the extent of required noise mitigation.”

Further to this BS4142:2014 also notes that other standards may be relevant; in this development this would include BS8233:2014.

- 3.16 The rating levels in BS4142 are as follows:

“a) Typically, the greater this difference, the greater the magnitude of the impact.

b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.

c) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.

d) 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.”

- 3.17 BS4142:2014 also states *‘where the initial estimate of the impact needs to be modified due to the context, take all pertinent factors into consideration’*. In terms of those factors the document states the following: *‘The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions, such as, facade insulation ii) ventilation and/or cooling that will reduce the need to have windows open so as to provide rapid or purge ventilation; and acoustic screening.’*
- 3.18 Where there is an adverse impact in terms of the BS4142 rating mitigation can be proposed to reduce the impact or achieve desirable internal noise levels.



4. Survey Methodology

- 4.1 The survey was conducted over a 2-hour period on February 5th, 2025, 08:00 – 10:00. This time was chosen as the quietest time during operational hours and therefore a worst-case scenario for noise impacts.
- 4.2 The instrument used for the survey was a Bruel & Kjaer 2260 precision grade sound level meter.
- 4.3 The sound level meter was calibrated immediately before and after the survey with a Bruel & Kjaer 4231 Acoustic Calibrator producing 94dB_A at 1KHz and no drift was noted in calibration readings. Both calibration results were 93.8dB_A.
- 4.4 The measurements at MP1 were taken with the microphone on a tripod with no reflecting surfaces, other than the ground, within 3.5 metres.
- 4.5 During the background survey the temperature was 5°C with a wind speed of 0.1 metres per second and no precipitation. Cloud cover was a maximum of 50%.



5. Acoustic Survey Results

- 5.1 The results of the survey show that the typical measured background for the measurement period was 44dB L_{A90} , the typical ambient sound pressure level was 47dB L_{Aeq} . The measurement data can be found in Appendix 4.
- 5.2 The following tables show the impact of the office use at the receptor's house and in the garden.

Table 2. Impact of the office use at receptor house

Event	Sound Pressure Levels	Distance to Receptor	Distance Correction	Building Attenuation	Screening Attenuation	L_{Aeq}
Office internal sound level	58dB _A	53m	-34	-40 (solid brick façade facing Receptor)	-10 (fence along access road)	0

Table 3. Impact of the office use at receptor garden

Event	Sound Pressure Levels	Distance to Receptor	Distance Correction	Building Attenuation	Screening Attenuation	L_{Aeq}
Office internal sound level	58dB _A	36m	-31	-40 (solid brick façade facing Receptor)	-10 (fence along access road)	0

Table 4. Impact of the staff vehicles at receptor house

Event	Duration	Sound Pressure Levels	Distance to Receptor	Distance Correction	Correction to 1-Hour	Screening Attenuation	L _{Aeq}
Staff vehicles arriving (10 vehicles)	10 seconds per vehicle	68dB _A	42m	-32	-16	-10 (fence along access road)	10
Staff vehicles leaving (10 vehicles)	10 seconds per vehicle	68dB _A	42m	-32	-16	-10 (fence along access road)	10
Total							13

Table 5. Impact of the staff vehicles at receptor garden

Event	Duration	Sound Pressure Levels	Distance to Receptor	Distance Correction	Correction to 1-Hour	Screening Attenuation	L _{Aeq}
Staff vehicles arriving (10 vehicles)	10 seconds per vehicle	68dB _A	28m	-29	-16	-10 (fence along access road)	13
Staff vehicles leaving (10 vehicles)	10 seconds per vehicle	68dB _A	28m	-29	-16	-10 (fence along access road)	13
Total							16

5.4 The following tables present the BS4142 assessment for the noise from the hourly operation at the nearest noise sensitive receptor façade and in the receptor's garden.



Table 6. BS4142 assessment for the impact of the noise from the activity at the nearest residential property

Results	Measurement	Clause	Commentary
Typical ambient sound level	$L_{Aeq} = 47\text{dB}$	7.3.1	
Typical background sound level	$L_{A90} = 44\text{dB}$	8.3	
Specific sound level of the activity at nearest receptor	13dB_A		
Acoustic feature	0dB	9.2	No penalty as the movement of vehicles will not be distinguishable above the residual ambient sound pressure level
Rating level	13dB_A	11	Sound source
Typical background sound level	$L_{A90} = 44\text{dB}$	8.3	
Rating level at receptor point	-31dB	11	
The assessment shows that there is likely to be no adverse impact at receptor point			
Uncertainty of the assessment			The rating level is -31dB and in this instance the uncertainty of the measurement does not have any significance to the outcome of the assessment.



Table 7. BS4142 assessment for the impact of the noise from the activity at the nearest residential garden

Results	Measurement	Clause	Commentary
Typical ambient sound level	$L_{Aeq} = 47\text{dB}$	7.3.1	
Typical background sound level	$L_{A90} = 44\text{dB}$	8.3	
Specific sound level of the activity at receptor's garden	16dB_A		
Acoustic feature	0dB	9.2	No penalty as the movement of vehicles will not be distinguishable above the residual ambient sound pressure level
Rating level	16dB_A	11	Sound source
Typical background sound level	$L_{A90} = 44\text{dB}$	8.3	
Rating level at receptor point	-28dB	11	
The assessment shows that there is likely to be no adverse impact at receptor point			
Uncertainty of the assessment			The rating level is -28dB and in this instance the uncertainty of the measurement does not have any significance to the outcome of the assessment.



6 Discussion

- 6.1 The suitability of the site has been determined by comparing the measured noise levels with the criteria set out in Section 3 of this report.
- 6.2 The rating level for the site at the receptor point during operational hours is 31dB below the background sound level at the receptor's house and 28dB below the background in the middle of the receptor's garden.
- 6.3 No penalties have been added to the rating for intermittency as the intermittent operation will not be audible at the nearest residential property as it will be 31dB lower than the background sound pressure level. BS4142:2014+A1 2019 states that a penalty for intermittency can be added if it is readily distinct against the residual acoustic environment. In this case the intermittent action will not be distinctive against the residual acoustic environment.
- 6.4 No penalty for any other acoustic features has been added as none of the activities on site would be audible against the residual acoustic environment.
- 6.5 In terms of rating for BS4142 the results show that there will be no impact and no noise control system is required.
- 6.6 In terms of internal noise levels at the nearest receptor, with windows open, the noise generated from the office at Walnut Hill Nursery will have no impact internally and, in the garden, any brief vehicle movements as staff arrive or leave would be indistinguishable from road traffic noise. The vehicle movements would be quieter than any vehicles using the road as they are moving more slowly.
- 6.7 The predictions of the impact of the use of Walnut Hill Nursery show that the sound from the office use of the has a BS4142 rating of 31dB



below the background at the nearest residential receptor and 28dB below the background in the middle of the garden. This rating level shows that in terms of noise is no impact and therefore there cannot be any harm in planning terms to the nearest residents.

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Appendix 1: Glossary of Terms

Daytime Defined in BS8233 and BS4142 as the period 07:00-23:00 hours.

Night-time Defined in BS8233 and BS4142 as the period 23:00-07:00 hours.

Decibel (dB): A unit of level derived from the logarithm of the ratio between the value of a quantity and a reference value. It is used to describe the level of many different quantities. For sound pressure levels the reference quantity is 20 uPa. The threshold of normal hearing is in the region of 0 dB and 140 dB is the threshold of pain. A change of 1 dB is only perceptible under controlled conditions.

dB_A : Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB_A broadly agree with people's assessment of loudness. A change of 3 dB is the minimum perceptible under normal conditions, and a change of 10 dB corresponds roughly to halving or doubling the loudness of a sound. The background noise in a living room may be about 30 dB_A ; normal conversation about 60 dB_A at 1 metre; heavy road traffic about 80 dB_A at 10 metres; the level near a pneumatic drill about 100 dB_A .

$L_{A10,T}$: The A weighted noise level exceeded for 10% of the measurement period, T. It gives an indication of the upper limit of fluctuating noise such as that from road traffic.

$L_{A90,T}$: The A weighted noise level exceeded for 90% of the measurement period, T. This is defined in BS 4142 as the background noise level.

L_{AE} : The sound exposure level – the level of a sound with a period of 1 second that has the same sound energy as the event considered.



$L_{Aeq,T}$: The equivalent continuous sound level – the sound level of a notionally steady sound having the same energy as a fluctuating sound over a specified measurement period (T).

$L_{A\ Max}$: The highest A weighted noise level recorded during a noise event. The time weighting (slow or fast) should be stated.



Appendix 2: Calibration Certificates

Laboratory Location

Campbell Associates Ltd
5b Chelmsford Road Industrial Estate
GREAT DUNMOW, Essex, GB-CM6 1HD
Phone 01371 871030



Certificate of Calibration

Certificate number: 47900

Test Object: Sound Level Meter, BS EN 60651 and or BS EN 60804 Class 1

Producer: Brüel & Kjær
Type: 2260
Serial number: 2034414
Customer: Ned Johnson Acoustic Consultants Ltd
Address: 378 Church Street,
London. N9 9HS.
Contact Person: Ned Johnson
Order No: TBC

Introduction:

Calibration has been performed as set out in CA Technical Procedures which are based on the procedures for periodic verification of sound level meters as per the **Test Object** listed above. Results and conformance statement are overleaf and detailed results, where appropriate, are provided in the attached Measurement Report.

Tested:	Producer	Type	Serial No	Certificate No
Microphone	Brüel & Kjær	4189	2169417	47899
Calibrator*	Brüel & Kjær	4231_V7	2039392	47898
Preamplifier	Brüel & Kjær	ZC0026	NoCode	Included

* The calibrator was complete with any required coupler for the microphone specified.

Additional items that have also been submitted for verification:

Wind shield N/A
Attenuator N/A
Extension cable N/A

These items have been taken into account wherever appropriate.

Conditions	Pressure kPa	Temperature °C	Humidity %RH
Reference conditions	101.325	23	50
Measurement conditions	100.72 ±0.01	21.13 ±0.2	64.40 ±2.4

Calibration Dates:

Received date: 16/05/2024 Reviewed date: 23/05/2024
Calibration date: 23/05/2024 Issued date: 23/05/2024

Technicians: (Electronic certificate)

Calibrated by: *Palanivel Marappan B.Eng (Hons), M.Sc*

Reviewed by: *Jenny Crawford*

This certificate is issued in accordance with the CA Quality Management system. It provides traceability of measurement to recognized national standards, and to the units of measurement realized at the National Physical Laboratory or other recognized national standards laboratories. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

Doc ref: Sim-Cert-Master-V3-07



Laboratory Location

Campbell Associates Ltd
 5b Chelmsford Road Industrial Estate
 GREAT DUNMOW, Essex, GB-CM6 1HD
 Phone 01371 871030

**Certificate of Calibration**Certificate number: **47899**Test Object: **Measurement Microphone**

Producer: **Brüel & Kjær**
 Type: **4189**
 Serial number: **2169417**
 Customer: **Ned Johnson Acoustic Consultants Ltd**
 Address: **378 Church Street,
 London. N9 9HS.**
 Contact Person: **Ned Johnson**
 Order No: **TBC**

Measurement Results	Sensitivity (dB re 1V/Pa)	Sensitivity (mV/Pa)	Capacitance (pF)
Measurement 1	-24.95	56.54	13.75
Measurement 2	-24.95	56.55	13.76
Measurement 3	-24.95	56.54	13.76
Result (Average):	-24.95	56.54	13.76
Expanded Uncertainty:	0.10		2.00
Degree of Freedom:	>100		>100
Coverage Factor:	2		2

The stated sensitivity is the pressure sensitivity at 250Hz, S₂₅₀, and is valid at reference conditions. The following correction factors have been applied during the measurement:

Pressure:-0.01 dB/kPa Temperature:-0.006 dB/°C Humidity:0 dB/%RH

Conditions	Pressure kPa	Temperature °C	Humidity %RH
Reference conditions	101.325	23	50
Measurement conditions	100.69 ± 0.040	20.8 ± 0.1	64.2 ± 0.7

The calibration test report shown on the next page gives details of the response at other frequencies relative to this 250 Hz reference sensitivity. Results ≥100 Hz are obtained using an electrostatic actuator as described in BS EN 61094-6 and those below 100 Hz are obtained in a reference pressure chamber. Detailed results are available from the calibration laboratory upon request.

The reported expanded uncertainty of measurements is based on a standard uncertainty multiplied by the coverage factor of k=2, providing a coverage probability of approximately 95%. Where the degrees of freedom are insufficient to maintain this confidence level, the coverage factor is increased to maintain this confidence level.

Calibration Dates:

Received date: 16/05/2024 Reviewed date: 23/05/2024
 Calibration date: 23/05/2024 Issued date: 23/05/2024

Technicians: (Electronic certificate)

Calibrated by: *Palanivel Marappan B.Eng (Hons), M.Sc*
 Reviewed by: *Jenny Crawford*

This certificate is issued in accordance with the CA Quality Management system. It provides traceability of measurement to recognized national standards, and to the units of measurement realized at the National Physical Laboratory or other recognized national standards laboratories. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

Doc ref: Mic-Cert-Master-V3-04



Laboratory Location

Campbell Associates Ltd
5b Chelmsford Road Industrial Estate
GREAT DUNMOW, Essex, GB-CM6 1HD
Phone 01371 871030

**Certificate of Calibration**

Certificate number: 47898

Test Object: Sound Calibrator

Producer: Brüel & Kjær
Type: 4231
Serial number: 2039392
Customer: Ned Johnson Acoustic Consultants Ltd
Address: 378 Church Street,
London. N9 9HS.
Contact Person: Ned Johnson
Order No: TBC

Measurement Results	Level dB	Level Stability dB	Frequency Hz	Distortion %
Measurement 1	94.11	0.02	999.85	0.53
Measurement 2	94.11	0.02	999.86	0.51
Measurement 3	94.11	0.02	999.86	0.52
Result (Average):	94.11	0.02	999.86	0.52
Expanded Uncertainty:	0.1	0.02	1	0.1
Degree of Freedom:	>100	>100	>100	>100
Coverage Factor:	2	2	2	2

The stated level is relative to 20µPa. The level is traceable to National Standards. The stated level is valid at reference conditions. The following correction factors have been applied during the measurement

Pres:0.0008 dB/kPa Temp:0.0015 dB/°C Humi:0.001 dB/%RH Load volume: 0.0002 dB/mm3

Conditions	Pressure kPa	Temperature °C	Humidity %RH
Reference conditions	101.325	23	50
Measurement conditions	100.69 ±0.040	20.8 ±0.1	64.2 ±0.7

The reported expanded uncertainty of measurements is based on a standard uncertainty multiplied by the coverage factor of k=2, providing a level of confidence of approximately 95%. Where the degrees of freedom are insufficient to maintain this confidence level, the coverage factor is increased to maintain this confidence level. The uncertainty has been determined in accordance with UKAS requirements.

Records: K:\C A\Calibration\Nor-1504\Nor-1018 Cal\Cal\Current Year\BNK4231_V7_2039392_M1.nmf

Preconditioning

The equipment was preconditioned for more than 4 hours in the specified calibration environment.

Method

Calibration has been performed as set out in the current version of CA Technical procedure TP01

Calibration Dates:

Received date:	16/05/2024	Reviewed date:	23/05/2024
Calibration date:	23/05/2024	Issued date:	23/05/2024

Technicians: (Electronic certificate)

Calibrated by: *Palanivel Marappan B.Eng(Hons), M.Sc*
Reviewed by: *Jenny Crawford*

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

Doc ref: Calb-Cert-Master-V3-07



Appendix 3: Uncertainty

The measurement method used was to measure the existing background noise levels. No measurement of the sources could be undertaken as they are not in place.

As part of the BS4142 assessment the headings from the 2014 standard have been used to consider where uncertainty in the measurements may have occurred.

The complexity of the sound source and the level of variability in sound emission from the source

The sound is from a few slow vehicle movements each day which do not vary greatly while in progress. The office sound will be inaudible.

The complexity and level of variability of the residual acoustic environment

The residual sound level is consistent and is mainly rural sounds such as birdsong punctuated with some traffic movements. noise level the noise over each 15-minute period varied very little.

The ambient environment overall provided consistent, reproducible results and therefore uncertainty for this aspect is low.

The level of residual sound in the presence of the specific sound at the measurement location

The vehicle movements take around 10 seconds and are indistinguishable from normal road traffic.



The location(s) selected for taking the measurements

The location for measurements followed the guidance in BS4142:2014+A1 2019 and was representative of the noise sources in the area. The results were reproducible.

The distance between sources of sound and the measurement location and intervening ground conditions

The vehicle movements were taken at 1 metre and the impact at the receptor was then calculated.

The number of measurements taken

A full 2-hours of data was collected in 15-minute periods providing a data set which is representative of the quietest conditions during operational hours. Overall there is a reliable dataset from which to derive the typical background noise levels and uncertainty is low.

The measurement time intervals

The time intervals for logged data were 15-minute periods, which is an appropriate period for this type of survey and uncertainty is low.

The range of times when the measurements have been taken

The measurement times were representative of the background and ambient sound levels.



The range of suitable weather conditions during which measurements have been taken

During the survey the wind conditions were suitable as they did not exceed 5m/s at any time; there was also no precipitation and temperature was 5°C. All conditions were recorded, including cloud cover and all were in line with the requirements of BS4142 and therefore uncertainty due to weather is low.

The measurement method and variability between different practitioners in the way the method is applied

The method for taking measurements followed that required in BS4142. The measurement procedure is reproducible and therefore uncertainty is low.

The level of rounding of each measurement recorded

Where necessary results have been rounded to the nearest whole decibel; any results at 0.5 have been rounded up.

The instrumentation used

The instruments used are class 1 sound level meters and calibrators and have all been calibrated to a traceable standard at a UKAS accredited laboratory in the last 24 months. Uncertainty due to instrumentation is low.



Appendix 4: Data

Table 3.

Start Time	L _{Aeq}	L _{A90}
08:00:02	47.73	44.55
08:15:00	46.76	44.59
08:30:00	50.91	44.42
08:45:00	47.35	44.25
09:00:00	48.6	43.42
09:15:00	47.98	42.69
09:30:00	44.14	42.60
09:45:00	47.64	44.03