



MEC
Consulting Group

ACOUSTIC AIR

Land off Edney's Hill, Barkham
Acoustic Assessment
February 2026

Report Ref: 30439-ENV-0401



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EXECUTIVE SUMMARY

Site Address	Land off Edney's Hill, Barkham
Site Description and Setting	The Site is located within the village of Barkham and is bound by Barkham Road to the north, Edney's Hill to the east, Mortimer Lodge Farm and open fields to the south and southeast, and existing dwellings to the west. The primary noise sources affecting the area are road traffic on the adjacent roads, with occasional contributions from agricultural activity at Mortimer Lodge Farm.
Proposed Development	Erection of 16 residential dwellings with access from Edney's Hill, including associated footpaths, parking, landscaping and infrastructure.
Assessment	An environmental sound survey and a detailed acoustic assessment were undertaken in accordance with BS 4142, BS 8233, ProPG and AVOG. <u>Farm Assessment</u> Agricultural noise from Mortimer Lodge Farm was assessed using robust BS 5228-1 data and was shown to result in a 'Low' daytime impact and an 'Adverse' night-time impact when assessed using external levels only. When taking into account the overall context, considering façade attenuation, the infrequent and seasonal nature of tractor activity, and dominance of road traffic, the farm is not expected to generate adverse noise effects. <u>Road Traffic Assessment</u> Road traffic was found to be the dominant noise source across the Site. With good acoustic design, the BS 8233 lower-level external amenity criterion of 50 dB $L_{Aeq,16hr}$ will be achieved across all gardens, without the need for any additional mitigation Internal noise level criteria in accordance with BS 8233 and ProPG can be achieved through appropriate façade design. All dwellings can be served by standard double glazing and trickle vents.
Conclusions	The Site is considered suitable for residential development from an acoustics perspective. External garden noise levels comply with BS 8233 without additional mitigation. Internal noise criteria can be met through standard façade design, with mechanical ventilation solutions recommended where increased air flow is required to address overheating.
Recommendations	• Provide glazing and ventilation systems meeting the minimum acoustic performance requirements specified in the report. • Install room specific mechanical ventilation systems in locations requiring additional ventilation for overheating compliance. • Confirm final ventilation sizing and specification at Building Control stage to ensure compliance with AD-O and acoustic requirements.
This summary should be read in conjunction with the full report and reflects an assessment of the site based on information received by MEC at the time of production.	

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1.0 INTRODUCTION

- 1.1 MEC Consulting Group Ltd (MEC) has been commissioned by Abbeymill Homes Ltd to undertake an Acoustic Assessment for a proposed residential development on Land off Edney's Hill, Barkham (hereafter referred to as 'the Site').

Existing Site

- 1.2 The Site is located within the village of Barkham, and is bound to the north by Barkham Road, to the east by Edney's Hill, to the south and south-east by Mortimer Lodge Farm and associated open greenfield; and to the west by existing residential dwellings.
- 1.3 The principal sources of noise affecting the Site is road traffic using Barkham Road and Edney's Hill, coupled with any contributions from operational noise from Mortimer Lodge Farm.
- 1.4 The site location plan is presented in Figure 1.1.

Figure 1.1: Site Location Plan



Development Proposals

- 1.5 The development proposals comprise a full application for the proposed erection of 16 no. dwellings with access off Edney's Hill, plus footpaths, car ports, parking, landscaping and associated works.
- 1.6 An initial sketch layout is presented in **Appendix A**.

Assessment Scope

- 1.7 It is understood that the Site has been refused planning permission by Wokingham Borough Council due to a number of reasons. Reason 6 in the decision notice relates to noise which states the following:

“6. The applicant has failed to demonstrate that future occupiers of the proposed development would not be subject to adverse noise from the existing surrounding environment.”

- 1.8 Therefore, in order to address the reason for refusal, the following scope of works has been undertaken:

- An environmental sound survey has been undertaken within the Site in order to determine the prevailing acoustic conditions;
- An acoustic model has been created in order to predict sound levels across the Site for comparison against relevant criteria contained within BS 4142¹, ProPG², BS 8233³ and AVOG⁴ with consideration given to the acoustic criteria contained in AD-O⁵; and
- Where required, appropriate mitigation measures have been provided to demonstrate compliance with the relevant standards.

- 1.9 The conclusions of this report aim to demonstrate to the Local Authority that external and internal acoustic conditions will be compliant with the relevant British Standards and Acoustic Guidance.

Disclaimer

- 1.10 MEC has completed this report for the benefit of the individuals referred to in Paragraph 1.1 and any relevant statutory authority which may require reference in relation to approvals for the proposed development. Other third parties should not use or rely upon the contents of this report unless explicit written approval has been gained from MEC.

- 1.11 MEC accepts no responsibility or liability for:

- The consequence of this documentation being used for any purpose or project other than that for which it was commissioned;
- The issue of this document to any third party with whom approval for use has not been agreed.

¹ BS 4142:2014 +A1:2019 'Methods for rating and assessing industrial and commercial sound.'

² Professional Practice Guidance on Planning and Noise, May 2017.

³ BS 8233:2014 'Guidance on sound insulation and noise reduction for buildings'

⁴ Acoustics Ventilation and Overheating, Residential Design Guide, V1.1. January 2020.

⁵ The Building Regulations 2010, Overheating, Approved Document 'O'.

2.0 STANDARDS AND GUIDANCE

General

2.1 An acoustic glossary is provided in **Appendix B** to assist the reader.

Summary of Guidance and Standards

2.2 The following guidance and standards relevant to the assessment are outlined below:

- National Planning Policy Framework (NPPF) 2024;
- Noise Policy Statement for England (NPSE) 2010;
- BS 4142:2014 +A1;2019 '*Methods for rating and assessing industrial and commercial sound*'
- Professional Practice Guidance on Planning and Noise (ProPG) 2017;
- BS 8233:2014 '*Guidance on sound insulation and noise reduction for buildings*'; and
- Acoustics Overheating and Ventilation Guide (AVOG) 2020.

2.3 For conciseness, the guidance and standards most appropriate to this assessment are summarised in this section.

BS 4142:2014 + A1;2019 '*Methods for rating and assessing industrial and commercial sound*'.

2.4 BS 4142 describes methods for rating and assessing industrial and/or commercial sound and includes, but is not limited to, the assessment of:

- Sound from industrial and manufacturing processes;
- Sound from fixed installations which comprise mechanical and electrical equipment;
- Sound from the (un)loading of goods and materials at industrial/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 on or around an industrial and/or commercial site.

2.5 The methods described in BS 4142 use outdoor sound levels to assess the likely effects of sound on people who are typically outside residential premises. Although indoor effects can be indicated where the façade composition is known. A summary of the approach set out in BS 4142 is set out below:

- Establish or predict the specific sound level of the source(s) by considering both the ambient (includes the source to be assessed) and residual (excludes the source to be assessed but includes all remaining sources) sound level;
- Measure the representative background sound levels, typically by measuring close to the receptor location;
- Rate the specific sound level to account for any distinguishing characteristics (see below);
- Estimate the impact by subtracting the background sound level from the rating level; and
- Consider the initial estimate of impact, as determined above, in the context of the noise and its environment.

- 2.6 The specific sound level is rated to account for distinguishing characteristics by using penalties for tonality, impulsivity, intermittency and other sound characteristics. The dominant acoustic characteristic should be applied to avoid large penalties which is in accordance with the Institute of Acoustics response to BS 4142.
- 2.7 The character corrections are flexible according to whether the acoustic character is just perceptible at the noise receptor, or is clearly perceptible or highly perceptible, and range from 0 to 6 dB for tonal noise, 3 to 9 dB for impulsive noise, and 3 dB for other non-tonal/impulsive acoustic characteristics.
- 2.8 An initial estimate of impact of the specific sound is obtained by subtracting the background sound level from the rating level. Typically, the greater the difference, the greater the magnitude of impact.
- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context;
 - A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context;
 - At differences lower than +5 dB a low impact is likely, depending on the context. The lower the rating level is to the measured background sound level, the less likely it is that the specific sound source will have an impact.
- 2.9 The results of the initial assessment should then be considered in light of all pertinent contextual factors.

Professional Practice Guidance on Planning and Noise – ProPG

- 2.10 ProPG seeks to secure good acoustic design for new residential developments. The guidance includes a framework to enable situations where noise is not an issue but to help identify the extent of risk at noisier sites. The guidance does not constitute an official government code of practice and neither replaces nor provides an authoritative interpretation of the law or government policy.
- 2.11 The guidance is restricted to sites that are exposed predominantly to noise from transportation sources. Where industrial or commercial noise is present on the site but is “not dominant”, its contribution may be included in the noise level used to establish the degree of risk. However, if the industrial/commercial source is dominant, an assessment in accordance with BS 4142⁶ should be conducted.
- 2.12 A two-stage approach is considered whereby:
- Stage 1 – an initial noise risk assessment of the proposed development site is undertaken;
 - Stage 2 – a systematic consideration of internal and external noise levels is considered ensuring good acoustic design and consideration of other relevant issues is recognised.
- 2.13 ProPG also references the World Health Organisation (WHO) guidance on maximum noise levels at night. Guidance from the WHO states that indoor sound pressure levels should not exceed approximately 45 dB L_{AFmax} more than 10 – 15 times per night. ProPG indicates that individual noise events do not exceed 45 dB L_{AFmax} more than 10 times a night and therefore this is considered as criteria in addition to that outlined in Table 2.1.

⁶ BS 4142:2014 +A1:2019 'Methods for rating and assessing industrial and commercial sound.'

- 2.14 Whilst ProPG does not define a measurement interval for the assessment of L_{AFmax} levels, research⁷ has been undertaken which indicates that, for Maximum Event Level assessments, a sampling interval of between 1 and 3 minutes relates most closely to how awakening events are experienced by people in reality when compared to longer sampling periods.
- 2.15 For brevity, within the study, the majority of people (circa 75-85%) under test returned to a sleep state by approximately 2.5 minutes after the initial awakening event.
- 2.16 In summary, a longer sampling period can result in the under assessment of the 10th highest maximum level, therefore, based upon research and the recommendation of the Institute of Acoustics (IOA), a sample measurement of 1 minute has been used to inform this assessment.
- 2.17 Upon completion of the ProPG's Stage 1 and 2 assessments, the findings should enable one of four possible recommendations to be presented to the decision maker, namely to grant permission without conditions, grant with conditions, 'avoid' or 'prevent'.

BS 8233:2014 'Guidance on sound insulation and noise reduction for buildings'

- 2.18 BS 8233 provides recommendations for the control of noise in and around buildings.
- 2.19 The guidance provided includes appropriate internal and external noise level criteria which are applicable to residential buildings exposed to steady external noise sources. It is stated in the British Standard that it is desirable for internal ambient noise levels to not exceed the criteria set out in Table 2.1.

Table 2.1: BS 8233: 2014 Table 4 – Indoor Ambient Noise Levels for Dwellings

Activity	Location	07:00 – 23:00 $L_{Aeq,16hr}$ dB	23:00 – 07:00 $L_{Aeq,8hr}$ dB
Resting	Living Room	35	-
Dining	Dining Room/Area	40	-
Sleeping (daytime resting)	Bedroom	35	30

- 2.20 Additional guidance in BS 8233 indicates that appropriate ventilation should be provided, if relying on closed windows to meet the guide values, and that such ventilation should not compromise the façade insulation and resulting noise levels.
- 2.21 BS 8233 additionally includes guidance on external amenity areas whereby it states that external noise levels should not exceed 50 dB $L_{Aeq, T}$ with an upper guideline of 55 dB $L_{Aeq, T}$ which would be acceptable in noisier environments.

Acoustics, Ventilation and Overheating Guide – AVOG

- 2.22 AVOG outlines a methodology for the assessment of airborne sound during overheating conditions, and emphasises the co-dependency of acoustics, ventilation and overheating design.

⁷ Paxton et al., Assessing L_{max} for residential development: The AVO Guide Approach, Institute of Acoustics, 2019

- 2.23 Many developments require closed windows to provide good internal acoustic conditions which is in direct contrast to residents opening windows to keep a building cool. These opposing requirements are becoming a significant issue in residential building design as only one environmental comfort is then possible: either comfortable noise levels with windows closed or thermal comfort with windows open.
- 2.24 AVOG prescribes a two-level assessment procedure, the first stage is based upon external sound levels and provides a risk of adverse acoustic conditions during periods of overheating. The second stage is a formal assessment which considers both internal acoustic conditions and increased ventilation during overheating concurrently, and is typically reserved for detailed design stage.
- 2.25 A Level 2 AVOG assessment gives consideration to internal noise levels on a sliding scale depending on the likelihood and duration of overheating, with the potential for internal adverse effect levels described as follows:
- NOAEL – No Observed Adverse Effect Level (no effect can be detected, typically BS 8233 criteria);
 - LOAEL – Lowest Observed Adverse Effect Level (adverse effects start to be detected); and
 - SOAEL – Significant Observed Adverse Effect Level (significant adverse effects on health and quality of life occur).
- 2.26 An interpretation of the sliding scale within AVOG is presented in Table 2.3.

Table 2.2: AVOG Level 2 Criteria, dB

Effect Level	Internal Noise Level Criteria	
	Daytime $L_{Aeq,16hr}$	Night-time $L_{Aeq,8hr}$
NOAEL	< 35	< 30
LOAEL	35	30
SOAEL	40 – 50	35 – 42
Note: As internal noise levels rise from LOAEL to SOAEL, there is an increasing risk of an adverse effect level and mitigation measures may be required. Furthermore, SOAEL is dependent on how often overheating is likely to occur as higher noise levels may only be tolerable for shorter periods.		

- 2.27 With regards to maximum event exposure during periods of overheating, and whilst AVOG does present a fixed external criterion of 65 dB L_{AFmax} , the more stringent internal criterion of 55 dB L_{AFmax} contained within AD-O for Building Control purposes, will be used to define mitigation where it is found that maximum event levels drive the acoustic design.

3.0 ENVIRONMENTAL SOUND SURVEY

3.1 An environmental sound survey was undertaken between Monday 9th and Tuesday 10th February 2026. The survey was undertaken in full accordance with the guidance set out in BS 7445⁸.

3.2 Sound Level Meters (SLMs) were installed at two locations, as follows:

- Continuous Measurement 1 (CM1): approximately 7.5m from the carriageway edge of Barkham Road; and
- Continuous Measurement 2 (CM2): approximately 14.5m from the carriageway edge of Edney's Hill.

3.3 The measurement positions are identified in Figure 3.1.

Figure 3.1: Measurement Positions



Equipment

3.4 Measurements were taken using Class 1 integrating/averaging SLMs housed in environmental protection apparatus. The SLMs were installed in a free field position at a height of 1.5m above local ground level and were field calibrated before and after the survey using Class 1 calibrators, with no significant drift in calibration noted.

3.5 The SLMs were set up to capture the following parameters at a minimum: L_{Aeq} , L_{A90} and L_{AFmax} values, and full details of the equipment used to undertake the survey are presented in Table 3.1.

⁸ BS 7445-1:2003 'Description and measurement of environmental noise, Part 1: Guide to quantities and procedures.'

Table 3.1: Equipment and Calibration Details

Measurement Position	Description	Manufacturer & Type No.	Serial No.	Calibration Due Date
CM1	Sound Level Meter	Type NOR140	1407932	22/02/2027
	Pre-Amplifier	Type 1209	23695	
	Microphone	Type 1225	505583	
	Calibrator	Norsonic 1251	34315	07/04/2026
CM2	Sound Level Meter	Type NOR140	1407773	23/03/2027
	Pre-Amplifier	Type 1209	23168	
	Microphone	Type 1225	413180	
	Calibrator	Norsonic 1255	125525772	16/11/2026

Meteorological Conditions

- 3.6 During setup of the SLMs on Monday 9th February, weather conditions were mild and partly cloudy, with a southerly breeze of 1.6 m/s. On return to Site on Tuesday 10th January, light rain was observed with southerly breeze of 2.4 m/s.
- 3.7 With the light rain fall and subsequent wet roads, it is noted that this could have led to partially elevated sound levels. However, it is considered that this would provide a robust approach when determining mitigation.

Observations

- 3.8 During the site visit, the overall acoustic environment was observed to be generally quiet. The primary source of noise affecting the Site was road traffic along Barkham Road, with an additional, lesser contribution from traffic using Edney's Hill.
- 3.9 Traffic flows on Edney's Hill are relatively infrequent and, as a result, noise from this source is not as significant as that from Barkham Road.
- 3.10 Whilst walking along the Site boundary, the site engineer did observe some tractor movements within the farmyard. However these were noted to be very infrequent and due to this, it was not possible to obtain sound levels of the operations. It was also noted that there was a livestock barn on the farm which housed cows at the time of the survey.

Results

- 3.11 Time history graphs for the measurement positions are provided in **Appendix C**.
- 3.12 Table 3.2 and Table 3.3 provide a summary of measured sound levels.

Table 3.2: Summary of Measured Sound Levels at CM1, dB

Date	Daytime 07:00 – 23:00	Night-time 23:00 – 07:00	
	L _{Aeq,T}	L _{Aeq,8hr}	Typical Maximum Event Level ^(a) L _{AFmax,1min}
Mon 9 th February	61 ^(b)	54	73
Tue 10 th February	63 ^(c)	-	-
(a) Maximum sound level not exceeded more than 10 times per night. (b) T = 10hr (c) T = 6hr			

- 3.13 As shown in Table 3.2, ambient daytime L_{Aeq,T} sound levels ranged between 61 dB and 63 dB, and the night-time L_{Aeq,8hr} sound level was 54 dB.
- 3.14 The derived L_{Aeq,16hr} sound level of 62 dB will be used for the purpose of the daytime assessment.
- 3.15 Analysis of the night-time L_{AFmax,1min} levels shows that the individual events did not exceed 73 dB more than 10 times during the measured night-time period. Audio recordings indicate that this level was a result of vehicle pass-bys on Barkham Road. Furthermore, this level occurred three times within the top 10 highest measured night-time maximum sound levels. Therefore, a value of 73 dB L_{AFmax,1min} is considered to be an appropriate typical maximum event level for the assessment.

Table 3.3: Summary of Measured Sound Levels at CM2, dB

Date	Daytime 07:00 – 23:00	Night-time 23:00 – 07:00	
	L _{Aeq,T}	L _{Aeq,8hr}	Typical Maximum Event Level ^(a) L _{AFmax,1min}
Mon 9 th February	54 ^(b)	46	68
Tue 10 th February	56 ^(c)	-	-
(a) Maximum noise level not exceeded more than 10 times per night. (b) T = 9hr (c) T = 7hr			

- 3.16 As shown in Table 3.3, ambient daytime L_{Aeq,T} sound levels ranged between 54 dB and 56 dB, and the night-time L_{Aeq,8hr} sound level was 46 dB.
- 3.17 The derived L_{Aeq,16hr} sound level of 55 dB will be used for the purpose of the daytime assessment.
- 3.18 Analysis of the night-time L_{AFmax,1min} levels shows that the individual events did not exceed 68 dB more than 10 times during the measured night-time period. Audio recordings indicate that this level was a result of vehicle pass-bys on Edney's Hill. Therefore, a value of 68 dB L_{AFmax,1min} is considered to be an appropriate typical maximum event level for the assessment.

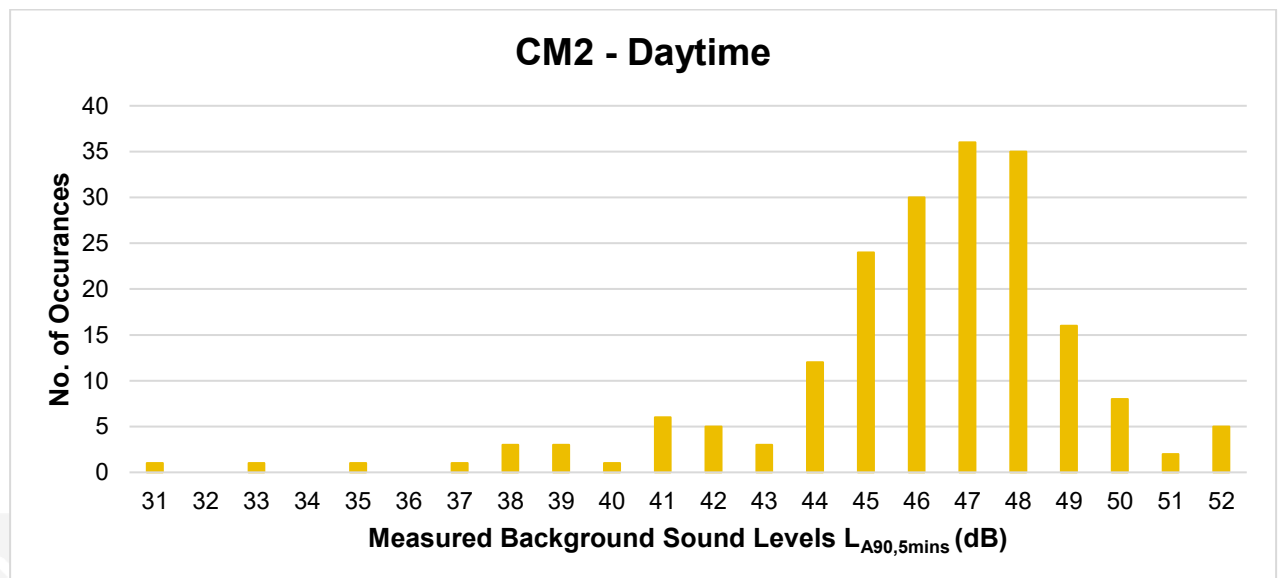
Statistical Analysis of L_{A90} Data

- 3.19 With regard to derivation of the L_{A90} background sound level for the purpose of the Mortimer Lodge Farm assessment, CM2 is considered to be appropriately representative of typical conditions for new dwellings

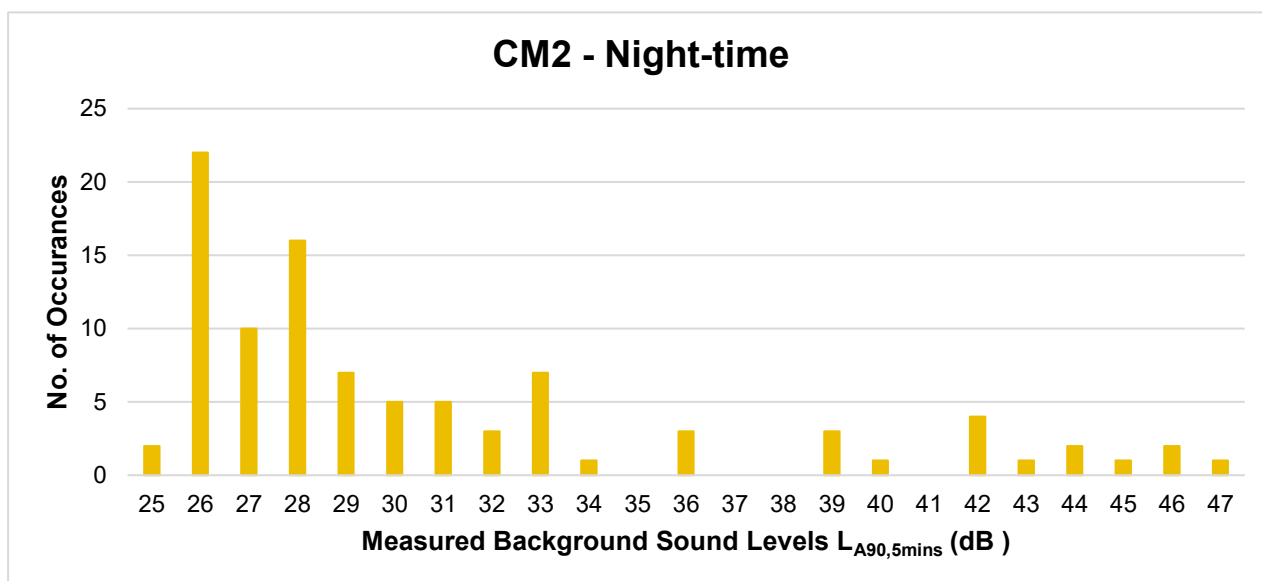
adjacent to the farm. Given the standoff distance from Barkham Road and the limited operations at the farm, this position is considered to provide robust background sound levels to use within the BS 4142 assessment.

- 3.20 Section 8 of BS 4142 makes it clear that the objective of the assessment *“is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods.”*
- 3.21 Paragraph 8.14 of BS 4142 similarly remarks that *“The monitoring duration should reflect the range of background sound levels for the period being assessed. In practice, there is no ‘single’ background sound level as this is a fluctuating parameter. However, the background sound level used for the assessment should be representative of the period being assessed.”*
- 3.22 The subsequent Note 1 states that *“A representative level ought to account for the range of background sound levels and ought not automatically to be assumed to be either the minimum or modal value”*.
- 3.23 A statistical analysis of the daytime $L_{A90,5\text{mins}}$ and night-time $L_{A90,5\text{mins}}$ sound measurements, consistent with the BS 4142 advice, is shown in Figure 3.2 and Figure 3.3.

Figure 3.2: Statistical Analysis of Daytime Background Sound Levels $L_{A90,5\text{mins}}$, CM2



- 3.24 During the daytime, the data shows a clear distribution pattern centred around 47 dB, with an overall range of daytime values extending from 31 dB to 52 dB $L_{A90,5\text{mins}}$. Therefore, 47 dB is considered to be an appropriate value to use for assessment purposes during the daytime.

Figure 3.3: Statistical Analysis of Night-time Background Sound Levels $L_{A90,5\text{mins}}$, CM2

- 3.25 Night-time background sound levels indicates a clear overarching background sound level of approximately 26 dB. On this basis, a background sound level of 26 dB is considered appropriate and robust for use in the night-time assessment.

4.0 ASSESSMENT METHODOLOGY

Acoustic Modelling

- 4.1 An acoustic model of the Site and environs has been generated in Datakustik CadnaA® modelling software. The model was generated to determine noise levels across the Site and noise source emissions have been informed by survey data and supplemented with data taken from BS 5228-1⁹.
- 4.2 CadnaA® considers various inputs, including topography, buildings and road noise sources, and calculates sound levels in accordance with national and international standards; in this case, the relevant UK standards are the procedures set out within ISO 9613-2¹⁰.

Modelling Parameters

- 4.3 The modelling assumptions and input information for the acoustic model are as follows:
- Digital Terrain Model – Lidar 1m (Environment Agency, downloaded on 29th January 2026)
 - Open Street Map data (publicly available);
 - Ground absorption for the Site = 0.5 (mixed ground);
 - Building heights estimated following site observations or based upon the site layout;
 - First order reflections included in the modelling;
 - Temperature set to 10°C; and
 - Relative humidity set to 70%

Farm Assessment

- 4.4 Based on site observations and experience from similar livestock farms, tractor movements are considered the most significant typical source of noise. These have therefore been modelled to assess the likely impact on the nearest proposed receptors.
- 4.5 As a tractor was not operational during the Site visit, sound pressure levels have been taken from Table C.4 in BS 5228-1. These levels have then been converted to sound power levels using the following formula:

$$L_w = L_p + 20 \log(r) + 11 - D$$

Where:

- $r = 10\text{m}$
- $D = 3$

- 4.6 The resulting sound power level data for the tractor is summarised in in Table 4.1.

⁹ BS 5228-1:2009 +A1:2014 'Code of practice for noise and vibration control on construction and open sites – Part 1: Noise.'

¹⁰ ISO 9613-2 'Acoustics – Attenuation of sound during propagation outdoors, Part 2: General method of calculation.'

Table 4.1: Tractor Sound Level Data, dB

Activity	SWL in Octave Band Centre Frequency (Hz)								SWL
	63	125	250	500	1k	2k	4k	8k	
Tractor Towing Equipment	107	99	106	103	106	98	89	83	108

- 4.7 It has been assumed for the purposes of this assessment that the tractor will be operating while towing equipment. Adopting this assumption ensures that the evaluation reflects typical real-world working conditions and accounts for the additional loads and operational demands associated with towing. On this basis, the assessment can be regarded as robust, as it considers the tractor under representative working conditions.
- 4.8 To account for the tractor movements, a moving point source has been included within the model based on the sound levels in Table 4.1. The moving point source assumes the tractor to undertake a loop within the farmyard to provide a robust assessment scenario.
- 4.9 An on-time correction has then been applied to account for the source being operational for half of the assessment period. Observations undertaken during site activities indicated that the relevant movements occurred only for very short durations, with intermittent operation rather than continuous use. As such, the assumption of a 50% on-time represents a reasonable worst-case scenario, ensuring that the assessment does not underestimate potential effects despite the limited duration of observed movements.
- 4.10 With reference to the noise criteria outlined in Section 2.0, the acoustic model has been used to predict sound levels across the Site in the following BS 4142 assessment scenarios:
- Daytime $L_{Aeq,1hr}$ external sound levels at ground floor (1.5m) height; and
 - Night-time $L_{Aeq,15mins}$ external sound levels at first floor (4m) height.
- 4.11 Sound level contour maps for the above scenarios are presented in **Appendix D**.

Road Traffic Assessment

- 4.12 Based on the environmental sound survey, the sound levels used to calibrate the 3D acoustic model are presented in Table 4.2.

Table 4.2: Sound Levels Used to Calibrate Acoustic Model, dB

Parameter	CM1	CM2
Daytime Ambient $L_{Aeq,16hr}$	62	55
Night-time Ambient $L_{Aeq,8hr}$	54	46
Night-time Maximum $L_{AFmax,1min}$	73	68

- 4.13 With reference to the noise criteria outlined in Section 2.0 the acoustic model has been used to predict sound levels across the Site in the following scenarios:
- Daytime $L_{Aeq,16hr}$ external sound levels at ground floor (1.5m) height;
 - Night-time $L_{Aeq,8hr}$ external sound levels at first floor (4m) height; and
 - Night-time $L_{AFmax,1min}$ external sound levels at first floor (4m) height.
- 4.14 Sound level contour maps for the above scenarios are presented in **Appendix E**.
- 4.15 For conciseness, this report tabulates the most exposed receptors to give context to the most stringent mitigation measures. The most exposed dwelling to Mortimer Lodge Farm is Plot 8-13, the most exposed dwelling to Barkham Road is Plot 3 and the most exposed dwelling to Edney's Hill is Plot 6.
- 4.16 All other receptors are assessed through the various sound level contour and mitigation reference drawings presented in the various appendices to this report.

5.0 FARM ASSESSMENT

Initial Numerical Impact Assessment

- 5.1 It is firstly noted that no character corrections have been applied within the following assessment. Tractor movements within the farmyard are considered typical of normal agricultural operations and do not exhibit any distinctive acoustic characteristics at the nearest proposed receptors that would warrant the application of a character correction under BS 4142. The sound generated is predominantly broadband in nature, lacks tonal or impulsive features, and is intermittent but not of a nature that would attract attention or increase annoyance.
- 5.2 In addition, the Site is located adjacent to existing roads, such that the prevailing acoustic environment is largely influenced by road traffic noise. In this context, tractor movements associated with the farm would not be readily distinguishable at nearby receptors, providing further justification for the absence of any character corrections.
- 5.3 The Initial Numerical Impact Assessments (INIA) for Plot 8-13 is presented in Table 5.1.

Table 5.1: Initial Numerical Impact Assessment

Assessment Step	Plot 8-13	
	Daytime	Night-time
Modelled Specific Sound Level [A]	33 dB L _{Aeq,1hr}	34 dB L _{Aeq,15mins}
Acoustic Character Correction [B]	-	-
Rating Level [C = A + B]	33 dB L _{Ar,1hr}	34 dB L _{Ar,15mins}
Background Sound Level [D]	47 dB L _{A90,5mins}	26 dB L _{A90,5mins}
Rating over Background [E = C – D]	-14 dB	+8 dB
Estimation of Impact ^(a)	Low	Adverse
^(a) Impact dependent upon context and other pertinent factors.		

- 5.4 During the daytime, the rating level due to operational noise lies -14 dB below the background sound level at the most exposed receptor, for which BS 4142 states, *“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.”*
- 5.5 During the night-time, the rating level lies 8 dB above the background sound level. Therefore, this would be an indication of the specific sound source having an ‘Adverse’ impact, depending on context.

Context

- 5.6 Context is an important factor in determining the BS 4142 impact upon existing receptors. BS 4142 states *“... to fully understand the context in which the sound from an industrial and/or commercial source(s) is being assessed, describe and report the sources of sound which comprise the acoustic environment.”*. BS 4142 goes on to state *“...The significance of sound of an industrial and/or commercial nature depends upon both margin by which the rating level of the specific sound source exceeds the background sound level, and the*

context in which the sound occurs. An effective assessment cannot be conducted without an understanding of the context in which the sound occurs/will occur. When making assessment and arriving at decisions, therefore, it is essential to place the sound in context”.

- 5.7 Consideration should therefore be given to the overall context of the planning application, general environment around the Site as well as other aspects of the design.

Infrequent Operations

- 5.8 The assessed tractor movements represent infrequent and short-duration activities associated with normal agricultural operations rather than continuous or regular noise sources. Such movements typically occur intermittently and are often linked to specific operational requirements, such as seasonal activities including harvesting, silage making, or livestock management. Any night-time activity would therefore be limited to particular times of the year and would not represent a routine or continuous source of noise. As a result, while individual movements may be audible during very quiet periods, their infrequent and temporary nature significantly limits the potential for repeated disturbance or adverse impacts.

Night-time Sound Levels

- 5.9 The night-time assessment has been undertaken using predicted external sound levels at the façades of the nearest proposed dwellings, in accordance with the methodology set out in BS 4142. However, it is noted that occupants are most likely to be indoors during night-time hours, and as such the façade insulation would provide a substantial reduction in internal sound levels. Consequently, the sound levels experienced internally would be substantially lower than those predicted externally, further reducing the likelihood of sleep disturbance or adverse effects, particularly given the intermittent nature of the assessed activities.

Receptor Design and Cumulative Noise Mitigation

- 5.10 In considering the introduction of new receptors in proximity to existing noise sources, BS 4142 recognises that appropriate design and mitigation measures may be required to ensure an acceptable internal acoustic environment. In this instance, any mitigation incorporated to address road traffic noise, such as the glazing and ventilation specifications, would also provide a level of attenuation to noise arising from agricultural activities at the Site. As a result, measures intended to mitigate the dominant road traffic noise source would also mitigate farm-related noise, further reducing the potential for adverse impact at the proposed dwellings.

Summary

- 5.11 BS 4142 advises that the significance of noise impact should not be determined solely by numerical comparison between rating and background sound levels but should be informed by professional judgement taking account of sound character, duration, frequency, and context. In this instance, despite a calculated exceedance of the background sound level during the night-time, the infrequent and seasonal nature of the operations, façade-based assessment methodology, and the overall road traffic mitigation strategy, it is considered that an 'Adverse' impact is highly unlikely.

6.0 ROAD TRAFFIC ASSESSMENT

ProPG Initial Noise Risk Assessment

6.1 As required by the ProPG, an Initial Noise Risk Assessment (INRA) is presented in Table 6.1.

Table 6.1: Initial Site Noise Risk Assessment, dB

Risk	Negligible		Low		Medium		High	
Period	Day	Night	Day	Night	Day	Night	Day	Night
ProPG Threshold ^(a)	< 50	< 40	50 – 60	40 – 50	60 – 70	50 – 60	> 70	> 60
Plot 3			58			51		
Risk Assessment			Low			Medium		
Plot 6			55	48				
Risk Assessment			Low					
^(a) L _{Aeq,16hr} dB for daytime assessment purposes and L _{Aeq,8hr} dB for night-time assessment purposes.								

6.2 Based on the modelled sound levels, the most exposed dwelling to Barkham Road falls within the ProPG risk category of 'Low' during the daytime, for which the guidance states *"the site is likely to be acceptable from a noise perspective provided that a good acoustic design process is followed"*.

6.3 The risk category increases to 'Medium' during the night-time, for which the guidance states the Site should follow a good acoustic design process which confirms how the adverse impacts of noise will be mitigated and minimised.

6.4 The most exposed dwelling to Edney's Hill falls in the ProPG risk category of 'Low' during both the daytime and night-time.

6.5 This report is considered to form the basis of the 'Acoustic Design Statement', which considers appropriate design measures to achieve suitable acoustic conditions for residential amenity.

External Amenity Criteria

6.6 The acoustic criterion often the most difficult to meet in residential environments situated next to busy transportation sources is BS 8233's criterion of 55 dB L_{Aeq,16hr} applicable to private external amenity spaces such as gardens.

6.7 It is noted that the Site follows good acoustic design principles, with dwelling frontages facing towards the surrounding roads and gardens located behind. The resulting daytime L_{Aeq,16hr} sound level contour map, shown on drawing 30439_04_120_03 in **Appendix E**, demonstrates that BS 8233's lower-level criterion of 50 dB L_{Aeq,16hr} will be satisfied at all gardens across the Site without the need for any additional mitigation.

Internal Acoustic Criteria

6.8 Table 6.2 presents the required external to internal reduction requirements for the most exposed dwellings.

Table 6.2: Required Façade Performance, dB

Plot	Parameter	External Level	Internal Criteria	Required Reduction ^(a)
3	Daytime Ambient L _{Aeq,16hr}	58	35	23
	Night-time Ambient L _{Aeq,8hr}	51	30	21
	Night-time Maximum L _{AFmax,1min}	70	45	25
6	Daytime Ambient L _{Aeq,16hr}	55	35	20
	Night-time Ambient L _{Aeq,8hr}	48	30	18
	Night-time Maximum L _{AFmax,1min}	68	45	23

6.9 For the most exposed receptor to Barkham Road (Plot 3), the results in Table 6.2 show that a sound reduction of up to 23 dB will be required to achieve the internal L_{Aeq,16hr} criteria within habitable rooms during the daytime. Façade performance for bedrooms is driven by the night-time maximum scenario, with a sound reduction of up to 25 dB required to achieve the 45 dB L_{AFmax} criteria.

6.10 For the most exposed receptor to Edney's Hill (Plot 6), a sound reduction of up to 20 dB will be required to achieve the internal L_{Aeq,16hr} criteria within habitable rooms during the daytime. Façade performance for bedrooms is driven by the night-time maximum scenario, with a sound reduction of up to 23 dB required to achieve the 45 dB L_{AFmax} criteria.

Acoustics Led Overheating Assessment

6.11 This part of the report considers the assessment of overheating in accordance with AVOG, and looks to determine whether an open windows acoustic strategy is permissible across the Site.

AVOG Level 1 Assessment

6.12 AVOG prescribes a two-stage assessment. Level 1 looks to determine if overheating needs to be considered further, based on the predicted external façade levels for the most exposed receptors.

6.13 The initial Level 1 assessment is presented in Table 6.3.

Table 6.3: AVOG Level 1 Assessment

Plot	Parameter	Predicted External Level dB	Level 1 Risk Grading	Level 2 Advised?
3	Daytime Ambient $L_{Aeq,16hr}$	58	Medium	Optional but recommended
	Night-time Ambient $L_{Aeq,8hr}$	51		
6	Daytime Ambient $L_{Aeq,16hr}$	55	Low	Optional
	Night-time Ambient $L_{Aeq,8hr}$	48		

6.14 The results demonstrate that at the most exposed receptors, an AVOG Level 2 assessment is recommended based on the modelled ambient sound levels.

6.15 It should also be noted that the night-time L_{AFmax} sound levels drive the acoustic design. Therefore, consideration will be given to internal sound levels during periods of overheating through a numerical assessment with comparisons also being made to internal acoustic criteria contained in AD-O.

AVOG Level 2 Assessment

Risk of Overheating

6.16 The likelihood of overheating can be determined via a qualitative assessment through the GHA Toolkit¹¹.

6.17 A qualitative assessment using the GHA Toolkit is presented in **Appendix F**. The qualitative assessment indicates a 'High' risk of overheating, due to the fact that internal noise levels will be exceeded with windows open and therefore, the 'duration for which overheating occurs' is considered to be 'most of the time' in accordance with AVOG.

6.18 To combat overheating, an increased ventilation rate is typically required to remove excess heat from the property. The means in which increased ventilation can be achieved, without opening windows, is typically viable through a passive ventilator, such as a room specific mechanical ventilation system within affected habitable rooms, or whole dwelling Mechanical Ventilation with Heat Recovery (MVHR) systems where significantly high external noise levels are present. For the purpose of this assessment, a room specific MV system will be assumed.

6.19 Calculations have been undertaken in accordance with BS 12354-3¹² to determine the predicted internal noise levels using the passive ventilation means for the most exposed plot (Plot 3) based upon a 'High' risk of overheating in accordance with the GHA toolkit.

6.20 It is noted that this AVOG Level 2 Assessment can be seen as a worst-case scenario as the proposed ventilation measures would theoretically reduce the risk of overheating from that of a 'High' risk. Therefore, assuming a 'High' risk with the inclusion of the mitigation measures, would represent a robust assessment scenario.

¹¹ Good Homes Alliance, Early-Stage Overheating Risk Tool, V1, July 2019 Toolkit

¹² BS EN ISO 12354-3:2017 'Building acoustics – Estimation of acoustic performance of buildings from the performance of elements – Part 3: Airborne sound insulation against outdoor sound.'

6.21 The resulting AVOG Level 2 Assessment for Plot 3 with the inclusion of the room specific MV system is presented in Figure 6.1 and Figure 6.2.

Figure 6.1: AVOG Level 2 Assessment of Daytime Conditions – Plot 3

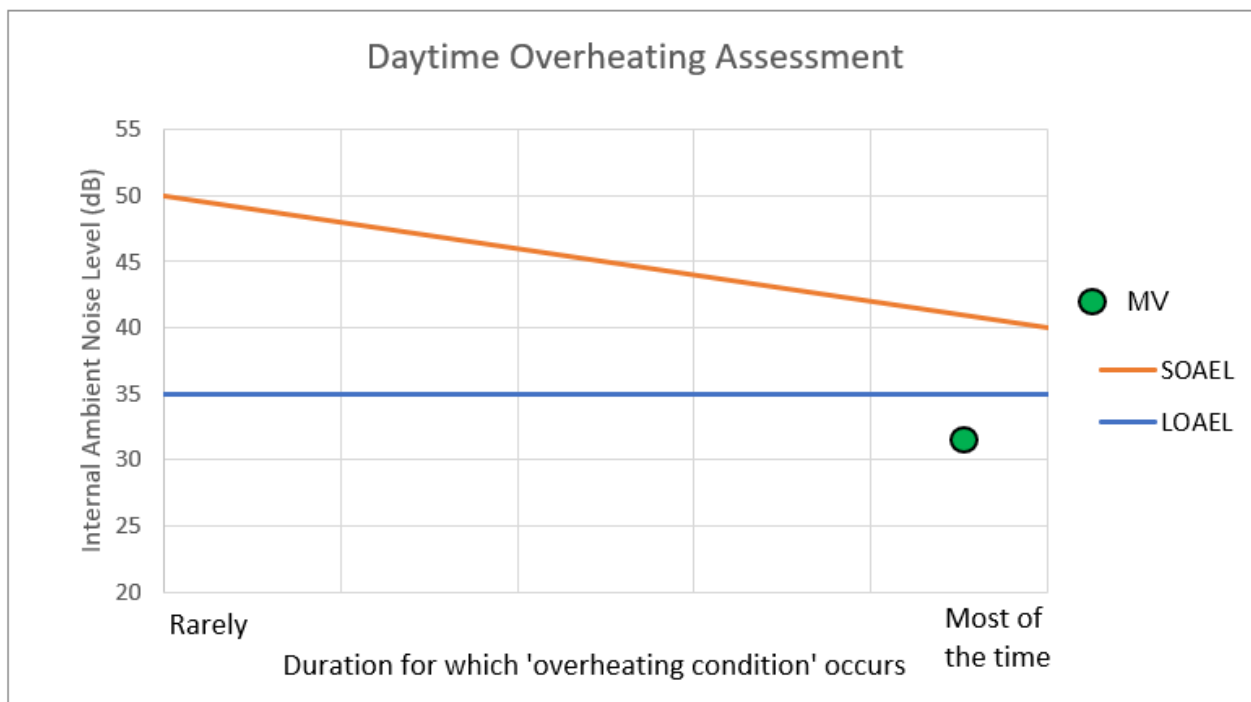
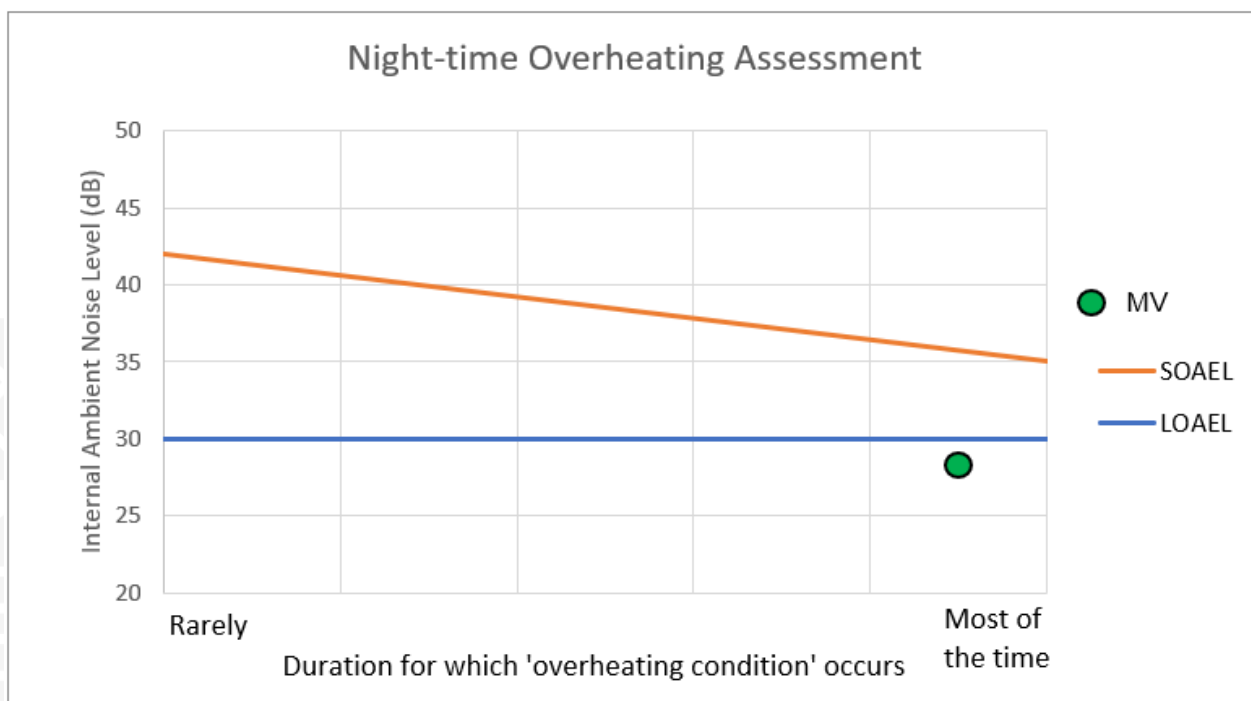


Figure 6.2: AVOG Level 2 Assessment of Night-time Conditions – Plot 3



6.22 The results in Figure 6.1 and Figure 6.2 indicate that internal noise levels using a room specific MV system would lie below the LOAEL.

Overheating Acoustics Assessment – Numerical Summary

- 6.23 Table 6.4 presents a summary numerical assessment for overheating conditions using a room specific MV system as a means of additional ventilation for the most exposed dwellings.

Table 6.4: Overheating Acoustics Assessment, dB

Plot	Parameter ^(a)	Criteria	Calculated Internal Level
48	Daytime Ambient $L_{Aeq,16hr}$	40	32
	Night-time Ambient $L_{Aeq,8hr}$	35	28
	Night-time Maximum $L_{AFmax,1min}^{(b)}$	55	44
(a) $L_{Aeq,T}$ criteria chosen as a point on the SOAEL based upon a high risk of overheating.			
(b) L_{AFmax} criterion as presented within AD-O.			

- 6.24 The information in Table 6.4 demonstrates that, with the inclusion of room specific MV systems, AVOG and AD-O criteria are comfortably satisfied.
- 6.25 However, it should be noted that the above indicative ventilation strategy is based on the qualitative GHAToolkit, which does not take into consideration mechanical ventilation flow rates needed to satisfy CIBSE TM59¹³.
- 6.26 Therefore, the mitigation schedule may be subject to change at Building Control stage based upon the outcome of any Dynamic Thermal Modelling undertaken to satisfy the requirements of AD-O.
- 6.27 It should be noted that where room specific mechanical ventilation systems are used to achieve suitable ventilation measures for overheating, whole dwelling ventilators (such as window mounted trickle vents) will also need to be included.
- 6.28 However, if a whole dwelling MVHR system is to be installed, this would negate the need to install whole dwelling ventilation solutions for typical conditions (window mounted trickle vents).
- 6.29 In any event, such measures should not influence the planning decision due to the fact that, as shown in this assessment, acoustic conditions have been considered during periods of overheating, and Environmental Health matters will be satisfied with an appropriate ventilation strategy.

Mechanical Ventilation System Limits

- 6.30 Any mechanical system included in the Site should adhere to the noise limits outlined in Table 6.5 for AD-F purposes and, ideally target the guidance values for overheating conditions.
- 6.31 The purpose of the guidance values during overheating periods is due to the fact that research indicates any increase in the noise produced by Mechanical Systems during periods of overheating, above that outlined below, is likely to result in residents turning off, or reducing the performance of such systems, which would result in a poor living environment. Once a Mechanical & Electrical engineer has specified the system to be

¹³ Design Methodology for the Assessment of Overheating Risk in Homes, TM59:2017.

installed, further acoustic calculations should be undertaken to determine appropriate in-line attenuation measures accordingly.

- 6.32 'Noise Sensitive Rooms' are defined as bedrooms and living rooms with the likes of kitchens and bathrooms defined as 'Less Sensitive.' The overheating guidance values are derived from AVOG and AD-O and is a reasonable target during brief overheating periods.

Table 6.5: Mechanical System Noise Limits

Area	Typical Conditions Limit ^(a) L _{Aeq, T} dB	Overheating Conditions Guidance Value ^(b) L _{Aeq, T} dB
Noise Sensitive Rooms	30	30 (±5)
Less Sensitive Rooms	45	35 (±5)
^(a) Taken from section 1.7 of Approved Document F ¹⁴ , Volume 1, 2021 Edition.		
^(b) Taken from AVOG.		

¹⁴ The Building Regulations 2010, Ventilation, Approved Document 'F'.

7.0 MITIGATION

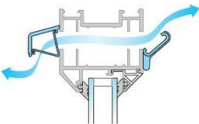
External Sound Levels

- 7.1 It has been demonstrated that with the proposed Site layout, the BS 8233 lower-level criterion of 50 dB $L_{Aeq,16hour}$ will be met for all gardens across the Site, without requiring further mitigation.

Internal Sound Levels

- 7.2 Acoustic modelling has demonstrated potential façade sound levels and, in accordance with BS 8233, ProPG and AVOG, sound reduction performance requirements of the façade have been determined. To ensure a robust approach, both the road traffic noise and commercial noise have been accounted for when determining the required glazing and ventilation.
- 7.3 In terms of acoustics, windows and ventilation strategies are the 'weakest' acoustic point in any façade and subsequently, the composite sound reduction performance is typically dominated by these elements. Therefore, minimum performance requirements to be provided by the glazing and ventilation elements at all dwellings are presented herein.
- 7.4 Drawing on the above, Table 7.1 provides the reduction requirements and indicative glazing and ventilation solutions across the Site in order to demonstrate compliance with the internal sound level criteria outlined in BS 8233 and ProPG during typical conditions; internal sound level criteria outlined in AVOG during overheating conditions; whilst adhering to the ventilation requirements of AD-F.
- 7.5 This table should be read in conjunction with the drawings in **Appendix G** whereby drawing 30439_04_120_06 demonstrates the required reduction for bedrooms and drawing 30439_04_120_07 demonstrates the required reduction for all other habitable rooms.
- 7.6 For each reference in Table 7.1, the sound reduction performance requirements, in octave band and weighted reduction format, are presented in **Appendix H**.

Table 7.1: Suggested Internal Mitigation Measures

Mitigation Ref.	Glazing Solution	Whole-Dwelling Ventilation Solution ^(a)	Overheating Ventilation Solution ^(b)
Ref. A-1	<u>Indicative Solution</u> 4mm glass panel 12mm air gap 4mm glass panel Req. 27 dB $R_w + C_{tr}$	<u>Standard Trickle Vent</u> Direct airpath trickle vent located in the top of the window frame  Req. $D_{n,e,w} + C_{tr} = 32$ dB	<u>No Overheating Mitigation Required.</u> Opening windows can be used to combat overheating and provide purge ventilation.
Ref. A-2			<u>MV System</u> Mechanical Ventilation Systems to provide room specific, or whole dwelling, extract and purge ventilation. 

^(a) Where a whole dwelling MVHR system is to be installed, this would negate the need to install whole dwelling ventilation solutions for typical conditions (window mounted trickle vents).

^(b) Indicative overheating solution – subject to change at Building Control stage based upon the outcome of any Dynamic Thermal Modelling undertaken to satisfy the requirements of AD-O.

8.0 CONCLUSIONS

- 8.1 MEC has been commissioned by Abbeymill Homes Ltd to undertake an Acoustic Assessment for a proposed residential development on Land off Edney's Hill, Barkham.

Farm Assessment

- 8.2 The assessment of noise from Mortimer Lodge Farm focused primarily on tractor movements, which represent the most significant potential source of agricultural noise affecting the proposed development. Using sound level data obtained from BS 5228-1 and a robust modelling approach, the predicted daytime rating level at the most exposed plots was significantly below the representative background sound level, indicating a 'Low' impact. Although the night-time assessment initially suggested an 'Adverse' numerical impact, this was based on external façade levels only and does not reflect real-world internal conditions, which would benefit from substantial attenuation through standard façade insulation.
- 8.3 When applying the contextual considerations required by BS 4142, the likelihood of any adverse impact is considered to be very low. Tractor movements at the farm are infrequent, short in duration and seasonal, and therefore do not represent a continuous or dominant noise source. Furthermore, residents are expected to be indoors during night-time hours, where glazing and ventilation systems would reduce the noise levels to well below the levels associated with disturbance.
- 8.4 Overall, when the nature, frequency and operational context of the farm activity are taken into account alongside the embedded façade mitigation specified for the development, agricultural noise is not expected to give rise to adverse effects at the proposed receptors. The farm-related noise environment is therefore not considered a constraint to the proposed development.

Road Traffic Assessment

- 8.5 Detailed assessments of the Site, during typical conditions, have been undertaken in accordance with BS 8233 and ProPG criteria whilst giving consideration to typical condition ventilation requirements in AD-F.

External Sound Levels

- 8.6 With the implementation of the good acoustic design principles, the acoustic modelling has demonstrated that the BS 8233 lower-level criterion of 50 dB $L_{Aeq,16hour}$ will be met for all gardens across the Site, without requiring further mitigation.

Internal Sound Levels

- 8.7 Embedded façade mitigation measures have been suggested in order to achieve internal noise level criteria in line with BS 8233 and ProPG. Calculations demonstrate that the Site can satisfy the internal acoustic criterion through the provision of standard thermal double glazing and standard window mounted trickle ventilators.

Overheating Considerations

- 8.8 During periods of overheating, alternative ventilation solutions have been explored. Calculations demonstrate that the relevant internal acoustic criteria can be achieved with the provision of room specific mechanical ventilation systems.
- 8.9 However, any overheating mitigation measures presented within this report are presented to satisfy internal acoustic conditions only. The exact ventilation requirements to combat overheating will need to be considered during the Building Control process of the Site. Nevertheless, matters relating to noise in respects of Environmental Health have been fully considered within this report.

Summary

- 8.10 In summary, based upon the assessment presented within this report, it is considered that the Site is suitable for development provided the mitigation measures are followed.



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APPENDICES

Appendix A





REVISIONS / AUTHOR			DATE
PURPOSE OF ISSUE			
PLANNING			
DRAWN		SCALE	
MW		1:500@A3	
CHECKED	SIGNED OFF		DATE
TN	TN		APR 2025
PROJECT			
LAND OFF EDNEYS HILL			
BARKHAM			
TITLE			
SITE LAYOUT			
DRAWING NUMBER			REV
WOK-PL101			C
<u>ABBEYMILL HOMES LTD.</u>			
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Appendix B



GLOSSARY OF TECHNICAL TERMS

Noise

Noise is defined as unwanted sound. Human ears are able to respond to sound in the frequency range 20 Hz (deep bass) to 20,000 Hz (high treble) and over the audible range of 0 dB (the threshold of perception) to 140 dB (the threshold 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 mechanism is used. This reduces the importance of lower and higher frequencies, in a similar manner to the human ear.

Furthermore, the perception of noise may be determined by a number of other factors, which may not necessarily be acoustic. 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 or impulsiveness 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.

The most widely used weighting mechanism that best corresponds to the response of the human ear is the 'A'-weighting scale. This is widely used for environmental noise measurements, and the levels are denoted as dB(A) or L_{Aeq} , L_{A90} etc., according to the parameter being measured.

The decibel scale is logarithmic rather than linear, and hence a 3 dB increase in sound level represents a doubling of the sound energy present. Judgement of sound is subjective, but as a general guide a 10 dB(A) increase can be taken to represent a doubling of loudness, whilst an increase in the order of 3 dB(A) is generally regarded as the minimum difference needed to perceive a change under normal listening conditions.

Typical sound levels found in the environment

Sound Level	Location
0 dB(A)	Threshold of hearing
20 to 30 dB(A)	Quiet bedroom at night
30 to 40 dB(A)	Living room during the day
40 to 50 dB(A)	Typical office
50 to 60 dB(A)	Inside a car
60 to 70 dB(A)	Typical high street
70 to 90 dB(A)	Inside a factory
100 to 110 dB(A)	Burglar alarm at 1m away
110 to 130 dB(A)	Jet aircraft taking off
140 dB(A)	Threshold of pain

Descriptor	Terminology
Sound Pressure	Sound, or sound pressure, is a fluctuation in air pressure over the static ambient pressure.
Sound Pressure Level	The sound level is the sound pressure relative to a standard reference pressure of $20\mu\text{Pa}$ (20×10^{-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 $20\mu\text{Pa}$.
A-weighting (dB(A))	The unit of sound level, weighted according to the A-scale, which takes into account the increased sensitivity of the human ear at some frequencies.
Noise Level Indices	Noise levels usually fluctuate over time, so it is often necessary to consider an average or statistical noise level. This can be done in several ways, so a number of different noise indices have been defined, according to how the averaging or statistics are carried out.
$L_{eq, T}$	A noise level index called the equivalent continuous noise level over the time period, T . This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
$L_{AFmax, T}$	A noise level index defined as the maximum noise level during the measurement period. L_{Max} is sometimes used for the assessment of discrete loud noises, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. It is typically measured using the 'fast' sound level meter response.
$L_{90, T}$	A noise level index. The noise level exceeded for 90% of the time over the period, T . L_{90} can be considered to be the "average minimum" noise level and is often used to describe the background noise.
$L_{10, T}$	A noise level index. The noise level exceeded for 10% of the time over the period, T . L_{10} can be considered to be the "average maximum" noise level. Generally used to describe road traffic noise.
Free-Field	Far from the presence of sound reflecting objects (except the ground), usually taken to mean at least 3.5m.
Façade	At a distance of 1m in front of a large sound reflecting object such as a building facade.
Fast/Slow Time Weighting	Averaging times used in sound level meters.
Octave Band	A range of frequencies whose upper limit is twice the frequency of the lower limit
One-third Octave Band	A frequency band in which the upper limit is $2^{1/3}$ times the frequency of the lower limit.
Rating Level	The specific sound level, plus any adjustment for characteristic feature of sound in BS 4142.
Specific Sound Level	The A-weighted L_{eq} sound level produced by a sound source during a specified period of time. Commonly known as the sound source under investigation as defined in BS 4142.
Typical Maximum Level	The 90 th percentile maximum event level (L_{AFmax}) measured during a period. Used for assessing night-time maximum levels under typical and overheating conditions.



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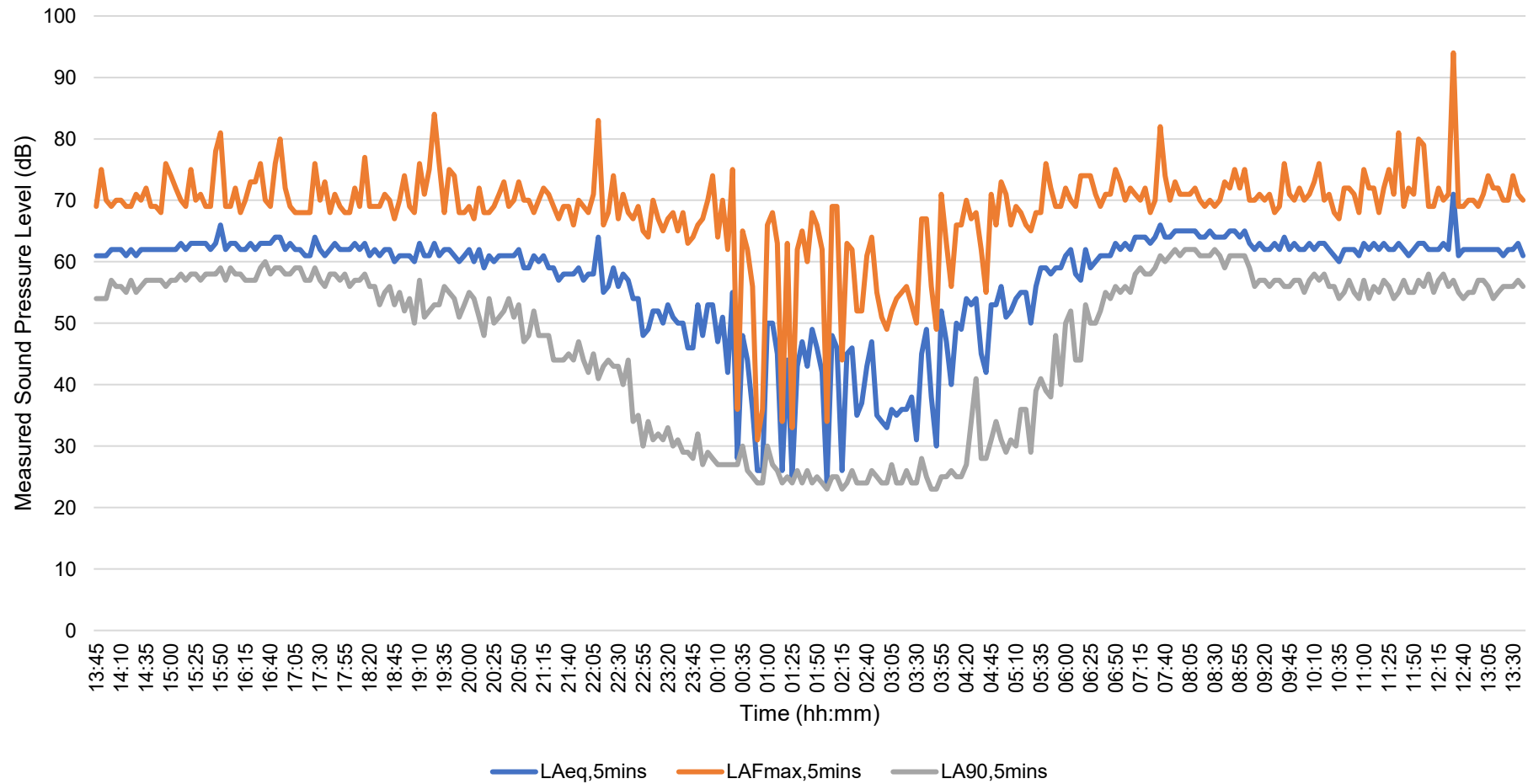
Appendix C



Land off Edneys Hill, Barkham, Wokingham - CM1

Environmental Sound Monitoring Survey Results

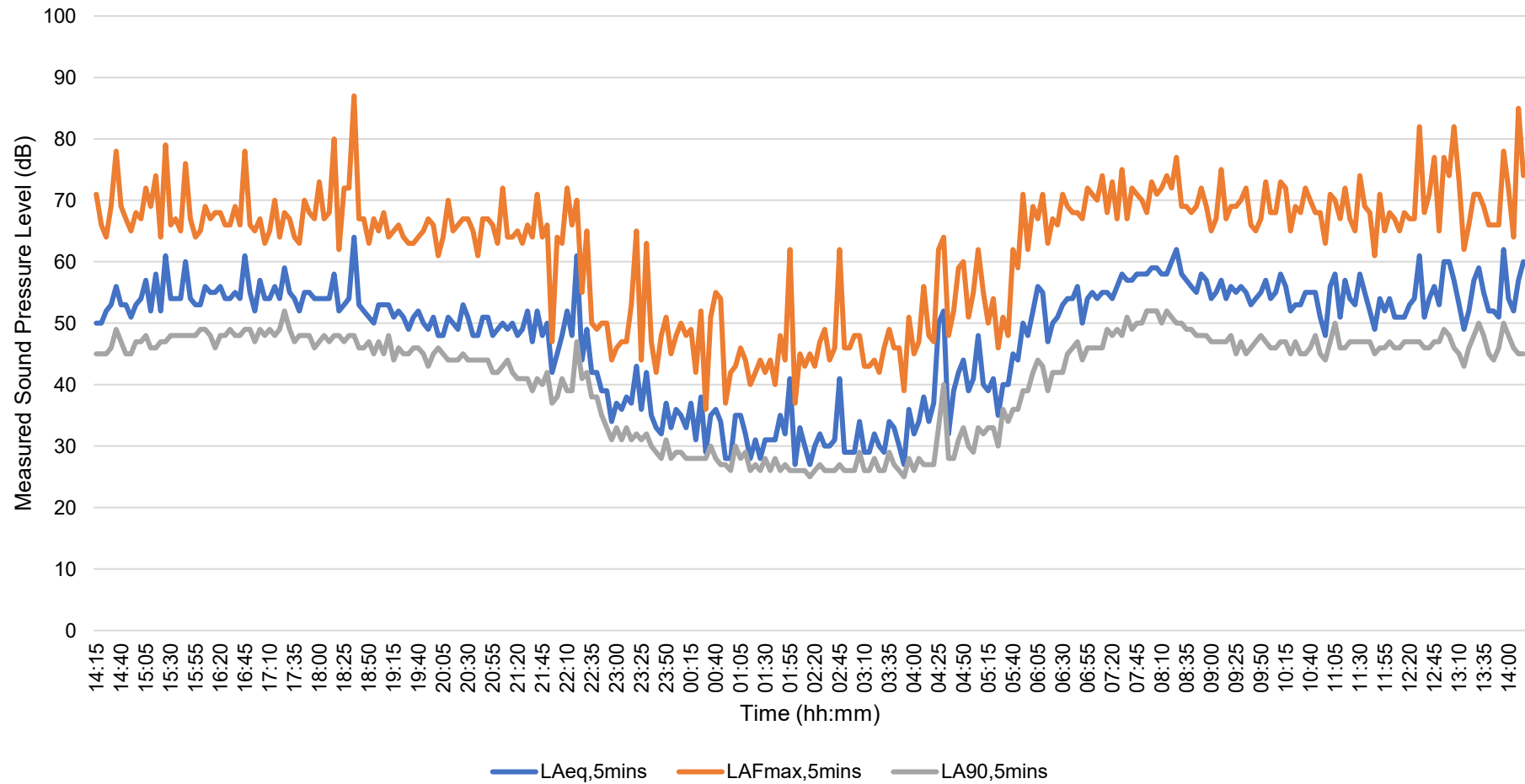
$L_{Aeq,5mins}$, $L_{AFmax,5mins}$ & $L_{A90,5mins}$ Measured Sound Levels - 9th to 10th February 2026



Land off Edneys Hill, Barkham, Wokingham - CM2

Environmental Sound Monitoring Survey Results

$L_{Aeq,5mins}$, $L_{AFmax,5mins}$ & $L_{A90,5mins}$ Measured Sound Levels - 9th to 10th February 2026



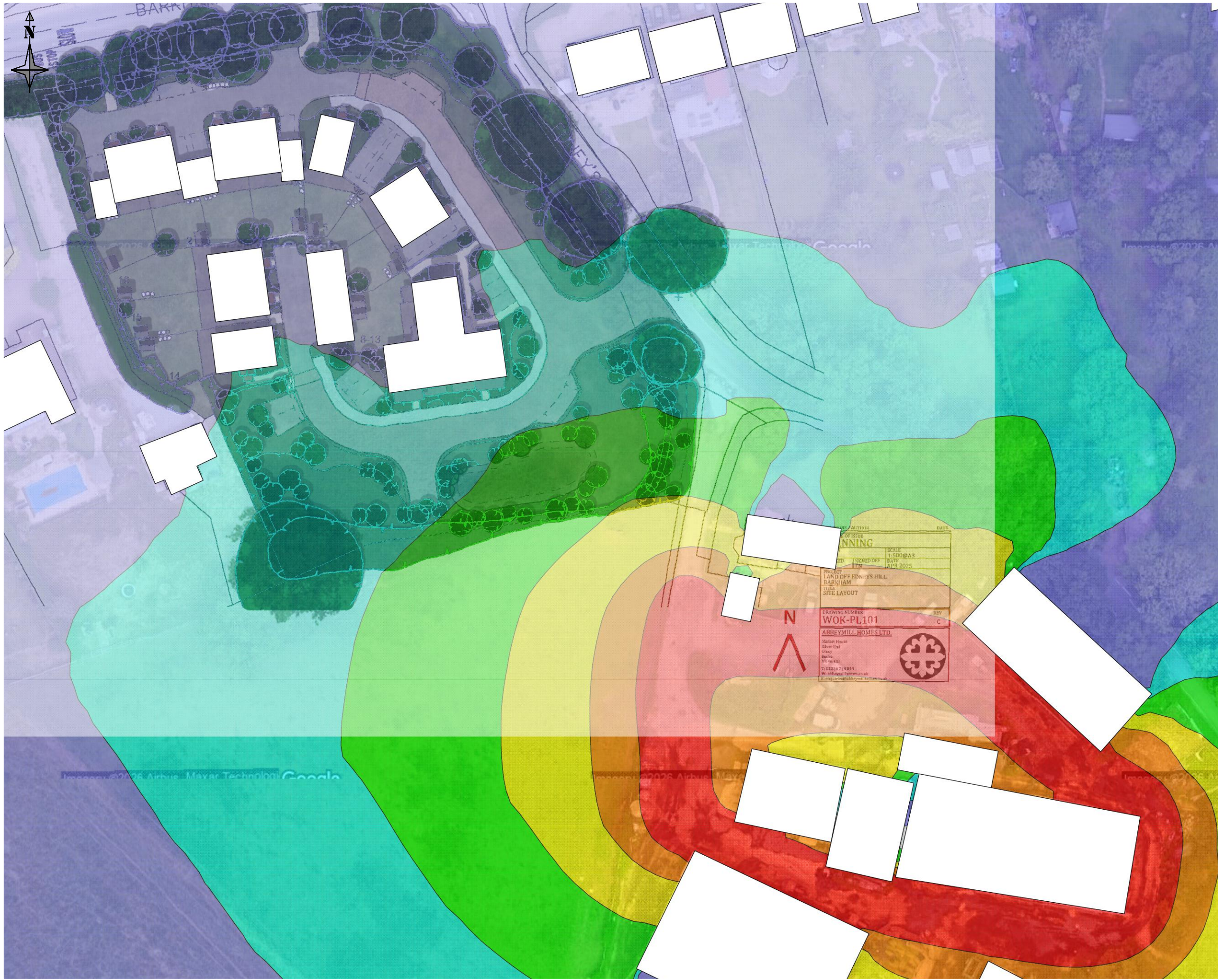


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Appendix D





NOTES:

1. DO NOT SCALE THIS DRAWING.

KEY

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	40–45dB(A)
	45–50dB(A)
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REV.	FIRST ISSUE	HL	NF	TR	17.02.26
REV.	AMENDMENTS:	DRN	CHK	APP	DATE:

PROJECT: LAND OFF EDNEY'S HILL, BARKHAM

DRAWING TITLE: EXTERNAL DAYTIME SOUND LEVELS FROM MORTIMER LODGE FARM LAeq,1hr

CLIENT: ABBEYMILL HOMES LTD

DRAWING NUMBER: 30439_04_120_01

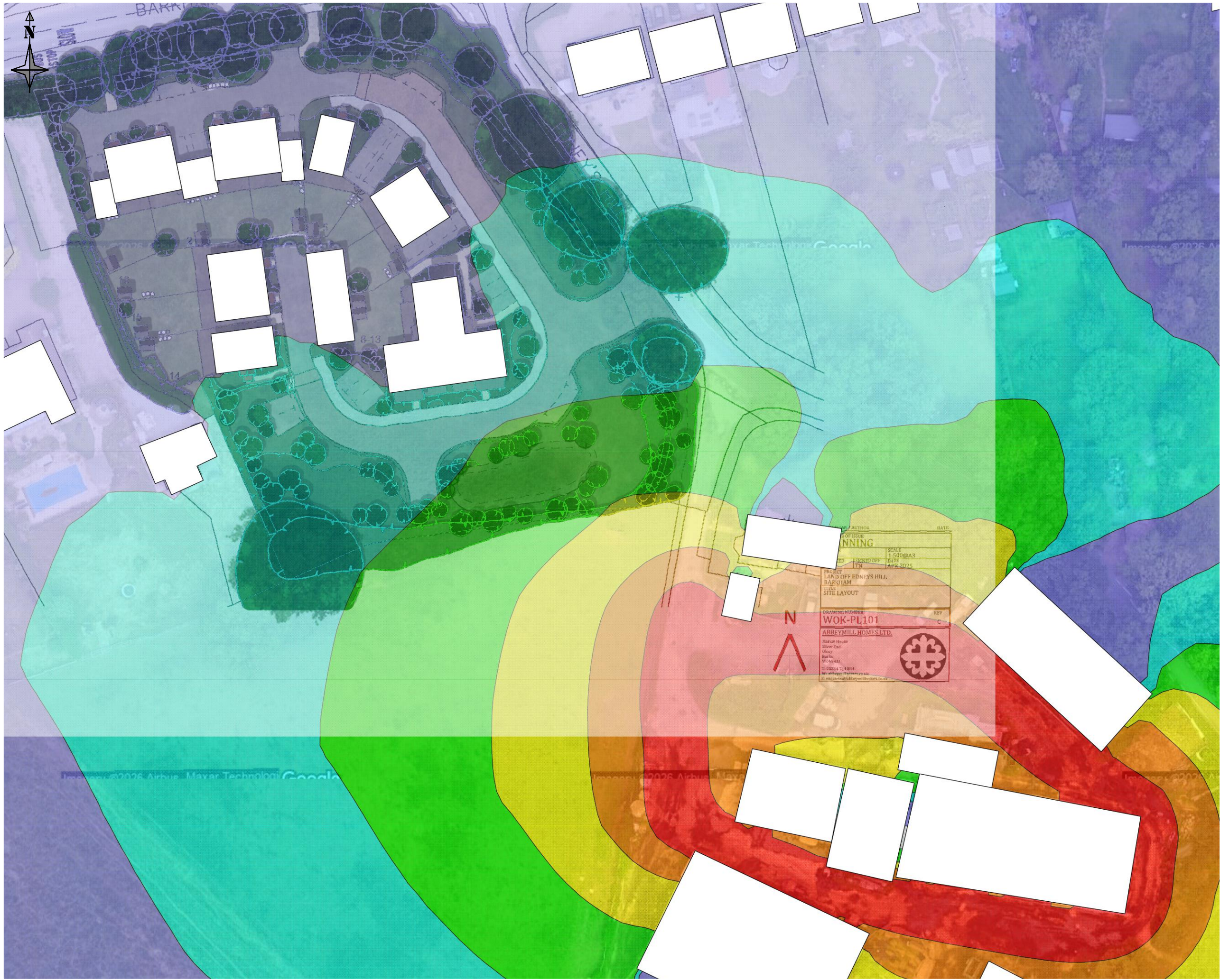
REVISION:	SHEET SIZE:	SCALE:
-	A3	NTS

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REV.	FIRST ISSUE	HL	NF	TR	17.02.26
REV.	AMENDMENTS:	DRN	CHK	APP	DATE:

PROJECT: LAND OFF EDNEY'S HILL, BARKHAM

DRAWING TITLE: EXTERNAL NIGHT-TIME SOUND LEVELS FROM MORTIMER LODGE FARM LAeq,15mins

CLIENT: ABBEYMILL HOMES LTD

DRAWING NUMBER: 30439_04_120_02

REVISION:	SHEET SIZE:	SCALE:
-	A3	NTS

STATUS: FOR INFORMATION / APPROVAL

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Appendix E





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REV.	AMENDMENTS	DRN	CHK	APP	DATE
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DRAWING TITLE: DAYTIME AMBIENT SOUND LEVELS, LAeq,16hr					
CLIENT: ABBEYMILL HOMES LTD					
DRAWING NUMBER: 30439_04_120_03					
REVISION:	SHEET SIZE:	SCALE:			
-	A3	NTS			
STATUS: FOR INFORMATION / APPROVAL					
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	>80dB(A)

REV.	FIRST ISSUE	HL	NF	TR	17.02.26
REV.	AMENDMENTS:	DRN	CHK	APP	DATE:
PROJECT: LAND OFF EDNEY'S HILL, BARKHAM					
DRAWING TITLE: NIGHT-TIME AMBIENT SOUND LEVELS, LAeq,8hr					
CLIENT: ABBEYMILL HOMES LTD					
DRAWING NUMBER: 30439_04_120_04					
REVISION:	SHEET SIZE:	SCALE:			
-	A3	NTS			
STATUS: FOR INFORMATION / APPROVAL					
MEC Consulting Group Birmingham Brighton Leicester		Telephone: 01530 264 753 Email: group@m-ec.co.uk Website: www.m-ec.co.uk ORDNANCE SURVEY © CROWN COPYRIGHT 2015. ALL RIGHTS RESERVED. LICENCE NUMBER 100055865.			



NOTES:

1. DO NOT SCALE THIS DRAWING.

KEY

	0–50dB(A)
	50–55dB(A)
	55–60dB(A)
	60–65dB(A)
	65–70dB(A)
	70–75dB(A)
	75–80dB(A)
	>80dB(A)

REV.	FIRST ISSUE	HL	NF	TR	17.02.26
	AMENDMENTS:	DRN	CHK	APP	DATE:
PROJECT: LAND OFF EDNEY'S HILL, BARKHAM					
DRAWING TITLE: NIGHT-TIME MAXIMUM SOUND LEVELS, LAFmax,T					
CLIENT: ABBEYMILL HOMES LTD					
DRAWING NUMBER: 30439_04_120_05					
REVISION:	SHEET SIZE:	SCALE:			
-	A3	NTS			
STATUS: FOR INFORMATION / APPROVAL					
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APPENDICES

Appendix F



Question	Answer	Points
#1 Where is the scheme in the UK?	Rest of England and Wales	2
#2 Is the site likely to see an Urban Heat Island effect?	Less dense suburban area	0
#3 Does the site have barriers to windows opening?	Barriers to some of the windows	4
	Some bedroom windows to be kept closed at night	8
#4 Are the dwellings flats?	No	0
#5 Does the scheme have community heating?	No	0
#6 What is the estimated average glazing ratio for the dwellings	>35%	4
#7 Are the dwellings single aspect?	Dual Aspect	0
#8 Do the site surroundings feature significant blue/green infrastructure?	Green space within 100m of Site	-1
#9 Are immediate surrounding surfaces in majority pale in colour, or blue green?	No	0
#10 Does the site have existing tall trees or buildings that will shade solar-exposed glazed areas?	No	0
#11 Do dwellings have high exposed thermal mass AND a means for secure and quiet night ventilation?	No	0
#12 Do floor-to-ceiling heights allow for ceiling fans now, or in the future?	No	0
#13 Is there useful external shading?	No	0
#14 Do windows & opening support effective ventilation?	Part F Only	0
Total		17
Overheating Risk		High
(a) Aside from the most exposed dwellings, all windows can be opened during the day and still achieve good acoustic conditions internally in accordance with BS 8233. (b) Calculations have been undertaken for a variety of plots to determine the average glazing ratio for the development.		



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APPENDICES

Appendix G





NOTES:

- DO NOT SCALE THIS DRAWING.
- Please refer to report reference 30439-ENV-0401 for details on the proposed glazing and ventilation specifications.

KEY

Ref. A-1

Ref. A-2

REV.	FIRST ISSUE	HJ	NE	TR	17.02.26
	AMENDMENTS:	DRN	CHK	APP	DATE:
PROJECT: LAND OFF EDNEY'S HILL, BARKHAM					
DRAWING TITLE: MITIGATION REFERENCE FOR HABITABLE BEDROOMS					
CLIENT: ABBEYMILL HOMES LTD					
DRAWING NUMBER: 30439_04_120_06					
REVISION:	SHEET SIZE:	SCALE:			
-	A3	NTS			
STATUS: FOR INFORMATION / APPROVAL					
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NOTES:

- DO NOT SCALE THIS DRAWING.
- Please refer to report reference 30439-ENV-0401 for details on the proposed glazing and ventilation specifications.

KEY

Ref. A-1

Ref. A-2

REV.	FIRST ISSUE	HJ	NF	TR	17.02.26
	AMENDMENTS:	DRN	CHK	APP	DATE:
PROJECT: LAND OFF EDNEY'S HILL, BARKHAM					
DRAWING TITLE: MITIGATION REFERENCE FOR ALL OTHER HABITABLE ROOMS (NON BEDROOMS)					
CLIENT: ABBEYMILL HOMES LTD					
DRAWING NUMBER: 30439_04_120_07					
REVISION:	SHEET SIZE:	SCALE:			
-	A3	NTS			
STATUS: FOR INFORMATION / APPROVAL					
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APPENDICES

Appendix H



Reference A-1 and A-2 Performance Requirements

Façade Element	Sound Insulation Performance Requirements (dB) in Octave Band Centre Frequencies (Hz)						$R_w / D_{n,e,w}$ (dB)	C_{tr} (dB)
	125	250	500	1k	2k	4k		
Glazing	22	20	26	36	39	31	31	-4
Ventilation and Overheating	32	32	31	33	31	31	32	0
The glazing reduction requirements can typically be found in a configuration of 4/12/4, where the information is presented in terms of the thickness of one pane of glass in mm, followed by the size of the air gap in mm, followed by the thickness of the second pane of glass in mm. The background ventilation requirements can be found in standard window mounted non-acoustic trickle ventilators.								

It is appreciated that it is impractical to achieve every octave band minimum performance requirement, therefore, during procurement of solutions, the $R_w + C_{tr}$ or $D_{n,e,w} + C_{tr}$ should be adhered to at a minimum.



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