
Wealden House, Lewes Road, Ashurst Wood, West Sussex

Noise Impact Assessment Report
Report 31104.NIA.01

Antler Homes

Report 31104.NIA.01 Revision History		
Revision	Written by	Checked by
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31104.TH1-3	Environmental noise time histories
31104.SP1	Acoustic zones plan
Appendix A	Glossary of acoustics terminology
Appendix B	Site layout plan
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1.0 INTRODUCTION

This Noise Impact Assessment has been prepared for Antler Homes to support the residential development at Wealden House, Lewes Road, Ashurst Wood, West Sussex (Ref. 31104.NIA.01).

The purpose of the report is to quantify the existing noise environment, assess the site's suitability for residential use, and set out the acoustic design measures needed to meet planning requirements.

The report provides external building fabric and ventilation performance to achieve the BS 8233 internal criteria (Condition 6A), assesses external amenity areas against BS 8233 (Condition 6A), and evaluates fixed plant proposals so that rating levels meet the Planning Condition 6B requirement.

2.0 SITE SURVEYS

2.1 Site Description

As shown on Google Maps, Wealden House occupies a small compound on the south side of the A22 (Lewes Road) in Brambletye, East Grinstead. The site contains Wealden House and the adjacent Ashbourne House plus a large outbuilding. It is bounded by the A22 to the north, open fields and hedgerows to the south and east, and further grassland with a small pond to the west. Nearby housing lies across the A22 and along Windmill Lane, with additional dwellings in the village of Ashurst Wood further east. Notable landmarks include Brambletye School a few hundred metres to the southwest and The Three Crowns pub just east along the A22. The local noise environment is dominated by steady road traffic on the A22.

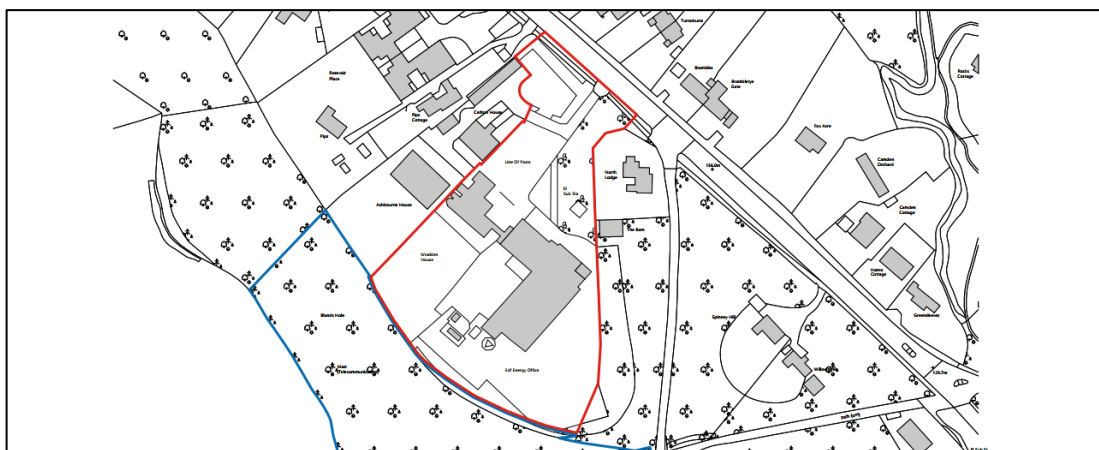


Figure 2.1 Site location (Image source: Lytle Associates Architects)

2.2 Environmental Noise Survey Procedure

A noise survey was undertaken on the proposed site as shown in Figure 2.1.

Continuous automated monitoring was undertaken for the duration of the survey between 12:00 on 28 October 2025 and 13:00 on 29 October 2025.

Weather conditions were generally dry with light winds and therefore suitable for the measurement of environmental noise. The measurement procedure complied with ISO 1996-2:2017 Acoustics '*Description, measurement and assessment of environmental noise - Part 2: Determination of environmental noise levels*'.

2.3 Measurement Positions

Measurement positions are listed below and shown in Figure 2.2. Locations were selected to capture worst-case noise levels across the site from all nearby sources.

- **Position 1:** Northern boundary, microphone 1.5 m above ground and any other reflective surfaces. Ambient and background noise measured.
- **Position 2:** Eastern boundary, microphone 1.5 m above ground and any other reflective surfaces. Ambient noise measured.
- **Position 3:** Southern boundary, microphone 1.5 m above ground and any other reflective surfaces. Ambient noise measured.

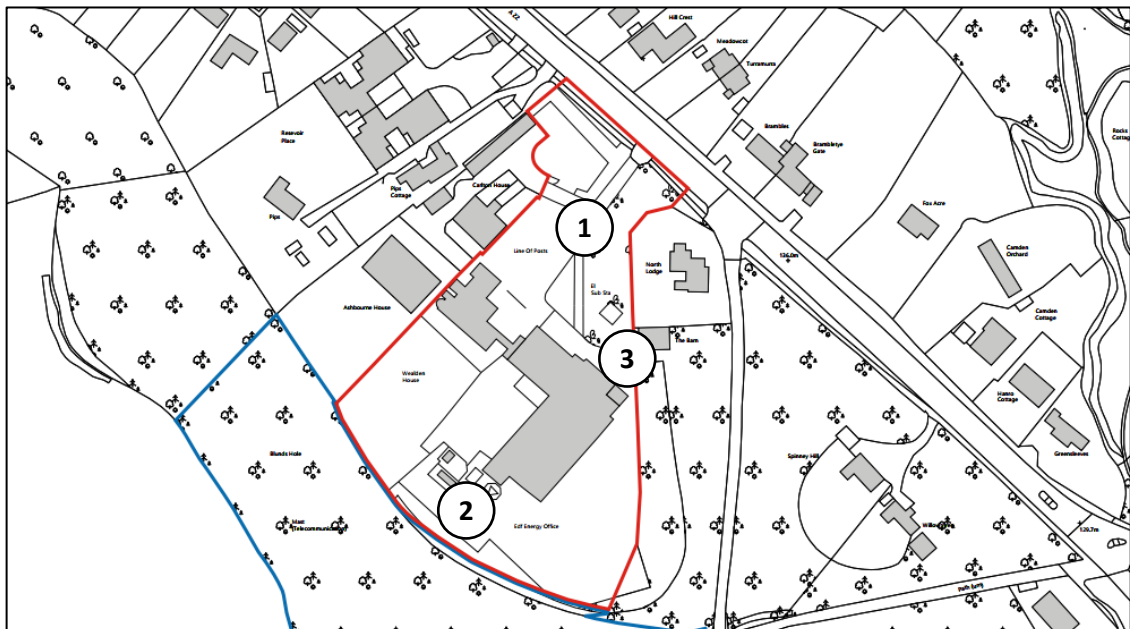


Figure 2.2 Site measurement positions (Image Source: Google Maps)

2.4 Equipment

The equipment calibration was verified before and after use and no abnormalities were observed. The equipment used is described within Table 2.1.

Ref.	Measurement Instrumentation	Serial No.	Calibration Date
NV7	Svantek Type 958A Class 1 Sound & Vibration Level Meter	98394	01/05/2025
	Free-field microphone PCB 377B02	347071	
	Preamp PCB 426E01	82937	
	External windshield	-	-
NV9	Svantek Type 958A Class 1 Sound & Vibration Level Meter	98397	01/05/2025
	Free-field microphone PCB 377B02	347614	
	Preamp PCB 426E01	82999	
	External windshield	-	-
N25	NTI Audio XL2 Class 1 Sound Level Meter	A2A-21141-E0	22/07/2024
	Free-field microphone NTI Acoustics MC230A	A23583	
	Preamp NTI Acoustics MA220	10992	
	NTI Audio External Weatherproof Shroud	-	-
NTi Class 1 Sound Calibrator CR515		107395	01/04/2025

Table 212 Measurement instrumentation

3.0 ENVIRONMENTAL NOISE SURVEY RESULTS

3.1 Time Histories

The $L_{Aeq,5min}$, $L_{Amax,5min}$ and $L_{A90,5min}$ acoustic parameters were measured throughout the duration of the survey. Measured levels are shown as a time histories in Figures 31104.TH1-3.

3.2 Results

The measured ambient $L_{Aeq,T}$ noise levels, as shown in Table 3.1:

Ambient $L_{Aeq,T}$ Noise Levels (dBA)			
Time Period	Position 1	Position 2	Position 3
Daytime $L_{Aeq,16hour}$	59	50	52
Night-time $L_{Aeq,8hour}$	51	46	45

Table 3.1 Site average noise levels for daytime and night time

The measured typical background L_{A90} noise levels, as shown in Table 3.2:

Background L_{A90} Noise Levels (dBA)	
Time Period	Position 1
Daytime	52

Background LA ₉₀ Noise Levels (dBA)	
Time Period	Position 1
Night-time	30

Table 3.2 Site background noise levels for daytime and night time

Background (L_{A90,T}) measurements were derived from Position 1. This position was subject to all significant noise sources affecting the site and therefore provides the most representative indication of the prevailing background sound environment.

4.0 NOISE ASSESSMENT GUIDANCE

4.1 Local Authority Planning Conditions

Planning permission for the development (Ref. DM/22/2832) was granted by Mid Sussex District Council on 19 November 2024. The permission includes conditions relating to the control of environmental noise and the protection of residential amenity. The relevant conditions are summarised below.

Condition 6A – External Noise

“No development shall take place until a scheme for protecting the residential unit from noise generated by road traffic or other external sources, has been submitted to, and approved in writing by, the local planning authority. The scheme shall include an Acoustic Design Statement in line with the recommendations of ProPG: Planning and Noise 2017 and shall ensure that internal and external noise levels are in accordance with BS 8233:2014: Guidance on Sound Insulation and Noise Reduction for Buildings. Noise from individual external events typical to the area shall not exceed 45 dB LA_{max} when measured in bedrooms internally between 23:00 and 07:00 hours, post construction unless otherwise agreed in writing with the LPA. Where the internal noise levels will be exceeded by more than 5 dB with windows open, then the applicant shall submit details of an alternative means of ventilation with sufficient capacity to ensure the thermal comfort of the occupants with windows closed.

Noise levels in gardens and public open spaces shall not exceed 55 dB LA_{eq} 1 hour when measured at any period unless otherwise agreed in writing.

All works that form part of the scheme shall be completed before the noise sensitive development is occupied.”

Condition 6B – Air source heat pumps

“The air source heat pumps serving each property shall not come into use until a scheme has been submitted to the LPA demonstrating that the noise rating level (L_{Ar,Tr}) of each heat pump operating at the maximum setting shall be at least 5 dB below the background noise level

(LA90,T) at the nearest residential facade. All measurements shall be defined and derived in accordance with BS4142: 2014+A1:2019.”

These conditions form the basis for the acoustic assessment presented within this report, which addresses compliance with the planning requirements for both external and plant noise.

4.2 National Planning Policy Framework 2024 & Noise Policy Statement for England 2010

The National Planning Policy Framework (NPPF, 2024) replaces the former Planning Policy Guidance Note 24 (PPG24), which previously addressed noise and planning matters in England.

Paragraph 187 of the NPPF states that planning policies and decisions should contribute to the protection and enhancement of the natural and local environment by:

“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.”

Paragraph 198 further requires that:

“Planning policies and decisions should 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 wider area to impacts that could arise from the development.”

In doing so, planning authorities should:

- 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 quality of life; and
- Identify and protect tranquil areas which have remained relatively undisturbed by noise and are valued for their recreational and amenity qualities.

The Noise Policy Statement for England (NPSE), published by DEFRA in 2010, aims to:

“Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.”

The NPSE sets out three overarching aims to guide decision-making:

- Avoid significant adverse impacts on health and quality of life;
- Mitigate and minimise adverse impacts on health and quality of life; and
- Where possible, contribute to the improvement of health and quality of life.

To assist with interpretation, the NPSE introduces the following effect levels:

- **NOEL – No Observed Effect Level:** the level below which no effect can be detected; noise at this level has no impact on health or quality of life.
- **LOAEL – Lowest Observed Adverse Effect Level:** the level above which adverse effects on health and quality of life can be detected.
- **SOAEL – Significant Observed Adverse Effect Level:** the level above which significant adverse effects on health and quality of life occur.

The NPSE acknowledges that there is no single objective measure of SOAEL applicable to all noise sources and situations. Accordingly, no specific numerical criteria are prescribed, allowing flexibility in interpretation based on the context of each assessment.

4.3 Planning Practice Guidance – Noise (PPG-N)

Planning Practice Guidance – Noise (PPG) was introduced by the Ministry of Housing, Communities & Local Government in March 2014 and revised in July 2019. It is an online digital resource that *“advises on how planning can manage potential noise impacts in new development”*. It gives guidance on establishing whether noise will likely cause a concern, factors of influence on noise impact and methods by which planning can address adverse effects of noise sources.

A noise exposure hierarchy table is provided within the guidance that follows the same observed effect descriptors given within the NPSE guidance, i.e. NOEL, NOAEL and LOAEL and SOAEL.

For a NOAEL descriptor:

“A noise has no adverse effect so long as the exposure does not cause any change in behaviour, attitude or other physiological responses of those affected by it. The noise may slightly affect the acoustic character of an area but not to the extent there is a change in quality of life”

4.4 ProPG: Planning and Noise

As outlined above, the National Planning Policy Framework encourages improved standards of design, although it provides no specific noise levels which should be achieved on site for

varying standards of acoustic acceptability, or a prescriptive method for the assessment of noise.

ProPG: Planning and Noise was published in May 2017 in order to encourage better acoustic design for new residential schemes in order to protect future residents from the harmful effects of noise. This guidance can be seen as the missing link between the current NPPF and its predecessor, PPG24 (Planning Policy Guidance 24: Planning and Noise), which provided a prescriptive method for assessing sites for residential development, but without the nuance of ‘good acoustic design’ as outlined in ProPG.

ProPG allows the assessor to take a holistic approach to consider the site’s suitability, taking into consideration numerous design factors which previously may not have been considered alongside the noise level measured on site, for example the orientation of the building in relation to the main source of noise incident upon it.

It should be noted this document is not an official government code of practice, and neither replaces nor provides an authoritative interpretation of the law or government policy and therefore should be seen as a good practice document only.

4.5 British Standard BS 8233:2014

BS 8233:2014 ‘*Sound insulation and noise reduction for buildings*’ describes recommended internal noise levels for residential spaces. These levels are shown in Table 4.1.

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living Rooms	35dBA	-
Dining	Dining Room/area	40dBA	-
Sleeping (daytime resting)	Bedrooms	35dBA	30dBA

Table 4.1 BS8233 recommended internal background noise levels

It should be noted that the recommended internal noise levels outlined above are not applicable under “purge ventilation” conditions as defined by Approved Document F of the Building Regulations, as this should only occur occasionally (e.g. to remove odour from painting or burnt food). However, the levels above should be achieved whilst providing sufficient background ventilation, either via passive or mechanical methods.

The external building fabric would need to be carefully designed to achieve these recommended internal levels.

In addition to guidance on internal levels, BS8233:2014 also states the following with regards to noise within external amenity spaces:

“For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB LAeq,T, with an upper guideline value of 55 dB LAeq,T, which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited.”

As outlined above, the resulting noise levels in external amenity areas should not be a reason for refusal, providing that the noise levels are designed to be as low as practically possible within external amenity areas.

4.6 WHO Guidelines for Community Noise (1999) & Night Noise Guidelines for Europe (2009)

WHO Guidelines for Community Noise (1999) recommend that internal noise levels for individual events should not exceed 45dB L_{Amax} more than 10-15 times per night.

WHO Night Noise Guidelines for Europe (2009) presents guidelines for noise levels outside dwellings and discusses the relationship between these and the criteria for internal noise presented in Guidelines for Community Noise. The document states that the two should be considered complimentary and that the 1999 guidelines should be considered valid to achieve the 2009 guidelines.

4.7 Approved Document O

Approved Document O (ADO) supports Part O of the Building Regulations and sets requirements to limit overheating in new residential buildings.

Requirement O1 requires limiting solar gains and providing adequate heat removal while ensuring occupant safety and comfort. Mechanical cooling may only be used where natural ventilation is insufficient.

ADO applies to new dwellings, care homes, student accommodation and similar residential uses. Paragraphs 3.2–3.3 relate specifically to bedrooms at night (23:00–07:00). Windows are assumed closed if internal noise exceeds:

- 40 dB L_{Aeq,8h}
- 55 dB L_{AFmax} more than 10 times per night.

If these limits are exceeded with open windows, alternative ventilation or cooling methods (e.g. louvres, mechanical systems) must be used, as advised by an overheating specialist.

5.0 EXTERNAL BUILDING FABRIC SPECIFICATION (CONDITION 6A)

Sound reduction calculations have been undertaken to determine the minimum performance required from glazed and non-glazed façade elements to achieve the internal noise levels set out in Table 4.1, based on the measured external noise environment.

Calculations are based on a typical worst-case room configuration of 3 m (length) × 3 m (width) × 2.5 m (height) with a 6 m² window area. These values will be refined once detailed design proposals are finalised.

Please note that the glazed and non-glazed element calculations would need to be finalised once all design proposals are finalised.

5.1 Non-Glazed Elements

The non-glazed façade elements are expected to comprise the constructions outlined in Table 5.1. The associated sound reduction indices have been calculated in accordance with the *BS EN ISO 10140* series and represent the minimum performance required for compliance.

Element	Sound Reduction Index, dB, at Octave Band Centre Frequency, Hz					
	125	250	500	1k	2k	4k
Brickwork Cavity Wall	41	43	48	50	55	55

Table 5.1 Assumed sound reduction performance for non-glazed elements

5.2 Glazed Elements

Minimum octave band sound reduction index (SRI) values for all glazed elements are summarised in Table 5.2. These values apply to the complete window unit, including frame and seals. Calculations were based on measured daytime and night-time noise levels.

The table below should be read in conjunction with the *Figure 31104.SP1* enclosed within the Appendix.

Zone	Sound Reduction Index, dB, at Octave Band Centre Frequency, Hz						R _w (C;C _{tr}), dB	Example glazing type
	125	250	500	1k	2k	4k		
Zones 1-3	24	20	25	35	38	35	31(-1;-4)	4/12/4mm

Zone	Sound Reduction Index, dB, at Octave Band Centre Frequency, Hz						R _w (C;C _{tr}), dB	Example glazing type
	125	250	500	1k	2k	4k		
Zone 4	26	27	34	40	38	46	37(-1;-4)	10/12/6mm

Table 5.2 Required glazing performance

Example glazing types are indicative only. The glazing supplier must confirm that the proposed system meets the octave band attenuation values in Table 5.2. All major building elements should be tested in accordance with the *BS EN ISO 10140* series, with performance verified through independent testing at a UKAS-accredited laboratory for the final configuration.

6.0 VENTILATION AND OVERHEATING RELIEF (CONDITION 6A)

6.1 Ventilation Strategy

Approved Document F 2021 describes the following system types for background and extract ventilation:

Ventilation System Type	Whole Dwelling Ventilation	Extract Ventilation
Natural Ventilation	Trickle ventilators	Intermittent extract fans
Continuous Mechanical Extract Ventilation (MEV)	Continuous mechanical extract (low rate) and trickle vents for supply	Continuous mechanical extract (high rate) with trickle vents providing inlet air
Mechanical Ventilation with Heat Recovery (MVHR)	Continuous mechanical supply and extract (low rate)	Continuous mechanical supply and extract (high rate)

Table 6.1 Ventilation system types as described in ADF 2021

Based on the results of the noise survey, the suitability of each system type and the required trickle ventilator performance (where appropriate) is shown in Table 6.2 below. The ventilation acceptability zones referenced in the table correspond with the Natural Ventilation Plan (*Figure 31104.SP1*) enclosed in the Appendix. These should be read together for full context.

Zone	ADF Ventilation System Type Suitable?			Minimum Trickle Ventilator Performance (dB D _{n,e,w})
	Natural Vent (Trickle Ventilators)	MEV (Mechanical Extract)	MVHR (Mechanical Supply & Extract)	
Zone 1	Yes	Yes	Yes	42
Zone 2	Yes	Yes	Yes	23
Zone 3	Yes	Yes	Yes	23
Zone 4	Yes	Yes	Yes	42

Table 6.2 Suitability and required performance of ventilation systems

For this assessment, it has been assumed that one trickle ventilator is installed in each of the assessed rooms. Since trickle vents are an acoustic weak point in the façade, increasing their number will reduce the overall composite sound insulation performance. Therefore, the total number and location of trickle vents for each noise-sensitive room should be confirmed to ensure that the façade performance calculations are accurately revised if necessary.

Where mechanical ventilation systems are proposed, they should be designed to ensure that the combined internal noise from both external sources and the ventilation system itself does not exceed the BS 8233:2014 internal noise criteria outlined in Table 4.1.

In all cases, purge ventilation will be provided by openable windows. As noted in Section 4.5, the internal noise level criteria do not apply during purge conditions, as this mode of ventilation is used only occasionally (e.g., to remove odours or excess heat).

6.2 Openable Windows for Overheating Relief

Approved Document O (ADO) applies to bedrooms during the night-time period (23:00–07:00). The guidance within this section therefore relates specifically to bedrooms to ensure that the internal night-time noise targets of 40dB L_{Aeq,8hr} and 55dB L_{AFmax} (no more than ten exceedances per night) are not exceeded.

Specification of Suitable Open Area

To achieve these internal noise limits, the open area of the window must be restricted to provide adequate sound attenuation from outside to inside. Table 6.3 presents the maximum openable window area (expressed as a percentage of bedroom floor area) that would be permissible while maintaining compliance with ADO's internal night-time noise criteria.

Zone	Maximum Open Area of the Window as a Percentage of the Floor Area to Achieve ADO Target Internal Noise Levels
Zone 1	1 %
Zone 2	7 %
Zone 3	8 %
Zone 4	0 %

Table 6.3 Window open areas

Overheating Design Implications

The overheating model should inform whether the openable area limits set out above are sufficient to remove excess heat during night-time hours. If they are insufficient, the following should be explored:

- Alternative methods to reduce solar gain (e.g. shading, glazing treatment), as per Section 2.7 of ADO; and
- Alternative means of heat removal (e.g. passive stack, mechanical ventilation, etc.), as per Section 2.10 of ADO.

In Zone 4, where the required acoustic free area is determined to be 0%, this does not imply that overheating relief via natural ventilation is impossible. The ADO methodology assumes a conservative noise ingress rate through an open window; performance may be improved through the use of acoustically optimised window designs, acoustic louvres, or other passive ventilation strategies.

Further Design Coordination

Where mitigation of overheating is required, this must be led by a specialist M&E, overheating or energy consultant. KP Acoustics Ltd would be happy to provide further input on the acoustic implications of any proposed strategies, which may require a more detailed façade-specific assessment and/or coordination with MEP and sustainability team.

7.0 EXTERNAL AMENITY AREA ASSESSMENT (CONDITION 6A)

External amenity areas (e.g., rear gardens) are proposed for all units. These areas will be screened from surrounding noise sources by garden fencing. Daytime noise levels should ideally comply with the requirements of British Standard BS8233:2014 (as outlined in Section 4.5 of this report).

Environmental noise levels of the existing site (without any new buildings or fencing) have been measured/derived and compared to the relevant criteria and mitigation measures where necessary:

Ambient $L_{Aeq,T}$ Noise Levels (dBA)				
Time Period	Zone 1	Zone 2	Zone 3	Zone 4
Daytime $L_{Aeq,16hour}$	60	50	52	64
BS8233:2014 Criteria	≤ 55	≤ 55	≤ 55	≤ 55
Compliant?	X	✓	✓	X
Proposed Mitigation	Required	None required	None required	Required

Table 7.1 Site average noise levels for daytime and night time

Gardens in Zone 1 and Zone 4 may exceed the required noise levels if mitigation measures are not considered. Gardens in Zones 2 and 3 meet the BS8233:2014 target guidance, so no specific mitigation measures are required.

For Zones 1 and 4, the following mitigation measures are available:

- Garden fencing should be installed to a minimum height of 2.5 meters. The fencing should be imperforate and have a minimum surface density of 15kg/m². This would attenuate noise by 10dB near the fence (where the road is more effectively screened) and up to 5dB at the building facade (where the road is less effectively screened).
- Gardens could be re-orientated so that the dwelling is placed between the garden and the road. This would allow the building to act as a screen, providing attenuation from 10-25dB depending on the location within the garden.

BS8233:2014 guidance states:

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

8.0 PLANT NOISE ASSESSMENT (CONDITION 6B)

8.1 Plant Noise Criteria

In order to achieve the requirements of Planning Condition 6B, plant noise emissions criteria has been set to be 5dB below the measured background noise level at the nearest noise sensitive receiver (NSR), as below:

Period	Maximum Plant Noise Level at Nearest NSR (dBA)
Daytime (0700-2300)	47
Night-time (2300-0700)	25

Table 8.1 Plant noise criteria

Plant Proposals

It is proposed that each plot will be served by an individual air source heat pump (ASHP). The Vaillant VWL series has been identified as the preferred system type. The corresponding sound power levels, dependent on the specific model selected, are as follows:

- VWL 35/6 A 230V S2 (55 °C) – 54 dB L_w
- VWL 65/6 A 230V S2 (55 °C) – 55 dB L_w
- VWL 105/6 A 230V S2 (55 °C) – 60 dB L_w
- VWL 105/6 A S2 (55 °C) – 51 dB L_w

The proposed plant layout is presented in *Appendix B Site Layout*. ASHPs are expected to operate on a 24-hour basis in line with occupant demands.

8.2 Nearest Noise Sensitive Receivers

As the ASHP units are located within private rear gardens, the most relevant noise-sensitive receptors are the façades of the new residential dwellings adjoining each plot. The cumulative contribution from multiple units operating simultaneously has been assessed to ensure that the overall noise exposure remains within acceptable limits when all plant is running. The most exposed and therefore most onerous noise-sensitive receivers (NSRs 1–6) have been identified for assessment, as shown in *Appendix B Site Layout*.

8.3 Mitigation Measures

To ensure compliance with the Local Authority's noise criteria and to prevent adverse impacts on neighbouring dwellings, the following mitigation measures are to be implemented:

Air Source Heat Pumps

All ASHP units are to be limited to a maximum sound power level of 51 dB L_w. This could be achievable with the Vaillant VWL 105/6 A S2 (55 °C) unit.

This may be achieved either by selecting models with a manufacturer-rated level not exceeding 51 dB L_w, or by incorporating attenuation measures such as proprietary acoustic enclosures or barrier shielding. The manufacturer must confirm that the selected equipment achieves the stated performance rating under normal operating conditions.

Garden Fencing

All boundary fencing should be completely imperforate and constructed to a minimum surface density of 15 kg/m².

A minimum height of 2.5m is required for garden fencing along the northern and eastern site boundaries, while a minimum height of 2.25 m should be provided for all other plots. The exact locations are indicated in *Appendix C Plant Noise Mitigation Measures*.

Absorptive Treatment

To further reduce reflected sound energy within enclosed garden areas, Class B (minimum) absorptive panels should be installed immediately behind the ASHP units, as shown in *Appendix C Plant Noise Mitigation Measures*.

8.4 Calculations

Noise propagation from the proposed air source heat pumps (ASHPs) was modelled to determine the cumulative impact at the nearest noise-sensitive receiver windows (NSRs 1–6). Calculations were undertaken in accordance with the methodology set out in BS 4142:2014 + A1:2019. The modelling accounted for the proposed site layout, barrier screening from boundary fencing, and the relative distances and orientations between ASHP units and neighbouring façades.

All of the mitigation measures described in Section 8.4—including limiting ASHP source levels to 51 dB L_w, installation of imperforate garden fencing with a minimum surface density of 15kg/m², and the inclusion of absorptive panels (minimum Class B)—have been incorporated within the calculations to represent the final design condition.

Each ASHP was assumed to operate simultaneously under continuous full-load conditions, representing a conservative worst-case scenario. Directivity corrections were applied to reflect ground-mounted operation adjacent to reflective façades, with barrier and distance attenuation modelled geometrically.

Figures 8.1 and 8.2 present the predicted external noise contour maps for the proposed ASHP locations. The results show that, with the proposed mitigation in place, the maximum predicted noise level at any residential window is 25 dB $L_{Aeq,T}$, which satisfies the adopted plant noise criteria.

Accordingly, the assessment demonstrates that the cumulative noise emissions from all proposed ASHPs will comply with the requirements of Planning Condition 6B. The proposed mitigation strategy is therefore considered robust and effective in achieving compliance with the relevant planning and acoustic design objectives.

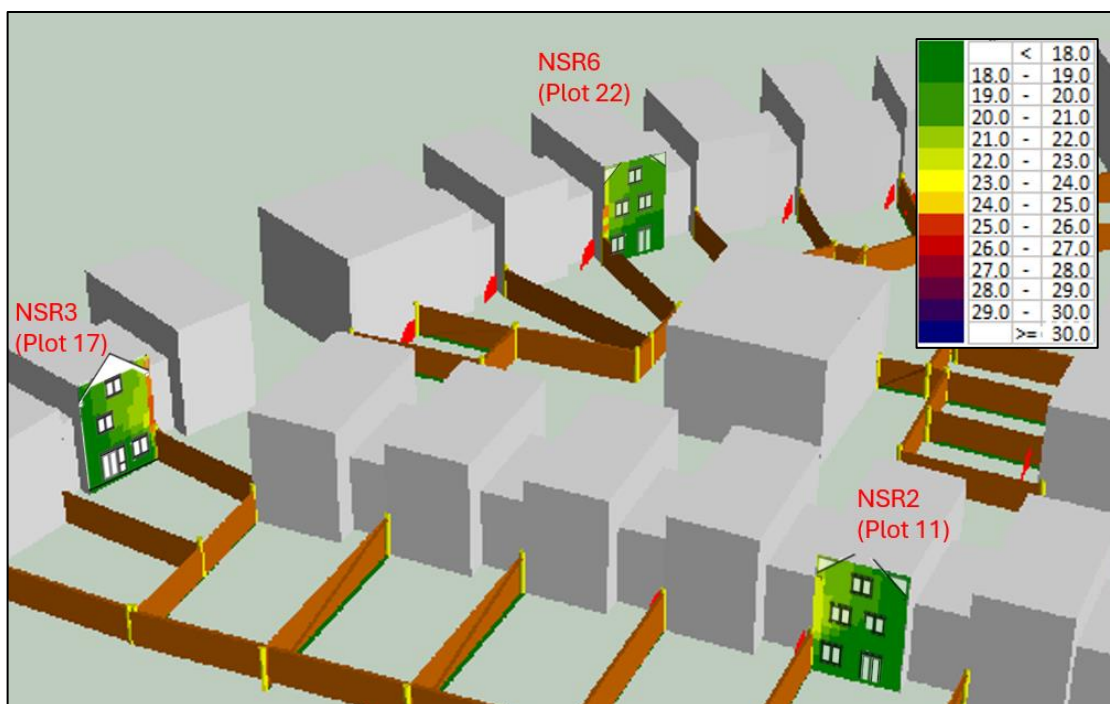


Figure 8.1 Plant noise levels at NSR2, NSR3 and NSR6

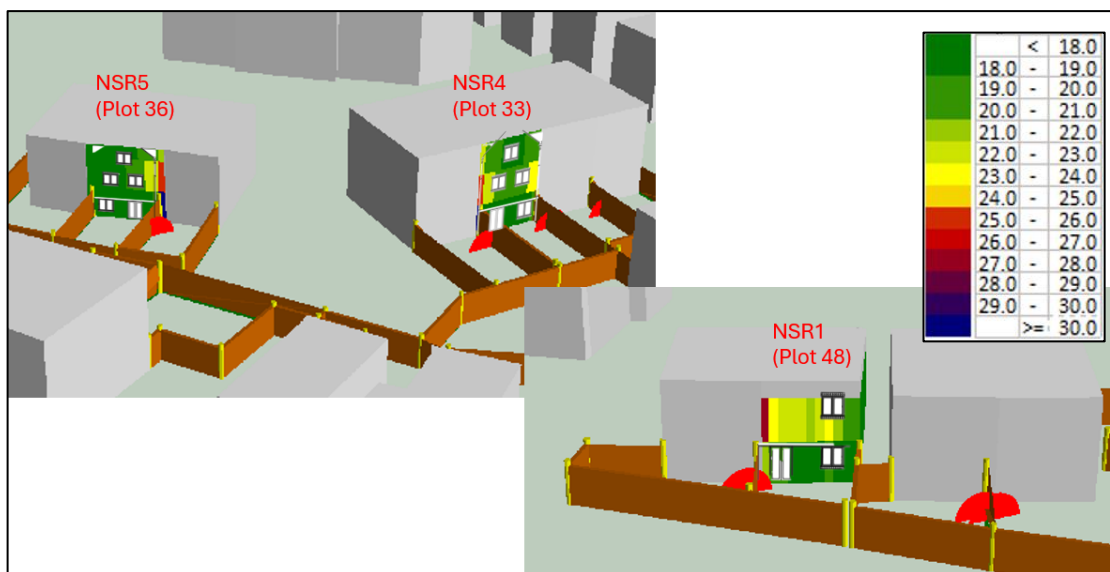


Figure 8.2 Plant noise levels at NSR1, NSR4 and NSR5

9.0 CONCLUSION

Baseline noise across the site is primarily influenced by road traffic on the A22. The proposed glazing and ventilation strategy ensures that internal noise levels within all habitable rooms meet the BS 8233:2014 criteria, satisfying Planning Condition 6A for internal noise.

External amenity areas in Zones 2 and 3 achieve the BS 8233 guidance without additional measures, while Zones 1 and 4 meet the criteria through the installation of imperforate fencing to the specified height and density. This represents the lowest practicable external noise level achievable and ensures compliance with Condition 6A.

The air source heat pump assessment demonstrates that, with the proposed mitigation—source levels limited to 51 dB L_w, acoustic fencing, and absorptive panels—the maximum predicted level at any residential window is 25dB L_{Aeq,T}. Cumulative emissions therefore meet the requirement of Condition 6B, maintaining noise levels at least 5dB below background at the nearest residential window.

Overall, the proposed development is acoustically suitable for residential use, and the design achieves compliance with both Planning Conditions 6A and 6B.

Wealden House, Lewes Road, Ashurst Wood, West Sussex - Position 1
Environmental Time History
28/10/2025 to 29/10/2025

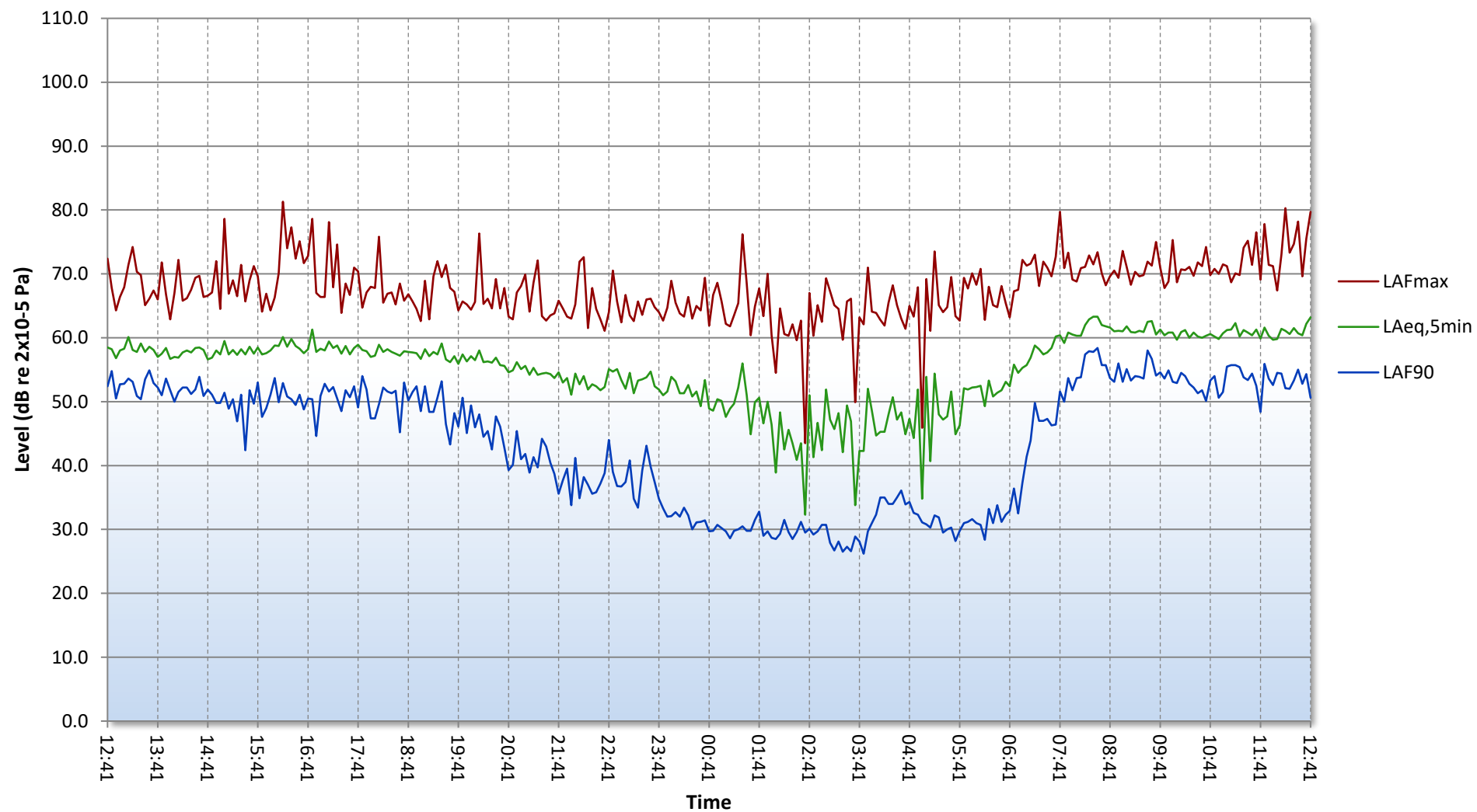


Figure 31104.TH1

Wealden House, Lewes Road, Ashurst Wood, West Sussex - Position 1
Representative Daytime Background Noise Level
28/10/2025 to 29/10/2025

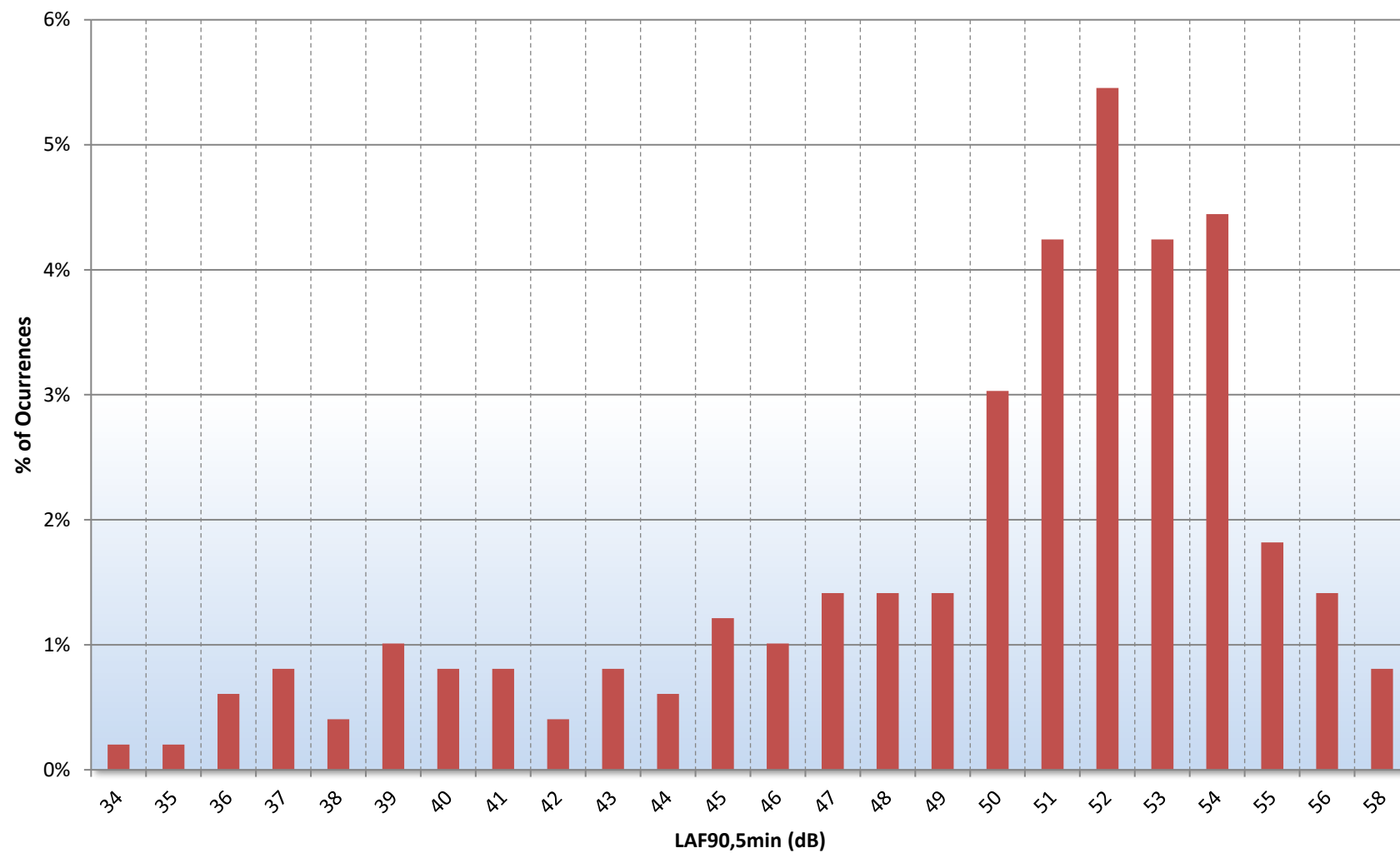


Figure 31104.Daytime L90.TH1

Wealden House, Lewes Road, Ashurst Wood, West Sussex - Position 1
Representative Night-time Background Noise Level
28/10/2025 to 29/10/2025

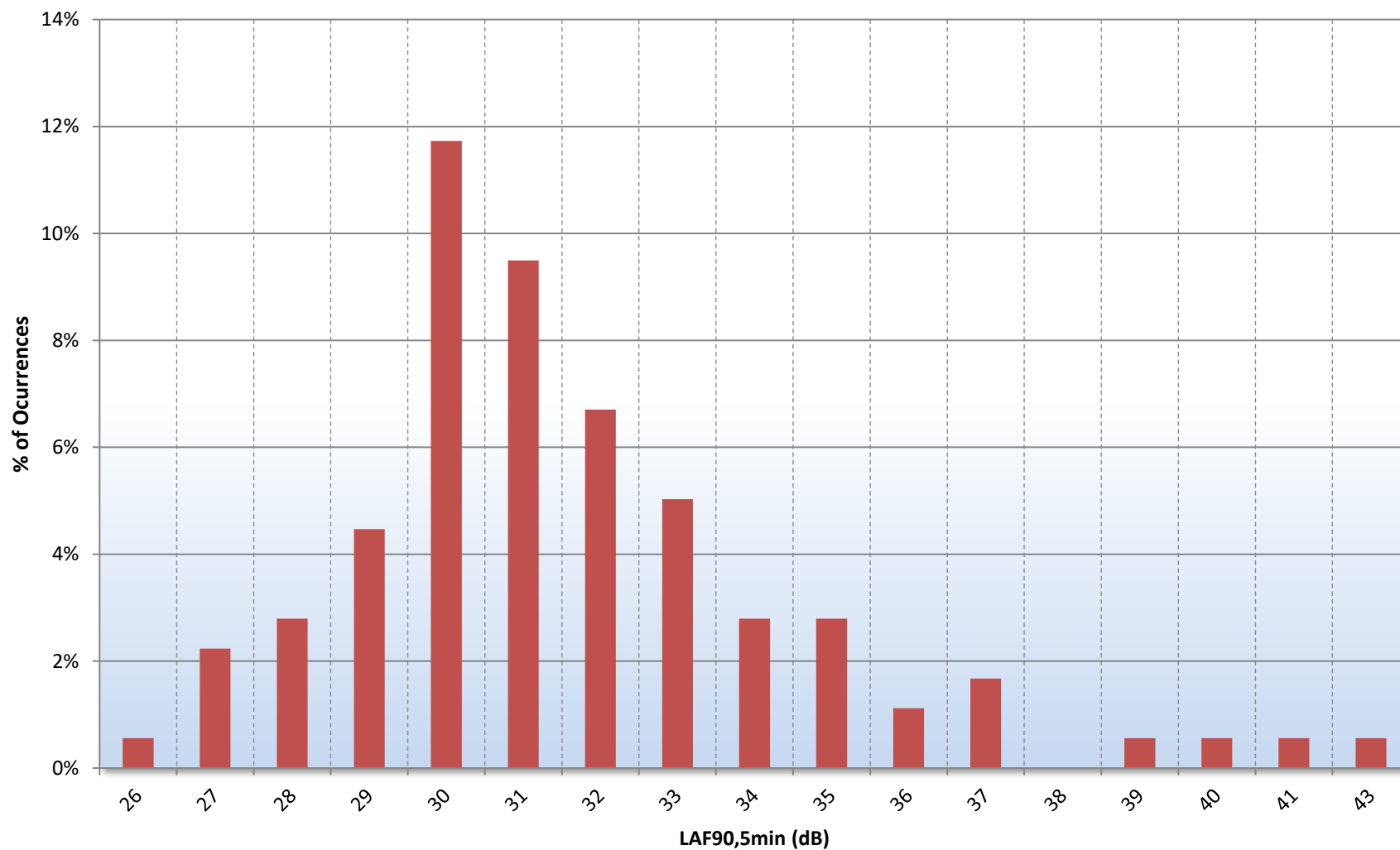


Figure 31104.Night-time L90.TH1

Wealden House, Lewes Road, Ashurst Wood, West Sussex - Position 2
Environmental Time History
28/10/2025 to 29/10/2025

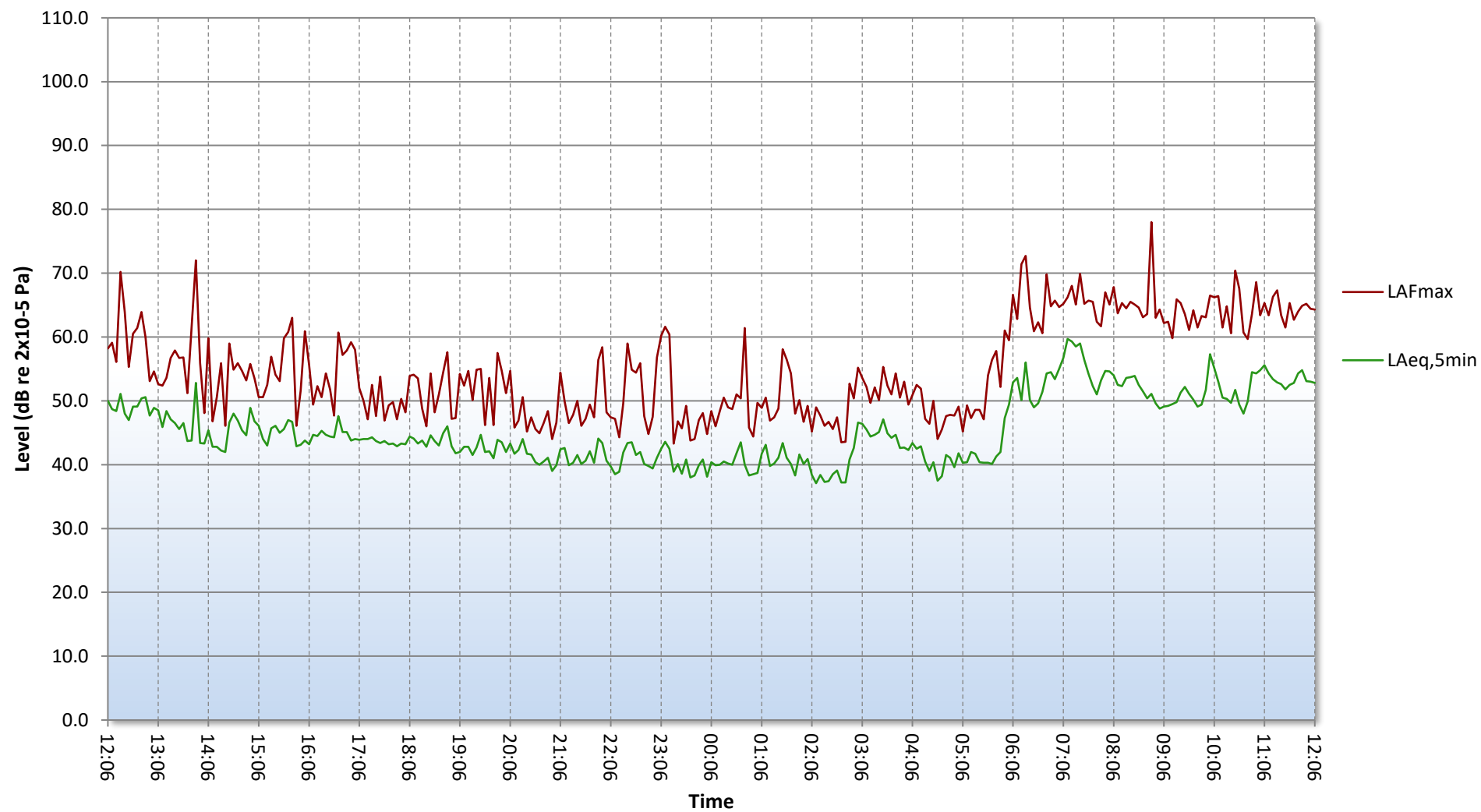


Figure 31104.TH2

Wealden House, Lewes Road, Ashurst Wood, West Sussex - Position 3
Environmental Time History
28/10/2025 to 29/10/2025

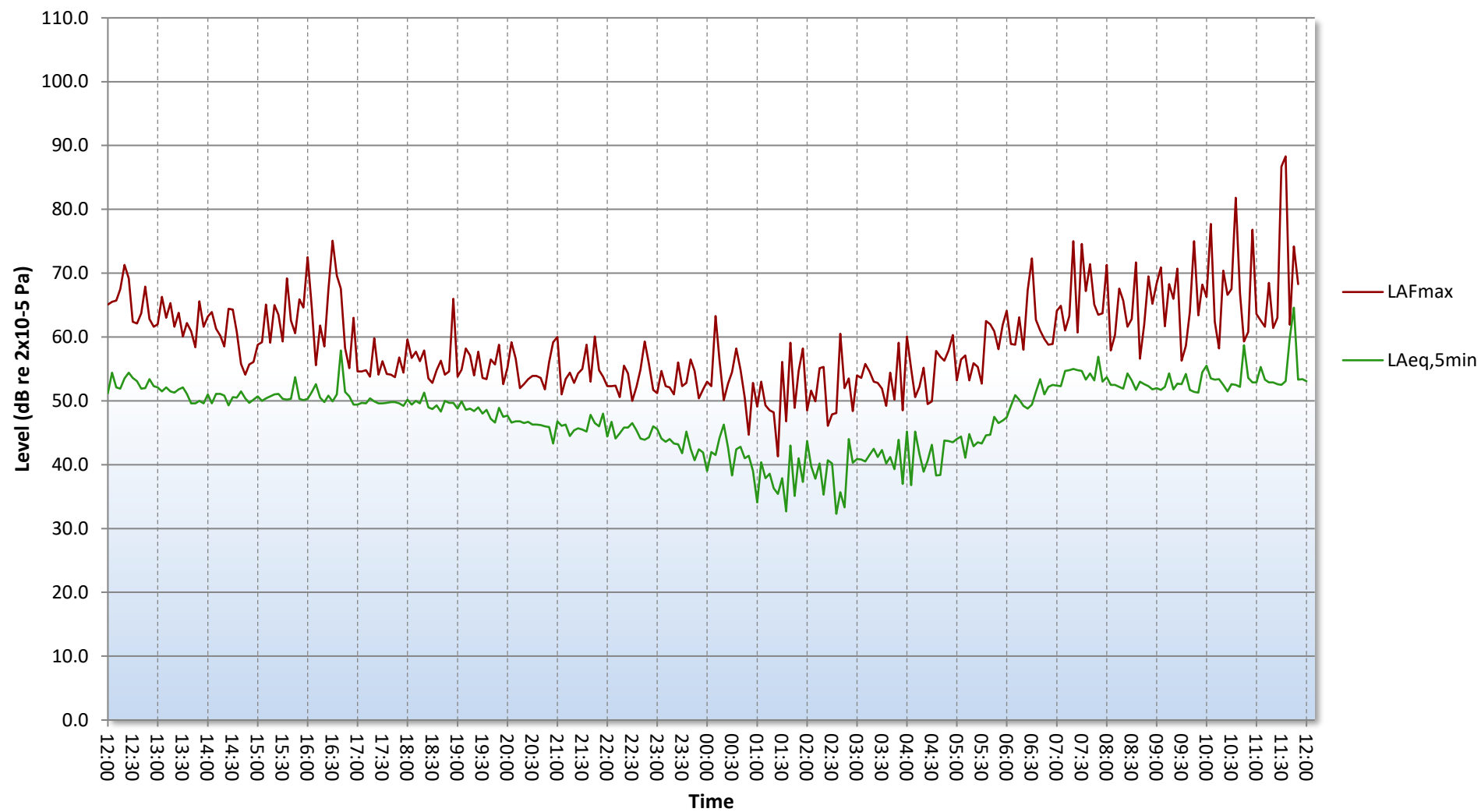
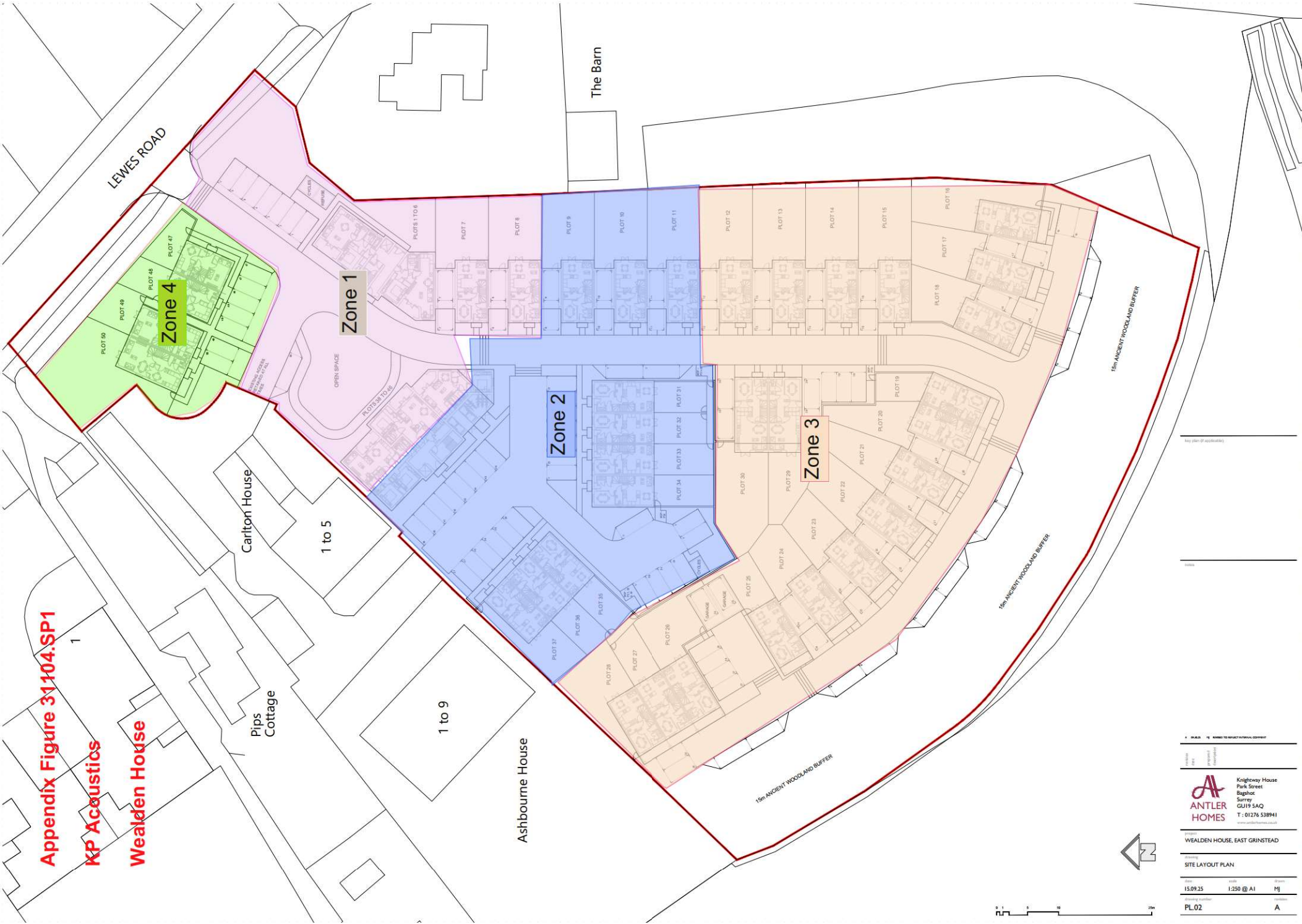


Figure 31104.TH3

Appendix Figure 31104.SP1

KP Acoustics

Wealden House



GENERAL ACOUSTIC TERMINOLOGY

Decibel scale - dB

In practice, when sound intensity or sound pressure is measured, a logarithmic scale is used in which the unit is the 'decibel', dB. This is derived from the human auditory system, where the dynamic range of human hearing is so large, in the order of 10^{13} units, that only a logarithmic scale is the sensible solution for displaying such a range.

Decibel scale, 'A' weighted - dB(A)

The human ear is less sensitive at frequency extremes, below 125Hz and above 16Khz. A sound level meter models the ears variable sensitivity to sound at different frequencies. This is achieved by building a filter into the Sound Level Meter with a similar frequency response to that of the ear, an A-weighted filter where the unit is dB(A).

L_{eq}

The sound from noise sources often fluctuates widely during a given period of time. An average value can be measured, the equivalent sound pressure level L_{eq} . The L_{eq} is the equivalent sound level which would deliver the same sound energy as the actual fluctuating sound measured in the same time period.

L_{10}

This is the level exceeded for no more than 10% of the time. This parameter is often used as a "not to exceed" criterion for noise.

L_{90}

This is the level exceeded for no more than 90% of the time. This parameter is often used as a descriptor of "background noise" for environmental impact studies.

L_{max}

This is the maximum sound pressure level that has been measured over a period.

Octave Bands

In order to completely determine the composition of a sound it is necessary to determine the sound level at each frequency individually. Usually, values are stated in octave bands. The audible frequency region is divided into 11 such octave bands whose centre frequencies are defined in accordance with international standards. These centre frequencies are: 16, 31.5, 63, 125, 250, 500, 1000, 2000, 4000, 8000 and 16000 Hertz.

Environmental noise terms are defined in BS7445, *Description and Measurement of Environmental Noise*.

APPLIED ACOUSTIC TERMINOLOGY

Addition of noise from several sources

Noise from different sound sources combines to produce a sound level higher than that from any individual source. Two equally intense sound sources operating together produce a sound level which is 3dB higher than a single source and 4 sources produce a 6dB higher sound level.

Attenuation by distance

Sound which propagates from a point source in free air attenuates by 6dB for each doubling of distance from the noise source. Sound energy from line sources (e.g. stream of cars) drops off by 3dB for each doubling of distance.

Subjective impression of noise

Hearing perception is highly individualised. Sensitivity to noise also depends on frequency content, time of occurrence, duration of sound and psychological factors such as emotion and expectations. The following table is a guide to explain increases or decreases in sound levels for many scenarios.

Change in sound level (dB)	Change in perceived loudness
1	Imperceptible
3	Just barely perceptible
6	Clearly noticeable
10	About twice as loud

Transmission path(s)

The transmission path is the path the sound takes from the source to the receiver. Where multiple paths exist in parallel, the reduction in each path should be calculated and summed at the receiving point. Outdoor barriers can block transmission paths, for example traffic noise. The effectiveness of barriers is dependent on factors such as its distance from the noise source and the receiver, its height and construction.

Ground-borne vibration

In addition to airborne noise levels caused by transportation, construction, and industrial sources there is also the generation of ground-borne vibration to consider. This can lead to structure-borne noise, perceptible vibration, or in rare cases, building damage.

Sound insulation - Absorption within porous materials

Upon encountering a porous material, sound energy is absorbed. Porous materials which are intended to absorb sound are known as absorbents, and usually absorb 50 to 90% of the energy and are frequency dependent. Some are designed to absorb low frequencies, some for high frequencies and more exotic designs being able to absorb very wide ranges of frequencies. The energy is converted into both mechanical movement and heat within the material; both the stiffness and mass of panels affect the sound insulation performance.

KPA APPENDIX B
Site Layout Plan
31104.NIA.01



key plan (F01a1-b1b)

Notes

A. 01/23 19. REVISION TO REFLECT INTERNAL COPYRIGHT

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project
WEALDEN HOUSE, EAST GRINSTEAD

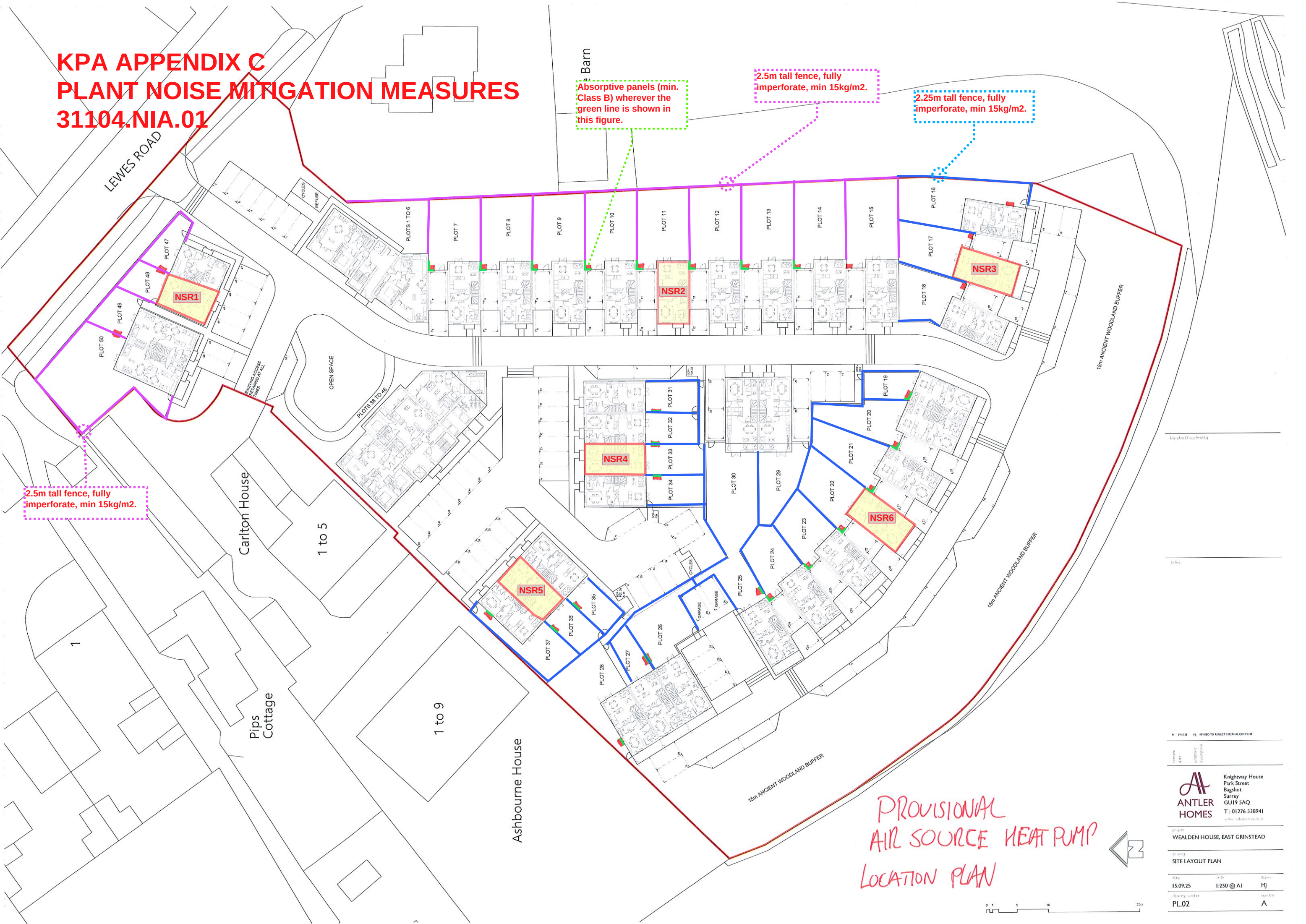
drawing
SITE LAYOUT PLAN

date 15.09.25	scale 1:250 @ A1	drawn MJ
drawing number PL.02	sheet A	

PROVISIONAL
AIR SOURCE HEAT PUMP
LOCATION PLAN



KPA APPENDIX C PLANT NOISE MITIGATION MEASURES 31104.NIA.01



key plan (F01a1-01b)

Notes

A. 01/23 19. REVISION TO REFLECT INTERNAL COMMENTS

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project
WEALDEN HOUSE, EAST GRINSTEAD

drawing
SITE LAYOUT PLAN

date
15.09.25

drawing number
PL.02

scale
1:250 @ A1

author
MJ

checked
A

PROVISIONAL
AIR SOURCE HEAT PUMP
LOCATION PLAN

ANTI-VIBRATION MOUNTING REFERENCE DOCUMENT

1.0 GENERAL

- 1.1.1 All mountings must provide suitable static deflection when under the equipment weight. Mounting selection should allow for any eccentric load distribution or torque reaction so that the design deflection is achieved on all mountings under operating conditions.
- 1.1.2 A positioning or restraining device should be provided where required, to prevent the equipment position changing if its load changes (e.g. during maintenance). The device shall consist of a stud passing through an oversize hole with a nut and locknut providing restraint, with a fibre or neoprene washer fitted between nut and restraining member leaving a clearance of at least 3mm.
- 1.1.3 It is the supplier's responsibility to ensure that all mountings offered are suitable for the loads, operating and environmental conditions which will prevail. Particular attention should be paid to mountings which will be exposed to atmospheric conditions to prevent corrosion.
- 1.1.4 All mountings shall be colour coded, or otherwise marked, to indicate their load capacity, to facilitate identification during installation.
- 1.1.5 Where use of resilient supports allows omission of pipe flexible connections for vibration/noise isolation, it shall be the Mechanical Services Consultant's or Contractor's responsibility to decide whether such devices are required to compensate for misalignment or thermal strain.

2.0 MOUNTINGS

2.1 Caged Spring Type

- 2.1.1 Each mounting shall consist of cast or fabricated telescopic top and bottom housings enclosing one or more helical steel springs as the principal isolation elements and shall incorporate a built-in levelling device. The housing should be designed to permit visual inspection of the springs after installation, i.e. the spring must not be totally enclosed.
- 2.1.2 The springs shall have an outside diameter of not less than 75% of the operating height and be selected to have at least 50% overload capacity before becoming coil-bound.
- 2.1.3 The bottom plate of each mounting shall have bonded to it a rubber/neoprene pad designed to attenuate any high frequency energy transmitted by the springs.
- 2.1.4 Mountings incorporating snubbers or restraining devices shall be designed so that the snubbing, damping, or restraining mechanism is capable of being adjusted to have no significant effect during the normal running of the isolated machine.
- 2.1.5 All nuts, bolts or other elements used for adjustment of a mounting shall incorporate locking mechanisms to prevent the isolator going out of adjustment due to vibration or accidental or unauthorised tampering.

2.2 Open Spring Type

- 2.2.1 Each mounting shall consist of one or more helical steel springs as the principal isolation elements and shall incorporate a built-in levelling device.
- 2.2.2 The springs shall be fixed or otherwise securely located to cast or fabricated top and bottom plates, shall have an outside diameter of not less than 75% of the operating height, and shall be selected to have at least 50% overload capacity before becoming coil-bound.
- 2.2.3 The bottom plate shall have bonded to it a rubber/ neoprene pad designed to attenuate any high frequency energy transmitted by the springs.

2.3 Rubber/Neoprene Type

- 2.3.1 Each mounting shall consist of a steel top plate and base plate completely embedded in oil resistant rubber/neoprene. Each mounting shall be capable of being fitted with a levelling device and should have bolt holes in the base plate and a threaded metal insert in the top plate so that they can be bolted to the floor and equipment where required.

2.4 Hangers

- 2.4.1 Hangers shall incorporate a helical steel spring or neoprene in shear element, as required, located securely in a steel cage. The clearance hold at the bottom of the cage should allow lateral movement of the lower anger rod of at least 15 degrees included angle.
- 2.4.2 If hangers incorporate a positions device, this should include a locking mechanism to prevent the hanger going out of adjustment either due to vibration or tampering.

3.0 PLANT BASES

3.1 A.V. Rails

- 3.1.1 An A.V. Rail shall comprise a steel beam with two or more height-saving brackets. The steel sections must be sufficiently rigid to prevent undue strain in the equipment and if necessary, should be checked by the Structural Engineer.

3.2 Steel Plant Bases

- 3.2.1 Steel plant bases shall comprise an all-welded steel framework of sufficient rigidity to provide adequate support for the equipment and be fitted with isolator height saving brackets. The frame depth shall be approximately $1/10^{\text{th}}$ of the longest dimension of the equipment with a minimum of 150 mm. This form of base may be used as a composite A.V. rail system.

3.3 Concrete Inertia Base (for use with steel springs)

- 3.3.1 These shall consist of an all-welded steel pouring framework with height saving brackets, and a frame depth of approximately $1/12^{\text{th}}$ of the longest dimension of the equipment, with a minimum of 100 mm. The bottom of the pouring frame should be blanked off, and concrete (2300 kg/m^3) poured in over steel reinforcing rods positioned 35 mm above the bottom. The inertia base should be sufficiently large to provide support for all parts of the equipment, including any components which over-hang the equipment base, such as suction and discharge elbows on centrifugal pumps.
- 3.3.2 A typical rule of thumb is that the ratio of mass of the base to mass of the supported equipment should be 1.5 : 1.0 for most conventional equipment, including pumps. However, this could rise to 5.0 : 1.0 for equipment with large lateral out-of-balance forces.

3.4 Concrete Split Plinth Bases

- 3.4.1 These should comprise a concrete inertia base of sufficient size to permit support for all parts of the equipment, including any components which overhang the equipment base, such as suction and discharge elbows on centrifugal pumps. The inertia base should be cast onto a permanent bottom shuttering and supported on the specified neoprene mounts or pads, the whole resting on a plinth as required. It should be noted that the construction of concrete bases on cork, expanded polystyrene or mineral wool slabs is not normally permitted. Where neoprene pads are used, small areas of pad must be equally spaced to provide the correct deflection. The supplier should advise the correct number, dimensions and locations of such pads.