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GREENHAYES PLANNING

THE LAWNS, ASHINGDON, HORSHAM

NOISE IMPACT ASSESSMENT

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THE LAWNS, ASHINGTON, HORSHAM NOISE IMPACT ASSESSMENT

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1 INTRODUCTION

RF Environmental Ltd (RFE) was commissioned by GreenHayes Planning in January 2026 to prepare an acoustic report to support a planning application to Horsham District Council. The application relates to the construction of 2no. detached residential properties at the land to rear of The Lawns, Ashington, Horsham, RH20 3JR.

A noise impact assessment has been carried out to determine the likely noise exposure from road traffic at the proposed dwellings and provide guidance on appropriate façade elements to ensure that desirable internal noise levels can be achieved. The report also presents a noise assessment of external amenity areas, based on the measured levels on site.

The existing site and proposed development are described in the following section of this report, while the legislation and assessment criteria are set out in Section 3. The noise survey is presented in Section 4. Details of the computer-based noise modelling are provided in Section 5, and the results of the noise assessment are discussed in Section 6. A glazing and ventilation strategy for the development is outlined in Section 7, along with an assessment of potential overheating impacts and associated screening options. The conclusions of this study are summarised in Section 8.

Figures and Tables are provided in Appendices A and B, respectively, and a glossary of useful acoustic terms is included in Appendix C.

The report has been produced by Jamie Pearson (MIOA) and reviewed by Richard Fenton (MIOA, MCIEH). Jamie and Richard are experienced in the production of noise impact assessments and have produced a significant number of assessments in consultancy roles and reviewed them in local authority roles.



2 SITE DESCRIPTION AND PROPOSED DEVELOPMENT

2.1 Site Description

The site is located within the administrative area of Horsham District Council (HDC).

The surrounding area is wholly residential. To the north of the site are open fields. The A24 is to the east and to the south and west are residential properties.

Approximately 75m to the east of the site is an automobile centre which operates as a dealership as well as a servicing and MOT centre.

A plan of the site and immediate area is presented in Figure A1 of Appendix A.

2.2 Proposed Development

The proposed development consists of the construction of 2no. 3-bedroom detached dwellings, including 2no. parking spaces per dwelling, 2no. visitor parking bays and private external amenity space.

The proposed site layout and floor plans are displayed in Figure A2 of Appendix A.

2.3 Existing Sound Sources

The ambient noise climate in the immediate vicinity of the development site is dominated by road traffic noise from the A24.



3 NOISE POLICY, STANDARDS AND GUIDANCE

3.1 Noise Policy Statement for England (NPSE)

The Noise Policy Statement for England (March 2010)¹, sets out the long-term vision of Government noise policy.

The vision of the NPSE is to ‘Promote good health and a good quality of life through the effective management and control of noise within the context of Government policy on sustainable development.’ This vision is supported by three key aims:

- avoid significant adverse impacts on health and quality of life;
- mitigate and reduce to a minimum other adverse impacts on health and quality of life; and
- where possible, contribute to the improvement of health and quality of life.

The NPSE should apply to all forms of noise including environmental noise, neighbour noise and neighbourhood noise but does not apply to noise in the workplace (occupational noise).

The NPSE had adopted the following concepts, to help consider whether noise is likely to have ‘significant adverse’ or ‘adverse’ effects on health and quality of life:

NOEL – No Observed Effect Level

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

LOAEL – Lowest Observed Adverse Effect Level

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

SOAEL – Significant Observed Adverse Effect Level

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

However the NPSE goes on to state that:

‘it is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available.’

¹ Department for Environment, Food and Rural Affairs (DEFRA). Noise Policy Statement for England (NPSE), 2010.



3.2 National Planning Policy Framework

The NPPF 2024² does not include specific noise criteria to be applied in planning decisions. It contains the following relevant guidance relating to noise and development:

“15.Conserving and enhancing the natural environment

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

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

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

c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.

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

201. The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities.”

The Noise Policy Statement for England is referred to in the footnote of the NPPF.

3.3 Planning Practice Guidance - Noise

Planning Practice Guidance (PPG) on noise³ was issued in March 2014 and updated in July 2019. This web-based guidance advises local planning authorities that “Noise needs to be

² Department of Communities and Local Government. National Planning Policy Framework, 2024

³ Department for Communities and Local Government: Planning Practice Guidance – Noise paragraph 001 Ref. ID: 30-001-20190722. Revision date July 2019.



considered when new developments may create additional noise (including any anticipated changes to that environment from activities that are permitted but not yet commenced)...” It states that...

“noise can override other concerns, where justified, although it is important to look at noise in the context of the wider characteristics of a development proposal, its likely users and its surroundings, as these can have an important effect on whether noise is likely to pose a concern”

As regards planning decisions, the PPG advises that the decision taker ‘should take into account the acoustic environment, and in doing so consider the following:

“whether or not a significant adverse effect is occurring or likely to occur;

whether or not an adverse effect is occurring or likely to occur; and

whether or not a good standard of amenity can be achieved.”

“In line with the explanatory note of the noise policy statement for England, this would include identifying whether the overall effect of the noise exposure (including the impact during the construction phase wherever applicable) is, or would be, above or below the significant observed adverse effect level and the lowest observed adverse effect level for the given situation.” (paragraph 003)

The PPG paragraph 004 refers to the NSPE ‘observed effect levels’ but states that ‘while the word ‘level’ is used, this does not mean that the effects can only be defined in terms of a single value of noise exposure.

Paragraph 005 includes a noise exposure hierarchy table which is set out below. It is based on the ‘likely average response,’ and gives example outcomes.

The hierarchy table provides guidance regarding how the concept of SOAELs and LOAELs, introduced through the NPSE, can be applied; and allows for informed subjective perceptions to be made in respect of the noticeability of noise in the context of potential effect levels. The PPG states that *“Although the word ‘level’ is used here, this does not mean that the effects can only be defined in terms of a single value of noise exposure. In some circumstances adverse effects are defined in terms of a combination of more than one factor such as noise exposure, the number of occurrences of the noise in a given time period, the duration of the noise and the time of the day the noise occurs”.*

Response	Examples of Outcomes	Increasing Effect Level	Action
No Observed Effect Level			
Not Present	No Effect	No Observed Adverse Effect	No specific measures required
No Observed Adverse Effect Level			
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Present of disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

TABLE 3.1: PPG NOISE EXPOSURE HIERARCHY

(Source –Planning Practice Guidance)

The PPG paragraph 006 advises that:

“The subjective nature of noise means that there is not a simple relationship between noise levels and the impact on those affected. This will depend on how various factors combine in any particular situation. These factors include:

- the source and absolute level of the noise together with the time of day it occurs...
- for a new noise making source, how the noise from it relates to the existing sound environment;
- for non-continuous sources of noise, the number of noise events, and the frequency and pattern of occurrence of the noise;
- the spectral content of the noise...”
- the local arrangement of buildings...”

3.4 Local Authority Requirements

Noise

Local Authorities in Sussex, including Horsham District Council (HDC), have produced a planning guidance document 'Planning Noise Advice Document – Sussex⁴ which sets out the required approach for undertaking a noise assessment, for certain types of development.

For new residential dwellings, the guidance presents information which states:

“When assessing the impact of transportation noise, be that from road, rail or air, then an Acoustic Design Statement shall be provided following the principles set out in ProPG:Planning and Noise (2017) “Professional Planning Guidance on Planning and Noise – New Residential Development. A Good Acoustic Design process shall be followed to achieve appropriate internal and external acoustic conditions.”

The guidance goes on to say:

“For a new noise sensitive development near an existing source of transport noise (road, rail, ports or aircraft) the L_{Aeq} (16hr day and 8hr night), should be measured. In addition, suitable shorter term L_{Aeq} , L_{A90} , L_{A10} and $L_{A_{fmax}}$ would be expected in order to give a clearer picture of the existing noise environment.

Where the external $L_{A_{fmax}}$ sound levels are likely to exceed 60 dB during the night period, overnight monitoring will be necessary. A specific $L_{A_{fmax},1}$ minute risk assessment shall be provided for the whole night period. This could also apply to extensions/ alterations to existing development.”

3.5 British Standard BS8233:2014

BS 8233:2014 Guidance on sound insulation and noise reduction for buildings⁵ gives recommendations for the control of noise in and around buildings. The Standard suggests appropriate criteria and limits for different situations to guide the design of new or refurbished buildings undergoing a change of use.

Desirable upper noise levels inside residential habitable rooms are specified in the Standard and are reproduced below in Table 3.2.

ctivity	Room	Ambient Indoor Noise Level 07:00 to 23:00 hrs, dB $L_{Aeq,16}$ hr	Ambient Indoor Noise Level 23:00 to 07:00 hrs, dB $L_{Aeq,8}$ hr
Resting	Living Room	35	-
Dining	Dining room/ area	40	-
Sleeping (daytime resting)	Bedroom	35	30

TABLE 3.2: BS8233 DESIRABLE INDOOR AMBIENT NOISE LEVELS FOR DWELLINGS

⁴ The Planning Noise Advice Document: Sussex. 2023.

⁵ British Standard BS 8233: 2014. Guidance on sound insulation and noise reduction in buildings.

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

In external amenity spaces, such as private gardens and patios, BS 8233 indicates that it is desirable that the external noise level in these areas does not exceed 50 dB $L_{Aeq,T}$ with an upper guideline value of 55 dB $L_{Aeq,T}$ in noisier environments.

3.6 World Health Organisation

The most recent WHO guidelines '*Environmental Noise Guidelines for the European Region*'⁶ acknowledge that 'single event noise indicators such as the maximum sound pressure level are warranted in specific situations such as night time railway or aircraft noise events that can clearly elicit awakenings', however, the guidance indicates that 'the relationship between different types of single-event noise indicators and long-term health outcomes at the population level remains tentative' and therefore does not make any recommendations for single event noise indicators.

However, guideline values for community noise in specific environments are presented in the WHO's '*Guidelines for Community Noise*'⁷ document. The guideline values are presented in Table 3.3.

Specific Environment	Critical Health Effect(s)	dB $L_{Aeq,T}$	Time Base hours	dB $L_{Amax,F}$
Outdoor living area	Serious annoyance, daytime and evening	55	16	-
	Moderate annoyance, daytime and evening	50	16	-
Dwelling indoors	Speech intelligibility and moderate annoyance, daytime and evening	35	16	-
Inside bedrooms	Sleep disturbance, night-time	30	8	45

TABLE 3.3: WHO GUIDELINE NOISE VALUES

Note 1: For a good sleep, the WHO states that indoor sound pressure levels should not exceed approximately 45 dB L_{Amax} more than 10–15 times per night.

The Night Noise Guidelines (NNG) for Europe⁸ is described as an extension of the WHO Guidelines for Community Noise publication. The threshold levels of noise exposure presented in the document are described as milestones in the process of evaluating the health consequences of environmental exposure. The health-based guideline values for the assessment and control of night noise exposure were derived from a review of available scientific evidence on the health effects of night noise. These include the effects and threshold levels for night time $L_{Amax,F}$, which are lower than those presented in the WHO community noise guidelines. These revised levels are presented in Table 3.4 below.

⁶ World Health Organisation. 2018. Environmental Noise Guidelines for the European Region.

⁷ World Health Organisation. 1999. Guidelines for Community Noise.

⁸ World Health Organisation. Night Noise Guidelines for Europe. 2009.

Effect	Description	Indicator	NOEL Threshold
Sleep Quality	Waking up in night and/or too early in the morning	dB L _{Amax,F}	42

TABLE 3.4: WHO NIGHT-TIME NOISE GUIDELINES

3.7 ProPG: Planning & Noise

ProPG (Professional Practice Guidance: Planning and Noise)⁹ was jointly developed by the Institute of Acoustics (IOA), the Association of Noise Consultants (ANC) and the Chartered Institute of Environmental Health (CIEH) to guide Local Planning Authorities (LPA's) and Practitioners in assessing the suitability for residential development on sites predominantly exposed to airborne transport noise. Practitioners in assessing the suitability for residential development on sites predominantly exposed to airborne transport noise.

ProPG introduced a sequential 2-stage approach allowing for early consideration of noise issues at Stage 1 followed by more detailed consideration of noise issues at Stage 2, should this be identified as necessary in Stage 1.

Stage 1 introduces the concept of noise risk categories ranging from Negligible Risk to High Risk to help LPAs in making accelerated straightforward decisions for low risk sites and to provide guidance for more detailed consideration associated with challenging higher risk sites.

Following the outcome of Stage 1, Stage 2 then applies to sites assessed as low to high risk. This stage should not be necessary for sites assessed as negligible risk.

Stage 2 requires consideration be given to four key elements:

- Element 1: Good Acoustic Design Process;
- Element 2: Internal Noise Level Guidelines;
- Element 3: External Amenity Area Noise Assessment; and
- Element 4: Other Relevant Issues.

Further details on these elements are discussed in the acoustic design section of this report. Table 3.5 below provides a summary of ProPG's noise risk categories and their associated free-field noise levels, along with the assessment implications.

⁹ Institute of Acoustics (IOA), Association of Noise Consultants (ANC) and Chartered Institute of Environmental Health (CIEH), "Professional Practice Guidance on Planning & Noise," 2017.

Risk Category	Indicative Daytime Noise Levels $L_{Aeq,16hr}$	Indicative Night-time Noise Levels $L_{Aeq,8hr}$	Pre-Planning Application Advice
Negligible Risk	<50 dB	< 40 dB	Indication that the development site is likely to be acceptable from a noise perspective and application need not normally be delayed on noise grounds.
Low Risk	50 - 60 dB	40 - 50 dB	Indication that the development site is likely to be acceptable provided a good acoustic design process is followed and is confirmed in a detailed Acoustic Design Statement confirming how noise will be mitigated.
Medium Risk	60 - 70 dB	50 - 60 dB	
High Risk	> 70 dB	> 60 dB	Indication that the development site may be refused on noise grounds unless a good acoustic design process and detailed Acoustic Design statement can demonstrate the significant noise risk can be mitigated.

TABLE 3.5: PROPG STAGE 1 - INITIAL SITE NOISE RISK ASSESSMENT

Notes [1] Noise levels should be assessed without inclusion of the acoustic effect of any scheme specific noise mitigation measures. [2] Noise levels are the combined free-field noise level from all sources of transport noise and may also include industrial/commercial noise where this is present, but not dominant; [3] $L_{Aeq,16hr}$ is for daytime 07:00-23:00, $L_{Aeq,8hr}$ is for night-time 23:00 to 07:00; and [4] An indication that there may be more than ten noise events at night (23:00-07:00) with $L_{Amax,F} > 60$ dB means the site should not be regarded as negligible risk.

3.8 Approved Document O (AD-O)

Approved Document O 'Overheating'¹⁰ was released in December 2021 and came into effect in England on 15th June 2022. It introduces requirements for various types of residential premises to limit unwanted solar gains in summer and provide an adequate means to remove heat from the indoor environment.

Requirement O1(2)(a) of the regulation requires that account must be taken of the safety of an occupant, and their reasonable enjoyment of the residence. There is also a requirement (O2(b)) that mechanical cooling may only be used where sufficient heat cannot be removed from the indoor environment without it.

The statutory guidance to support Requirement O1(2)(a), Approved Document O contains information relating to noise at night.

Paragraph 3.3 of AD-O states:

Windows are likely to be closed during sleeping hours if noise within bedrooms exceeds the following limits:

- 40dB $L_{Aeq,T}$, averaged over 8 hours (between 11pm and 7am); and
- 55dB L_{AFmax} , more than 10 times a night (between 11pm and 7am).

¹⁰ Approved Document O – Overheating (2021). HM Stationary Office. 2021.

4 ENVIRONMENTAL NOISE SURVEY

4.1 Unattended Baseline Noise Survey

Unattended continuous monitoring of existing noise levels was undertaken at the monitoring location shown as LT1 on Figure A1 of Appendix A. The equipment used during the survey is presented in Table 4.1 below.

Manufacturer	Model No.	Description	Serial No.	Calibration Due Date
Larson Davis	LxT	Sound Level Meter	0006489	May 2027
Larson Davis	Cal200	Calibrator	12981	April 2026

TABLE 4.1: SOUND MONITORING EQUIPMENT

The sound level meter was powered by dry cell batteries and stored inside a weatherproof security box. A photograph of the monitoring equipment can be seen in Figure 4.1 below.



FIGURE 4.1: PHOTOGRAPH SHOWING UNATTENDED MONITORING EQUIPMENT

Measurements were obtained using the 'F' time weighting and A-weighting frequency network. The equipment was calibrated before and after the survey to generate a calibration level of 114.0 dB at 1 kHz.

15-minute measurements of $L_{Amax,F}$, $L_{Aeq,15min}$, and $L_{A90,15min}$ noise levels were obtained at this monitoring location between 10:15 hrs on Friday 16th January 2026 and 07:00 hrs on Monday 19th January 2026, with the microphone position set at a height of approximately 1.8 m above the ground level in free field conditions.

4.2 Weather Conditions

Weather conditions during the site visits are presented below in Table 4.2.

Site Visit	Date and Time	Noted Weather
Noise Monitor Setup	Friday 16/01/2026 10:15hrs	Overcast; 7.5°C; Average windspeeds <0.5m/s; 98% humidity.
Noise Monitor Collection	Monday 19/01/2026 09:30hrs	Light rain; 9.5°C; Average windspeeds <0.8m/s; 98% humidity.

TABLE 4.2: WEATHER CONDITIONS DURING SITE VISITS

A history of the weather conditions during the continuous noise survey period has been obtained from an internet source (www.wunderground.com) and are displayed in Figure A3 of Appendix A.

Analysis of the data during the noise survey period between Friday 16th January 2026 and Monday 19th January 2026 shows a period of dry and calm weather.

4.3 Unattended Noise Survey Results

The results of the unattended noise measurement survey are presented graphically in Figure A4 of Appendix A, tabulated in Table B1 of Appendix B and summarised in Table 4.3 below.

Date	Measured Free-field Noise Levels, dB ^[1]					
	Daytime (07:00 - 23:00)			Night-time (23:00 - 07:00)		
	L _{Amax,F}	L _{Aeq,16hr}	L _{A90,16hr}	L _{Amax,F}	L _{Aeq,8hr}	L _{A90,8hr}
Fri 16/01/26 ^[1]	72 (77 / 68)	66	60	68 (71 / 64)	58	40
Sat 17/01/26	72 (78 / 68)	65	59	67 (69 / 64)	56	36
Sun 18/01/26	71 (79 / 66)	65	58	68 (75 / 64)	60	39
Mon 19/01/26 ^[1]	73 (78 / 71)	67	64	-	-	-
Average	72 (78 / 68)	66	60	68 (72 / 64)	58	38

TABLE 4.3: SUMMARY OF UNATTENDED NOISE MEASUREMENTS, LT1

Note: [1] Incomplete daytime periods due to equipment set up and collection.

The results of the unattended noise measurement show that ambient day time L_{Aeq,16hr} sound levels produced an arithmetic average of 66 dB L_{Aeq,16hr}. The ambient night-time L_{Aeq,8hr} sound levels produced an arithmetic average of 58 dB L_{Aeq,8hr}.

5 NOISE MODELLING

5.1 Calculation of Noise Levels Across the Site

Noise Prediction Model

A computer-based noise propagation model has been constructed using SoundPLAN version 6.0. This commercially available software package performs complex acoustic calculations using ray-tracing techniques, taking into account the reflective and absorptive properties of building elements and surrounding surfaces. Noise levels predicted by the model are based on the calculation procedures set out in *Calculation of Road Traffic Noise (CRTN)*, 1988.

The unattended measurement position (LT1) was included within the noise model for calibration purposes. The A24 road traffic noise source was calibrated to within ± 0.1 dB of the derived $L_{Aeq,16hr}$ and $L_{Aeq,8hr}$ noise levels at this location.

Following calibration, the proposed development was incorporated into the noise model, and calculation receptors were added to all exposed façades and were assigned the calculation receptor I.D.s. These receptors are shown in Figure A5 of Appendix A.

The noise modelling assumptions are set out below.

- Ground cover across the site has been modelled as mixture of hard and soft ground;
- The surrounding roads are modelled as hard ground;
- The topography of the surrounding area has been modelled as flat;
- Buildings and any other solid barriers, such as walls and fencing (existing and proposed), are modelled as reflective acoustic screens;
- At this stage, no perimeter fencing has been applied to the model to provide a worst-case assessment; and
- Receivers have been modelled at a height of 1.5m in free-field conditions.

The results of the calculated noise levels across the development site are presented in Table 5.1 below.

Plot	Calculation Receptor I.D.	Facade	Predicted Free-field Daytime Noise Level $L_{Aeq,16hr}$	Predicted Free-field Night-Time Noise Level $L_{Aeq,8hr}$
1	R1	North	63	55
	R2	East	60	52
	R3	South	62	54
	R4	West	48	40
2	R5	North	65	57
	R6	East	68	60
	R7	South	64	56
	R8	West	49	41

TABLE 5.1: CALCULATED DAYTIME AND NIGHT-TIME NOISE LEVELS ACROSS THE DEVELOPMENT SITE



6 PRO-PG AND INTERNAL NOISE LEVEL ASSESSMENT

6.1 ProPG Stage 1 Assessment

Following ProPG guidance, a Stage 1 – Initial Site Noise Risk assessment has been undertaken to characterise the application site in terms of the likely risk of adverse effects from noise on the future occupants of the development.

Analysis of the site noise levels presented in Table 5.1 indicates that the noise levels across the site indicate a 'Medium Risk' for both daytime (60 -70dB L_{Aeq}) and night-time (50-60dB L_{Aeq}) periods, according to ProPG's Stage 1 – Initial Site Risk Assessment.

6.2 ProPG Stage 2 Assessment

Element 1 - Good Acoustic Design Process

Section 5 of BS 8233: 2014 contains guidance on the sequence of stages to be followed in the planning and early acoustic design of a new development. Section 5.4 of BS 8233:2014 outlines a general approach to determining appropriate noise control measures including the following suggested steps:

- a) Check the feasibility of reducing noise levels and/or relocating noise sources;
- b) Consider options for planning the site or building layout;
- c) Consider the orientation of proposed building(s);
- d) Select construction types and methods for meeting building performance requirements;
- e) Examine the effects of noise control measures on the requirements for ventilation, fire regulation, health and safety, cost, CDM (construction, design and management), etc; and
- f) Assess the viability of alternative solutions.

The designer should then decide which of the following options can be applied to reduce noise levels:

- a) Quietening or removing the source of noise;
- b) Attenuating the sound on its path to the receiver;
- c) Obstructing the sound path between source and receiver;
- d) Improving the sound insulation of the building envelope; and
- e) Using agreements to manage noise.



The main source of noise affecting the proposed development is road traffic noise from the A24.

Mitigation measures may be considered to alter the sound propagation path between the source (A24) and the receiver (the proposed dwellings). One option is the installation of a noise barrier along the eastern site boundary to control noise from the A24.

The noise model has been updated to include 3.0m high noise barriers along this boundary. Analysis indicates that, at the locations most exposed to road traffic noise, site noise levels could reduce by approximately 5 dB. A reduction of this magnitude would be clearly perceptible, and it is recommended that the developer considers incorporating this measure into the design.

Any noise barrier should provide sufficient mass (minimum 10 kg/m²) and be constructed without gaps or openings that could allow sound to pass through, for example, gaps between panels or poorly sealed gates.

In addition to the use of noise barriers, it is recommended that the developer adopts, where practicable, good acoustic design principles. This should include careful consideration of internal layouts to minimise the number of noise sensitive rooms facing the dominant road traffic source.

It should be noted that the assessment presented herein excludes the recommended noise barriers, to provide a worst-case scenario.

Element 2 – Internal Noise Level Guidelines

Internal Ambient Noise Level Assessment

Following the Element 1 assessment, an assessment of internal noise levels (Element 2) at the development site has been undertaken.

BS 8233:2014 contains recommended guideline levels of 35 dB L_{Aeq,T} for resting inside bedrooms and living rooms during the daytime, 40 dB L_{Aeq,T} for dining areas and 30 dB L_{Aeq,T} for sleeping inside bedrooms at night.

The approximate sound reduction value for standard thermal double glazing is 30dB R_w.

Taking this typical sound reduction performance into consideration, and on the understanding that the external façade of the new dwellings will provide a similar sound reduction to a brick/block type construction, initial internal noise levels have been predicted inside the habitable rooms at the assessment positions listed.

Noise levels have been calculated using the sound reduction values discussed above. The results for each receptor location are summarised in Table 6.1.

Plot	Receptor I.D.	Façade	Predicted Free-field Daytime Noise Level $L_{Aeq,16hr}$	Windows - Closed Predicted Daytime Internal Noise Level, dB $L_{Aeq,16hr}^{[1]}$	Predicted Free-field Night-Time Noise Level $L_{Aeq,8hr}$	Windows - Closed Predicted Night-time Internal Noise Level, dB $L_{Aeq,8hr}^{[1]}$
1	R1	North	63	33	55	25
	R2	East	60	30	52	22
	R3	South	62	32	54	24
	R4	West	48	18	40	10
2	R5	North	65	35	57	27
	R6	East	68	38	60	30
	R7	South	64	34	56	26
	R8	West	49	19	41	11

TABLE 6.1: CALCULATED DAYTIME AND NIGHT-TIME NOISE LEVELS ACROSS THE DEVELOPMENT SITE

Note: red highlight indicates an exceedance of the BS 8233:2014 guideline noise levels.

Based on the assumed typical facade reduction described above, the noise predictions show that internal noise level may exceed the daytime guideline values at the R6 calculation receptor, which is representative of the east façade of plot 2.

The daytime guideline noise value of 35 dB is met at all other façades.

During the night-time period, the guideline level of 30 dB $L_{Aeq,T}$, is met on all façades.

Suitable glazing products, to ensure the internal noise criteria can be achieved, are provided in Section 7.

Internal Maximum Noise Level Assessment

Single event noise indicators such as maximum $L_{Amax,F}$ noise levels generated at night have also been considered at the proposed development site.

The WHO 2009 guidance sets an internal sleep disturbance noise limit of 42 dB $L_{Amax,F}$ for the onset of critical health effects, which is a level which should not be exceeded on a regular basis. Based on an interpretation that for a noise to be regular, it needs to occur several (i.e. more than two) times per hour, the $L_{Amax,F}$ noise needs to be based upon an average of at least 10-15 events that are typical in nature.

The Sussex Noise Guidance requests a risk assessment of measured $L_{Amax,1\text{ minute}}$ noise levels over a whole night period.

The 90th percentile $L_{Amax, F}$ value of 68 dB (free-field), calculated using the 1-minute night-time $L_{Amax,F}$ noise levels measured at LT1, has been used as the basis to determine $L_{Amax, F}$ noise levels across the development site.

These $L_{Amax, F}$ noise levels have then been used to calibrate the road source noise level in the noise prediction model, with the site in its current form, prior to adding the proposed development to the noise model to allow an estimate of $L_{Amax, F}$ noise levels across the site.

The typical facade reduction described above are then used to estimate internal $L_{Amax,F}$ noise levels across the development and presented in Table 6.2 below.

Plot	Receptor I.D.	Façade	Predicted Free-field Night-Time Noise Level $L_{Amax,F}$	Windows - Closed Predicted Night-time Internal Noise Level, dB $L_{Amax,F}^{[1]}$
1	R1	North	65	35
	R2	East	62	32
	R3	South	64	34
	R4	West	50	20
2	R5	North	67	37
	R6	East	70	40
	R7	South	66	36
	R8	West	51	21

TABLE 6.2: ASSESSMENT OF ESTIMATED INTERNAL $L_{Amax,F}$ NIGHT-TIME NOISE LEVELS

Notes:

[1] assuming a 30dB(A) reduction for windows closed.

The results indicate that the WHO $L_{Amax,F}$ criteria is met on all facades, again assuming a 30dB(A) reduction for windows closed.

Element 3 – External Amenity Area Noise Assessment

BS 8233 indicates that it is desirable that the external noise level in external amenity areas does not exceed 50 dB $L_{Aeq,T}$ with an upper guideline value of 55 dB $L_{Aeq,T}$ in noisier environments.

The predicted noise levels at the calculation receptor's EXT1 and EXT2 are representative of the proposed outdoor amenity spaces of Plot 1 and Plot 2, respectively.

The results of the external noise levels are presented in Table 6.3 below.

Calculation Receptor	Predicted Free-field Daytime Noise Level $L_{Aeq,16hr}$
Plot 1	61
Plot 2	64

TABLE 6.3: ASSESSMENT OF DAYTIME NOISE LEVELS IN EXTERNAL AREAS

The predicted free-field external noise level is over the upper guideline level of 55 dB $L_{Aeq, 16hrs}$ at both external receptors.

However, it is recognised in BS 8233 that these guideline values are not achievable in all circumstances where development might be desirable for other reasons than noise. In higher noise areas, such as city centres or urban areas adjoining the strategic 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. Therefore, it does not preclude the suitability of the site for residential development.



Notwithstanding this, as discussed in Section 6.2 above, with the introduction of suitable boundary fencing on the eastern boundary, the noise levels could reduce by up to 5 dB at both Plots. While this would not bring the levels down to below the upper guideline level, it would ensure the noise is reduced as far as reasonably practicable.

Element 4 – Assessment of Other Relevant Issues

Element 4 is intended to consider other potential noise issues and/or sources that may be introduced by the proposed development.

Should plant such as air source heat pumps be installed as part of the project proposals, there is potential for them to cause to adverse noise impact when in operation. This will require further consideration at the detailed design stage.

It is recommended that any plant associated with the development is designed so that the rating level does not exceed the representative background sound level when assessed in accordance with BS 4142:2014+A1:2019.

It could be conditioned as part of any planning approval, to request a scheme of design to demonstrate that this level criteria can be achieved.

7 NOISE MITIGATION STRATEGY

7.1 Glazing Strategy

Based on the noise assessment, it is considered that:

- Enhanced double glazing which can provide a minimum sound level difference of 33dB should be used for all habitable rooms on the east façade of Plot 2;
- Standard double glazing which can provide a minimum sound level difference of 30dB should be used for all other habitable rooms on the development.

Examples of suitable glazing products are presented in Table 7.1 below.

Facade	Sound Insulation Requirements	Typical Glazing Specification ^[1]
All habitable rooms	R _w 30dB	4mm glass / 16mm air cavity / 4mm glass
All habitable rooms on the East elevation	R _w 35dB	4mm glass / 14mm air cavity / 6mm glass

TABLE 7.1: APPROPRIATE GLAZING SPECIFICATION FOR THE DEVELOPMENT

Note^[1]: Based on Velfac Glazing product range.

Note: *This information is based on a broad assessment to provide an early indication of glazing requirements for the residential development site. It is possible that a more enhanced glazing product will be required, depending on the final ventilation strategy selected. Detailed internal calculations should be undertaken for the worst affected facades once final façade information has been determined to ensure the glazing and ventilation selection is suitable.

7.2 Ventilation Strategy

The results have shown that with appropriate glazing, desirable internal conditions can be achieved. However, the development will also need to incorporate a background ventilation system, in compliance with Approved Document F¹¹.

The ventilation requirements set out in Approved Document F can be delivered by a natural ventilation system or a mechanical ventilation system or a combination of both.

Overheating

The internal assessment has shown that with an appropriate scheme of façade construction, adequate protection against existing external noise can meet the BS 8233:2014 guideline values.

Consideration has also been given to the internal noise levels when windows to habitable rooms are open, for example, during the summer months, to help combat overheating.

¹¹ The Building Regulations 2010. Approved Document F.

Paragraph 3.3 of AD-O states that windows are likely to be closed during sleeping hours if noise within bedrooms exceeds the following limits.

- 40dB $L_{Aeq,T}$, averaged over 8 hours (between 11pm and 7am); and
- 55dB L_{AFmax} , more than 10 times a night (between 11pm and 7am).

Assuming a 10 dB difference between an external free-field noise level and internal noise level¹² through an open window, based on the postcode of the site not being in a high-risk zone for overheating, an indication of internal $L_{Aeq,8hr}$ and $L_{Amax,F}$ noise levels have been estimated. The results are presented below in Tables 7.2 and 7.3 for the calculated internal ambient and maximum noise levels, respectively.

Plot	Receptor I.D.	Façade	Predicted Free-field Night-Time Noise Level $L_{Aeq,8hr}$	Windows - Open Predicted Night-time Internal Noise Level, dB $L_{Aeq,8hr}^{[1]}$
1	R1	North	55	45
	R2	East	52	42
	R3	South	54	44
	R4	West	40	30
2	R5	North	57	47
	R6	East	60	50
	R7	South	56	46
	R8	West	41	31

TABLE 7.2: ESTIMATE OF INTERNAL $L_{Aeq,T}$ NOISE LEVELS – WINDOWS OPEN

Notes: [1] allows for 10dB reduction through a partially open window.

Plot	Receptor I.D.	Façade	Predicted Free-field Night-Time Noise Level $L_{Amax,F}$	Windows - Open Predicted Night-time Internal Noise Level, dB $L_{Amax,F}^{[1]}$
1	R1	North	65	55
	R2	East	62	52
	R3	South	64	54
	R4	West	50	40
2	R5	North	67	57
	R6	East	70	60
	R7	South	66	56
	R8	West	51	41

TABLE 7.3: ESTIMATE OF INTERNAL $L_{Amax,F}$ NOISE LEVELS – WINDOWS OPEN

Notes: [1] allows for 10dB reduction through a partially open window.

The results of the assessment indicate that, during the night-time period, the estimated internal $L_{Aeq,8hr}$ noise levels within bedrooms would exceed the 40 dB $L_{Aeq,T}$ limit set out in AD-O at all façades, with the exception of the west facing façades of Plots 1 and 2, represented by calculation receptors R4 and R8.

¹² Approved Document O Noise Guide. November 2024.



The assessment also indicates that opening windows for cooling purposes during the night-time period would result in exceedances of the 55 dB $L_{Amax,F}$ limit specified in AD-O at calculation receptors R5, R6 and R7, which are representative of the north, east and south façades of Plot 2.

Based on the results of this assessment, alternative forms of cooling may need to be considered in bedrooms, if an overheating assessment identifies a risk of overheating if windows were to remain closed. However, it is important to note that the degree of adverse impact will depend on a number of factors including the time, duration and frequency for which the windows would need to remain open.



8 CONCLUSIONS

RF Environmental Ltd (RFE) was commissioned by Greenhayes Planning Ltd in January 2026 to prepare an acoustic report to support a planning application to Horsham District Council (HDC) for a proposed residential development at land to the rear of The Lawns, Ashington, Horsham.

To support this application, an acoustic assessment, based on the predicted impacts of noise from surrounding sources, has been undertaken.

The existing noise environment has been established through unattended noise monitoring.

Subjective observations undertaken on site indicate that road traffic on the A24 was the dominant noise source impacting the site.

Computer noise modelling software has been used to predict the external noise levels across the proposed development site.

The noise conditions on site indicate that it would be categorised as a 'Medium Risk' site according to ProPG Stage 1 - Initial Site Risk assessment guidelines. Following this, a Stage 2 – Full Assessment has been undertaken and advice has been given on the design of the building envelope to ensure that internal noise levels inside habitable rooms fall within guideline limits recommended in ProPG, BS 8233: 2014 and WHO Guidelines. A glazing and ventilation strategy, to ensure desirable internal conditions can be achieved in all habitable rooms on the development, is presented in Section 7.

Calculated noise levels in the proposed external amenity areas, are predicted to exceed the upper guideline of 55 dB $L_{Aeq,16hr}$ specified in BS 8233;2014. However, this exceedance does not preclude the suitability of the site for residential development and further noise modelling indicates that with the inclusion of 3.0m high noise barriers along the eastern site boundary, site noise levels could reduce by approximately 5 dB.

With windows open to help combat overheating, habitable rooms on the most exposed façades to the road traffic noise may experience internal noise levels which could lead to adverse impact. This risk should be considered further when the overheating strategy for the development is finalised.

Based on the ProPG approach followed in this assessment, our recommendation to the decision maker with regard to noise is that "Planning consent may be granted subject to the inclusion of suitable noise conditions". These would be expected with regard to the achievement of appropriate internal noise levels within habitable spaces intended for residential use and for noise emissions from building services plant associated with the development to nearby sensitive properties, although it is acknowledged that at this stage this is not proposed.

APPENDIX A: FIGURES



FIGURE A1: LOCATION OF PROPOSED DEVELOPMENT SITE AND UNATTENDED NOISE MONITORING LOCATION (LT1)



FIGURE A2: PROPOSED SITE LAYOUT AND FLOOR PLANS

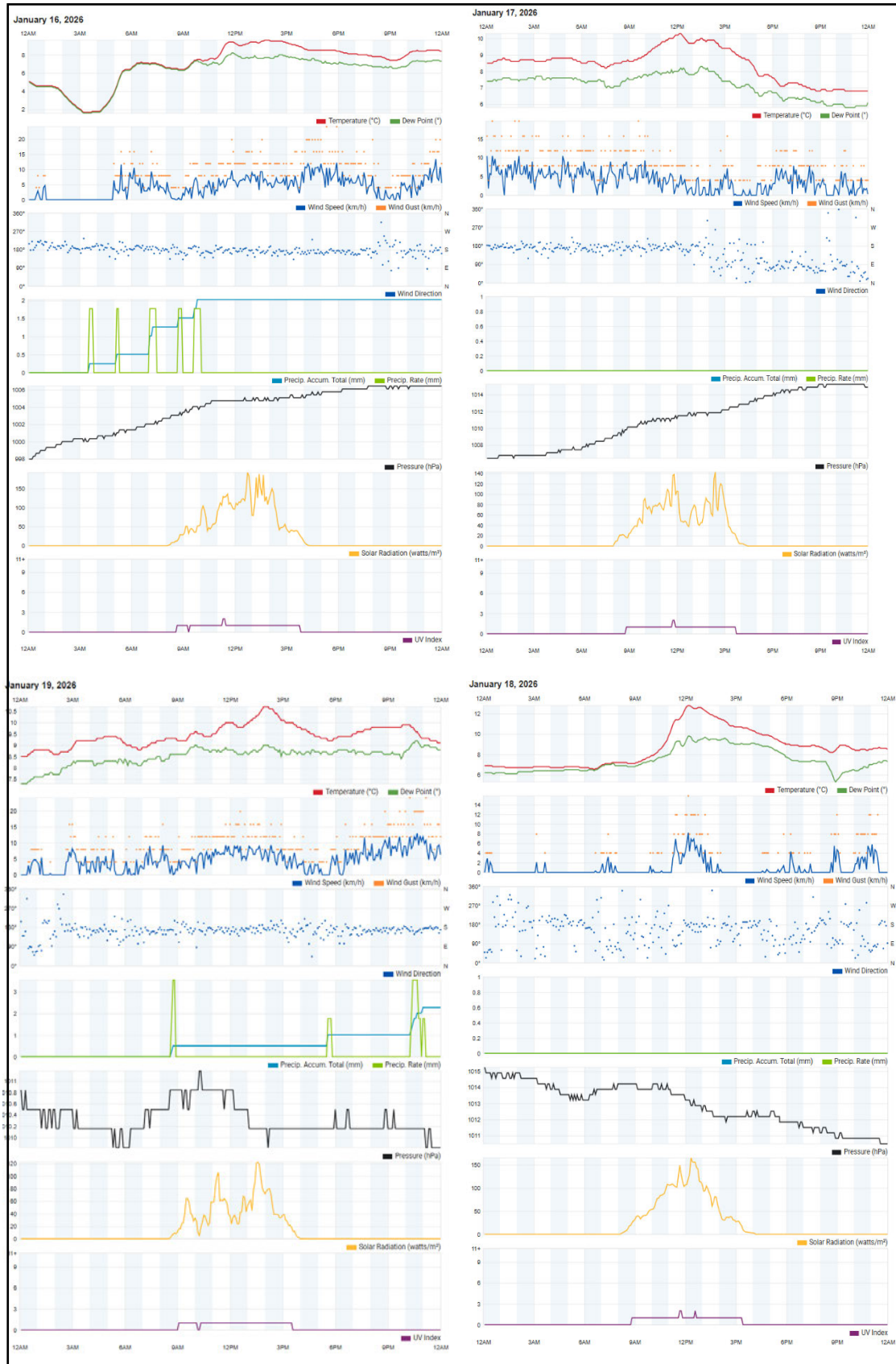


FIGURE A3: WEATHER CONDITIONS DURING UNATTENDED NOISE SURVEY

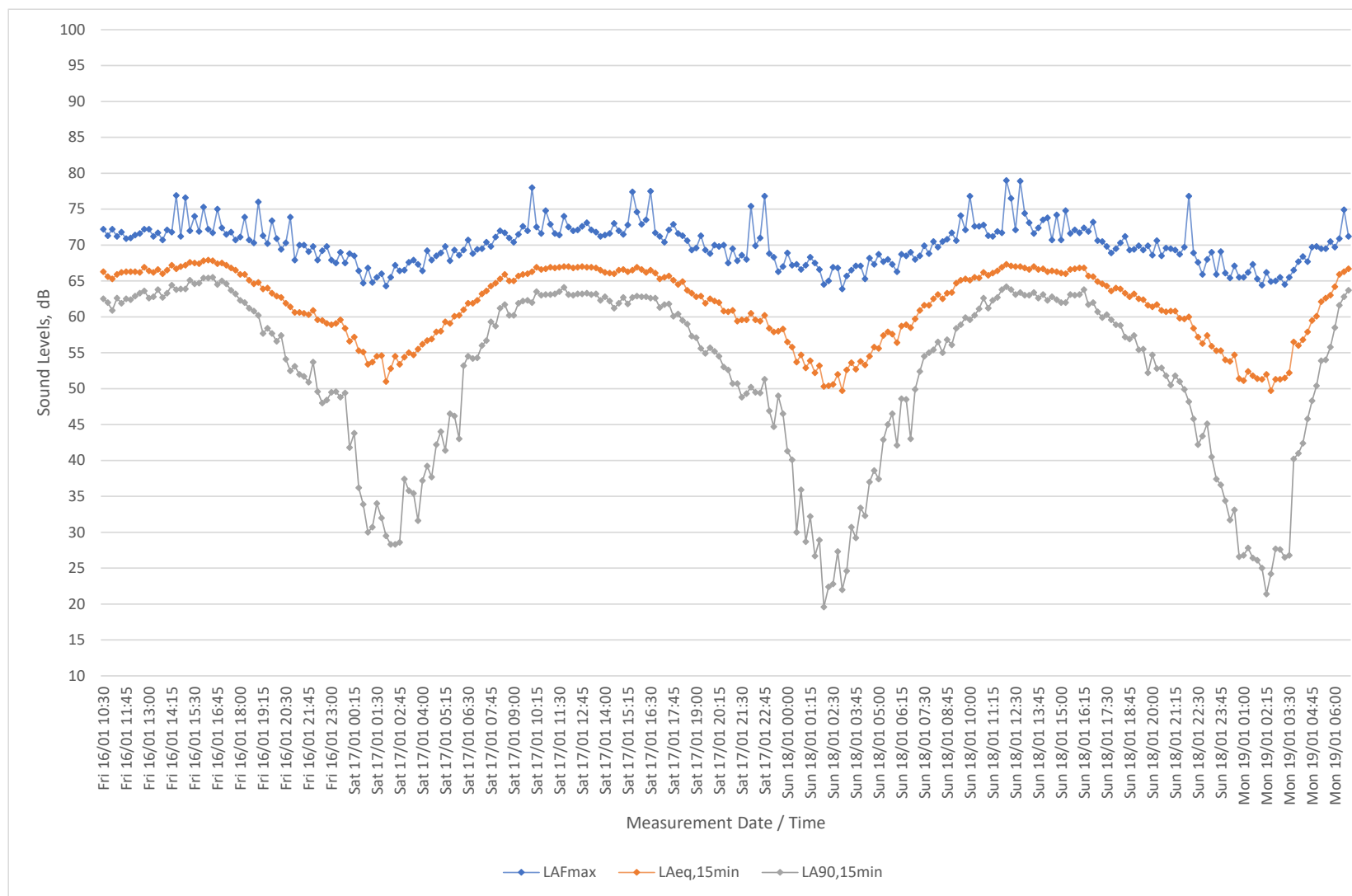


FIGURE A4: TIME HISTORY OF CONTINUOUS NOISE MONITORING DATA, LT1

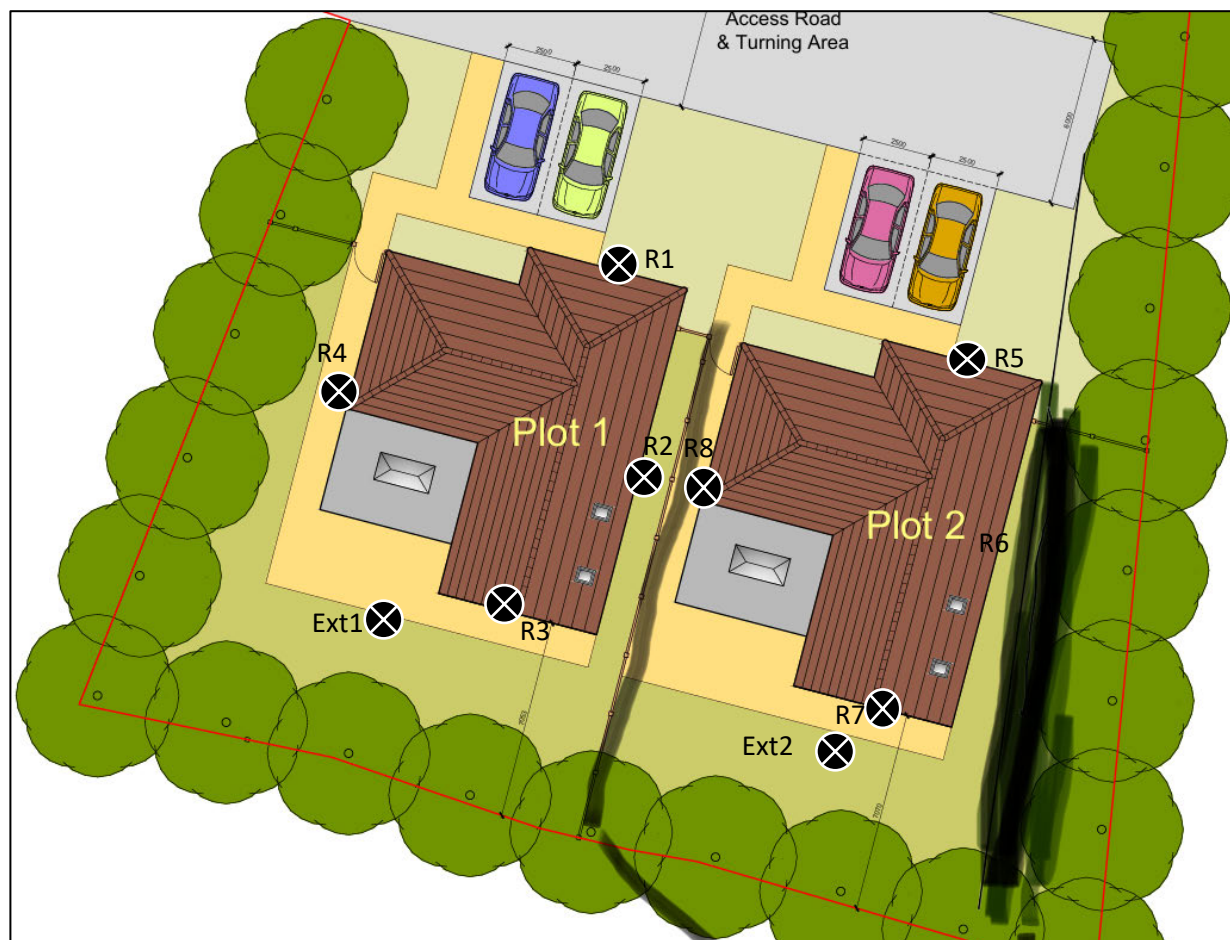


FIGURE A5: CALCULATION RECEPTORS

APPENDIX B: TABLES

Date of Meas.	Start Time	Measured Sound Levels, dB		
		L _{Amax,F}	L _{Aeq,15min}	L _{A90,15min}
16 th January 2026	10:30	72.2	66.3	62.5
	10:45	71.3	65.6	62.0
	11:00	72.2	65.3	60.9
	11:15	71.2	65.9	62.6
	11:30	71.8	66.2	61.9
	11:45	70.9	66.3	62.5
	12:00	71.0	66.3	62.4
	12:15	71.4	66.3	62.9
	12:30	71.6	66.2	63.3
	12:45	72.2	66.9	63.6
	13:00	72.2	66.4	62.6
	13:15	71.2	66.2	62.8
	13:30	71.7	66.6	63.8
	13:45	70.7	66.0	62.7
	14:00	72.1	66.5	63.3
	14:15	71.8	67.2	64.4
	14:30	76.9	66.7	63.8
	14:45	71.2	67.0	63.9
	15:00	76.6	67.2	63.9
	15:15	72.0	67.6	65.1
	15:30	74.0	67.5	64.6
	15:45	71.9	67.4	64.7
	16:00	75.3	67.8	65.4
	16:15	72.2	67.9	65.4
	16:30	71.7	67.8	65.5
	16:45	75.0	67.4	64.5
	17:00	72.4	67.5	65.0
	17:15	71.5	67.2	64.6
	17:30	71.8	66.8	63.7
	17:45	70.7	66.5	63.2
	18:00	71.1	65.9	62.3
	18:15	73.9	65.9	62.0
	18:30	70.7	65.1	61.2
	18:45	70.3	64.6	60.8
	19:00	76.0	64.8	60.2
	19:15	71.3	63.9	57.7
	19:30	70.2	64.0	58.4
	19:45	73.4	63.3	57.7
	20:00	70.9	62.9	56.6
	20:15	69.4	62.7	57.4
	20:30	70.3	61.9	54.1
	20:45	73.9	61.4	52.5
	21:00	67.9	60.6	53.1
	21:15	70.0	60.6	52.0
	21:30	70.0	60.5	51.7
	21:45	69.1	60.3	50.9

17 th January 2026	22:00	69.8	60.9	53.7
	22:15	67.9	59.6	49.6
	22:30	69.2	59.5	48.0
	22:45	69.8	59.1	48.4
	23:00	67.9	58.9	49.5
	23:15	67.5	59.1	49.6
	23:30	69.0	59.6	48.8
	23:45	67.5	58.4	49.4
	00:00	68.8	56.6	41.8
	00:15	68.5	57.2	43.8
	00:30	66.4	55.3	36.2
	00:45	64.7	55.1	33.9
	01:00	66.8	53.4	30.0
	01:15	64.8	53.7	30.7
	01:30	65.5	54.5	34.0
	01:45	66.0	54.6	32.0
	02:00	64.3	51.0	29.5
	02:15	65.5	52.8	28.3
	02:30	67.2	54.5	28.3
	02:45	66.4	53.4	28.6
	03:00	66.5	54.4	37.4
	03:15	67.6	55.0	35.8
	03:30	67.9	54.7	35.4
	03:45	67.3	55.5	31.6
	04:00	66.4	56.2	37.2
	04:15	69.2	56.7	39.2
	04:30	67.9	56.9	37.7
	04:45	68.5	57.9	42.2
	05:00	68.9	58.0	44.0
	05:15	69.8	59.3	41.4
	05:30	67.8	59.1	46.5
	05:45	69.3	60.1	46.2
	06:00	68.6	60.2	43.0
	06:15	69.3	61.0	53.2
	06:30	70.7	61.9	54.5
	06:45	68.8	61.9	54.2
	07:00	69.4	62.3	54.3
	07:15	69.5	63.2	56.0
	07:30	70.4	63.6	56.7
	07:45	69.8	64.3	59.3
	08:00	71.1	64.7	58.7
	08:15	72.0	65.3	61.2
	08:30	71.7	65.9	61.7
	08:45	71.0	65.0	60.2
	09:00	70.4	65.0	60.2
	09:15	71.5	65.7	61.9
	09:30	72.6	65.9	62.2
	09:45	72.0	66.0	62.3

	10:00	78.0	66.3	62.0
	10:15	72.5	66.9	63.5
	10:30	71.6	66.6	63.0
	10:45	74.8	66.7	63.1
	11:00	72.9	66.9	63.1
	11:15	71.6	66.8	63.2
	11:30	71.4	66.9	63.5
	11:45	74.0	67.0	64.1
	12:00	72.5	67.0	63.1
	12:15	72.0	66.8	63.0
	12:30	72.1	66.9	63.2
	12:45	72.6	67.0	63.2
	13:00	73.1	66.9	63.3
	13:15	72.1	66.9	63.1
	13:30	71.8	66.8	63.2
	13:45	71.2	66.5	62.3
	14:00	71.4	66.2	62.8
	14:15	71.6	66.1	62.2
	14:30	73.0	66.0	61.2
	14:45	72.0	66.5	61.9
	15:00	71.5	66.6	62.7
	15:15	72.8	66.3	61.8
	15:30	77.4	66.5	62.7
	15:45	74.6	66.9	62.9
	16:00	72.9	66.6	62.8
	16:15	73.5	66.2	62.8
	16:30	77.5	66.5	62.6
	16:45	71.7	66.1	62.6
	17:00	71.2	65.3	61.3
	17:15	70.4	65.5	61.7
	17:30	72.1	65.7	61.8
	17:45	72.9	65.1	60.1
	18:00	71.6	64.5	60.4
	18:15	71.3	64.9	59.5
	18:30	70.6	63.7	59.0
	18:45	69.3	63.3	57.3
	19:00	69.6	62.8	57.1
	19:15	71.3	62.9	55.6
	19:30	69.3	61.9	54.9
	19:45	68.8	62.5	55.7
	20:00	70.0	62.2	55.2
	20:15	69.8	62.0	54.5
	20:30	70.0	60.8	53.0
	20:45	67.5	60.7	52.6
	21:00	69.5	60.9	50.7
	21:15	67.8	59.4	50.7
	21:30	68.6	59.6	48.8
	21:45	68.0	59.6	49.3

18 th January 2026	22:00	75.4	60.5	50.2
	22:15	69.9	59.6	49.5
	22:30	71.0	59.4	49.4
	22:45	76.8	60.2	51.3
	23:00	68.8	58.4	46.9
	23:15	68.3	57.9	44.7
	23:30	66.3	58.0	49.0
	23:45	67.0	58.3	46.5
	00:00	68.9	56.5	41.3
	00:15	67.2	55.8	40.1
	00:30	67.3	53.7	30.0
	00:45	66.6	54.7	35.9
	01:00	67.2	52.9	28.7
	01:15	68.3	53.9	32.2
	01:30	67.5	52.2	26.7
	01:45	66.6	53.2	28.9
	02:00	64.5	50.3	19.6
	02:15	65.0	50.4	22.4
	02:30	66.9	50.6	22.8
	02:45	66.8	52.0	27.3
	03:00	63.9	49.7	22.0
	03:15	65.7	52.6	24.6
	03:30	66.5	53.6	30.7
	03:45	67.1	52.7	29.2
	04:00	67.1	53.8	33.4
	04:15	65.3	53.3	32.3
	04:30	68.2	54.5	37.0
	04:45	67.3	55.8	38.6
	05:00	68.7	55.6	37.4
	05:15	67.7	57.4	42.9
	05:30	68.0	57.9	45.0
	05:45	67.3	57.6	46.5
	06:00	66.3	56.4	42.1
	06:15	68.7	58.7	48.6
	06:30	68.5	58.9	48.5
	06:45	69.0	58.5	43.0
	07:00	68.0	59.7	49.9
	07:15	68.5	60.9	52.4
	07:30	69.9	61.6	54.5
	07:45	68.8	61.6	55.0
	08:00	70.5	62.5	55.4
	08:15	69.7	63.1	56.5
	08:30	70.5	62.5	55.0
	08:45	70.8	63.3	56.8
	09:00	71.7	63.4	56.1
	09:15	70.6	64.7	58.4
	09:30	74.1	65.1	58.9
	09:45	72.1	65.3	59.9

	10:00	76.8	65.1	59.6
	10:15	72.6	65.5	60.2
	10:30	72.6	65.4	61.1
	10:45	72.8	66.2	62.6
	11:00	71.3	65.8	61.2
	11:15	71.2	66.1	62.3
	11:30	71.9	66.4	62.7
	11:45	71.7	66.9	63.8
	12:00	79.0	67.3	64.2
	12:15	76.5	67.1	63.8
	12:30	72.1	67.0	63.1
	12:45	78.9	67.0	63.4
	13:00	74.4	66.8	63.0
	13:15	73.1	66.6	63.0
	13:30	71.6	67.0	63.4
	13:45	72.4	66.6	62.6
	14:00	73.5	66.7	63.1
	14:15	73.8	66.3	62.3
	14:30	70.7	66.4	62.8
	14:45	74.2	66.3	62.4
	15:00	70.7	66.1	62.0
	15:15	74.8	66.0	62.0
	15:30	71.6	66.6	63.1
	15:45	72.1	66.7	63.0
	16:00	71.7	66.8	63.1
	16:15	72.4	66.8	63.8
	16:30	71.9	65.7	61.7
	16:45	73.2	65.6	62.0
	17:00	70.6	64.9	60.7
	17:15	70.5	64.6	59.9
	17:30	69.8	64.3	60.3
	17:45	68.9	63.6	59.6
	18:00	69.5	64.0	58.9
	18:15	70.3	63.9	58.8
	18:30	71.2	63.3	57.2
	18:45	69.3	62.8	56.9
	19:00	69.4	63.2	57.4
	19:15	69.9	62.5	55.4
	19:30	69.3	62.4	55.5
	19:45	69.9	61.6	52.2
	20:00	68.6	61.4	54.7
	20:15	70.6	61.7	52.8
	20:30	68.5	60.9	52.9
	20:45	69.6	60.7	51.8
	21:00	69.5	60.8	50.5
	21:15	69.3	60.8	51.8
	21:30	68.7	59.8	51.0
	21:45	69.7	59.7	49.9

19 th January 2026	22:00	76.8	60.0	48.2
	22:15	68.9	58.4	45.8
	22:30	67.6	57.2	42.2
	22:45	65.9	56.3	43.4
	23:00	68.0	57.4	45.1
	23:15	69.0	55.9	40.5
	23:30	65.9	55.3	37.4
	23:45	69.1	55.3	36.6
	00:00	66.1	54.0	34.4
	00:15	65.4	53.8	31.7
	00:30	67.1	54.7	33.1
	00:45	65.5	51.4	26.6
	01:00	65.5	51.1	26.8
	01:15	66.2	52.4	27.8
	01:30	67.3	51.8	26.4
	01:45	65.3	51.4	26.1
	02:00	64.4	51.3	25.0
	02:15	66.2	52.0	21.4
	02:30	64.9	49.7	24.2
	02:45	65.0	51.3	27.7
	03:00	65.5	51.3	27.6
	03:15	64.5	51.5	26.5
	03:30	65.5	52.2	26.8
	03:45	66.5	56.5	40.2
	04:00	67.7	56.0	41.0
	04:15	68.4	56.8	42.4
	04:30	67.7	57.9	45.8
	04:45	69.7	59.5	48.3
	05:00	69.8	60.1	50.4
	05:15	69.5	62.1	53.9
	05:30	69.5	62.6	54.0
	05:45	70.5	63.0	55.8
	06:00	69.7	64.2	58.5
	06:15	70.9	65.9	61.6
	06:30	74.9	66.3	62.8
	06:45	71.2	66.7	63.7

TABLE B1: CONTINUOUS NOISE MONITORING DATA, FRIDAY 16TH JANUARY TO MONDAY 19TH JANUARY

APPENDIX C: GLOSSARY OF ACOUSTIC TERMS

Noise

Noise is defined as unwanted sound. The range of audible sound is from 0 to 140 dB. The frequency response of the ear is usually taken to be around 18 Hz (number of oscillations per second) to 18000 Hz. The ear does not respond equally to different frequencies at the same level. It is more sensitive in the mid-frequency range than the lower and higher frequencies and because of this, the low and high frequency components of a sound are reduced in importance by applying a weighting (filtering) circuit to the noise measuring instrument. The weighting which is most widely used and which correlates best with subjective response to noise is the dBA weighting. This is an internationally accepted standard for noise measurements.

For variable sources, such as traffic, a difference of 3 dBA is just distinguishable. In addition, a doubling of traffic flow will increase the overall noise by 3 dBA. The 'loudness' of a noise is a purely subjective parameter, but it is generally accepted that an increase/ decrease of 10 dBA corresponds to a doubling/ halving in perceived loudness. Noise is measured on a logarithmic scale in decibels (dB) because of the ears' sensitivity to a wide range of pressure changes. The sound pressure level (SPL) of a signal is denoted by the symbol L_p and defined by the equation $L_p = 10 \log (p/p_0)^2$ where p is the root mean square pressure of the signal and p_0 is the reference sound pressure (2×10^{-5} Pa).

An indication of the range of sound pressure levels commonly found in the environment is given below:

Location	$L_{pA dB(A)}$
Normal threshold of hearing	-10 to 20
Music halls and theatres	20 to 30
Living rooms and offices	30 to 50
Inside motor vehicles	50 to 70
Industrial premises	70 to 100
Burglar alarms at 1 m	100 to 110
Jet aircraft on take-off	110 to 130
Threshold of pain	130 to 140

External noise levels are rarely steady, but rise and fall according to activities within an area. In attempt to produce a figure that relates this variable noise level to subjective response, a number of noise indices have been developed. These include:

i) The L_{Amax} noise level

This is the maximum noise level recorded over the measurement period.

ii) The L_{Aeq} noise level

This is “equivalent continuous A-weighted sound pressure level, in decibels” and is defined in British Standard BS 7445 as the “value of the A-weighted sound pressure level of a continuous, steady sound that, within a specified time interval, T , has the same mean square sound pressure as a sound under consideration whose level varies with time”.

It is a unit commonly used to describe construction noise and noise from industrial premises and is the most suitable unit for the description of other forms of environmental noise. In more straightforward terms, it is a measure of energy within the varying noise.

iii) The L_{A10} noise level

This is the noise level that is exceeded for 10% of the measurement period and gives an indication of the noisier levels. It is a unit that has been used over many years for the measurement and assessment of road traffic noise.

iv) The L_{A90} noise level

This is the noise level that is exceeded for 90% of the measurement period and gives an indication of the noise level during the quieter periods. It is often referred to as the background noise level and is used in the assessment of disturbance from industrial noise.

Community response to environmental noise sources is dependent on both acoustic and non-acoustic factors. The acoustic factors include absolute noise level, changes or exceedances of background and ambient levels as well as the characteristics, time, duration and frequency of noise.