noise.co.uk Ltd

T+44(0)2476 545 397
F+44(0)2476 545 010
The Haybarn
Newnham Grounds
Kings Newnham Lane
Bretford
Warwickshire
CV23 0JU

Environmental Noise Survey

Prepared: 29th March 2022

Report No	21840-1-R1
Client	Places for People Developments
Site	Havant and South Downs College College Road, Hampshire PO7 8AA

noise.co.uk

1. Quality Management

Report Number	21840 – 1-R1
Issue	Revision 1
Prepared	29th March 2022
Prepared By	[redacted] Jonathan Seiffert BSc, AMIOA
Authorised By	[redacted] Bill Whitfield PhD, MSc, MIOA

2. Limitations

2.1.1. noise.co.uk Ltd ('Noise') has prepared this report for the sole use of Places for People Developments ('Client') in accordance with the Agreement under which our services were performed, proposal reference number 21840. No other warranty, expressed or implied, is made as to the professional advice included in this report or any other services provided by Noise. This report is confidential and may not be disclosed by the Client nor relied upon by any other party without the prior and express written agreement of noise.co.uk Ltd.

2.1.2. The conclusions and recommendations contained in this report are based upon information provided by others and upon the assumption that all relevant information has been provided by those parties from whom it has been requested and that such information is accurate. Information obtained by Noise has not been independently verified by Noise, unless otherwise stated in the report.

2.1.3. The methodology adopted and the sources of information used by Noise in providing its services are outlined in this report. The work described in this report was undertaken on the 29th March 2022 and is based on the conditions encountered and the information available up to the said date. The scope of this report and the services are accordingly factually limited by these circumstances.

2.1.4. Where assessments of works or costs identified in this report are made, such assessments are based upon the information available at the time and where appropriate are subject to further investigations or information which may become available.

2.1.5. Noise disclaim any undertaking or obligation to advise any person of any change in any matter affecting the report, which may come or be brought to Noise's attention after the date of the report.

2.1.6. Certain statements made in the report that are not historical facts may constitute estimates, projections or other forward looking statements and even though they are based on reasonable assumptions as of the date of the report, such forward-looking statements by their nature involve risks and uncertainties that could cause actual results to differ materially from the results predicted. Noise specifically does not guarantee or warrant any estimate or projections contained in this report.

2.1.7. Copyright: © This report is the copyright of noise.co.uk Ltd.

3. Executive Summary

3.1.1. An environmental noise assessment has been carried out for a proposed residential development at Havant and South Downs College, College Road, Hampshire, PO7 8AA ("Proposed Development").

3.2. Report Revision

3.2.1. This report has been revised to include the latest site layout ref 20.001.SK045.

3.3. Measurement, Assessment and Evaluation

3.3.1. The survey was carried out to BS7445-1:2003[1] and BS7445-2:1991[2] which are covered under our UKAS Accreditation.

3.3.2. The interpretation of the data and the specification of suitable mitigation or treatment are outside the scope of our UKAS accreditation but is covered in our 17025 Quality Management System and reporting procedure.

3.4. Scope

3.4.1. This report covers all aspects of the noise survey, including:

- the identification of acoustic design criteria;
- an objective sound pressure level survey of the existing site;
- analysis of the data; and,
- the design of any mitigation to meet the required internal noise criteria.

3.5. Conclusions Summary

3.5.1. The facade sound insulation required to meet the guideline values from BS8233:2014 are summarised in Table 1. The glazing performance has been specified in terms of the road traffic corrected weighted sound reduction index, $R_w + C_{tr}$, and the ventilator performance has been specified in terms of the road traffic corrected element normalised level difference $D_{ne,w} + C_{tr}$.

Living rooms (Daytime)	Bedrooms (Night-time)
Specification 1 – Facades facing College Road	
31dB $R_w + C_{tr}$ /37dB $D_{ne,w} + C_{tr}$	25dB $R_w + C_{tr}$ /31dB $D_{ne,w} + C_{tr}$
Specification 2 – Facades facing A3(M)	
30dB $R_w + C_{tr}$ /36dB $D_{ne,w} + C_{tr}$	28dB $R_w + C_{tr}$ /34dB $D_{ne,w} + C_{tr}$

Table 1 – Required facade sound insulation (Glazing/Ventilator)

[1] BS7445-1:2003 "Description and measurement of environmental noise – Part 1: Description of quantities and procedures"
[2] BS7445-2:1991 "Description and measurement of environmental noise – Part 2: Guide to the acquisition of data pertinent to land use"

5. Contents

1. Quality Management 2
2. Limitations 2
3. Executive Summary 3
5. Contents 4
6. Background 5
7. Introduction 7
8. Assessment Criteria 8
9. Survey 10
10. Mitigation 12
11. Conclusions 14
12. Appendix 15

6. Background

6.1. Noise Policy Statement for England

6.1.1. The Noise Policy Statement for England (NPSE), published in March 2010, states the long-term vision of Government noise policy is 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".*

6.1.2. This long-term vision is supported by the following aims; through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

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

6.1.3. The intention is that the NPSE should apply to all types of noise apart from noise in the workplace (occupational noise).

6.2. National Planning Policy Framework

6.2.1. The National Planning Policy Framework (NPPF) was published on the 27th of March 2012 and was most recently updated on the 20th July 2021; it sets out the Government's planning policies for England and how these are expected to be applied. The framework states that the planning system should contribute to and enhance the natural and local environment by:

> *"preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability".*

6.2.2. The NPPF requires that new developments be appropriate to their locations such that the effects of pollution on health have been taken into account. Planning policies and decisions should aim to:

1. avoid noise giving rise to significant adverse impacts on health and the quality of life;
2. mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development; and,
3. identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value.

6.2.3. Existing businesses near to proposed development 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.

6.3. National Planning Practice Guidance

6.3.1. The National Planning Practice Guidance (PPG) is a web-based resource, launched by the Department for Communities and Local Government (DCLG) which was published on the 29th November 2016 and is regularly updated to reflect the changes made to the NPPF and make it more accessible.[3]

[3] http://planningguidance.communities.gov.uk/

6.3.2. There are a number of factors that determine whether a noise could be a concern to a receptor. These include: the absolute level of the noise and when it occurs, whether it is existing or new to the area, temporal characteristics, spectral content and the acoustic absorption in the area.

Perception	Examples of outcomes	Effect level	Action
Not noticeable	No effect	No observed effect	No specific measures required
Noticeable and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect (NOAEL)	No specific measures required
Lowest Observed Adverse Effect Level (LOAEL)			
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level (SOAEL)			
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep 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
Noticeable and very intrusive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

Table 2 – Noise exposure hierarchy

6.3.3. It is emphasised in the PPG that the planning process should be used to mitigate and minimise the impact of noise. This could include: engineering the noise sources to be quiet, minimising the impact of noise through layout, using conditions/obligations to restrict activities, mitigating the impact in places where noise is likely to be experienced (e.g. using facade sound insulation).

7. Introduction

7.1.1. An environmental noise survey has been carried out for a proposed residential development at Havant and South Downs College, College Road, Hampshire, PO7 8AA.

7.2. Proposed Development

7.2.1. An image showing the proposed location and layout of the Proposed Development is given in Figure 1.

Figure 1 - Plan showing the layout of the Proposed Development

7.3. Noise Climate

7.3.1. The general noise climate was dominated by road traffic noise from College Road and the nearby A3(M).

8. Assessment Criteria

8.1. Guideline Values

BS8233:2014 Internal Ambient Noise Criteria

8.1.1. BS8233:2014 draws on the results of research and experience to provide information on the design of buildings that have internal acoustic environments appropriate to their function. The standard provides guideline internal values for dwellings for steady external noise sources. These have been summarised in Table 3.

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

Table 3 – BS8233:2014 guideline values for internal ambient noise levels from steady external noise sources

8.1.2. The guideline values are issued by the World Health Organisation (WHO) and assume normal diurnal fluctuations in external noise. They are expected to be achieved based on normal annual data and not in all circumstances. For example, it is normal to exclude occasional events such as fireworks night or New Year's Eve.

BS8233:2014 Garden Criteria

8.1.3. For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50dB $L_{Aeq,T}$ with an upper guideline value of 55dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognised that these guideline values are not achievable in all circumstances where development might be desirable. In such cases, the lowest practicable levels should be achieved in external amenity areas but the development should not be prohibited.

8.2. Ventilation Requirements

8.2.1. This section addresses ventilation issues that may conflict with the acoustic design of the building. They are provided for reference purposes only as this report is addressing the acoustic parameters of the development and building design only.

8.2.2. BS8233:2014 states that, if relying on closed windows to achieve the guideline values, there needs to be an appropriate alternative ventilation scheme that does not compromise the facade sound insulation or the resulting noise level. However, rooms should have adequate ventilation, i.e. trickle ventilators should be assumed to be open for any assessment. Ventilation requirements for dwellings are covered under Building Regulations Approved Document F[4] ("ADF"). It describes the purpose of ventilation as for the removal of stale air from inside a building and replacement with fresh air from outside.

8.2.3. ADF prescribes three types of ventilation provision:

1. **Whole dwelling ventilation** – running continuously (includes background ventilation)
2. **Extract ventilation** – removing vapour/pollutants from a space e.g. from bathrooms and kitchens
3. **Purge ventilation** – manually controlled rapid ventilation

8.2.4. ProPG[5] states that the internal noise guidelines are generally not applicable under "purge ventilation" conditions as defined by ADF, as this should only occur occasionally (e.g. to remove odour from painting and decorating or from burnt food). Where a means of ventilation is required as an alternative to open windows, there are four broad categories of ventilation system that each meet the requirements of ADF:

- **System 1** – Background ventilators and intermittent extract fans
- **System 2** – Passive stack ventilation
- **System 3** – Continuous mechanical extract ventilation (MEV)
- **System 4** – Continuous mechanical supply and extract with heat recovery (MVHR)

8.2.5. Systems 1-3 require penetrations in the facade to allow air to flow into and out of the building. In order to control the noise break-in from external noise sources, it should be checked that the penetration offers sufficient resistance to the passage of sound. The sound insulation of these, typically small, penetrations is often specified in terms of the element normalised sound pressure level difference, $D_{ne,w}$, which is often corrected for the spectrum shape of road traffic using the C_{tr} correction term.

8.2.6. Ventilation provisions, including open windows, will not necessarily meet cooling needs. Building Regulations Approved Document L2a[6] ("ADL2a") requires that overheating be mitigated by controlling the solar gains by means of building orientation, shading and the g-value of the glazing. It recommends that the developer assess the overheating risk using CIBSE TM 37.[7]

8.2.7. Where one of these assessments indicates that open windows are required to control overheating, consideration of the likely impact on future residents is required. An assessment methodology has been presented below, based on guidance published by the ANC.[8]

[4] Approved Document F: Means of Ventilation (2010 Edition)
[5] The Professional Practice Guidance on Planning and Noise, ANC, May 2017
[6] Approved Document L2a: Conservation of Fuel and Power (2013 Edition)
[7] CIBSE Guide TM 37 "Design for Improved Solar Shading Control"
[8] Acoustics Ventilation and Overheating – Residential Design Guide, January 2020

9. Survey

9.1. Measurement Locations

9.1.1. Fixed position monitoring took place at two positions to account for the likely dominant noise sources. The monitoring equipment was located 1.5m from the ground and at least 3m from the next nearest reflecting surface. The monitoring position is shown in Figure 2.

Figure 2 - Noise monitoring locations on site

9.1.2. The measurement instrumentation used during the survey is detailed in the appendix. The acoustic equipment was calibrated to comply with Section 4.2 of BS7445-1:2003[9] before and after the surveys. The calibration details are also detailed in the appendix.

9.2. Meteorology

9.2.1. During the survey the weather information was noted. This is summarised in Table 4.

	2nd November 2021	3rd November 2021
Roads(Wet/Dry)	Dry	Dry
Wind Speed (ms^{-1})/Direction	1 / N	2 / N

Table 4 - Meteorological data noted during the survey

[9] BS7445-1:2003 "Description and measurement of environmental noise – Part 1: Guide to quantities and procedures"

9.3. Measurement and Timescale

9.3.1. Unattended monitoring was carried out between 2nd November 2021 and 3rd November 2021. The measurements that have been made are summarised in Table 5.

Monitoring position	Date	Type	Quantity
1	02/11/2021 – 03/11/2021	Fixed/unattended	$L_{Aeq,5min}$
2	02/11/2021 – 03/11/2021	Fixed/unattended	$L_{Aeq,5min}$

Table 5 – Measurements made at the site of the Proposed Development

9.3.2. Sound pressure measurements were subsequently averaged into hourly, daytime and night-time periods. The acoustic measurements and their interpretation have been in accordance with BS 7445: Parts 1, and 2[10]. All sound pressure levels are in dB (re 20µPa).

9.4. Results Summary

9.4.1. The fixed position external measurement results are summarised in Table 6.

Measurement location	Daytime dB, $L_{Aeq,16hr}$	Night-time dB, $L_{Aeq,8hr}$
1	65.1	54.5
2	77.0	70.3

Table 6 - Summary of the external sound pressure levels measured

9.5. Distance Correction

9.5.1. The monitoring carried out at position 2 was located a significant distance from the development. For this reason a distance correction has been carried out to determine the sound pressure levels incident on the nearest proposed façade caused by the road traffic noise on the A3(M).

9.5.2. The formula for calculating the distance correction is given below:

$$L_{p_2} = L_{p_1} - 10 * Log\left(\frac{r_2}{r_1}\right)$$

Where: L_{p1} = measured sound pressure level at monitoring position

L_{p2} = predicted sound pressure level at receiver position

r_1 = Distance between the source and measurement location (15m)

r_2 = Approximate distance between the source and receiver (estimated using layout plan)

9.5.3. Table 7 shows the distance corrections and the corrected sound pressure levels to be used for the specification of mitigation.

Monitoring position	r_2	Correction	Corrected $L_{Aeq,16\ hour}$	Corrected $L_{Aeq,8hour}$
2	256m	-12.3dB	64.7dB	58.0dB

Table 7 - Distance corrections and corrected sound pressure levels

9.5.4. It should be noted that the above distance correction does not take into account differing terrain levels or screening and so would be considered a worst case scenario.

[10] BS7445-2:1991 "Description and measurement of environmental noise – Part 2: Guide to the acquisition of data pertinent to land use"

10. Mitigation

10.1. Methodology

10.1.1. Based on the measured and predicted free-field sound pressure levels at the worst affected facades, the simple calculation method from BS8233:2014 has been used to determine the necessary sound reduction to meet the guideline values. Standard forms of construction are assumed such that the glazing is likely to be the lowest performing facade element.

10.2. Required Mitigation

10.2.1. The single figure glazing and ventilator performance requirements in order to achieve the internal design criteria are summarised in Table 8. The glazing performance has been specified in terms of the road traffic corrected weighted sound reduction index, $R_w + C_{tr}$, and the ventilator performance has been specified in terms of the road traffic corrected element normalised level difference $D_{ne,w} + C_{tr}$.

Living rooms (Daytime)	Bedrooms (Night-time)
Specification 1 – Facades facing College Road	
31dB $R_w + C_{tr}$ /37dB $D_{ne,w} + C_{tr}$	25dB $R_w + C_{tr}$ /31dB $D_{ne,w} + C_{tr}$
Specification 2 – Facades facing A3(M)	
30dB $R_w + C_{tr}$ /36dB $D_{ne,w} + C_{tr}$	28dB $R_w + C_{tr}$ /34dB $D_{ne,w} + C_{tr}$

Table 8 – Required facade sound insulation (Glazing/Ventilator)

10.3. Glazing and Ventilator Specifications

10.3.1. The glazing and ventilator performance has been specified based on the performance data provided by Saint-Gobain and Greenwood Airvac. These are suggested configurations and any other glazing and vent combination can be used provided it achieves the minimum performance levels given in Table 8. The recommended glazing specification is given in Table 9.

Living rooms (Daytime)	Bedrooms (Night-time)
Specification 1 – Facades facing College Road	
Saint Gobain 4(6)6	Saint Gobain 4(12)4
Specification 2 – Facades facing A3(M)	
Saint Gobain 4(6)6	Saint Gobain 4(12)6

Table 9 - Our recommended glazing configurations

10.3.2. Should penetrations be required for ventilation purposes our recommended ventilator configurations, calculated to work in conjunction with the above glazing specifications, are summarised in Table 10. The specification provides an equivalent area of at least 5000mm^2. It should be checked by a suitably qualified person that this ventilator specification meets the requirements of Approved Document F.[11]

[11] Approved Document F: Means of Ventilation (2010 Edition)

Living rooms (Daytime)	Bedrooms (Night-time)
Specification 1 – Facades facing College Road	
Greenwood 5000EAW.AC1	Greenwood 5000EA
Specification 2 – Facades facing A3(M)	
Greenwood 5000EAW.AC1	Greenwood 5000EAW.AC1

Table 10 - Our recommended ventilator configurations.

10.3.3. Given the assumptions in this method the information in this section should be treated as general guidance only. The acoustic performance of third party products cannot be guaranteed by noise.co.uk.

10.4. Element 3: External Amenity Area Noise Assessment

10.4.1. BS8223 states that it is desirable that the external noise level for amenity spaces, such as gardens and patios, does not exceed 50dB $L_{Aeq,T}$ with an upper guideline value of 55dB $L_{Aeq,T}$ which would be acceptable in noisier environments.

10.4.2. However, the standard acknowledges that there may be areas where development is desirable where these guideline values are not achievable. This will be true for higher noise areas such as city centres or urban areas adjoining the strategic transport network. In these situations, a compromise between elevated noise levels and other factors might be warranted, such as:

- the convenience of living in these locations; and/or,
- making efficient use of land resources to ensure development needs can be met.

10.4.3. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited.

10.4.4. In this case, all of the garden areas are set back from the roads and so the inclusion of close boarded garden fences, with a minimum mass per unit area of 10kg/m^2 would be considered to provide the lowest practicable levels.

11. Conclusions

11.1.1. An environmental noise survey has been carried out at the site of a proposed residential development at Havant and South Downs College, College Road, Hampshire, PO7 8AA to determine typical ambient sound levels. The sound levels have been used to calculate the required facade sound insulation to meet the guideline internal levels from BS8233:2014.

11.1.2. Table 8 in section 10 gives the required facade sound reduction by any glazing and ventilator combination to be compliant with the guideline values.

11.1.3. We strongly recommend that this report be passed to the local planning authority for approval prior to any works being carried out.

12. Appendix

APPENDIX A: Summary Information

Required ISO Test Report Information (cross referenced where required)			
		Measurements carried out to:	Analysed to:
A	Standards	BS 7445-1: 2003 BS 7445-2: 1991	BS 8233:2014
B	Organisation performed the measurements	noise.co.uk Ltd, The Haybarn, Newnham Grounds, Kings Newnham Lane, Bretford, Coventry, CV23 0JU.	
C	Name of Client	Places for People Developments	
D	Full site address	Havant and South Downs College College Road, Hampshire PO7 8AA	
E	Date of surveys	Survey Date: 2nd November 2021 – 3rd November 2021	
F	Description & identification of Proposed Development	It is proposed to develop the site for residential use.	
G	Brief Description of details of Procedure & equipment	See Section 5 of this report.	

APPENDIX B: Technical Appendix

12.1.1. Measurements were made using the following equipment:

Monitoring Position	Sound Level Meter (Serial Number)	Calibrator (Serial Number)
1	SoftdB Piccolo 2 (PO221070105)	BSWA CA114 (590010)
2	SoftdB Piccolo 2 (PO221070104)	BSWA CA114 (590010)

12.1.2. The equipment has traceable calibration. The sound level meter was calibrated immediately prior to and immediately after the measurements were carried out.

Sound Level Meter	Before	After
SoftdB Piccolo 2 (PO221070105)	94.0 dB	94.0 dB
SoftdB Piccolo 2 (PO221070104)	94.0 dB	94.0 dB

12.1.3. There was no adverse deviation.

APPENDIX C: Glazing Markup Plan

Living rooms (Daytime)	Bedrooms (Night-time)
Specification 1 – Facades facing College Road	
31dB $R_w + C_{tr}$ /37dB $D_{ne,w} + C_{tr}$	25dB $R_w + C_{tr}$ /31dB $D_{ne,w} + C_{tr}$
Specification 2 – Facades facing A3(M)	
30dB $R_w + C_{tr}$ /36dB $D_{ne,w} + C_{tr}$	28dB $R_w + C_{tr}$ /34dB $D_{ne,w} + C_{tr}$