Chartered Building Consultancy

Acoustic South East

Noise Impact Assessment Residential Development

Site: **15a South Farm Road, Worthing**
Client: **Pristwood Ltd**

Report by:	Simon Barrett BSc(Hons) MSc MIOA MInstSCVE
Checked by:	Scott Castle BSc(Hons) CEnvH MCIEH MIOA
Date:	28/10/2025
Project:	J4095
Issue:	2

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Issue No.	Date	Comment(s)
1	8/10/2025	Initial Issue
2	28/10/2025	Corrected Flat numbering

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1 Introduction

Acoustic South East have been appointed to undertake an acoustic assessment of noise incident upon the proposed residential development at 15a South Farm Road, Worthing.

This report will be used as a technical document for the planning application.

Standards and guidance referenced for this assessment include:

- National Planning Policy Framework (NPPF) 2024
- BS8233 (Guidance on sound insulation and noise reduction for buildings 2014
- ProPG:2017 (Professional Practice Guidance on Planning and Noise)
- Approved Document O Overheating
- Approved Document E Resistance to the Passage of Sound 2003 (amended 2015)
- BS 6472 Guide to evaluation of human exposure to vibration in buildings 2008

A class 1 sound level meter (SLM) was installed at the front of the site to measure the sound pressure level incident upon the site over a period of 6 days and 7 nights.

Additionally, a Vibration Meter has been installed within the proposed first floor property to measure Vibration Dose Values (VDVs) experienced from Train Pass-by Events.

The Assessment has been carried out against the requirements of BS8233:2014 in terms of daytime and night-time average noise levels. Assessment has also been carried out against the criterion of ProPG:2017 in terms of Night-time Lmax noise levels in bedrooms.

The assessment shows that mitigation measures would be required in terms of glazing and ventilation due to the noise levels incident upon the property both during the day and night-time periods and also due to high numbers of night-time Lmax levels.

The glazing will need to be acoustically enhanced, also with acoustically enhanced ventilation.

The Assessment has also been carried out in relation to Outdoor Amenity Areas and in terms of Overheating Compliance for Approved Document O.

Sound Insulation Testing has also been carried out to show the level of Airborne Sound Insulation Performance between the ground floor commercial unit and the proposed 1st floor studio flat. This has shown to have a performance value of $D_{nT,w}$ + Ctr = 50dB. This is typically the requirement set out by the Local Authority (Adur and Worthing District Council) for floors which separate commercial and residential units and thus no additional work will be required for the separating floor/ceiling.

An assessment of vibration has also been undertaken and has shown to have effect which is below the “Low Probability of Adverse Comment” level defined in BS6472. Therefore, no mitigation in terms of vibration is required.

All mitigation measures are provided in Section 4 of this report and if adopted, it is recommended that planning consent is not withheld on noise grounds.

2 Context, Noise Criteria & Noise Assessment Methodology

2.1 Context and Location

It is proposed that the 1st floor kitchen relating to No. 15 South Farm Road, Worthing (which is a commercial unit) is to be re-developed into a new, separate, studio flat at the first-floor level and re-numbered to be “15a”. Number 15 on the ground floor remains as a commercial unit. The current windows in the application building (first floor) do not close / fit properly.

To the north of the site is the Chichester/Portsmouth – to – Brighton railway line but this is blocked from direct view by the existing 1st floor flat which lays between this proposed flat and the railway line, however a Level Crossing is visible from the east window.

To the East is South Farm Road, which is the main road which passes by the site and often sees traffic stationary at the Level Crossing, or a significant level of traffic passing.

To the South is Orme Road, a very minor road for accessing other residential properties.

To the West are residential properties.

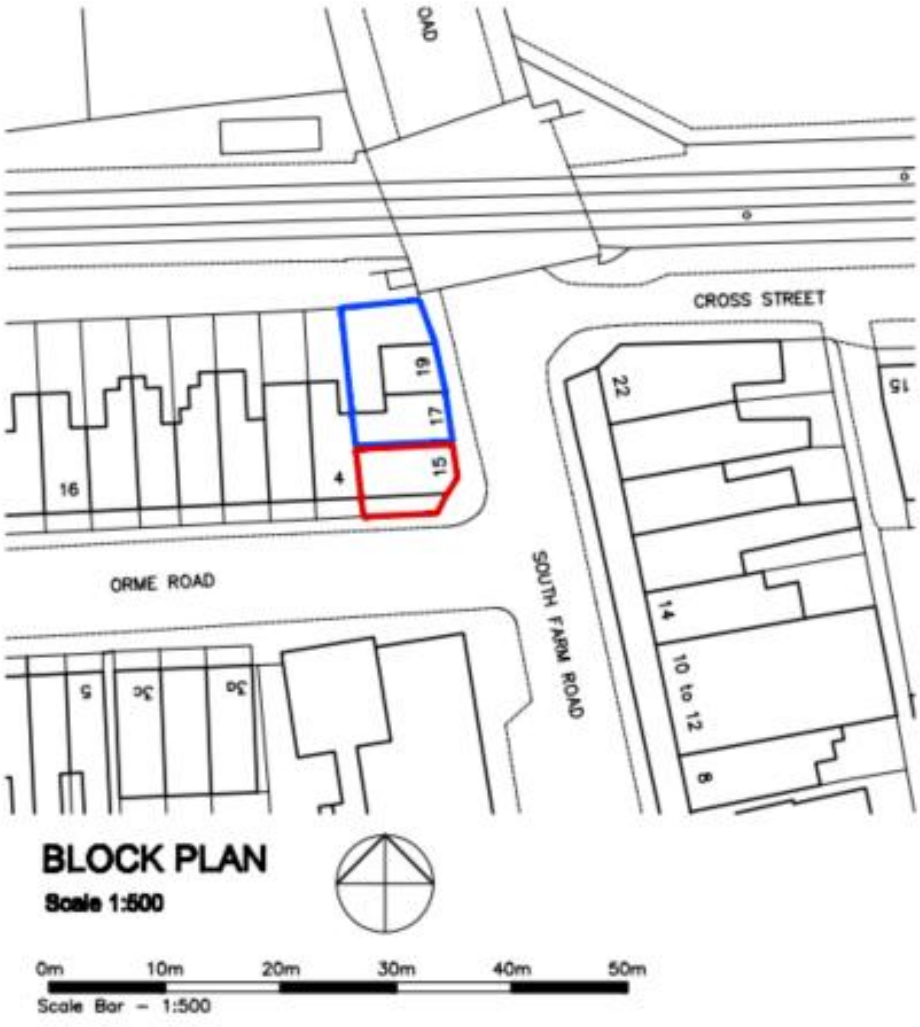


Figure 1. Location Plan showing the site

2.2 National Planning Policy Framework 2024

The National Planning Policy Framework (2024) defines the Government's planning policies for England and how these are expected to be applied. It sets out the Government's requirements for the planning system only to the extent that it is relevant, proportionate and necessary to do so.

The following paragraphs are relevant within NPPF Section 15 (Conserving and enhancing the natural environment) states the following:

Paragraph 187(e) - Preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability, and

Paragraph 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 impact 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

Paragraph 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.

2.3 BS8233 Guidance on Sound Insulation and Noise Reduction for Buildings 2014

Table 4 of BS8233:2014 provides the following guideline values but with enhanced daytime requirements.:

Activity	Location	Time period of day	
		07:00-23:00	23:00-07:00
Resting	Living Rooms	35dB $L_{Aeq,16hour}$	-
Dining	Dining Room/Area	40dB $L_{Aeq,16hour}$	-
Sleeping (daytime resting)	Bedroom	30dB $L_{Aeq,16hour}$	30dB $L_{Aeq,8hour}$

Table 1. BS8233:2014 Criteria

2.4 ProPG Planning and Noise 2017

Planning guidance (ProPG2017) relates to new residential development and airborne transportation noise, which includes exposure to road traffic, railway and aviation noise. Whilst ProPG, 2017 generally mirrors the requirements of BS8233:2014 and the World Health Organisation Guidelines, 1999, it goes further in setting a limit for inside bedrooms for L_{Amax} events and specifically, no more than 10 L_{Amax} events per night time period above 45dB(A).

The internal bedroom L_{AMax} values will be used in accordance with ProPG2017.

2.5 Building Regulations – Approved Document O

Recently introduced Part O of the building regulation requires an assessment of whether bedroom windows can be opened at night. It is assumed that bedroom windows will be closed if either of the conditions below are met:

- Internal noise level exceeds 40dB $L_{Aeq, 8hour}$
- L_{Amax} events exceed 55dB L_{Amax} more than 10 times a night.

Whilst this is strictly a Building Regulations function, it is relevant to be able to convey to the client whether bedroom windows are likely to be openable during the night time period.

2.6 Methodology and Approach

To ensure that sufficient information is presented to accompany the assessment, the following approach is taken:

1. Measure the existing outdoor LAeq Ambient Sound Pressure Levels on site for the period of approximately 6-7 days and nights, to include weekdays and a weekend
2. Measure the vibration dose values within the 1st floor unit
3. Assess the daytime and night-time average ambient sound pressure levels measured on site against the (enhanced) criteria of BS8233:2014 and the night-time Lmax criteria of ProPG:2017 and consider the basic overheating implications on the internal acoustics
4. Assess the VDVs against the criterion within BS 6472
5. Report the results and discuss mitigation measures if required
6. Conclude

3 Noise Survey Details

A Class 1 sound level meter was set up to run, unattended, from Monday 29th September – Monday 6th October 2025. The microphone was positioned at first floor level (4m) at the front of the site (South Farm Road) at 1m from the facade. It follows that all measurements were at façade-level.

The Survey included a weekend and used a 1-minute resolution, consistent with the approach required in the Planning Noise Advice Document Sussex 2023

The weather conditions were still and dry, with the exception of Friday PM and Saturday AM thus suitable for environmental monitoring once the high-wind periods were removed.

It is worthy to note also that the microphone locations were close to the proposed building line at both the front and rear of the site and thus no distance corrections will be needed.

3.1 Sound Survey Details

Survey(s) carried out by	Simon Barrett BSc(Hons) MSc MIOA
Equipment Used	1x Svantek SV971a Class 1 Sound Level Meter
Duration	Monday 29th September 2025 – Monday 6th October 2025
Survey Location	What3Words: ///former.poet.driver

Table 2. Survey Equipment - Sound

N.B. Raw measurement data is available upon request



Figure 2: Image showing survey location

3.2 Survey Results – Daytime and Night-time Average Noise Levels

3.2.1 External Ambient Sound Pressure Levels

The data has been processed into Daytime LAeq,16hr and Night-time LAeq,8hr data for each day and an arithmetic-average has been provided.

Additionally, columns have been added to show the BS8233:2014 criteria for daytime and night-time and the Sound Reduction Index (SRI) of the building envelope required to achieve this.

The table below shows the results of the site – these values are freefield values, having been converted from the façade level by reducing them by 3dB.

Survey Day	Daytime 07:00 – 23:00hrs $L_{eq,16hr}$ (dBA)	Night-time 23:00 – 07:00hrs $L_{eq,8hr}$ (dBA)	BS8233:2014 Criteria $L_{Aeq,(16hr\ /\ 8hr)}$ dB		SRI Required (dB)	
			Day	Night	Day	Night
Front of Site						
Mon	-	54.7	35	30	-	24.7
Tue	63.0	55.0	35	30	28.0	25.0
Wed	63.1	54.7	35	30	28.1	24.7
Thurs	63.3	56.5	35	30	28.3	26.5
Fri	63.2*	57.3*	35	30	-	-
Sat	63.2*	54.9	35	30	-	24.9
Sun	61.6	54.9	35	30	26.6	24.9
Arithmetic Mean	**62.7**	**55.1**	**30**	**30**	**27.7**	**25.1**

Table 3: Survey Results – External Ambient Sound Pressure Levels

In table 2, above, the asterisked values in the highlighted cells are values measured during periods of excessive wind speeds during the recent “Storm Amy” and have been removed from the overall arithmetic mean value. It is worthy to note, however, that in removing these values from the average, the overall arithmetic mean value only changed by -0.2dB for the daytime and -0.3dB for the night-time.

As can be seen in the final two columns, the average SRI required to enable the daytime LAeq criterion to be achieved is 28dB (rounded) during the daytime and 25dB (rounded) during the night-time hours.

3.2.2 Night-time Lmax Levels

As well as the daytime and night-time period continuous equivalent average noise levels the other metric to consider for this site is the A-Weighted Maximum sound pressure levels (LAmax) experienced in a bedroom over the night-time period.

The measurements have been carried out and an assessment has shown that with a typical closed window in-situ and open typical trickle-vents (for background ventilation), which is typically accepted to provide 21dB attenuation, there would be an average of 157 occurrences of the Lmax value exceeding 45dBA internally.

This is shown in Table 4, below:

LAmax over 45dBA	Avg	Night 1	Night 2	Night 3	Night 4	Night 5	Night 6	Night 7
21dB façade attenuation (closed window, open trickle vents)	157	157	135	137	154	219	164	135
34dB façade attenuation	6	6	8	5	8	5	5	3

Table 4: LAmax exceeding 45dB internally with 21dB (standard) facade attenuation

In order for the front of the site to be compliant with ALL nights having no more than 10 occurrences exceeding Lmax 45dBA internally, a sound insulation of 34dB would be required. This is also shown in Table 4.

Additional Mitigation measures would therefore be required for Lmax criterion to be met and these are the over-ruling requirement as they are more onerous than those required to comply with the criteria of BS8233, set out in Section 2.4 of this report.

4 Noise Mitigation

As discussed in Section 3, above, the sound insulation of the building envelope at the front of the building will need to be upgraded to provide a sound insulation of at least 34dB in order for the Night-time Lmax to be controlled to the requirements of ProPG:2017 for the proposed studio flat.

A BS8233 “Rigorous Calculation” has been carried out to show what glazing & ventilation arrangements would provide at least 34dB sound reduction relevant to the front bedroom of the top floor flat utilising the dimensions of windows and wall materials.

The rigorous calculation is included in the appendices of this report but the breakdown of the window and ventilators recommended for each situation are in the following sub-sections.

4.1 Glazing

The Rigorous Calculation has shown that to satisfy the BS8233 requirements, using an acoustically enhanced double-glazing with a specification of 6mm glass, 12mm cavity, 10mm glass would be required along for each window for this studio flat. This ventilation specification above, according to Pilkington Glass, is capable of providing a sound reduction of Rw = 38dB and RTra = 32dB. Therefore, any alternative glazing brand should match this performance specification. It is also important to note that this is the specification of the glass alone – when set in a frame it is likely to perform 2 – 3dB lower. Therefore, it is recommended to obtain a specification with 2-3dB higher value (i.e. Rw 40dB – Rw 41dB) unless the manufacturers have specifically tested the product when set in its frame.

4.2 Ventilation

Acoustically enhanced natural ventilator such as the Rytons AAC125HP would be required, if you are intending on utilising natural ventilation. If an alternative brand natural ventilation unit is specified, the sound insulation performance (denoted as Dn,e,w) should match for the “open” position. Therefore, anything with a performance of Dn,e,w = 43dB or higher would be acceptable.

An alternative ventilation approach would be to utilise mechanical ventilation with heat recovery (MVHR). If MVHR is employed for any of the properties, it is necessary to note that the operating internal noise levels need to be between 24-26dBA otherwise there is a high risk that the occupant would switch them off, causing major ventilation issues for the property.

5 Approved Document O

The newly introduced Building Regulations Document (ADO) creates two very specific criteria to determine if windows are likely to be closed during the night time period as follows with both parameters relating to sound pressure levels inside the bedroom environment.

Noise

3.2 In locations where external noise may be an issue (for example, where the local planning authority considered external noise to be an issue at the planning stage), the overheating mitigation strategy should take account of the likelihood that windows will be closed during sleeping hours (11pm to 7am).

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

a. 40dB $L_{Aeq,T}$, averaged over 8 hours (between 11pm and 7am).

b. 55dB L_{AFmax}, more than 10 times a night (between 11pm and 7am).

3.4 Where in-situ noise measurements are used as evidence that these limits are not exceeded, measurements should be taken in accordance with the Association of Noise Consultants' *Measurement of Sound Levels in Buildings* with the overheating mitigation strategy in use.

Figure 3. Extract from Approved Document O

It is relevant to note that the ADO assessment is a simplified assessment only and relates simply to whether future occupiers are able to open bedroom windows during then night time period (ie 23:00-07:00 hours) in order to mitigate thermal overheating. A simplified assessment may only be carried out where the external soundscape is below 50dB $L_{Aeq,8\ hour}$. For this site, the studio flat does not satisfy this criterion.

If a simplified assessment is not capable of being achieved, ie the external Leq is above 50dB at night, then an openable window area assessment may be carried out to determine the extent of an openable window. The SRI is the difference between 40dB internally and the external value (in this instance, the night value is 55dB) therefore the difference/SRI will be 15dB.

The calculation provides a result that an equivalent area of 0.35m^2 is required and has been found using the following equation:

Equation 1[8]

$$EA\ based\ on\ façade\ level\ difference = V \times 10^{\left(\frac{-(D_{2m,nT}+5)}{10}\right)}$$

Where

$D_{2m,nT}$ is the is the façade level difference between the A-weighted level 2m in front of the façade ($L_{1,2m}$), and the standardised internal A-weighted level ($L_{eq,2,nT}$). In the absence of any better alternative method, the same principle can be applied to L_{AFmax}.

V is the room volume (m^3)

EA is the Equivalent Area of the open window (m^2)

Equation 2[8]

$$EA\ based\ on\ freefield\ level\ difference = V \times 10^{\left(\frac{-(D_{nT}+8)}{10}\right)}$$

Figure 4: Equivalent Area of open window for overheating compliance

Please note that equation 1 has been used and the values fed into the equation are:

$D_{2m,nT}$ = 55dBA

V = 70m^3

It should be recognised that a standard through frame slot trickle vent is approximately 2500mm^2. This equates to 0.0025m^2. Therefore, an openable window of any less than this will not be practical. The data should be shared with your M+E/overheating consultant.

The above data should be used by the client in combination with a detailed overheating dynamic risk assessment to determine the risk of overheating, where this occurs and what mitigation measures may be required to facilitate cooling of bedrooms.

The requirements of ADO apply only to new residential properties at first floor level (or above).

The table below shows a simplified assessment for acoustics relating to overheating:

6 Sound Insulation Commercial to Residential

6.1 Introduction

As the proposed first floor studio flat will be a change of use, it is required that a sound insulation test between the remaining ground floor commercial and the first-floor unit is measured to ensure that it satisfies Approved Document E 2003 (amended 2015) of the Building Regulation 2010 for airborne sound insulation, plus any enhanced requirements:

It is often the case that Adur and Worthing District Council require an airborne sound insulation of $D_{nT,w}$ + C_{tr} = 50dB or higher for floors separating commercial units from residential units.

6.2 Survey Details

Measurements were carried out of the airborne sound insulation performance of the floor separating the ground floor and first floor units on 29th September 2025 using the following method:

Two loudspeakers were placed facing into the corners, separated from each other, at different heights in the source room and angled across the room to create a diffuse sound field. An amplifier was used to broadcast pink noise through the loudspeakers using two individual noise generators. The spectrum shape of the reverberant noise was checked to ensure that each 1/3 octave band was within 6 dB of its neighbouring bands. The spectrum shape was adjusted, if necessary, to comply with this criterion (Firstly loudspeaker position/s are adjusted until the criterion is achieved).

Measurements were taken in the source room at each 1/3 octave band centre frequency between 100 Hz and 3.15 kHz using the “sweep” technique as described in ISO140 (30 secs.). Further measurements were then taken in the same way in the receiving room on the other side of the test element. The reverberation time was also obtained using the interrupt stationery method for each 1/3 octave centre frequency in the receiving room. This was spatially averaged over 6 positions in the room using 1 source position.

Ambient sound pressure levels (without the source operating) were also taken at each frequency in the receiving rooms using the “sweep” technique as described in ISO140 (30 secs) to check that ambient noise levels were at least 10 dB below the measured levels due to generated noise and thus did not contribute to the measured levels. These too were spatially-averaged. Type of noise radiated: Broadband pink noise. Dominant sources of background noise were as follows: Road Traffic

Equipment used:

Description	Type	Serial	Manufacturer	Calibration Expiry Date	Calibration Certificate No.
Type 1 SLM	NOR118(A)	31460	Norsonic	9/6/2027	TCRT25/1449
Mic (118A)	1225	91973	Norsonic	9/6/2027	TCRT25/1449
Pre-Amp (118A)	1206	30779	Norsonic	9/6/2027	TCRT25/1449
SLM Calibrator	Type 1251 (Nor118A)	30974	Norsonic	5/6/2025	TCAC25/1438
Sound Source	2 Speaker (RCF)	TCCI00033/ TCCI00031	ART SERIES 310-A MK4	-	-

Table 5: Sound Insulation Test Equipment Used

N.B. Calibration certificates are available on request.

6.3 Results

The table below shows the result of the airborne sound insulation test:

Source Room	Receiving Room	DnT,w (dB)	DnT,w + Ctr (dB)	Minimum Pass Criterion (dB)	Minimum Pass Criterion Local Authority Enhancement (dB)	Pass/Fail	Test Reference
Ground Floor Commercial	First Floor Proposed Studio Flat	58	50	≥43	≥50	Pass (Both)	J4095/1

Table 6: Sound Insulation Test Result

N.B. For the purposes of interpretation of the tabulated data above, with airborne sound insulation it is the level difference that is being measured between rooms and the higher the result the better the insulation.

Please note that graphical representation of this result is available to view in the appendices of this report.

As can be seen, the airborne sound insulation performance meets the typical Local Authority enhanced requirement for airborne sound insulation between commercial and residential units as well as the basic Approved Document E requirements.

Therefore, no additional measures would be required to further enhance this sound insulation.

7 Vibration

A Semex-EngCon “Menhir” Vibration Meter was set up within the first-floor application unit on the nominal floor layer (carpet pulled back temporarily) to measure the vibration dose values (VDV) experienced within the building during the daytime and night time periods.

Survey(s) carried out by	Simon Barrett BSc(Hons) MSc MIOA MInstSCVE
Equipment Used	Semex-EngCon Menhir (S/N: V24282886)
Location	1st Floor Proposed Studio Flat by South Farm Road Façade
Duration	29th September 2025 to 6th October 2025

Table 7. Vibration Survey Data



Figure 5: Vibration Meter in Situ

7.1 Vibration Survey Details

The Menhir tri-axial accelerometer was installed on site within the proposed new studio flat given that it was already in a suitable form. The meter was placed on the timber floor with the carpet temporarily pulled back in order for the meter to be properly seated and with a good connection to the building. The X-axis was perpendicular to the road and inline with the direction of the railway line close by. The Y-axis was perpendicular to the railway line close by and perpendicular to South Farm Road and the Z axis was the vertical axis. The meter was set up to record continuously and in 30-second intervals. It used a 4G connection to record directly to the cloud for results to be stored and obtained.

7.2 Frequency Weighting

The manner in which people perceive building vibration depends on various factors, including the vibration frequency and direction. Different frequency weightings are required for different axes of motion. BS6472:2008 states which frequency weightings should be used for each axis. The weighting curve modulus for vertical acceleration is *W*b and *W*d for horizontal motion. The weighting curves are defined in BS 6841. The Menhir survey equipment was set up so that the correct frequency weightings were applied to the measurements.

7.3 VDV Measurements

The effect of building vibration on the people within is assessed by finding the appropriate vibration dose. Present knowledge shows that this type of vibration is best evaluated with the vibration dose value (VDV). The VDV is given by the fourth root of the time integral of the fourth power of the acceleration after it has been frequency-weighted. The Menhir calculates the 30-second VDV values internally.

Due to the survey setup time being part way through the hour and also midway through the day, this event is incomplete in itself. Likewise, the event on the survey collection date was stopped before the daytime period was up. The data is reported as incomplete.

Measurements started at 08:50 hours on the 1st October 2025 and ceased at 09:12 hours on 6th October 2025. The VDV values have been summed to show the VDV_{day} and VDV_{night} values:

$$VDV_{day} = \left(\sum_{23:00hrs}^{07:00hrs} VDV_{hr}^{\ 4} \right)^{0.25}$$

$$VDV_{night} = \left(\sum_{07:00hrs}^{23:00hrs} VDV_{hr}^{\ 4} \right)^{0.25}$$

	VDV Day				VDV Night			
Axis	**X**	**Y**	**Z**		**Axis**	**X**	**Y**	**Z**
Day 1*	0.00	0.00	0.00		Night 1	0.00	0.00	0.00
Day 2	0.00	0.00	0.00		Night 2	0.00	0.00	0.00
Day 3	0.00	0.00	0.01		Night 3	0.00	0.00	0.00
Day 4	0.00	0.00	0.01		Night 4	0.00	0.00	0.00
Day 5	0.00	0.00	0.00		Night 5	0.00	0.00	0.00
Day 6*	0.00	0.00	0.00					
*Denotes incomplete measurement periods								

Table 8: Measured Vibration Data for each Daytime and Night-time Period

The criteria from BS6472 have been replicated below for ease of reference.

Table 1 **Vibration dose value ranges which might result in various probabilities of adverse comment within residential buildings**

Place and time	Low probability of adverse comment $m \cdot s^{-1.75}$ 1)	Adverse comment possible $m \cdot s^{-1.75}$	Adverse comment probable $m \cdot s^{-1.75}$ 2)
Residential buildings 16 h day	0.2 to 0.4	0.4 to 0.8	0.8 to 1.6
Residential buildings 8 h night	0.1 to 0.2	0.2 to 0.4	0.4 to 0.8

Figure 6. BS6472:2008 Vibration Criteria

Freight trains do pass the site with differing configurations including aggregate trains and these typically occur at around 12:30pm each day.

As can be seen from the measurement data and comparing this with the criteria in Figure 10, the VDVs experienced within the proposed studio flat are below the levels of “Low probability of adverse comment” and thus no mitigation will be required in terms of vibration.

8 Conclusion (see front page)

An Acoustic Assessment and Vibration Assessment have been carried out at 15a South Farm Road where a material change of use from commercial unit to 1st floor studio flat is proposed.

The acoustic assessment has been carried out against the requirements of BS8233:2014 but with an enhanced criterion for daytime due to the area being amongst daytime commercial sites. Assessment has also been carried out against the criterion of ProPG:2017 in terms of Night-time Lmax noise levels in bedrooms.

The assessment has shown that mitigation measures would be required in terms of glazing and ventilation due to the noise levels incident upon the property both during the day and night-time periods and also due to high numbers of night-time Lmax levels.

The glazing will need to be acoustically enhanced, also with acoustically enhanced ventilation.

An assessment has also been carried out in relation to Overheating Compliance for Approved Document O.

Sound Insulation Testing has also been carried out to show the level of Airborne Sound Insulation Performance between the ground floor commercial unit and the proposed 1st floor studio flat. This has shown to have a performance value of $D_{nT,w}$ + Ctr = 50dB. This is typically the requirement set out by the Local Authority for floors which separate commercial and residential units and thus no additional work will be required for the separating floor/ceiling.

An Assessment of Vibration has also been undertaken and has shown to have effect which is below the “Low Probability of Adverse Comment” level defined in BS6472:2008. Therefore, no mitigation in terms of vibration is required.

All mitigation measures are provided in Section 4 of this report and if adopted, it is recommended that planning consent is not withheld on noise grounds.

Appendix A – BS8233 Rigorous Calculation

The purpose of this rigorous calculation is to show the façade elements required to achieve a sound reduction of the building envelope of 34dB or higher.

Non Frequency Dependent Variables		
Term	Derivation	Value
A_o	Given in BS EN 20140-10 = 10 (m^2)	10
S_f	Total Facade Area (m^2)	55.2
S_{wi}	Window Area (m^2)	4.5
S_{ew}	External Wall Area (m^2)	50.7
S_{rr}	Ceiling Area (m^2)	0.001
S	Total Area sound enters the room (m^2)	55.2

Key for Table Below	
R_{wi}	Sound Reduction of Window (Octave)
R_{ew}	Sound Reduction Index of External Wall (Octave)
R_{rr}	Sound Reduction Index of Roof/Ceiling (Octave)
A	Equivalent Absorbtion Area of Rx Room
$D_{n,e}$	Insulation of Trickle Vent (BS EN 20140-10)

Frequency Dependent Variables							
		Octave Band Centre Frequency					
Term	Description	125	250	500	1000	2000	4000
$L_{eq,ff}$	Free-Field External Noise Level	64.6	60.6	58.6	58.6	55.6	48.6
$D_{n,e}$	Rytons AAC125HP	48	45.8	49.9	64.2	66	73.4
R_{wi}	10_12_6	26	27	34	40	38	46
R_{ew}	Composite Wall - Calculated for Flat B	54	64	74	103	128	134
R_{rr}	No Roof	100	100	100	100	100	100
A	Equivalent Absorbtion Area of Room (Copied from BS8233)	11.00	14.00	16.00	16.00	15.00	15.00

BS8233 Calculation Details						
	Octave Band Centre Frequency					
Term From Equation Below	125	250	500	1000	2000	4000
$L_{eq,ff}$	64.6	60.6	58.6	58.6	55.6	48.6
Ao/S . 10^(-Dn,e/10)	2.871E-06	4.76E-06	1.85E-06	6.88749E-08	4.55052E-08	8.28058E-09
Swi/S . 10^(-Rwi/10)	0.0002048	0.000163	3.25E-05	8.15217E-06	1.29203E-05	2.04773E-06
Sew/S . 10^(-Rew/10)	3.657E-06	3.66E-07	3.66E-08	4.6033E-11	1.45569E-13	3.65653E-14
Srr/S . 10^(-Rrr/10)	1.812E-15	1.81E-15	1.81E-15	1.81159E-15	1.81159E-15	1.81159E-15
10log10(S/A)+3	10.005464	8.95811	8.378191	8.378190951	8.658478187	8.658478187
Leq,2	37.854481	31.80572	22.33679	16.12748753	15.38648151	0.388739127
A-Weighting	-16.1	-8.6	-3.2	0	1.2	1
A-Weighted Leq	**21.754481**	**23.20572**	**19.13679**	**16.12748753**	**16.58648151**	**1.388739127**

A-Weigted Level Outside	**63**
BS8233 Predicted Internal A-Weigted Level	**27**
Prediced Building Envelope SRI	**35**

BS8233 Calculation can be seen below:

$$L_{eq,2} \approx L_{eq,ff} + 10\log_{10}\left(\frac{A_0}{S}10^{\frac{-D_{n,e}}{10}} + \frac{S_{wi}}{S}10^{\frac{-R_{wi}}{10}} + \frac{S_{ew}}{S}10^{\frac{-R_{ew}}{10}} + \frac{S_{rr}}{S}10^{\frac{-R_{rr}}{10}}\right) + 10\log_{10}\left(\frac{S}{A}\right) + 3$$

Appendix B – Sound Insulation Test Graph

Standardized level difference according to ISO 140-4
Field measurements of airborne sound insulation between rooms

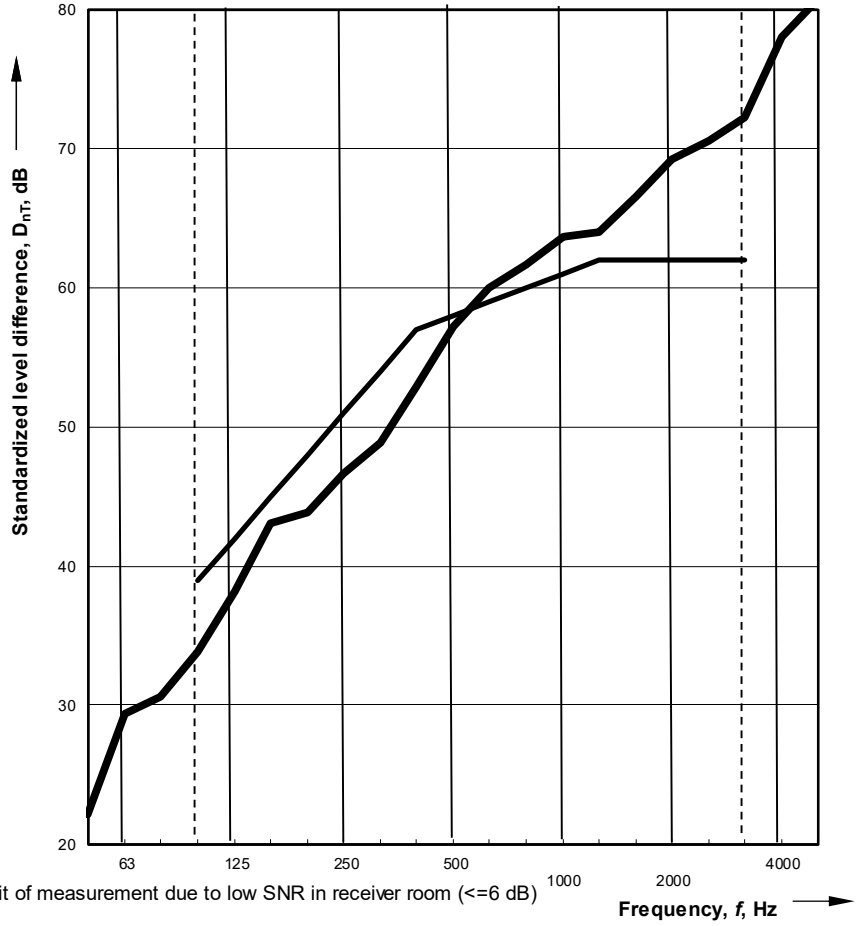
Client: Pristwood Ltd Date of test: 29/09/2025

Description and identification of the building construction and test arrangement, direction of measurement:
19a South Farm Road, Worthing
No. 15 Commercial Unit - No 15a Proposed Studio Flat (Vertical)

Source room volume: 75 m³
Receiving room volume: 70 m³

Frequency range according to the curve of reference values (ISO 717-1)

Frequency *f* Hz	D_{nT} (one-third octave) dB	
50	22.1	
63	29.4	
80	30.6	
100	33.8	
125	38.2	
160	43.1	
200	43.8	
250	46.6	
315	48.9	
400	52.9	
500	57.2	
630	60.0	
800	61.7	
1000	>= 63.7	*
1250	>= 64.0	*
1600	>= 66.6	*
2000	69.2	
2500	70.6	
3150	72.2	
4000	78.0	
5000	80.7	



* Result should be taken as limit of measurement due to low SNR in receiver room (<=6 dB)

Rating according to ISO 717-1

$D_{nT,w}$ (C;C_{tr}) = 58 (; -8) dB; $D_{nT,w} + C_{tr}$ = 50 dB

Evaluation based on field measurement
results obtained by an engineering method

No. of test report: J4095/1 Name of test institute: Acoustic South East
Date: 08/10/2025 Signature: Simon Barrett