

Acoustic South East



Noise Impact Assessment Change of Use to Residential

Site: **11 Market Square Horsham**

Client: **Mr. Paul Rooney**

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Date: 23/02/2026
Project: J4165
Issue: 1

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Issue No.	Date	Comment(s)
1	23/02/2026	Initial Issue

This report has been prepared by Acoustic South East with all reasonable skill, care and diligence and presents information included within the scope agreed with the client. If any third party whatsoever comes into possession of this report, they rely on it at their own risk and Acoustic South East accepts no duty or responsibility (Including in negligence) to any such third party.

1 Introduction

Acoustic South East have been appointed to undertake an acoustic assessment of noise incident upon the proposed redevelopment of a commercial unit into a residential dwelling.

The Local Authority has requested a noise impact assessment be carried out due to the number of restaurants and cafes operating in the vicinity.

This report will be used as a supporting 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)
- BS4142:2014+A1:2019 (Methods for rating and assessing industrial and commercial sound)
- ProPG:2017 (Professional Practice Guidance on Planning and Noise)
- Planning Noise Advice Document Sussex 2023

A class 1 sound level meter (SLM) was installed at the front of the site only (the rear is surrounded completely by residential properties) to record the sound pressure levels incident upon the site at the front over a period of 7 days and nights.

Assessment has been carried out against the requirements of BS8233:2014 but with an enhanced criterion for daytime period 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 L_{max} noise levels in bedrooms.

Due to the Grade II listed nature of the property, a measurement of the existing front façade sound insulation performance was carried out (windows closed).

The assessment has found that the required sound reduction for the daytime period of 07:00 – 23:00hrs is 22dB. For the night-time period of 23:00 – 07:00hrs, the required sound reduction is 20dB.

However, night-time also requires the L_{max} to be considered and for this property to be compliant, a total sound reduction of 35dB 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 vacant commercial unit is to be re-developed into a residential dwelling. The building is Grade II listed.

To the north of the site are commercial buildings which include restaurants and cafes and for this reason the Local Authority has requested a noise impact assessment to check that the building envelope can resist the sound from these outfits.

The figure below shows the site, outlined in red.



Figure 1. The proposed 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 BS4142:2014+A1:2019 Criteria

This document provides a means of assessing the impact of industrial or commercial sound upon nearby noise-sensitive receptors, including residential properties.

It does this by comparing the Rating Level of the noise from the industrial or commercial source with the pre-existent L_{90} background noise level affecting the same noise-sensitive premises. The Standard provides guidance that:

- a) Typically, the greater the difference, the greater the magnitude of the impact.
- b) A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- c) A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context.

- d) The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background noise level, this is an indication of the specific sound source having a low impact, depending on the context.

Section 8.5 of BS4142:2014+A1:2019 states that where residential is being introduced to an area of existing commercial sound where there is no control over mitigation at source, it is wise to consider the use of an alternative noise criterion standard.

Typically, in this situation it is wise to consider assessing against BS8233:2014 but enhancing the criteria by 5dB. In this instance, only the daytime will see enhanced criteria as all the immediately-local industry/commercial outfits close before the night-time period begins.

2.4 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	30dB $L_{Aeq,16hour}$ (Enhanced)	-
Dining	Dining Room/Area	35dB $L_{Aeq,16hour}$ (Enhanced)	-
Sleeping (daytime resting)	Bedroom	30dB $L_{Aeq,16hour}$ (Enhanced)	30dB $L_{Aeq,8hour}$ (NOT Enhanced)

Table 1. BS8233:2014 Criteria

2.5 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.

2.6 Methodology and Approach

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

1. Measure the existing LAeq Ambient and background Sound Pressure Levels on site for the period of approximately 6-7 days and nights, to include weekdays and a weekend.
2. Measurements will be carried out in facade conditions and converted to free-field thereafter.
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.
4. Report the results and discuss mitigation measures if required.
5. Conclude.

3 Noise Survey Details

A Class 1 sound level meter was set up to run, unattended, from Wednesday 4th February – Wednesday 11th February 2025. The microphone was positioned out of a 1st floor window (1-metre from the façade) to remain secure whilst measuring the outdoor sound pressure levels incident upon the building. It follows that all measurements were at “façade level”.

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 mixed wet/dry, but suitable for environmental monitoring.

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

3.1 Survey Details

Survey(s) carried out by	Simon Barrett BSc(Hons) MSc MIOA
Equipment Used	1x Svantek SV971a Class 1 Sound Level Meter
Duration	Wednesday 4 th February 2026 – Wednesday 11 th February 2026
Survey Location	What3Words: ///lowest.bless.snaps

Table 2. Survey Equipment - Sound

N.B. Raw measurement data is available upon request

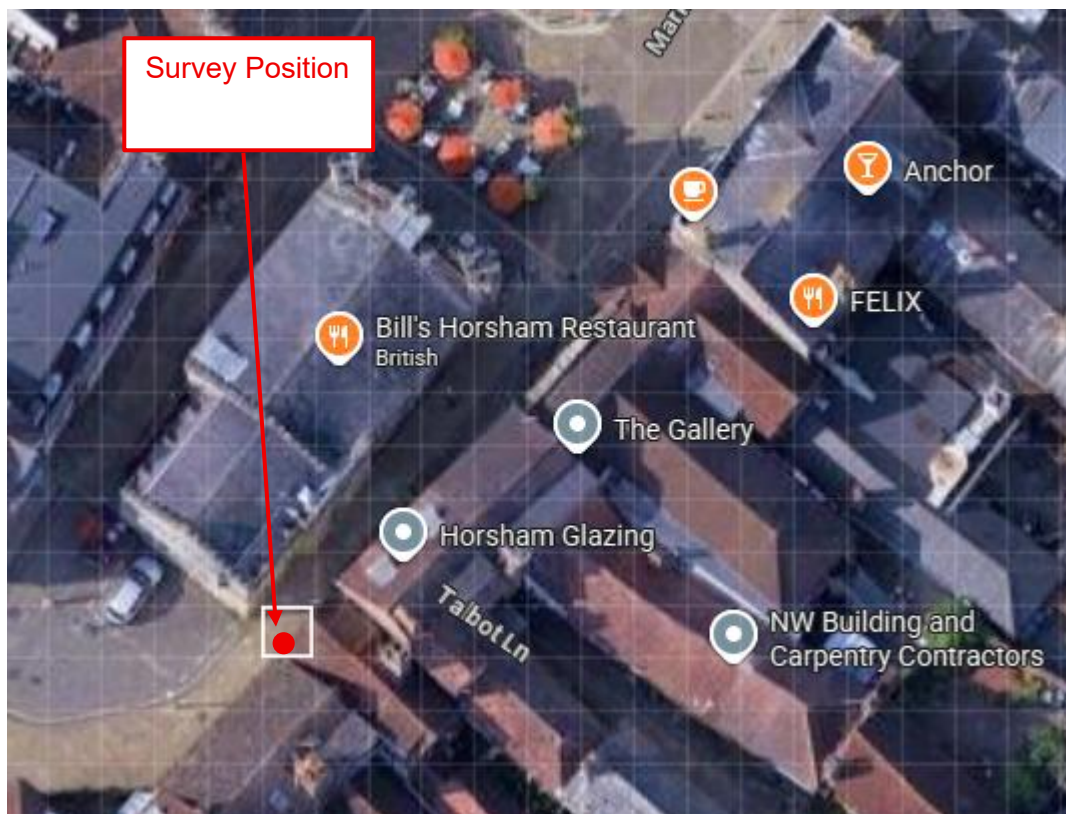


Figure 2: Image showing survey locations

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 for the site, these were measured as façade levels, but the final row sees the values converted to Freefield by the reduction of 3dB.:

Survey Day	Daytime 07:00 – 23:00hrs LAeq,16hr (dBA)	Night-time 23:00 – 07:00hrs LAeq,8hr (dBA)	BS8233:2014 Criteria LAeq,(16hr / 8hr) dB		SRI Required (dB)	
			Day	Night	Day	Night
Day 1	53.5	50.8	30	30	23.5	20.8
Day 2	55.2	54.8	30	30	25.2	24.8
Day 3	56.4	51.5	30	30	26.4	21.5
Day 4	53.6	52.6	30	30	23.6	22.6
Day 5	52.6	55.7	30	30	22.6	25.7
Day 6	59.1	51.2	30	30	29.1	21.2
Day 7	-	54.5	30	30	-	24.5
Arithmetic Mean (rounded) Façade	55.1	53	30	30	25.1	23
Arithmetic Mean (rounded) Free-field	52.1	50	30	30	22.1	20

Table 3: Survey Results – External Ambient Sound Pressure Levels

As can be seen in the final two columns, the average SRI required to enable the daytime LAeq criterion to be achieved is 22dB (values are rounded to the nearest 1dB).

The average SRI required to enable the night-time LAeq criterion to be achieved is 20dB (values are rounded to the nearest 1dB).

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 partially open window in-situ which is typically accepted to provide 13dB attenuation, there would be an average of 81 occurrences of the Lmax value exceeding 45dBA internally.

This is shown in the table below:

LAmax over 45dBA (measured attenuation)	Average	Night 1	Night 2	Night 3	Night 4	Night 5	Night 6	Night 7
Front of Site	81	64	78	116	84	94	49	82

Table 4: LAmax exceeding 45dB internally with the measured 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 35dB would be required.

Additional Mitigation measures would therefore be required for the Lmax criterion to be met and these are the over-ruling requirement for the front façade as they are more onerous than those required to comply with the (enhanced) criteria of BS8233, set out in Section 2.4 of this report. It is important to state that the LAmax SRI requirements relate to bedrooms only

4 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 35dB in order for the Night-time L_{max} to be controlled to the requirements of ProPG:2017 for the proposed front bedrooms as well as the (enhanced) daytime requirements of BS8233 for the front façade, which require at least 22dB sound reduction.

As this building is Grade II Listed, it is highly unlikely that the glazing can be replaced. Therefore, a measurement of the building's façade sound insulation was carried out during the survey to see how much sound insulation it had when windows were closed. This was found to be 20dB, which is clearly lower than the daytime 22dB SRI requirement and the night-time SRI requirement of 35dB.

The first line of defence against noise from the front façade would be to carry out good acoustic design - this would entail arranging the layout such that bedrooms do not face out on to the front façade and will be thus protected.

4.1 Glazing

If it is not possible to re-arrange the internal layout as above, due to the listed nature of the building, it would be necessary to install secondary glazing which is capable of providing sufficient sound insulation. In this case, the necessary performance would be R_w 35dB or higher ($R_{Traffic}$ is not necessary as road traffic does not pass-by the building). Assuming the existing glass is 3mm thick (single glazing) it has been calculated using the "Insul" sound insulation prediction software that using a cavity of 100mm and a secondary pane of 6mm glass will provide a sound reduction of R_w 44dB.

4.2 Ventilation

Given that this is a material change of use from a commercial property to a residential property, the likelihood is that background ventilation will need to be considered also, for compliance with Approved Document F. If so, then acoustically enhanced ventilation will be required for any bedrooms that remain on the front façade. In order to work out which is sufficient, a BS8233 "Rigorous Calculation" will be carried out (see appendices).

The calculation has found that the following natural ventilation units would be suitable:

- Rytons 9x9 Airliner LookRyt
- Rytons AAC125HP
- Greenwood MH3501

4.3 Outdoor Amenity Areas

Up to this point, all assessment has been with regard to internal ambient noise levels. BS8233:2014 (and WHO Guidelines) state that in order to avoid "moderate annoyance" in outdoor amenity areas, the Daytime $L_{eq,16hr}$ should be no higher than 50dBA and in order to avoid "serious annoyance", the Daytime $L_{eq,16hr}$ should be no higher than 55dBA.

Measurements occurred at the front façade only, as this was the location exposed to public and commercial sounds. During the daytime, the LAeq,16hr was measured as 52dBA.

There are, however, no amenity areas at the front of the building. To the rear, however, there is a small outdoor courtyard area, which is significantly shielded from the commercial and public sound, so the ambient sound pressure level here would be significantly lower and thus below 50dBA.

This would satisfy the requirement for outdoor amenity areas.

5 Conclusion

An Acoustic Assessment has been carried out at 11 Market Square, Horsham to assess the sound incident upon the property from the environment, especially as restaurants exist out to the front, which the Local Authority was concerned about.

Whilst BS8233:2014 has been used as the assessment criteria, due to the nature of the area having a commercial element, an enhanced daytime criterion has been used (30dBA internally rather than 35dBA).

The assessment has found that the required sound reduction for the daytime period of 07:00 – 23:00hrs is 22dB. For the night-time period of 23:00 – 07:00hrs, the required sound reduction is 20dB.

However, night-time also requires the L_{max} to be considered and for this property to be compliant, a total sound reduction of 35dB 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 to show sufficient sound reduction

Non Frequency Dependent Variables			Key for Table Below	
Term	Derivation	Value	R _{wi}	Sound Reduction of Window (Octave)
A _o	Given in BS EN 20140-10 = 10 (m ²)	10	R _{ew}	Sound Reduction Index of External Wall (Octave)
S _f	Total Facade Area (m ²)	5	R _{rr}	Sound Reduction Index of Roof/Ceiling (Octave)
S _{wi}	Window Area (m ²)	1.1	A	Equivalent Absorption Area of Rx Room
S _{ew}	External Wall Area (m ²)	3.9	D _{n,e}	Insulation of Trickle Vent (BS EN 20140-10)
S _{rr}	Ceiling Area (m ²)	30		
S	Total Area sound enters the room (m ²)	35		

Frequency Dependent Variables							
Term	Description	Octave Band Centre Frequency					
		125	250	500	1000	2000	4000
Leq,ff	Free-Field External Noise Level	54.9	50.9	48.9	48.9	45.9	38.9
D _{n,e}	Greenwood MA3051	46.7	46.3	49	55.7	66.3	69.3
R _{wi}	3/100/6	19	34	43	49	51	53
R _{ew}	Cavity brickwork with ties 102/50/102 plastered on both sides	34	34	40	56	73	76
R _{rr}	Tiles on felt, pitched roof, lath and plaster ceiling	47	47	47	47	47	47
A	Equivalent Absorption Area of Room (Copied from BS8233)	11.00	14.00	16.00	16.00	15.00	15.00

BS8233 Calculation Details						
Term From Equation Below	Octave Band Centre Frequency					
	125	250	500	1000	2000	4000
Leq,ff	54.9	50.9	48.9	48.9	45.9	38.9
A _o /S . 10 [^] (-D _{n,e} /10)	6.108E-06	6.7E-06	3.6E-06	7.6901E-07	6.6978E-08	3.35685E-08
S _{wi} /S . 10 [^] (-R _{wi} /10)	0.0003957	1.25E-05	1.58E-06	3.95662E-07	2.49646E-07	1.57516E-07
S _{ew} /S . 10 [^] (-R _{ew} /10)	4.436E-05	4.44E-05	1.11E-05	2.79896E-07	5.58466E-09	2.79896E-09
S _{rr} /S . 10 [^] (-R _{rr} /10)	1.71E-05	1.71E-05	1.71E-05	1.71022E-05	1.71022E-05	1.71022E-05
10log10(S/A)+3	8.0267536	6.9794	6.399481	6.399480617	6.679767853	6.679767853
Leq,2	29.584753	16.94666	10.53918	7.982174379	4.991360397	-2.04074227
A-Weighting	-16.1	-8.6	-3.2	0	1.2	1
A-Weighted Leq	13.484753	8.346655	7.339181	7.982174379	6.191360397	-1.04074227

A-Weighted Level Outside	53
BS8233 Predicted Internal A-Weighted Level	17
Predicted Building Envelope SRI	36

BS8233 Calculation can be seen below:

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