

BS8233 & BS4142 ASSESSMENT

OF 13 ELM GROVE,

HAYLING ISLAND

PO11 9EA

10th December 2025

Prepared by:

James Flitton AMIOA



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1.0 Introduction

- 1.01 E2 Consultants have been commissioned to undertake a noise impact survey and assessment for a proposed conversion of a first-floor office area to a residential dwelling at 13 Elm Grove, Hayling Island PO11 9EA.
- 1.02 The methodology used for this assessment will be BS8233:2014 as this is a new development within the designated area. BS4142:2014+A1:2019 will also be considered with the possibility of industrial noise to the rear of the proposed dwelling from a nearby extraction unit.
- 1.03 The report will also issue recommendations of acoustic performance of glazing and, if required, ventilation proposals in order for the future dwelling to meet all necessary criteria.

2.0 Development Description

- 2.0.1 The proposed dwellings are in the first-floor area above a salon at 13 Elm Grove, Hayling Island PO11 9EA. The rear of the property overlooks a car-parking area with adjacent retail and residential units.
- 2.0.2 The development consists of the conversion of this first-floor office space into two flats, one of them being a studio and the other a one-bedroom dwelling.
- 2.0.3 The main noise sources likely to disrupt the proposed building are traffic and patron noise to the front of the building and any car parking plus industrial noise to the rear.
- 2.0.4 With the above sources in mind the monitoring took place at 2 locations. One with a microphone out of windows to the front, and one to the rear of the property. These locations would ascertain the background noise for the area and also if there is any existing noise impact from the extraction unit from the adjacent Indian restaurant.

2.1 Location of Monitors

- 2.1.1 Two Type 1 sound level meters were installed at first floor level within the existing property. The meters were positioned out of windows to measure external noise at the façade point of the windows.
- 2.1.2 Figure 1-2 shows the area where the monitors were installed.
- 2.1.3 All locations are displayed on site map in figure 3.

Figure 1 – TV Stand Area



Figure 2 – Nearest NSR Boundary

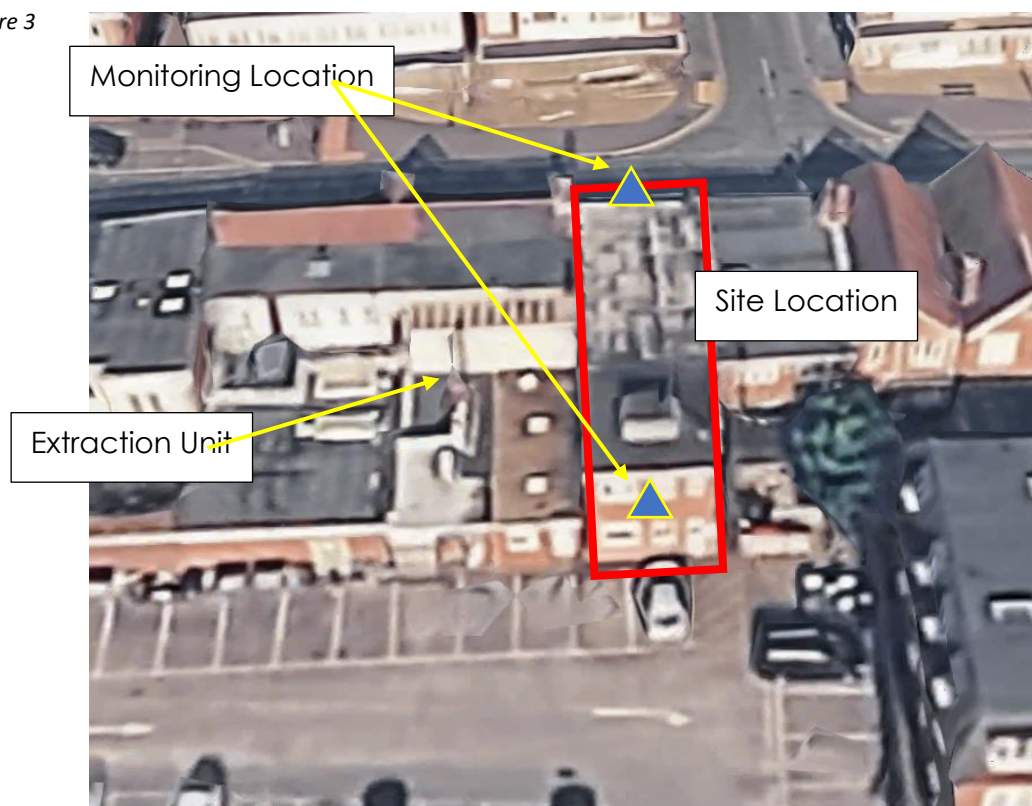


- 2.1.4 The data was averaged into L_{Aeq_16hr} daytime and L_{Aeq_8hr} night-time with data also recorded for L_{Amax} in both day and night periods for the BS8233:2014 assessment. Data was also collected to create L_{Aeq_1hr} daytime and L_{Aeq_15min} night-time periods for the BS4142:2014 assessment. L_{A90s} and 1/1 & 1/3 Octave band data was also collected.

- 2.1.5 The monitoring was conducted using 2 x Type 1 NTi XL2 sound level meters, outdoor case with batteries and outdoor microphone protection.
- 2.1.6 The measurements were taken by a fully qualified engineer with AMIOA status with the institute of Acoustics.
- 2.1.7 All measurements were taken after a field calibration was undertaken to ensure accuracy and repeatability of measurements. Drift was also checked post-measurement to validate the data collected.
- 2.1.8 Further data such as wind speed, wind direction, rainfall intensity, temperature and cloud cover were all recorded at the beginning and end of the assessment at the monitoring location.
- 2.1.9 Any anomalies (such as noise by the engineer during setup and collection of the kit) were removed from the survey for a true reflection of the ambient levels in the vicinity. This was done by recording audio throughout the survey at each location and listening back through the files during the analysis process to confirm what was recorded manually during the survey.
- 2.1.10 Care was taken to inform any residents in the area that audio recording was taking place.

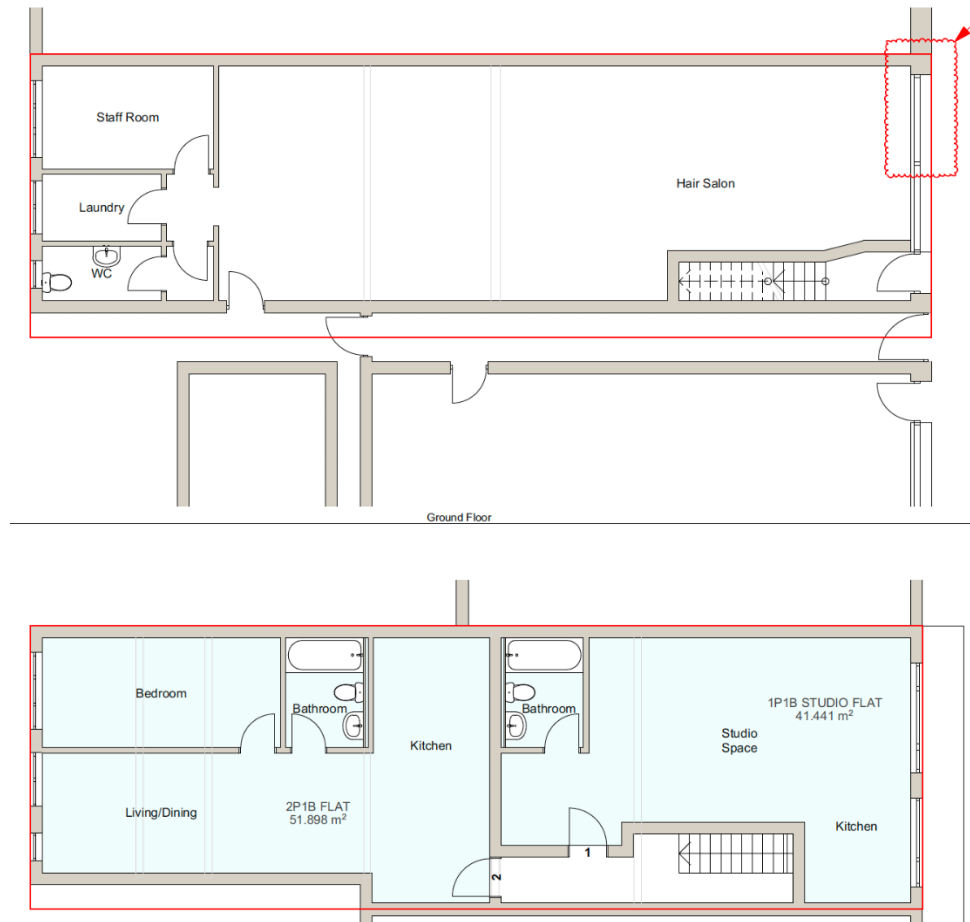
2.2 Plan Views of Site with Designated Work Areas

Figure 3



2.3 Proposed Layout

Figure 4



3.0 Noise Assessment Criteria

- 3.0.1 The National Planning Policy Framework (NPPF) sets out the Government's economic, environmental and social planning policies for England and "these policies articulate the Government's vision of sustainable development." In respect of noise, Paragraph 174 of the NPPF states the following:

"Planning policies and decisions should contribute to and enhance the natural and local environment by:

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."

Paragraph 185 goes on to mention:

"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;"

- 3.0.2 The NPPF reinforces the March 2010 DEFRA publication, "Noise Policy Statement for England" (NPSE), which states three policy aims, as follows:

"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;
- and where possible, contribute to the improvement of health and quality of life."

- 3.0.3 Together, the first two aims require that no significant adverse impact should occur and that, where a noise level which falls between a level which represents the lowest observable adverse effect and a level which represents a significant observed adverse effect, then according to the explanatory notes in the statement:

“... all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life whilst also taking into consideration the guiding principles of sustainable development. This does not mean that such effects cannot occur.”

3.0.4. It is possible to apply objective standards to the assessment of noise and the effect produced by the introduction of a certain noise source may be determined by several methods, as follows:

- The effect may be determined by reference to guideline noise values. British Standard (BS) 8233:2014 and World Health Organisation (WHO) “Guidelines for Community Noise” contain such guidelines.
- Another method is to compare the resultant noise level against the background noise level (L_{A90}) of the area. This is the method employed by BS 4142:2014 to determine the likelihood of complaint from noise of an industrial nature. It is best suited to the assessment of steady or pseudo-steady noise.

3.0.5 British Standard 8233:2014 is principally intended to assist in the design of new dwellings; however, the Standard does state that it may be used in the assessment of noise from new sources being brought to existing dwellings.

3.0.6 The WHO guideline values are appropriate to what are termed “critical health effects”. This means that the limits are at the lowest noise level that would result in any psychological or physiological effect.

The WHO/BS 8233 guideline noise values are summarised in the following table:

Table 1

Guidance Document	L _{AeqT}	L _{AMax}	Outcome
World Health Organisation "Community Noise 2000"	55dB		Serious annoyance, daytime and evening. (Continuous noise, outdoor living areas)
	50dB		Moderate annoyance, daytime and evening. (Continuous noise, outdoor living areas).
	35dB		Moderate annoyance, daytime and evening. (Continuous noise, dwellings, indoors)
	30dB		Sleep disturbance, night-time (indoors)
		60dB	Sleep disturbance, windows open at night. (Noise peaks outside bedrooms, external level).
		45dB	Sleep disturbance at night (Noise peaks inside bedrooms, internal level)
BS 8233:2014 "Sound Insulation and noise reduction for buildings"	55dB		Upper limit for external steady noise. (gardens and patios).
	50dB		Desirable limit for external steady noise. (gardens and patios).
	L _{Aeq} 16 hours = 35 dB		Resting, living room day. (Internal – steady noise)
	L _{Aeq} 16 hours = 40 dB		Dining, dining room day. (Internal – steady noise)
	L _{Aeq} 16 hour = 35 dB		Sleeping, bedroom day (Internal – steady noise)
	L _{Aeq} 8 hours = 30 dB		Sleeping, bedroom day (Internal – steady noise)

3.0.7 For L_{AeqT} criteria the time base (T) given in the documents is 16 hours for daytime limits and 8 hours for night time limits. All surveys are conducted on 1 hour daytime and 15 minute night values – based on 1 second readings on a Type 1 sound level meter.

The readings are taken every 5 mins for noise to allow the elimination of erroneous data if required.

- 3.0.8 The WHO guidelines are also concerned with the $L_{A\text{Max}}$ for night-time sleep disturbance. The guideline states:

“For a good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45 dB $L_{A\text{Fmax}}$ more than 10-15 times per night”

- 3.0.9 On this basis, for the purpose of assessing night-time $L_{A\text{Fmax}}$ noise events, it is considered appropriate to adopt the 10th highest $L_{A\text{Fmax}}$ noise event occurring in a typical night-time (23:00 – 07:00) period.

- 3.0.10 Audio recordings are taken throughout the measurements to allow for further assessments on high levels. Listening to the audio and performing tonal analysis will allow anomalies to be removed from the data, if required.

- 3.0.11 BS8233 also provides more specific guidelines for Hotels and halls of residence:

The noise level in any hotel bedroom, with windows closed, from all external sources, including road, rail and air traffic and noise from activities outside the hotel and any adjacent premises, are to be within the range of average noise levels in Table H.3

Table H.3

Indoor ambient noise level ranges for hotel bedrooms	
Period	Noise level
Daytime (07:00 – 23:00 hrs)	30 – 40 dB $L_{Aeq,1\text{hour}}$
Night-time (23:00 – 07:00 hrs)	25 – 35 dB $L_{Aeq,1\text{hour}}$
Night-time (23:00 – 07:00 hrs)	45 – 55 dB $L_{A\text{max}}$

3.1 BS4142:2014 +A1 (2019)

- 3.1.1 Noise effects on residential properties and the proposed hotel itself have been assessed according to the guidance in BS 4142:2014. This standard primarily provides a numerical method by which to determine the significance of sound of an industrial nature (i.e. the ‘specific sound’ from the proposed development) at residential sensitive receptors.
- 3.1.2 The specific sound level may then be corrected for the character of the sound (e.g. perceptibility of tones and/or impulses), if appropriate, and it is then termed the ‘rating level’, whether or not a rating penalty is applied. The ‘residual sound’ is defined as the ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound.
- 3.1.3 According to BS 4142:2014, the background sound levels adopted for the assessment should be representative of the periods being assessed. The standard recommends that the background sound level should be collected from continuous measurements of normally not less than 15-minute intervals. However, the Standard states that there is no ‘single’ background sound level that can be derived from such measurements. It is particularly difficult to determine what is ‘representative’ of the night-time period

because it can be subject to a wide variation in background sound levels between the shoulder night periods.

- 3.1.4 The method chosen for this section of the report is to use the data collected at the nearest NSR for the day and night periods to provide the ambient and background noise levels. The mode $L_{Aeq_1hr(Day)}$ and $L_{Aeq_15min(Night)}$ value will then be used for each time period over the course of the measurement as the most appropriate way of creating a representative value.
- 3.1.5 The specific sound levels have been determined separately in terms of the L_{Aeq1hr} during the daytime $L_{Aeq15min}$ during the night-time. Daytime is typically between 07:00 and 23:00 hours and night-time is typically between 23:00 and 07:00 hours, so these periods have been adopted for this assessment.
- 3.1.6 At each of the most likely sensitive receptor locations, the rating level has been determined from the predicted specific sound level. Where it has considered it to be appropriate, a rating penalty has been applied for tonality, impulsivity and/or intermittent specific sounds as described in the commentary to paragraph 9.2 of BS4142:2014. This has been applied with consideration for the main sound sources from site that contribute to the level of specific sound at the receptor location.
- 3.1.7 As per the requirements of the standard, an initial estimate of the impact of the specific sound has been obtained by subtracting the measured background sound level from the rating level of the specific sound. Table 2 provides the initial evaluation of impact following this method.

Table 2

Magnitude	Difference Between rating Level and Background Level	Comments
High	+10dB	Significant Adverse impact Likely
Medium	+5 to +10dB	Adverse impact Likely
Low	0 to +5 dB	Low chance of Adverse Impact
Negligible	Less than 0dB	Low chance of Adverse Impact

- 3.1.8 Following the initial evaluation of impact, the context of the sound has also been considered, which is a key requirement of the Standard. In evaluation of the context, the following factors have been considered:
- the absolute level of the sound;
 - the character and level of the residual sound compared to the character and level of the specific sound and
 - the sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions.

4.0 Results

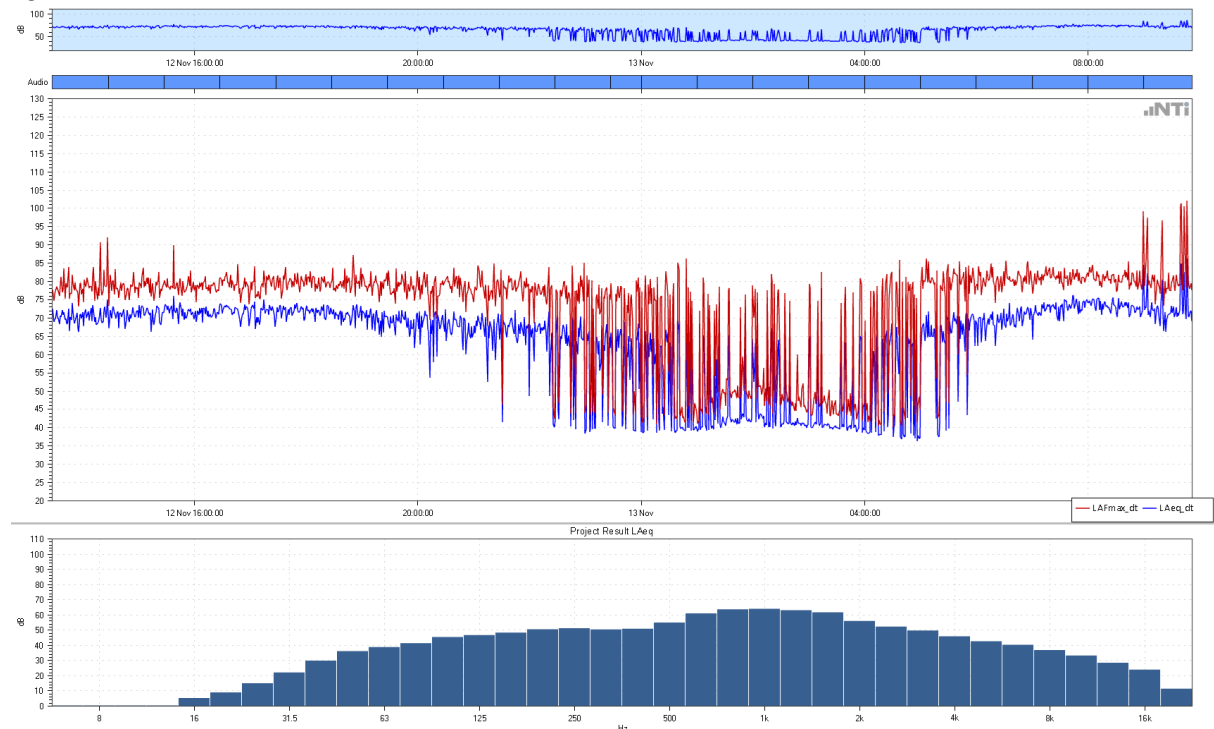
4.1 Front/Elm Grove 12/11/25 13.35pm -

Table 3

Location	L _{Aeq_1hr}	L _{Aeq_16hr}	L _{Aeq_15min}	L _{Aeq_8hr}	L _{Amax} (10th highest)	L _{A90}
Day 0700-2300	71.8dBA	71.0dBA				60.8dBA
Night 2300-0700			62.6dBA	60.4dBA	84.3dBA	38.2dBA

4.1.1 Comments: High traffic noise with some shouting from passing patrons

Figure 5



Day/Time	Cloud Cover	Temperature (Celcius)	Presence of fog/snow/ice	Wind Speed (m/s)	Wind Direction
Installation	5	11	No	0.9	NW
Collection	3	8	No	1.5	NNW

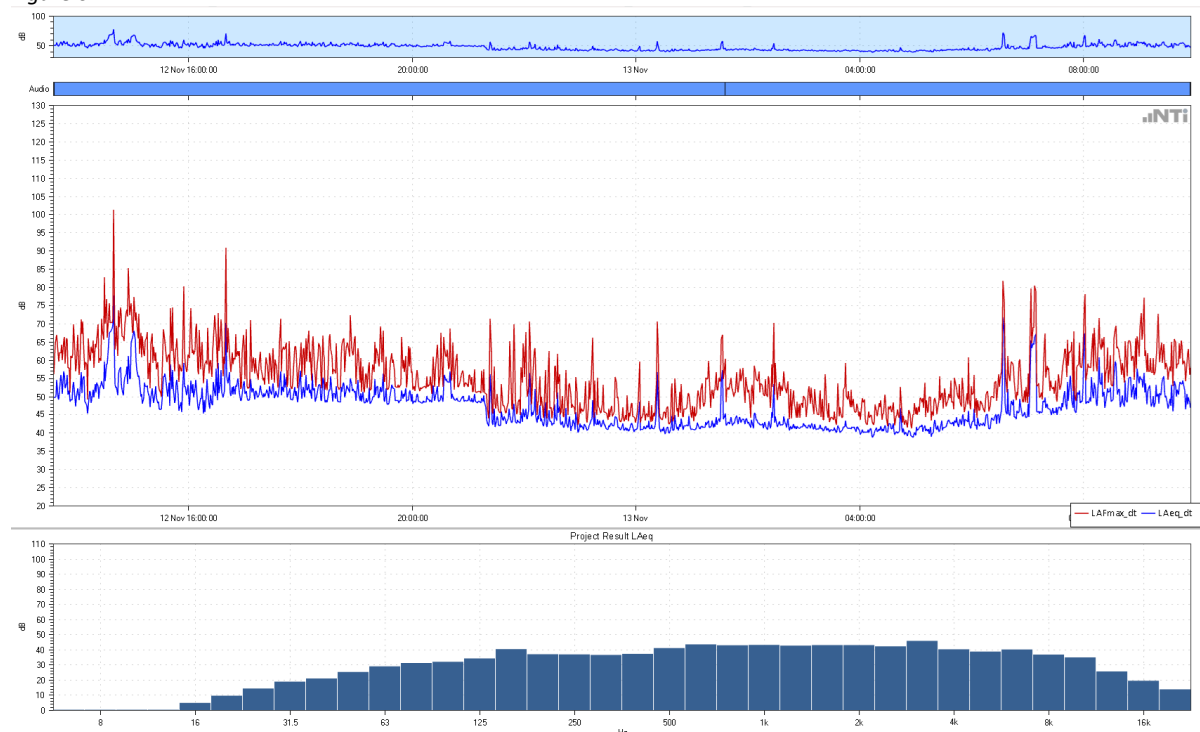
4.2 Rear/Parking Area

Table 4

Location	L _{Aeq_1hr}	L _{Aeq_16hr}	L _{Aeq_15min}	L _{Aeq_8hr}	L _{Amax} (10th highest)	L _{A90}
Day	52.2dBA	53.2dBA				47.9dBA
Night			42.7dBA	43.2dBA	59.1dBA	39.9dBA

4.2.1 Comments: Some patron and low-level industrial noise until approx. 10pm

Figure 6



Day/Time	Cloud Cover	Temperature (Celcius)	Presence of fog/snow/ice	Wind Speed (m/s)	Wind Direction
Installation	5	11	No	0.9	NW
Collection	3	8	No	1.5	NNW

4.3 Comparison of Results to BS8233

Table 6

Location	L _{AeqT} (16hr Day & 8hr Night)	L _{AMax}	BS8233 & WHO Internal noise	BS8233 & WHO External Noise	Difference to L _{Aeq} (internal/external) limit	Difference to Max (internal/external)
Front/Elm Grove						
Day (0700-2300)	71dBA		35dBA	55dBA	(+36dBA/ +16dBA)	-
Night (2300-0700)	60dBA	84dBA (10 th Highest)	30dBA (45dBA L _{AMax})	(60dBA L _{AMax})	(+30dBA)	(+39dBA)
Rear/Car Park						
Day (0700-2300)	53dBA		35dBA	55dBA	(+18dBA/ -2dBA)	-
Night (2300-0700)	43dBA	59dBA (10 th Highest)	30dBA (45dBA L _{AMax})	(60dBA L _{AMax})	(+13dBA)	(+14dBA)

5.0 Observations and Further Discussions

- 5.0.1 The measured L_{Aeq} values for both the day and the night periods are shown in table 6. The day period is 36dBA above the limit for indoor noise levels to the front of the building. The rear of the building is only 18dBA above the limits in accordance with BS8233:2014.
- 5.0.2 The night value at the front of the building is 30dBA above the recommended value for internal noise to prevent sleep disturbance to the front of the proposed dwelling, with the rear 13dBA above the limit. This shows that a lower-grade attenuation can be used on the glazing specification to the year of the development as opposed to the front area.
- 5.0.3 BS8233 assumes that a standard double-glazed window will provide up to 15dB reduction when open (with some council guidelines leaning on the side of caution and assuming a 10dB reduction). Either option would mean that any modern double-glazed window in the building cannot be the main source of ventilation with a low chance of sleep disturbance being had by the inhabitants of the proposed dwellings to the front. The rear of the building can have openable windows with only a low risk of sleep disturbance occurring. Trickle vents/acoustic vents or mechanical ventilation will therefore be required throughout the proposed building to prevent overheating in accordance with document O of the building regs.
- 5.0.4 The L_{AMax} value to prevent the likelihood of sleep disturbance is set at 60dBA external and 45dBA internal. Based on the highest value from the tenth-highest daily value measured during the week the reading for L_{AMax} night was 84dBA at the front. This value

is 39dBA above the required value externally for sleep disturbance and increase the required glazing spec for the front of the development. The rear was much lower at only 14dBA above the required values to prevent sleep disturbance.

5.0.5 These figures will now be calculated fully using the BS8233 Annex G calculation procedure to provide specific product examples for the glazing and ventilation in the proposed dwelling. The night L_{Aeq} comparison value will be used to the rear of the building as the highest potential difference.

5.1 BS8233:2014 Annex G Calculations for example room

Front

Overall dBA		Octave Band Frequency (Hz)					
Time Period		125	250	500	1000	2000	4000
LAMax	84.3	74	77	78	79	75	73
Room Details		Bedroom Front					
Height	(m)	2.2					
Width		2.6					
Length		5					
Sample Room Volume		28.6					
Sample Room Surface Area		33.44					
Element		Area/No.of					
External Wall		5.72					
Windows		2.25					
Ceiling		13					
Ventilation		1					
Element Specification		Traditional brick and block with ties and insulation					
		6 mm / 16 mm argon / 8.8 mm Pilkington Optiphon™					
		DucoMax acoustic trickle ventilator ≥ Dn,e,w 45dB					
Element SRI		Area/No.of					
Element		Octave Band Frequency (Hz)					
Walls	4	125	250	500	1000	2000	4000
Windows	1	47	49	49	58	68	79
Ceiling	1	25	27	38	48	47	55
Ventilation (Dn,e)	1	28	34	40	45	49	52
	1	32	34	41	50	42	40
Single Figure Rating							
		57					
		41					
		45					
Overall Sound Reduction							
Calculated Internal SPL		Octave Band Frequency (Hz)					
Overall		125	250	500	1000	2000	4000
Leq,2	44.9	33.3	41.1	38.6	33.1	35.3	34.5
Limit	45						
Value under limit	0.1						

Rear

Overall dBA		Octave Band Frequency (Hz)					
Time Period		125	250	500	1000	2000	4000
L _{Aeq}	Daytime	42	45	46	49	48	46
Room Details		Living Space Rear					
Height	(m)	2.2					
Width		4					
Length		6					
Sample Room Volume		52.8					
Sample Room Surface Area		44					
Element		Area/No.of					
External Wall		8.8					
Windows		2.25					
Ceiling		24					
Ventilation		1					
Element Specification		Traditional brick and block with ties and insulation					
		4 mm / (6-16 mm) / 4mm					
		Standard non-acoustic trickle ventilator typically ≥ Dn,e,w 30dB					
Element SRI		Area/No.of					
Element		Octave Band Frequency (Hz)					
Walls	4	125	250	500	1000	2000	4000
Windows	1	47	49	49	58	68	79
Ceiling	1	21	17	25	35	37	31
Ventilation (Dn,e)	1	28	34	40	45	49	52
	1	30	30	30	30	30	28
Single Figure Rating							
		57					
		29					
		30					
Overall Sound Reduction							
Calculated Internal SPL		Octave Band Frequency (Hz)					
Overall		125	250	500	1000	2000	4000
Leq,2	24.8	3.2	16.7	16.8	18.2	17.9	18.7
Limit	35						
Value under limit	10.2						

6.0 Glazing, Structural and Ventilation Recommendations

6.1 External Walls

6.1.1 External walls of the proposed building are understood to be traditional 9" brick

Table 7

Description	Octave Band Centre Frequency (Hz)					
	Sound Reduction Index <i>R</i> dB					
	125	250	500	1k	2k	4k
Traditional solid 9" brick & block with ties	47	49	49	58	68	79

6.2 Glazing

6.2.1 Suitable sound insulation performance of all windows and patio doors of the development may be achieved with the examples set out in table 7.

Table 8

Location	Description	Octave Band Centre Frequency (Hz)						Rw (C; Ctr)
		Sound Reduction Index <i>R</i> dB						
		125	250	500	1k	2k	4k	
Front	6 mm / 16 mm argon / 8.8 mm Pilkington Optiphon™	25	27	38	48	47	55	41 (-2,-6)
Rear	4 mm / (6-16 mm argon) / 4 mm	21	17	25	35	37	31	29 (-1; -4)

6.3 Ventilation

6.3.1 It is anticipated that a ventilation system will be needed to be incorporated into the scheme design, such that residents of the properties are able to have background ventilation without necessarily needing to open windows. Table 8 provides an example product that any vents or mechanical ventilation should meet the specification of.

Table 9

Location	Description	Octave Band Centre Frequency (Hz)					
		Sound Reduction Index <i>D_{n,e}</i> dB					
		125	250	500	1k	2k	4k
Front	DucoMax Acoustic trickle ventilator $\geq D_{n,e,w}$ 45dB	32	34	41	50	42	40
Rear	Standard non-acoustic trickle ventilator typically $\geq D_{n,e,w}$ 30dB	30	30	30	30	30	28

7.0 BS4142:2014+A1:2019 Consideration

- 7.0.1 The Indian restaurant has an extraction flue at the rear that will need to be considered as part of this report, in accordance with BS4142:2014. This is highlighted in figure 7 below. The unit was one constantly through the installation and was also present during the removal of the equipment. It has therefore been assumed that the unit is in use daily and will need to be assessed. There was also another flue on the opposite site of the proposed development. However, despite being active, there was no audible noise from this system, shown in figure 8. This, along with the AC unit in the same area, were also well shielded around the side of the building and would not have had an impact on the proposed dwellings even if there were any audibility from either.

Figure 7 – Extraction unit from restaurant to the rear

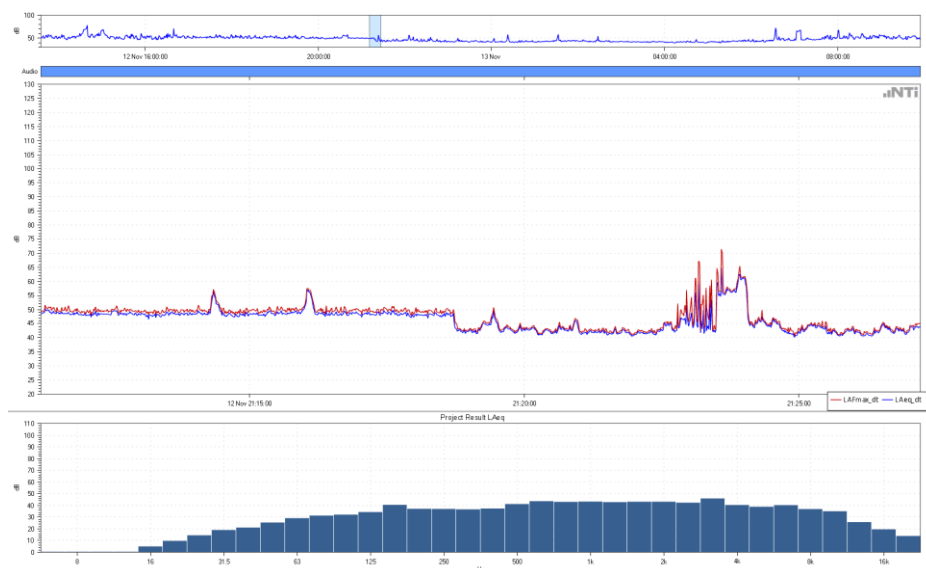


Figure 8 – Other extraction Flue



- 7.0.2 The extraction system from the restaurant side visibly turns off when looking at the graphical representation of the data collected. The image shown in figure 9 is the zoomed-in version of that section of the graph and displays the drop in levels as this is deactivated. This point has therefore been used to calculate the specific noise level from the extraction system to make sure that there is no adverse impact on the proposed development.

Figure 9 – zoomed-in section of extraction on/off point



- 7.0.3 The extraction unit deactivates around 9.18pm. This causes a drop in the ambient levels of 5dB (from around 48dBA to 43dBA). This change in value shows that the specific noise level of the extraction unit at the rear façade of the proposed development is 46dBA. This can now be used in table 10 to assess the adverse impact.

Table 10 – BS4142:2014 Assessment Table

Measurement Type	Parameter	Result	Comment
Day			
Ambient sound	L _{Aeq}	48dBA	Measured - Source Active
Residual sound level	L _{Aeq5min}	43dBA	Measured 9.20pm when source inactive
Background sound level	L _{A901hr}	42dBA	Measured 9.20pm when source inactive
Specific Sound Level	L _{Aeq1hr}	46dBA	Modelled
Acoustic Feature Correction	dBA	+0	No tonal or impulsive noise from plant.
Rating Level	dBA	46dBA	
Difference of Background vs Rating level	dBA	+4dB	
Chance of Adverse impact			Low Chance of Adverse Impact

- 7.0.4 As the extraction system is not used beyond 11pm only the daytime assessment has been conducted.

8.0 Conclusion

- 8.0.1 The use of the suggested configuration specification in section 6 will allow the proposed site to meet the regulations for acoustic performance in accordance with BS8233:2014.
- 8.0.2 The rear of the property will also reduce the chance of adverse impact from the existing extraction units from the Indian restaurant. This is because, despite the extraction unit being 4dB above background noise levels, the specification of the glazing in section 6 proposes standard double-glazing. The example product from Pilkington would provide 10dB more attenuation that is required under BS8233:2014. This also provides an adequate buffer to reduce the noise impact of the extraction system internally. This would mean that the extraction system is not audible internally once the development has been completed. As there are no external balcony areas or outdoor amenity areas no further mitigation measures need to be taken to reduce the impact of the extraction system, in accordance with BS4142:2014.

9.0 Credentials

Name	Title	Credentials
James Flitton BSc AMIOA	Acoustic Consultant	IOA Diploma in Acoustics and Noise Control
		Associate Member Institute of Acoustics
		CSCS Professionally Qualified person
		Affiliate Member of IDE
Signed		

Appendix A – Acoustic Terminology

Parameter	Description
Ambient Noise Level	The totally encompassing sound in a given situation at a given time, usually composed of a sound from many sources both distant and near ($L_{Aeq,T}$).
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s_1 and s_2 is given by $20 \log_{10} (s_1/s_2)$. The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is $20\mu Pa$. The threshold of normal hearing is in the region of 0 dB and 140 dB is the threshold of pain. A change of 1 dB is only perceptible under controlled conditions.
dB(A), L_{Ax}	Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB(A) broadly agree with people's assessment of loudness. A change of 3 dB(A) is the minimum perceptible under normal conditions, and a change of 10 dB(A) corresponds roughly to halving or doubling the loudness of a sound. The background noise in a living room may be about 30 dB(A); normal conversation about 60 dB(A) at 1 metre; heavy road traffic about 80 dB(A) at 10 metres; the level near a pneumatic drill about 100 dB(A).
Free-field	Sound pressure level measured outside, far away from reflecting surfaces (except the ground), usually taken to mean at least 3.5 metres
Façade	Sound pressure level measured at a distance of 1 metre in front of a large sound reflecting object such as a building façade.
$L_{Aeq,T}$	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
$L_{max,T}$	A noise level index defined as the maximum noise level recorded during a noise event with a period T. L_{max} is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
$L_{10,T}$	A noise level index. The noise level exceeded for 10% of the time over the period T. L_{10} can be considered to be the "average maximum" noise level. Generally used to describe road traffic noise. $L_{A10,18h}$ is the A-weighted arithmetic average of the 18 hourly $L_{A10,1h}$ values from 06:00-24:00.
$L_{90,T}$	A noise level index. The noise level exceeded for 90% of the time over the period T. Generally used to describe background noise level.

Appendix B - Noise Survey Instrumentation

Type	Manufacturer	Model	Serial Number	Last Cal	Cal Due
SLM	NTi	XL2-TA	A2A-18475-E0	12/11/2024	12/11/2026
Pre-amp	NTi	MA220	9378	12/11/2024	12/11/2026
Microphone	NTi	MC230A	A19093	12/11/2024	12/11/2026
Calibrator	NTi	CAL200	19829	12/11/2024	12/11/2025
SLM	NTi	XL2-TA	A2A-21300-F0	21/07/2025	21/07/2027
Pre-amp	NTi	MA220	13799	21/07/2025	21/07/2027
Microphone	NTi	MC230A		21/07/2025	21/07/2027
Calibrator	NTi	CAL2000	20850	21/07/2025	21/07/2026

Appendix C – Weather Conditions Chart Used

(Blank version)

Weather Conditions				
Measurement Location	Date/Time	Description	Beginning of Survey	End of Survey
		Temperature:		
<div> <p>Cloud Cover</p> <p>Symbol Scale in oktas (eighths)</p> <p> 0 Sky completely clear</p> <p> 1</p> <p> 2</p> <p> 3</p> <p> 4 Sky half cloudy</p> <p> 5</p> <p> 6</p> <p> 7</p> <p> 8 Sky completely cloudy</p> <p> (9) Sky obstructed from view</p> </div>		Precipitation:		
		Cloud cover (oktas - see guide)		
		Presence of fog/snow/ice		
		Presence of damp roads/wet ground		
		Wind Speed (m/s)		
		Wind Direction		
		Conditions that may cause temperature inversion (i.e. calm nights with no cloud)		

Appendix D – BS8233:2014 Annex G Calcs

		Octave Band Frequency (Hz)					
		125	250	500	1000	2000	4000
Leq,ff	A	74	77	78	79	75	73
Dn,e		32	34	41	50	42	40
$\frac{A_o}{S} 10^{\frac{-Dn,e}{10}}$	B	0.00034	0.00021	0.00004	0.00001	0.00003	0.00005
Rwi		25	27	38	48	47	55
$\frac{S_{wi}}{S_f} 10^{\frac{-Rwi}{10}}$	C	0.00124	0.00078	0.00006	0.00001	0.00001	0.00000
Rew		47	49	49	58	68	79
$\frac{S_{ew}}{S_f} 10^{\frac{-Rew}{10}}$	D	0.00001	0.00001	0.00001	0.00000	0.00000	0.00000
Rrr		28	34	40	45	49	52
$\frac{S_{rr}}{S_f} 10^{\frac{-Rrr}{10}}$	E	0.00360	0.00090	0.00023	0.00007	0.00003	0.00001
10log10(B+C+D+E)	F	-28.0	-30.0	-39.5	-49.0	-43.8	-42.6
A (furnished)		11	14	16	16	15	14
$\text{Log}10 \frac{S}{A}$		0.2	0.1	0.1	0.1	0.1	0.1
Leq,2	A+F+G+3	49.3	50.1	41.6	33.1	34.3	33.5
A-weighting		-16	-9	-3	0	1	1
LAeq,2		33.3	41.1	38.6	33.1	35.3	34.5
Total	44.9						

		Octave Band Frequency (Hz)					
		125	250	500	1000	2000	4000
Leq,ff	A	42	45	46	49	48	46
Dn,e		30	30	30	30	30	28
$\frac{A_o}{S} 10^{\frac{-Dn,e}{10}}$	B	0.00030	0.00030	0.00030	0.00030	0.00030	0.00048
Rwi		21	17	25	35	37	31
$\frac{S_{wi}}{S_f} 10^{\frac{-Rwi}{10}}$	C	0.00203	0.00510	0.00081	0.00008	0.00005	0.00020
Rew		47	49	49	58	68	79
$\frac{S_{ew}}{S_f} 10^{\frac{-Rew}{10}}$	D	0.00001	0.00001	0.00001	0.00000	0.00000	0.00000
Rrr		28	34	40	45	49	52
$\frac{S_{rr}}{S_f} 10^{\frac{-Rrr}{10}}$	E	0.00432	0.00109	0.00027	0.00009	0.00003	0.00002
10log10(B+C+D+E)	F	-26.3	-22.7	-29.5	-34.1	-34.5	-31.6
A (furnished)		11	14	16	16	15	14
$\text{Log}10 \frac{S}{A}$		0.5	0.4	0.3	0.3	0.3	0.4
Leq,2	A+F+G+3	19.2	25.7	19.8	18.2	16.9	17.7
A-weighting		-16	-9	-3	0	1	1
LAeq,2		3.2	16.7	16.8	18.2	17.9	18.7
Total	24.8						