

CHANGE OF USE COMMERCIAL TO DOMESTIC

1 DRAKE STREET, ROCHDALE, OL16 1LU



Noise Impact Assessment

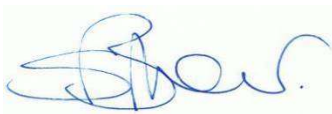
Report by
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Ref: E22478

Site Visits: 14th and 17th February 2025

Signed:

A handwritten signature in blue ink, appearing to read "S. B. Mellor".

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1.0 INTRODUCTION

Upon instruction from Cassel & Fletcher Ltd., SBM Safety Solutions were instructed to carry out an environmental noise impact assessment at 1 Drake Street, Rochdale, OL16 1LU. It is proposed that the first floor is converted from commercial space to 6 x apartments, second floor to 4 x apartments and roof space to a 7 x bedroom HMO. Monitoring at this location would establish the existing noise climate and inform an assessment considering the potential for any impact on future residents of the upper floors, with the ground floor being retained for commercial use.

Figure 1



The property comprises of a three-storey building as shown above. The rear of the building, a former coaching inn, has already been converted to domestic use.

This report would evaluate the existing background noise levels as well as existing / future sources of noise which may impact on the future residents. Existing ambient and background measurements were taken over a weekend period because of the town centre location and associated night time activities.

Acoustic terminology is explained at Appendix 1 of this report; references in Appendix 2; the author's qualifications and experience are described in Appendix 3; images of the location and monitoring positions in Appendix 4; extraction technical data in Appendix 5.

2.0 SITE DESCRIPTION

The building is located off Duke Street in the centre of Rochdale town centre. Surrounding uses include the existing flats at the rear as noted above, a solicitors office, chicken shops, mini-market and tattoo parlour opposite the front of the building. At approximately 35m to the north of the site is a large Wetherspoon pub, The Regal Moon. The pub has some external seating. There is a Reel cinema opposite the pub.

There appears to be limited road traffic but there is a tramway which runs to the front of the building.

Figure 2 – Monitoring Positions



Positions 1 and 2 – Ambient and Background dBA.

Monitoring was carried out at Positions 1 and 2 to establish the existing noise climate – ambient and background levels L90 (existing dwelling). It was anticipated that the background levels would naturally be lower at

the rear being screened by the building from traffic and commercial uses
There are few windows at the rear of the building.

Sources of noise at the location contributing to the ambient noise levels:

- Distant road traffic and trams on Duke Street.
- Patrons of the nearby shops, commercial businesses and pedestrians passing etc.

3.0 NOISE CRITERION

3.1 NPPF (National Planning Policy Framework)

When considering applications for new residential development adjacent to existing noise sources, the relevant document is the “National Planning Policy Framework” or NPPF (2023). This replaces earlier versions from first 2012, 2018, 2019, 2021, and September 2023.

The national Planning Practice Guidance (PPG) web-based resource was launched by the Department for Communities and Local Government (DCLG) on 6 March 2014 to support the original National Planning Policy Framework and make it more accessible.

The overall aim of the guidance, tying in with the principles of the NPPF and the Explanatory Note of the Noise Policy Statement for England, is to identify whether the overall effect of noise exposure is, or would be, above or below the significant observed adverse effect level and the lowest observed adverse effect level for the given situation.

A summary of the effects of noise exposure associated with both noise generating developments and noise sensitive developments is presented within the PPG:

Table 1

Perception	Examples of Outcomes	Increasing 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 (NOEL)	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; closing windows for some of the time because of the noise. Potential for non-awakening 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. having to keep windows closed most of the time, avoiding certain activities during periods of intrusion. 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 disruptive	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 Observed Adverse Effect	Prevent

The NPPF, NSPE and PPG:Noise do not, however, present absolute noise level criteria which define SOAEL, LOAEL and NOEL which is applicable to all sources of noise in all situations. Therefore, within the context of the proposed development, national planning policy and appropriate guidance documents including the 'World Health Organisation Community Noise Guidelines' (1999) and 'BS 8233 – Guidance on Sound Insulation and Noise Reduction for Buildings (2014)', which presents the noise level criteria used as a basis for this assessment.

The PPG:Noise also states that neither the NPSE nor the NPPF (which reflects the Noise Policy Statement) expects noise to be considered in isolation, separately from the economic, social and other environmental dimensions of the proposed development.

3.2 ProPG Professional Practice Guidance on Planning & Noise (May 2017) excerpts are reproduced below

The Professional Practice Guidance on Planning and Noise (ProPG) has been produced to provide practitioners with guidance on a recommended approach to the management of noise within the planning system in England.

The scope of ProPG is restricted to the consideration of new residential development that will be exposed predominantly to airborne noise from transport sources.

New apartments, flats and houses are the most common type of new residential development; however, the guidance can also be applied to other types of residential developments such as residential institutions, care homes etc.

The two sequential stages of the overall approach are:

Stage 1 – an initial noise risk assessment of the proposed development site; and
Stage 2 – a systematic consideration of four key elements.

The overall Stage 1 approach is considered to support wider Government planning and noise policy and guidance at the date of publication of this document, including the NPPF, NPSE and PPG-Noise.

The noise risk assessment may be based on measurement or prediction (or a combination) as appropriate and should aim to describe noise levels over a “typical worst case” 24-hour day either now or in the foreseeable future.

The four key elements to be undertaken in parallel during Stage 2 of the recommended approach are:

- **Element 1 – demonstrating a “Good Acoustic Design Process”;**
- **Element 2 – observing internal “Noise Level Guidelines”;**
- **Element 3 – undertaking an “External Amenity Area Noise Assessment”; and**
- **Element 4 – consideration of “Other Relevant Issues”.**

The approach is underpinned by the preparation and delivery of an “Acoustic Design Statement” (ADS). An ADS for a site assessed as high risk should be more detailed than for a site assessed as low risk.

An ADS should not be necessary for a site assessed as negligible risk. The choice of recommendation is as follows: “grant without conditions”, “grant with conditions”, “avoid” or “prevent”.

The recommended ProPG internal noise level guidelines are described in Figure 4. These guidelines reflect and extend current practice contained in BS8233:2014.

Figure 3

ACTIVITY	LOCATION	07:00 – 23:00 HRS	23:00 – 07:00 HRS
Resting	Living room	35 dB $L_{Aeq,16\text{ hr}}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16\text{ hr}}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16\text{ hr}}$	30 dB $L_{Aeq,8\text{ hr}}$ 45 dB $L_{Amax,F}$ (Note 4)

NOTE 1 The Table provides recommended internal L_{Aeq} target levels for overall noise in the design of a building. These are the sum total of structure-borne and airborne noise sources. Ground-borne noise is assessed separately and is not included as part of these targets, as human response to ground-borne noise varies with many factors such as level, character, timing, occupant expectation and sensitivity.

NOTE 2 The internal L_{Aeq} target levels shown in the Table are based on the existing guidelines issued by the WHO and assume normal diurnal fluctuations in external noise. In cases where local conditions do not follow a typical diurnal pattern, for example on a road serving a port with high levels of traffic at certain times of the night, an appropriate alternative period, e.g. 1 hour, may be used, but the level should be selected to ensure consistency with the internal L_{Aeq} target levels recommended in the Table.

NOTE 3 These internal L_{Aeq} target levels are based on annual average data and do not have to be achieved in all circumstances. For example, it is normal to exclude occasional events, such as fireworks night or New Year's Eve.

NOTE 4 Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$, depending on the character and number of events per night. Sporadic noise events could require separate values. In most circumstances in noise-sensitive rooms at night (e.g. bedrooms) good acoustic design can be used so that individual noise events do not normally exceed 45dB $L_{Amax,F}$ more than 10 times a night. However, where it is not reasonably practicable to achieve this guideline then the judgement of acceptability will depend not only on the maximum noise levels but also on factors such as the source, number, distribution, predictability and regularity of noise events (see Appendix A).

NOTE 5 Designing the site layout and the dwellings so that the internal target levels can be achieved with open windows in as many properties as possible demonstrates good acoustic design. Where it is not possible to meet internal target levels with windows open, internal noise levels can be assessed with windows closed, however any façade openings used to provide whole dwelling ventilation (e.g. trickle ventilators) should be assessed in the “open” position and, in this scenario, the internal L_{Aeq} target levels should not normally be exceeded, subject to the further advice in Note 7.

NOTE 6 Attention is drawn to the requirements of the Building Regulations.

NOTE 7 Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal L_{Aeq} target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved. The more often internal L_{Aeq} levels start to exceed the internal L_{Aeq} target levels by more than 5 dB, the more that most people are likely to regard them as “unreasonable”. Where such exceedances are predicted, applicants should be required to show how the relevant number of rooms affected has been kept to a minimum. Once internal L_{Aeq} levels exceed the target levels by more than 10 dB, they are highly likely to be regarded as “unacceptable” by most people, particularly if such levels occur more than occasionally. Every effort should be made to avoid relevant rooms experiencing “unacceptable” noise levels at all and where such levels are likely to occur frequently, the development should be prevented in its proposed form (see Section 3.D).

It should be noted that the acoustic performance of the building envelope will be reduced in the event windows are opened for ventilation or cooling purposes, typically reducing the insulation to no more than 10 to 15 dB(A).

Most residents value the ability to open windows at will, for a variety of reasons. *“The acoustic environment of external amenity areas that are an intrinsic part of the overall design should always be assessed, and noise levels should ideally not be above the range 50 – 55 dB LAeq,16hr.”*

ProPG Stage 1

For an initial assessment, the following table can be referred for indications of suitability:

Table 2

Level Day	Level Night	Risk	Conclusion
Below 50 dB(A) day	Below 40 dB(A) at night	Negligible Risk	Site is likely to be acceptable
Between 50 and 60-65 dB(A) day	Between 40 and 50-55 dB(A) night	Low Risk	Likely to be acceptable provided that Good Acoustic Design (GAD) is followed
Between 60-65 and 70 dB(A) day	Between 50-55 and 60 dB(A) night	Medium Risk	Likely to be less suitable and application may be refused unless ADS demonstrates GAD, how adverse effects will be mitigated, and significant adverse effects avoided
Above 70 dB(A) day	Above 60 dB(A) night	High Risk	Increased risk of refusal, which may be reduced by demonstrating GAD in a detailed ADS, expert advice recommended

3.3 British Standard 8233:2014 (Guidance on Sound Insulation and Noise Reduction for Buildings)

The latest version of BS.8233 “Guidance on Sound Insulation and Noise Reduction for Buildings”, was published in February 2014. BS 8233:2014 adopts guideline external noise values provided in WHO for external amenity areas such as gardens and patios. The Standard states that it is “desirable” that the external noise does not exceed 50 dB $L_{Aeq,T}$ with an upper guideline value of 55 dB $L_{Aeq,T}$. Where design standards cannot be achieved for traditional amenity spaces (e.g. gardens and patios) then the ‘lowest practical levels’ should be achieved.

An extract of the “Design Range” of BS.8233's Table 4 for indoor noise levels (with Notes 4 & 7) appears below and it should also be noted that the assessment period is for the whole of the day (16 hours) or night (8 hours).

Figure 4

Table 4 Indoor ambient noise levels for dwellings

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

NOTE 4 regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,P}$ depending on the character and number of events per night. Sporadic noise events could require separate values.

NOTE 7 Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved.

“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 50 dB LAeq,T, with an upper guideline value of 55 dB LAeq,T. which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable.”

3.4 WHO “Guidelines for Community Noise”

These guidelines entitled “Guidance for Community Noise”; were approved by the World Health Organisation and consider guideline values for annoyance in the community. These have been set at 50 or 55 dBA, representing daytime levels below which a majority of the adult population will be protected from becoming moderately or seriously annoyed, respectively. An extract of “Table 4.1 from Section 4.4” appears below:

Figure 5

Table 4.1: Guideline values for community noise in specific environments (Extract).

<i>Specific environment</i>	<i>Critical health effect(s)</i>	<i>LAeq [dB]</i>	<i>Time base [hours]</i>	<i>LAmx, fast [dB]</i>
<i>Outdoor living area</i>	<i>Serious annoyance, daytime and evening Moderate annoyance, daytime and evening</i>	55	16	-
		50	16	-
<i>Dwelling, indoors Inside bedrooms</i>	<i>Speech intelligibility and moderate annoyance, daytime and evening Sleep disturbance, night-time</i>	35	16	
		30	8	45
<i>Outside bedrooms</i>	<i>Sleep disturbance, window open (outdoor values)</i>	45	8	60

The guidelines also suggest that; *“At night, sound pressure levels at the outside façades of the living spaces should not exceed 45 dB LAeq and 60 dB LAm_{ax}, so that people may sleep with bedroom windows open. These values have been obtained by assuming that the noise reduction from outside to inside with the window partly open is 15 dB.”* LAeq for daytime is for 16 h and for night-time 8h. BS8223 is based on the WHO Guidelines and as can be seen has similar values.

3.5 BS4142:2014 – Rating Industrial Noise Affecting Mixed Residential and Industrial Areas

BS4142:2014 states, *“Response to sound can be subjective and is affected by many factors, both acoustic and non-acoustic.*

The significance of its impact, for example, can depend on such factors as the margin by which a sound exceeds the background sound level, its absolute level, time of day and change in the acoustic environment, as well as local attitudes to the source of the sound and the character of the neighbourhood...This British Standard describes methods for rating and assessing sound of an industrial and/or commercial nature”.

This British Standard describes a method for assessing whether a specific sound may have an adverse impact. The Standard requires that the ambient noise (***totally encompassing sound in a given situation at a given time, usually composed of sound from many sources near and far***) including the “specific” sound from the source in question is measured in

terms of the equivalent continuous sound level L_{Aeq} [see Appendix 1 for acoustic terms], which is then corrected for the residual sound (total L_{Aeq} excluding the “specific” sound). A correction for character is made if “**a tone, impulse or other characteristic occurs**”. For tonality, a correction of between +2dB and 6dB is considered acceptable and for impulsivity between 3 and 9dB. See table below.

Table 3

Character	Just Perceptible	Clearly Perceptible	Highly Perceptible
Tonality	+2dB	+4dB	+6dB
Impulsivity	+3dB	+6dB	+9dB

Where the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied. Where tonal and impulsive characteristics are present in the specific sound within the same reference period then these two corrections can both be taken into account. If one feature is dominant, then it might be appropriate to apply a single correction.

Where both features are likely to affect perception and response, the corrections ought normally to be added in a linear fashion.

Intermittency

“When the specific sound has identifiable on/off conditions...if the intermittency is readily distinctive against the residual acoustic

environment, a penalty of 3 dB can be applied”.

The final figure, including any character correction is known as the Rating level. This Rating Level is then compared with the measured background [LA90] level.

The greater this difference the greater the likelihood of “adverse impact” (See Notes 1 & 2 from BS4142:2014 below).

NOTE 1

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

NOTE 2

Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact.

4.0 MEASUREMENT PROCEDURE

The site was visited on Friday 14th February 2025 and instrumentation was installed for a weekend period until Monday 17th February 2025 at the front of the building. As equipment was located approximately 1m from the façade then a correction is necessary for reflection (-3dBA). LAeq, 1hr measurements were taken to establish the existing noise climate – i.e. ambient and background levels L90. A shorter period of measurement was used at position 2 to establish the difference between the front and rear.

Additional measurements were made on site (in both buildings) to establish the existing level of sound insulation afforded by the building. A portable sound system was used which produces “pink noise.” “Sweep” measurements were made inside the ground floor to measure the internal level and indicate the level of sound insulation between the floors.

Measurements were also made externally to establish the “breakout” level and therefore the level of sound insulation provided by the building.

Figure 6 – “Pink Noise” Source



The weather conditions during the entire period were dry, sunny at times, with up to 50% cloud cover and cold, with temperatures between 0 to 5 degrees Celsius (night / day). There were very light to light winds with speeds ranging between $<0.5\text{m/s}$ and 2m/s (SE/E) measured on an electronic anemometer, similar to those forecast. It is not considered that weather conditions would have influenced the results.

The sound level meters used, and ancillary equipment can be found in the table below. The meters calibrated correctly before and after the on-site measurements at 94dBA (977A) and 114dBA (977) to within +/- 0.2dBA.

Table 4

Instrument	Type	Serial No.	Calibration Cert. No.	Date of Due Calibration
Svan 977A	Sound Level Meter	69280	1501866-1	07/03/2026
Svan SV12L	Preamp	110531	1501866-1	07/03/2026
Aco Pacific 7052E	Microphone	61121	1501866-1	07/03/2026
Cirrus 511E	Calibrator	39816	Cirrus 248531	26/04/2026
Svan 977	Sound Level Meter	36870	1502651-1	21/05/2025
Svan SV12L	Preamp	71675	1502651-1	21/05/2025
Aco Pacific 7052E	Microphone	70160	1502651-1	21/05/2025
Svan SV33B	Calibrator	112680	1502651-2	21/05/2025
With outdoor kit and all-weather windmuffs				

The instrumentation has been laboratory calibrated within the preceding 2 years.

5.0 MEASUREMENT RESULTS

The results obtained are shown in Tables 5-9 below.

Table 5 – Existing Ambient and Background (L90) dBA Position 1

Day / Start Time	L _{Aeq}	L _{Amax}	L _{Amin}	L01	L10	L50	L90	L95
14/02/2025 12:00:00	64.0	82.1	50.8	75.6	67.0	57.5	54.2	53.5
14/02/2025 13:00:00	63.0	85.3	49.6	74.2	66.0	57.3	54.1	53.3
14/02/2025 14:00:00	63.4	82.1	48.9	74.1	66.9	57.7	54.1	53.1
14/02/2025 15:00:00	63.7	83.0	49.1	75.4	66.4	57.7	54.5	53.7
14/02/2025 16:00:00	63.9	81.3	50.9	74.9	67.3	58.2	55.0	54.2
14/02/2025 17:00:00	63.2	79.6	51.2	73.8	66.7	58.6	55.5	54.8
14/02/2025 18:00:00	64.3	83.2	51.7	75.4	67.9	58.1	55.0	54.3
14/02/2025 19:00:00	63.6	80.2	49.2	74.3	66.9	58.4	55.0	54.0
14/02/2025 20:00:00	63.6	83.6	50.6	74.2	66.7	58.8	55.6	54.5
14/02/2025 21:00:00	65.9	87.2	53.5	76.8	66.9	61.9	58.8	57.8
14/02/2025 22:00:00	63.0	80.3	49.9	73.9	66.2	57.7	54.7	53.9
14/02/2025 23:00:00	62.4	80.8	49.1	73.3	65.1	58.1	54.7	53.7
15/02/2025 00:00:00	60.7	78.3	46.0	72.1	62.6	55.8	51.1	50.0
15/02/2025 01:00:00	56.2	78.0	44.2	65.1	58.5	53.8	49.9	48.8
15/02/2025 02:00:00	53.3	68.9	44.4	60.9	55.8	51.7	48.4	47.6
15/02/2025 03:00:00	52.2	68.7	43.3	60.4	54.6	50.1	47.1	46.4
15/02/2025 04:00:00	51.7	73.3	44.5	58.8	53.9	50.1	47.4	46.7
15/02/2025 05:00:00	56.5	81.4	43.0	69.8	55.0	48.4	45.8	45.2
15/02/2025 06:00:00	59.9	78.8	42.8	72.0	62.7	48.9	45.8	45.2
15/02/2025 07:00:00	60.7	79.8	42.5	72.7	63.7	53.0	46.2	45.3
15/02/2025 08:00:00	63.7	81.4	48.0	74.3	66.3	59.6	54.9	52.9
15/02/2025 09:00:00	62.4	80.8	50.8	73.0	65.4	58.1	54.8	53.9
15/02/2025 10:00:00	62.5	84.0	49.9	72.9	65.3	58.0	54.3	53.5
15/02/2025 11:00:00	64.0	83.0	51.7	74.4	66.7	60.4	56.3	55.2
15/02/2025 12:00:00	63.4	81.7	51.2	74.0	65.2	59.9	56.9	56.0
15/02/2025 13:00:00	63.0	88.2	49.4	73.7	65.1	59.1	54.8	53.6
15/02/2025 14:00:00	63.7	85.5	51.8	74.0	66.3	59.8	55.6	54.6
15/02/2025 15:00:00	63.2	80.1	50.8	74.0	65.7	59.2	55.4	54.3
15/02/2025 16:00:00	63.2	84.0	50.7	73.6	65.8	59.1	55.4	54.5
15/02/2025 17:00:00	62.8	83.1	49.9	74.0	64.8	58.3	54.4	53.4
15/02/2025 18:00:00	62.1	80.6	50.1	72.5	64.7	58.2	54.5	53.6
15/02/2025 19:00:00	62.1	80.0	49.6	72.9	64.6	58.2	53.9	52.9
15/02/2025 20:00:00	62.3	81.9	50.9	72.4	64.7	59.2	55.8	54.9
15/02/2025 21:00:00	61.6	80.3	50.9	71.4	63.8	59.1	55.5	54.6

15/02/2025 22:00:00	61.6	79.2	51.1	69.9	64.0	59.7	56.0	55.0
15/02/2025 23:00:00	61.5	78.5	49.3	69.5	64.1	59.6	55.5	54.3
16/02/2025 00:00:00	62.7	80.6	51.7	70.6	65.3	60.9	57.0	56.1
16/02/2025 01:00:00	58.8	72.7	44.5	66.7	61.8	56.9	52.4	51.1
16/02/2025 02:00:00	58.8	74.3	41.2	69.0	61.2	55.5	50.4	48.9
16/02/2025 03:00:00	56.4	72.2	38.0	67.0	59.6	51.7	43.8	42.5
16/02/2025 04:00:00	53.5	79.4	43.4	62.8	55.0	49.9	46.7	45.9
16/02/2025 05:00:00	55.9	91.3	42.8	64.2	54.6	49.1	45.9	45.2
16/02/2025 06:00:00	56.1	77.3	39.9	66.0	58.5	53.2	43.3	42.6
16/02/2025 07:00:00	60.8	80.0	47.7	70.6	62.7	57.7	54.5	53.4
16/02/2025 08:00:00	59.4	79.6	43.0	71.3	61.4	53.1	47.2	46.2
16/02/2025 09:00:00	61.8	80.5	45.1	73.1	64.7	56.3	49.8	48.5
16/02/2025 10:00:00	60.7	78.5	46.8	71.3	64.3	55.7	51.8	50.6
16/02/2025 11:00:00	62.2	84.7	45.0	73.6	65.1	55.4	51.3	50.0
16/02/2025 12:00:00	61.8	81.5	46.7	74.1	63.9	54.1	50.3	49.4
16/02/2025 13:00:00	62.8	86.2	47.6	74.7	65.0	55.0	51.2	50.4
16/02/2025 14:00:00	62.5	82.9	46.8	74.7	64.8	54.5	50.9	50.0
16/02/2025 15:00:00	62.1	80.8	46.8	74.8	63.5	54.8	51.0	50.0
16/02/2025 16:00:00	61.8	83.5	46.6	73.4	63.7	54.5	51.0	50.1
16/02/2025 17:00:00	63.4	83.8	47.8	75.8	65.0	56.2	51.8	50.8
16/02/2025 18:00:00	63.0	80.3	49.7	75.2	64.9	55.8	52.6	51.9
16/02/2025 19:00:00	61.4	83.1	46.1	73.3	63.4	54.4	50.5	49.6
16/02/2025 20:00:00	61.9	82.1	47.1	73.8	64.1	54.8	50.6	49.7
16/02/2025 21:00:00	61.5	78.6	45.6	74.4	62.1	52.4	48.8	48.1
16/02/2025 22:00:00	60.6	82.5	43.1	74.0	60.9	49.4	46.1	45.4
16/02/2025 23:00:00	60.3	79.2	43.0	73.2	61.0	50.9	46.8	46.1
17/02/2025 00:00:00	55.7	80.1	43.7	68.6	53.3	49.3	46.5	45.8
17/02/2025 01:00:00	50.2	76.0	42.9	58.8	51.7	47.7	45.3	44.7
17/02/2025 02:00:00	47.7	67.4	40.3	55.4	50.4	45.6	43.0	42.4
17/02/2025 03:00:00	46.6	67.2	40.8	53.9	48.0	45.5	43.5	42.9
17/02/2025 04:00:00	51.2	78.4	42.8	58.6	50.3	47.6	45.4	44.8
17/02/2025 05:00:00	58.1	78.3	43.4	70.9	58.5	49.2	46.5	45.8
17/02/2025 06:00:00	63.3	82.0	44.9	75.3	67.3	53.2	48.6	47.9
17/02/2025 07:00:00	63.4	83.2	47.7	74.4	67.2	57.0	52.2	51.0
17/02/2025 08:00:00	65.2	82.7	51.9	75.4	68.4	61.1	56.7	55.6
17/02/2025 09:00:00	61.8	80.1	48.7	73.5	64.0	56.3	53.2	52.4
17/02/2025 10:00:00	62.3	81.1	46.7	74.1	65.3	55.1	51.8	50.8
17/02/2025 11:00:00	63.5	83.2	49.4	75.3	65.7	57.1	54.1	53.3
17/02/2025 12:00:00	64.2	85.7	48.0	76.0	66.8	56.7	53.0	52.1
17/02/2025 13:00:00	64.0	82.7	48.7	75.3	67.0	58.2	54.6	53.7
	LAeq	Time	Façade Correction					
Day	62.9	50 hours	59.9					
Night	58.3	24 hours	55.3					

Table 6 – Existing Ambient and Background (L90) dBA Position 2

Day / Start Time	LAeq	LAmaz	LAMin	L01	L10	L50	L90	L95
17/02/2025 13:15:26.800	53.3	84.3	46.5	58.9	54.6	52.0	50.0	49.5

Noise levels at the front around 64dBA at the same time and so noise levels at the rear estimated to be around 10-11dBA lower generally.

Table 7 – Position 1 – 1/1 Octave Band Levels

1/1 Octave	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz
Day	59.3	58.7	58.4	55.8	50.0	41.9
Night	52.6	52.1	52.4	48.5	42.1	32.3

Table 8 – Position 2 – 1/1 Octave Band Levels

1/1 Octave	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz
Day	56.3	53.0	50.5	49.0	44.8	38.8

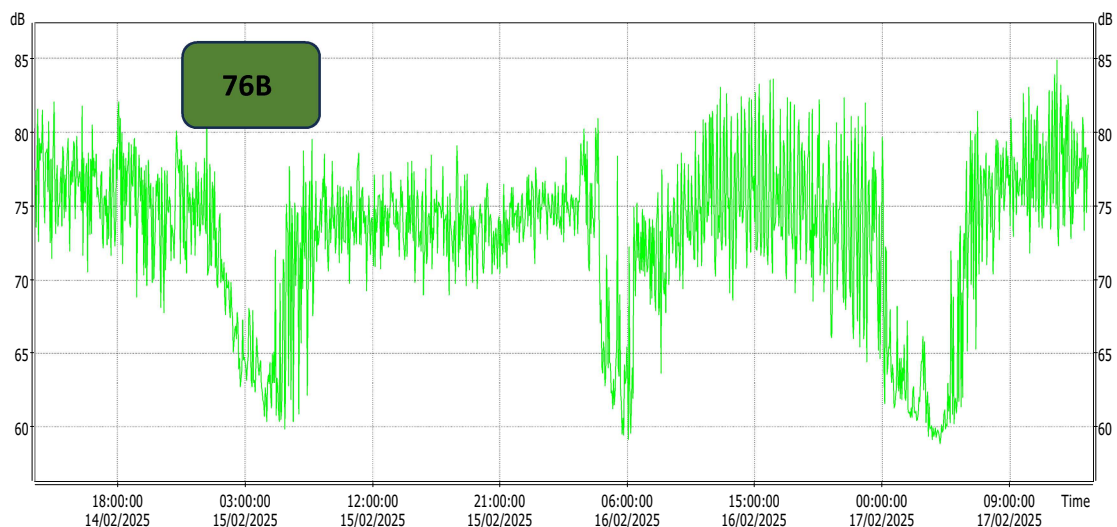
Table 9 – Sound Source Levels Internal and Externally (Breakout)

Start date & time	Duration	LAeq [dB]	LAFmax [dB]	LAFmin [dB]	L01	L10	L50	L90	L95	Notes
14/02/2025 11:18:41.800	00:02:01.000	107.4	110.9	103.7	110.0	108.8	107.2	105.1	104.7	Pink Noise Internal Sweep - Ground Floor
14/02/2025 11:21:18.600	00:02:02.000	67.6	85.0	59.4	78.8	69.3	62.9	60.9	60.4	External @ 2m from façade (window)
14/02/2025 11:26:52.500	00:02:03.000	65.2	83.2	57.2	76.5	65.4	62.0	58.5	57.9	First Floor Sweep

"Pink Noise" source activated inside and levels measured at 2m from the façade externally L90 used to eliminate extraneous noise below.

In addition to the above, the maximum readings were recorded, and the 10th highest LAmaz level at night was **76dB** with façade correction at position 1 (front).

Figure 7 – Position 1 (Front)



When considering maximum noise levels generated by road traffic or trams in this case, it is generally found that these levels are not governed by the volume of traffic, but by specific single events such as a car or motorbike passing by at high speed, an empty lorry passing over bumps or potholes in a section of road, a car horn, emergency siren or a vehicle skidding (see also impression below). There is also the potential for loud voices and similar from patrons heading to and from the Wetherspoon pub at this location.

The Regal Moon Opening Hours

Monday 08:00 - 00:00

Tuesday 08:00 - 00:00

Wednesday 08:00 - 00:00

Thursday 08:00 - 00:00

Friday 08:00 - 01:00

Saturday 8:00 - 01:00

Sunday 08:00 - 00:00

5.1 DEFRA Data

We can also compare measured levels with synthetic data available from DEFRA for road traffic noise at this location. The noise levels from the DEFRA data are reproduced below for road noise.

Figure 8 - Daytime Noise Levels for Road Traffic Noise



Figure 9 – Night time Noise Levels for Road Traffic Noise



The site suitability indicator for road traffic suggests a “negligible-low risk”.

This is a similar to our measured levels but ours tend towards the lower range suggesting other influences (as discussed).

Table 10 – Site Suitability Indicator (Road Traffic Noise)

Level Day	Level Night	Risk	Conclusion
Below 50 dB(A) day	Below 40 dB(A) at night	Negligible Risk	Site is likely to be acceptable
Between 50 and 60-65 dB(A) day	Between 40 and 50-55 dB(A) night	Low Risk	Likely to be acceptable provided that Good Acoustic Design (GAD) is followed

5.2 Level of Insulation Currently Provided (Building Breakout and Internal Floor)

From Table 8 above we can make the following estimates (L90 used for external levels):

- Breakout (internal to external front) = $[107.4 - 60.9] = \mathbf{46.5dBA}$
- Breakout (Party Floor) = $[107.4 - 65.2] = \mathbf{42.2dBA}$

Therefore the level of sound insulation provided by the building is approximately **47dBA** and by the party floor **42dBA** (between the ground floor and first floor proposed domestic use).

6.0 ADDITIONAL OBSERVATIONS

To the observer, the principal sources of noise at this location were associated with road traffic (near and distant) and the nearby tramway. There were also passing pedestrians, accessing the various shops etc.

7.0 ASSESSMENT OF RESULTS

7.1 Noise Levels from the Ground Floor Future Use

The party floor between the ground floor and upper floors will likely need to be tested (pre-completion testing) under Part E of the Building Regulations (**Approved Document E**). Currently the floor provides approximately **42dBA** of insulation which is good and subjectively this was the observation of the tester who also carries out sound insulation tests to ADE. This would be just below the requirements of the Building Regulations (43dBA for a conversion).

The sound levels generated in the commercial area on the ground floor are **unlikely to exceed** the desirable **daytime level for a bedroom** above on the first floor (**35dBA**) unless they are higher than 77dBA [77-42=35dBA] which is very unlikely for most retail uses.

7.2 Estimates of Potential Impact based on the breakout noise and distance to the nearest receptor (2m)

The level of the sound insulation provided by the building has been estimated, by measurement, to be around **47dBA**. There is a double door vestibule or lobby entrance. This is a good level of sound insulation.

It was not possible to measure any existing activities on the ground floor but we have taken measurements in retail and take-away type businesses previously. At a take-away with 4 staff and 5 customers (kitchen preparation sounds and kitchen extraction) the level of sound was **68dBA** using a sweep measurement method.

With an example internal level of **68dBA on the ground floor** then noise levels in the rooms above are not likely to be discernible (42dBA existing party floor sound insulation) $[68-42=26\text{dBA}]$, or externally, with building sound insulation at 47dBA, then external levels would again not be perceptible inside the buildings on the upper floors at **21dBA** $[68-47=21]$.

With a partially open window in Summer even these levels should not be an issue for future residents e.g. $[21-15^1=6\text{dBA}]$ with desirable internal levels being 35dBA.

7.3 Patron Sounds / Delivery Vehicles

Patron sounds (entering and leaving the retail space) are not likely to be discernible above similar sounds to the front. There are existing retail uses nearby. The occasional delivery vehicle is also not likely to be discernible from other vehicles and trams. Not all customers will arrive or leave at the same time of course and it will only take a few seconds on each occasion.

¹ 15dBA sound reduction for a partially open window from WHO Guidelines.

7.4 Subjective Observations

As noted above, sources of noise are typical for a location near to a town centre with a mix of uses including, principally, trams, road traffic (near and distant) and pedestrians accessing the nearby retail facilities.

7.5 BS4142

BS4142:2014 recognises that at night residents will be inside their properties [BS4142 A.6.1 and A.6.3] and that consequently "*Other guidance, such as BS 8233, might be applicable in this instance.*" Also, BS4142 is directed primarily to the circumstances of a proposed or existing noise source affecting existing property, i.e. circumstances where insulating the property is impracticable. Therefore, BS4142 can't take into account circumstances where the properties have not yet been built and where noise control, such as acoustic glazing and ventilation, can be incorporated such to alleviate "*...the primary concern is the potential for disturbance of residents who could be sleeping with open bedroom windows.*" The provision of acoustic glazing, ventilation and screening can all change the impact of external noise.

Consequently, where noise control can be incorporated into the properties [as here] SBM Safety Solutions uses BS 8233:2014, e.g. for the glazing and ventilation considering future retail customers, the Wetherspoon pub, taxi's etc. into the night etc.

7.6 Uncertainty

The following factors have a bearing on the uncertainty of the assessment:

- Future uses of the ground floor retail space may differ from the example take-away, but sources of noise (patrons entering and leaving) are likely to be similar unless external plant is installed but this would require a separate application.
- The existing party floors may perform better in reality than our estimates for the sound insulation level once all work has been completed.
- The level of sound insulation provided by the building may perform better once refurbishment work is completed, reducing the likelihood of adverse impact still further.

Overall, it is considered that the assessment is sufficiently robust.

8.0 INTERNAL SOUND LEVELS

8.1 Daytime Levels (07:00 to 23:00) Position 1

L_{Aeq},16hr = **59.9dB**

8.2 Night time Levels (23:00 to 07:00) Position 1

L_{Aeq},8hr = **55.3dB**

8.3 ProPG

ProPG is aimed principally at transport and new build housing. However, if we apply guidance regarding risk to this development site then with the present levels of noise, this would place the site in the **low risk** category as shown below. Therefore, *good acoustic design must be followed*. As discussed previously, night time sound levels can exceed the daytime sound levels at this location.

Table 11 – ProPg

Level Day	Level Night	Risk	Conclusion
Between 50 and 60-65 dB(A) day	Between 40 and 50-55 dB(A) night	Low Risk	Likely to be acceptable provided that Good Acoustic Design (GAD) is followed

8.4 External Noise Levels

From the available plans there does not appear to be any planned external amenity spaces.

8.5 Internal Noise Levels

Detailed internal levels have been calculated using the typical octave band levels and an example construction using the methodology described in BS EN 12354-3:2000.

For the purposes of prediction, the following have been assumed from the available plans (rooms highlighted below):

- Reverberation time is 0.3s for the bedrooms shown below
- Reverberation time is 0.5s for the living / kitchen space shown below
- Volume for the first floor bedroom (front) highlighted below (approximate) = 34m^3 and window area approximately = 2m^2
- Volume for the first floor bedroom (rear) highlighted below (approximate) = 34m^3 and window area approximately = 2m^2
- Volume for the living / kitchen space (front) highlighted below (approximate) = 62m^3 and window area approximately = $2 \times 2\text{m}^2$

Figure 10 – Internal Layout Ground and First Floor



8.6 Example Construction and Glazing

With the existing external noise level at **60dB** LAeq, 16hrs, desirable internal levels should be achievable where the structure is of solid brickwork, brick/block cavity, brick clad timber frame or timber frame with lightweight cladding, tiled/slatted roof, 9kg/m² plasterboard ceiling with insulation above and window and ventilation specification as described below.

The suggested glazing and ventilation is based on octave band levels established during the monitoring period and adjusted for the LAeq, 16hr daytime period level – this should achieve target internal levels.

The recommended specification is robust enough to mitigate any increase in activities at this location, i.e. a doubling of sound intensity (unlikely) and +3dBA. As the building is of historic interest we have recommended secondary glazing.

8.7 Ventilation, Overheating and Open Windows

The ventilation specifications from BS8233 and ProPG are based on achieving the requirements of Approved Document F (ADF) of the Building Regulations. ProPG states that typically the attenuation from a partially open window is no more than 15dBA. Therefore, external levels should not exceed 50dBA Leq,16hrs during the daytime, 45dBA Leq,8hrs and 60dBA Lmax, F.

ProPG suggests that purge ventilation should only occur occasionally e.g. to remove odour from painting or burnt food). In 2020 the ANC issued the *“Acoustic Ventilation and Overheating – Residential Design Guide (AVO)”*. AVO assumes that the attenuation from a partially open window where transportation is the main source is 13dBA (compared to the 15dBA as noted above).

AVO presents guidance for allowable noise levels from transportation where windows are opened for the control of overheating. Internal levels should be below 50dBA Leq, 16hrs during the daytime, 42dBA Leq, 8hrs at night and 65dBA Lmax,F night time. Therefore, we can summarise the level of noise where it may be considered acceptable to control overheating (via opening windows) using the following Table.

Table 12 – Cooling (Open Windows)

Activity	Location	Daytime Level LAeq, 16hrs dB	Night Time Level LAeq, 8hrs dB	Night Time LAmx,F
Resting	Living Room	63	-	-
Dining	Dining Room / Area	63	-	-
Sleeping (daytime resting)	Bedroom	63	55	78

From the above table, desirable internal levels are likely to be met, just at night, for rooms facing the front and rear (-10dBA difference) where windows are opened for general ventilation or to cool rooms if we allow for 13-15dBA attenuation for a partially open window with **daytime** levels at **59.9dBA** and **night time** levels at **55dBA** from (ANC Guidance, BS8233 and WHO Guidance²).

8.8 Bedroom (First Floor Front)

For this example bedroom it can be seen (Table 13) that the predicted internal night time (highest) noise level of **17.8dB LAeq,16hr** using 6/100/4 or 6/100/6 secondary glazing and wall ventilation would meet the daytime criteria of 35dB LAeq, 16hr from BS8223:2014.

² See References in the Appendix
Ref: E21425, REV1 printed

Table 13

BS EN 12354-Calcs		Use	Volume	Volume	34	L _{Aeq} Ext	59.9			
Version	4.3	length				L _{Aeq} Int	17.8			
© 2014 Martec Environmental Consultants Ltd		width		RT	0.3	dBA Diff	42			
& Acute Acoustics Ltd		height		Octave Band Centre Frequency [Hz]			dBA			
				125	250	500	1k	2k	4k	
External Spectrum Leq (Free Field & Linear)				59.3	58.7	58.4	55.8	50.0	41.9	59.9
Adjustment to Given Level if required										59.9
External Spectrum Adjusted for Level				59.3	58.7	58.4	55.8	50.0	41.9	59.9
			Area m2	Element Sound Reduction Index [SRI]						Contrib
Wall	Brick/block/cavity		10.0	41	45	45	54	58	58	12.7
Window	6/100/4_or_6/100/6_double_window		2.0	26	34	44	44	38	38	15.0
Window	None		0.0	0	0	0	0	0	0	0.0
Door	None		0.0	0	0	0	0	0	0	0.0
Roof	None		0.0	0	0	0	0	0	0	0.0
			# Vents							
Vent Dn,e	Greenwood MA3051 Acoustic Wall vent		1.0	47	46	49	56	66	69	9.6
										dBA
				27.5	20.4	15.9	7.8	5.6	0.0	17.8
										Internal SPL/dBLin

Given the difference between daytime and nighttime levels of 4.6dBA [59.9-55.3=4.6dBA], then this would also achieve the desirable internal night time levels for bedrooms (L_{Aeq}, 8hrs 30dB) at **13.2dB** L_{Aeq}, 8hr [17.8-4.6 = 13.2dB].

The highest L_{Amax} levels are typically around 76dB (see figure 7). Given the predicted difference between external and internal levels of 42dB this would equate to internal levels of **34dB L_{Amax}** which meets the L_{Amax} criteria of 45dB L_{Amax} (ProPG) [76-42 = 34].

8.9 Bedroom (First Floor Rear)

For this example bedroom it can be seen (Table 14) that the predicted internal night time noise level of **8.5dB L_{Aeq},16hr** using the same specification as above (as this is a building of historic interest) would

Table 15

BS EN 12354-Calcs		Use	Volume	Volume	62	LAeq Ext	59.9				
Version 4.3		length				LAeq Int	19.2				
© 2014 Martec Environmental Consultants Ltd		width		RT	0.5	dBA Diff	41				
& Acute Acoustics Ltd		height		Octave Band Centre Frequency [Hz]			dBA				
				125	250	500	1k	2k	4k		
				59.3	58.7	58.4	55.8	50.0	41.9	59.9	
										59.9	
				59.3	58.7	58.4	55.8	50.0	41.9	59.9	
				Element Sound Reduction Index [SRI]						Contrib	
Wall	Brick/block/cavity		Area m2	10.0	41	45	45	54	58	58	12.3
Window	6/100/4_or_6/100/6_double_window		2.0	26	34	44	44	38	38	14.6	
Window	6/100/4_or_6/100/6_double_window		2.0	26	34	44	44	38	38	14.6	
Door	None		0.0	0	0	0	0	0	0	0.0	
Roof	None		0.0	0	0	0	0	0	0	0.0	
				# Vents							
Vent Dn,e	Greenwood MA3051 Acoustic Wall vent		1.0	47	46	49	56	66	69	9.2	
										dBA	
				29.7	22.0	16.2	9.3	8.1	0.0	19.2	
				Internal SPL/dBLin							

9.0 CONCLUSIONS AND RECOMMENDATIONS

The above demonstrates that with considered specification appropriate noise levels can be met with reference to BS8233: 2014 and ProPG, and sources of noise mitigated (See Table 17 below).

The following noise control measures are recommended:

- For all habitable rooms, windows should be fitted with 6/1004 or 6/100/6 secondary glazing and wall ventilation (or similar acknowledging that this is a historic building) – see octave band specification in Table 16 below.
- For all other rooms existing well sealed windows would suffice.
- The floors will need to conform with Part E of the Building Regulations.

9.1 Overheating

The likelihood of “overheating” is beyond the scope of this acoustic report, but ventilation systems can incorporate cooling settings. The Good Homes Alliance has produced a tool for assessing the potential for overheating:

<https://goodhomes.org.uk/wp-content/uploads/2019/07/GHA-Overheating-in-New-Homes-Tool-and-Guidance-Tool-only.pdf>

9.2 Designing out Overheating

The best way to avoid overheating is to consider it at the design stage:

- designing in the correct use of thermal mass
- insulation and heating controls
- installing external shading
- maximising natural external spaces
- providing the correct cross ventilation regime.

9.3 Noise Levels from Ventilation/Cooling Systems

Typically, the ventilation arrangements should be designed to provide purge ventilation and Summertime cooling and to not cause noise levels within habitable space to exceed NR20 (noise rating) when in operation although each local authority may have their own requirements.

Table 16: Required Element Performance for the front or similar / better and approved [dB]

Element	Unit	Octave Band Centre Frequency [Hz]					
		125	250	500	1k	2k	4k
Secondary Glazing	SRI	26	34	44	44	38	38
Wall Ventilation	SRI	47	46	49	56	66	69

APPENDIX 1

EXPLANATION OF ACOUSTIC TERMS

The dB or the decibel, is the unit of noise. The number of decibels or the level, is measured using a sound level meter. It is common for the sound level meter to filter or 'weight' the incoming sound so as to mimic the frequency response of the human ear. Such measurements are designated **dB(A)**.

A doubling of the sound is perceived, by most people, when the level has increased by 10 dB(A). The least discernible difference is 2 dB(A). Thus, most people cannot distinguish between, say 30 and 31 dB(A).

The Background level of noise is most commonly represented by the level which is exceeded for 90% of the time i.e. the LA90.

If a noise varies over time then the **equivalent continuous level, or LAeq**, is the notional constant level of noise which would contain the same amount of acoustic energy as the time varying noise.

The following table gives an indication of the comparative loudness of various noises expressed in terms of the A weighted scale:

Source of noise	dB(A)	Nature of Noise
Inside Quiet bedroom at night	30	Very Quiet
Quiet office	40	
Rural background noise	45	
Normal conversational level	60	
Busy restaurant	65	
Typewriter @ 1m	73	
Inside suburban electric train	76	
Alarm clock ringing @ .5m	80	
Hand clap @ 1m	80	
HGV accelerating @ 6m	92	Very Loud

APPENDIX 2

REFERENCES

1. National Planning Policy Framework or NPPF (2023).
2. British Standard 8233:2014 (Guidance on Sound Insulation and Noise Reduction for Buildings).
3. WHO “Guidelines for Community Noise”.
4. BS4142:2014 – Rating Industrial Noise Affecting Mixed Residential and Industrial Areas.
5. ProPG Professional Practice Guidance on Planning & Noise, May 2017
6. BS EN 12354-3:2000 *Building Acoustics-Estimation of Acoustic Performance in buildings from the performance of elements. Part 3 Airborne sound Insulation against outdoor sound.”*
7. ANC Acoustics Ventilation, and Overheating, Residential Design Guide, 2020.

APPENDIX 3

QUALIFICATIONS AND EXPERIENCE OF M. S. MELLOR

My full name is Steven Brian Mellor. I am the principal consultant at the firm of SBM Safety Solutions Ltd, a consultancy company that specialises in health, safety and environmental services including noise assessment and control.

I hold a Master's degree in Health, Safety and Environmental Law, British Occupational Health Society (BOHS) M104 certificate in Noise and Vibration and Institute of Acoustics Certificate of Competence in Environmental Noise Measurement (Derby University), plus Diploma in Acoustics and Noise Control (Bristol University). I am member of the professional body for noise and vibration specialists, the Institute of Acoustics, MIOA.

I have some 24 years' experience of dealing with problems caused by noise and vibration, both regarding noise and vibration in the environment, the workplace, and the home. The firm SBM Safety Solutions Ltd. was formed 21 years ago. During that time, we have advised many groups including employers, residents, and developers about the problems of noise and vibration in the workplace and environment.

APPENDIX 4

Location and Site Images



Duke Street and Surrounding Retail and Domestic Use



Lobby Entrance

Existing windows



Rear Yard

Commercial uses Opposite – Chicken Shops etc.