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Proposed Residential Development, 22 High Street, Wombwell, S73 0AA

Noise Impact Assessment

For:
Mr. Zul Akram

11th October 2024

Ref: NIA-11736-24-11954-v1 22 High Street, Wombwell
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1 Introduction

1.1 Overview

Environmental Noise Solutions Ltd (ENS) has been commissioned by Mr. Zul Akram to undertake a noise survey and assessment for a proposed residential development at 22 High Street, Wombwell, S73 0AA (hereafter referred to as 'the site').

Planning permission (ref: 2024/0267) for the development was granted by Barnsley Metropolitan Borough Council (BMBC) in May 2024, subject to conditions. Condition 6 relates to the control of noise as follows:

6. *Prior to commencement of development a noise impact assessment shall be submitted to and approved in writing by the Local Planning Authority. The noise assessment shall identify the mitigation required for the residential element of this application. The proposed development is surrounded by commercial premises including a bar. The noise impact assessment should be used to inform the layout and design of the scheme such that mitigation to achieve the following sound levels are achieved within the dwelling:*

   Bedrooms: LAeq (8 hours) - 30dB (2300 to 0700 hours);
   Living Rooms & Bedrooms: LAeq (16 hour) - 35dB (0700 to 2300 hours);
   Bedrooms: LAFmax - 45dB (2300 to 0700 hours).

   Where the above noise criteria cannot be achieved with windows partially open, a system of alternative acoustically treated ventilation to all habitable rooms should be included. The development shall then proceed in accordance with the proposed mitigation measures which shall be retained throughout the lifetime of the development.

The objectives of the noise impact assessment were therefore to:

- Determine current external noise levels at the site
- Assess the potential impact of the external noise climate on the proposed residential development with reference to Condition 6 of Planning Permission ref: 2024/0267
- Provide recommendations for a scheme of sound attenuation works, as necessary, to protect future occupants of the proposed residential development from a loss of amenity due to noise

This report details the methodology and results of the assessment and provides recommendations for the building envelope (fenestration and ventilation). It has been prepared to aid in the discharge of Condition 6 of Planning Permission ref: 2024/0267.

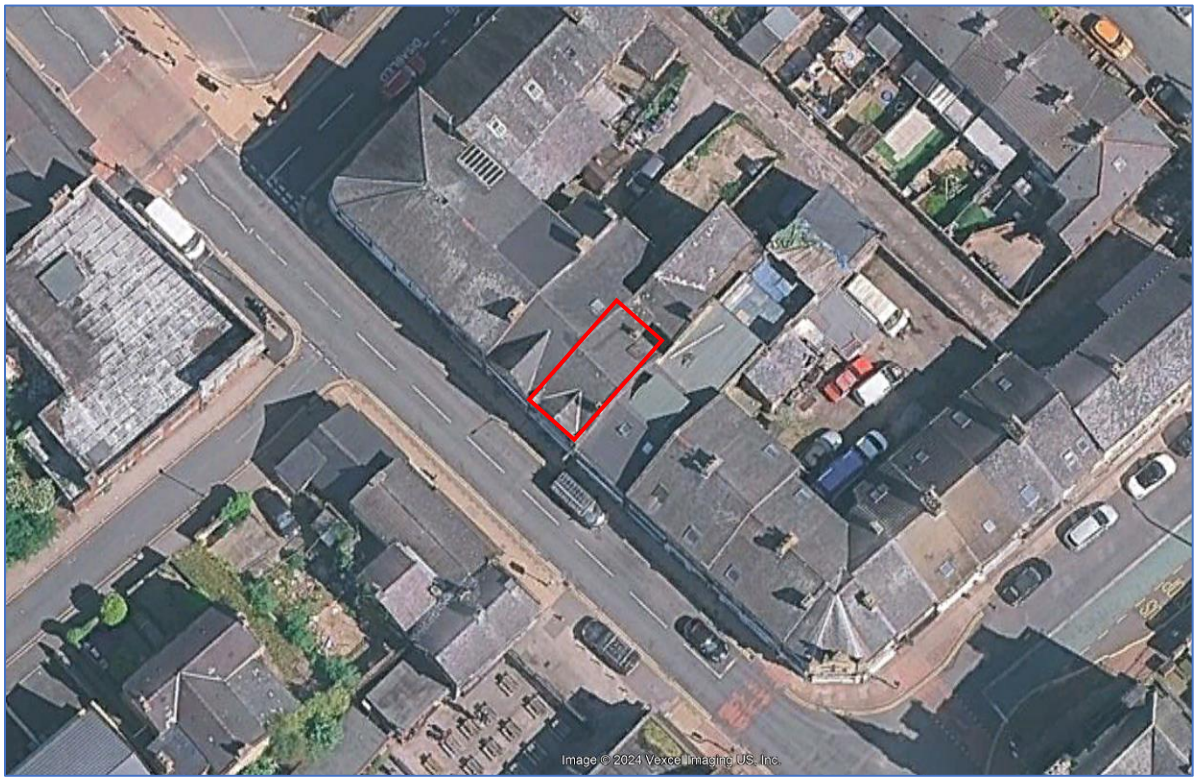
The report has been prepared for Mr. Zul Akram for the sole purpose described above and no extended duty of care to any third party is implied or offered. Third parties referring to the report should consult Mr. Zul Akram and ENS as to the extent to which the findings may be appropriate for their use.

A glossary of acoustic terms used in the main body of the text is contained in Appendix 1.

1.2 Site Description

The site is located at 22 High Street, Wombwell, in a mixed-use setting, circa 6.5 km to the south-east of Barnsley Town Centre, as shown (highlighted in red) in Figure 1.1.

Figure 1.1: Location of Proposed Development



The ambient noise climate at the site is controlled by road traffic noise on High Street, with patron/music noise associated with neighbouring licenced premises present during the late evening.

Development proposals are for the conversion of the first and second floors to form a single aspect 2 no. bedroom duplex flat.

2 Noise Criteria

Condition 6 of Planning Permission ref: 2024/0267 details the following criteria (with windows closed and an alternative acoustically treated means of ventilation provided):

- ≤ 35 dB $L_{Aeq\ (0700\text{-}2300)}$ in habitable rooms during the daytime
- ≤ 30 dB $L_{Aeq\ (2300\text{-}0700)}$ in bedrooms during the night-time
- 45 dB L_{AFMax} in bedrooms during the night-time

In relation to discrete event maxima, further guidance is taken from ProPG Planning and Noise: New Residential Development (ProPG)[1], which states:

'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.'

1 'ProPG Planning and Noise: New Residential Development (ProPG)', 2017. Association of Noise Consultants (ANC), Institute of Acoustics (IOA) and the Chartered Institute of Environmental Health (CIEH)

3 Noise Survey

3.1 Overview

In order to determine the level of external noise affecting the proposed development, noise monitoring was carried out on Friday 27th September through to Monday 30th September 2024.

For the purpose of the assessment, a single monitoring position (MP1) was adopted on the south-western (front) elevation of the existing building.

Noise measurements were undertaken at 1 metre from the existing building façade using an NTi XL3 Type 1 integrating sound level meter. The meter was connected to a windshield covered microphone positioned at the location detailed above. The measurement system calibration was verified immediately before and after the survey period using a Bruel & Kjaer Type 4231 calibrator. No drift in calibration levels greater than 0.5 dB was noted.

Measurements consisted of A–weighted broadband parameters including L_{Aeq}, L_{A10} L_{A90}, and L_{AFmax} together with linear octave band data.

The noted weather conditions during the survey were dry with wind speeds < 5 m/s. Weather conditions were therefore considered appropriate for noise monitoring.

3.2 Summary

Table 3.1 presents a summary of the noise data for each measurement session, at each measurement position, rounded to the nearest decibel. As measurements were made at 1 metre from the existing building façade, a –3 dB façade enhancement correction has been applied in order to establish the free field noise levels.

Table 3.1: Summary of Noise Measurement Data

Position	Date	Time	L_{Aeq} (dB)	L_{A90} (dB)	L_{A10} (dB)	L_{AFMax} (dB)	Comment
MP1	27/09/24	1030–2300	63	51	67	-	Road traffic on High Street, some music/patron noise associated with neighbouring premises during the late evening
	28/09/24	0700–2300	64	51	68	-	
	29/09/24	0700–2300	61	46	66	-	Road traffic on High Street
	30/09/24	0700–0800	64	50	71	-	
	27-28/09/24	2300–0700	53	33	55	76*	Road traffic on High Street, music/patron noise associated with neighbouring premises until circa 0000 hours
	28-29/09/24	2300–0700	59	34	66	78*	
	29-30/09/24	2300–0700	56	33	56	77*	Road traffic on High Street
** 11th highest maximum noise level event during the night-time*							

Noise levels at the site during daytime hours are controlled by the road traffic on High Street, with music and patron noise noted during the late evening until circa 0000 hours on Friday and Saturday night, consistent with the night-time economy setting.

Daytime and night-time noise levels at MP1 were measured at up to **64 dB $L_{Aeq\ (0700\text{-}2300)}$** and **59 dB $L_{Aeq\ (2300\text{-}0700)}$** respectively. Typical (11th highest) maximum noise levels at MP1 were measured at up to **78 dB L_{AFMax}** during the night-time.

4 Noise Assessment

Design noise levels at the site are as follows:

- **≤ 64 dB $L_{Aeq\ (0700\text{-}2300)}$** during the daytime
- **≤ 59 dB $L_{Aeq\ (2300\text{-}0700)}$** (and **78 dB L_{AFMax}**) during the night-time

In order to calculate the sound insulation requirements for the development the Building Research Establishment (BRE) building envelope insulation calculation spreadsheet was used. This spreadsheet is based on the calculation methodology advocated in BS 8233. The spreadsheet allows input of external noise levels, room dimensions and reverberation time together with parameters for the various elements of the building envelope and calculates the internal noise level in terms of the external noise level metric (L_{Aeq} and L_{AFMax} in this case).

It is recommended that the development is provided with a decentralised mechanical extract ventilation (dMEV) system using continuously-running kitchen and bathroom extracts on a 'trickle' rate.

Approved Document F 'Ventilation' (ADF) states that where MEV is used, background ventilators of at least 4000 mm² EA must be provided to each habitable room, with 1 no. ventilator required per bedroom and 2 no. ventilators required in living rooms.

Bedroom 1 and the living room (fronting onto High Street) should be fitted with enhanced laminated glazing rated at least **34 dB R_w+C_{tr}** (such as 6 mm glass / 6-20 Argon / 8.8 mm Pilkington Optiphon) in conjunction with acoustic wall vents rated at least **57 dB $D_{n,e,w}+C_{tr}$** per 4000 mm² EA (vent open), such as the DB-61AWV, or equivalent.

The 'Velux' roof window of Bedroom 2 should be rated at least **29 dB R_w+C_{tr}** (such as 8 mm glass / 12 mm cavity / 4 mm glass) in conjunction with an acoustic wall vent rated at least **41 dB $D_{n,e,w}+C_{tr}$,** such as the Ryton AAC125HP.

The ceilings (and side cheeks to any dormer windows) in the bedrooms should be double boarded with 2 layers of dense plasterboard (e.g. SoundBloc), with 100 mm (minimum) mineral wool insulation above/behind.

See Appendix 3 for selected BRE calculation spreadsheets.

The following points should be noted:

- The glazing recommendations apply to the window within a sealed unit. It is the responsibility of the window supplier to ensure that the window frame does not compromise the performance of the glazing.

- When selecting a glazing system to satisfy the requirements outlined above, it is important to ensure that the R_w+C_{tr} value is achieved (rather than simply the R_w value). Published R_w values tend to be higher than corresponding R_w+C_{tr} values; therefore, incorrect selection could result in an overestimation of sound reduction performance which in turn could result in higher internal noise levels.

- The opening and free area of the ventilation units should be checked by a mechanical service engineer before designs are finalised. Should the equivalent open area be insufficient to meet the minimum requirements of ADF, it may be necessary to increase the number of units per habitable room. Where this applies, the required sound reduction of the ventilation units may need to be increased accordingly

5 Summary and Conclusions

A noise impact assessment has been undertaken for the proposed residential development at 22 High Street, Wombwell, S73 0AA.

The noise environment at the site is controlled by road traffic on High Street, with patron/music noise associated with neighbouring licenced premises present during the late evening.

A scheme of sound insulation works has been developed to protect the proposed residential development from the ambient noise climate.

Appendix 1 – Abbreviations and Definitions

Sound Pressure Level (L_p)
The basic unit of sound measurement is the sound pressure level. As the pressures to which the human ear responds can range from 20 μPa to 200 Pa, a linear measurement of sound levels would involve many orders of magnitude. Consequently, the pressures are converted to a logarithmic scale and expressed in decibels (dB) as follows:

$L_p = 20 \log_{10}(p/p_o)$

Where L_p = sound pressure level in dB; p = rms sound pressure in Pa; and p_o = reference sound pressure (20 μPa).

A-weighting
A frequency filtering system in a sound level meter, which approximates under defined conditions the frequency response of the human ear. The A-weighted sound pressure level, expressed in dB(A), has been shown to correlate well with subjective response to noise.

Equivalent continuous A-weighted sound pressure level, $L_{Aeq, T}$
The value of the A-weighted sound pressure level in decibels of continuous steady sound that within a specified time interval, T, has the same mean-square sound pressure as a sound that varies with time. $L_{Aeq, 16h}$ (07:00 to 23:00 hours) and $L_{Aeq, 8h}$ (23:00 to 07:00 hours) are used to qualify daytime and night time noise levels.

$L_{A10, T}$
The A-weighted sound pressure level in decibels exceeded for 10% of the measurement period, T. $L_{A10, 18h}$ is the arithmetic mean of the 18 hourly values from 06:00 to 24:00 hours.

$L_{A90, T}$
The A-weighted sound pressure level of the residual noise in decibels exceeded 90% of a given time interval, T. L_{A90} is typically taken as representative of background noise.

$L_{AF\ max}$
The maximum A-weighted noise level recorded during the measurement period. The subscript 'F' denotes fast time weighting, slow time weighting 'S' is also used.

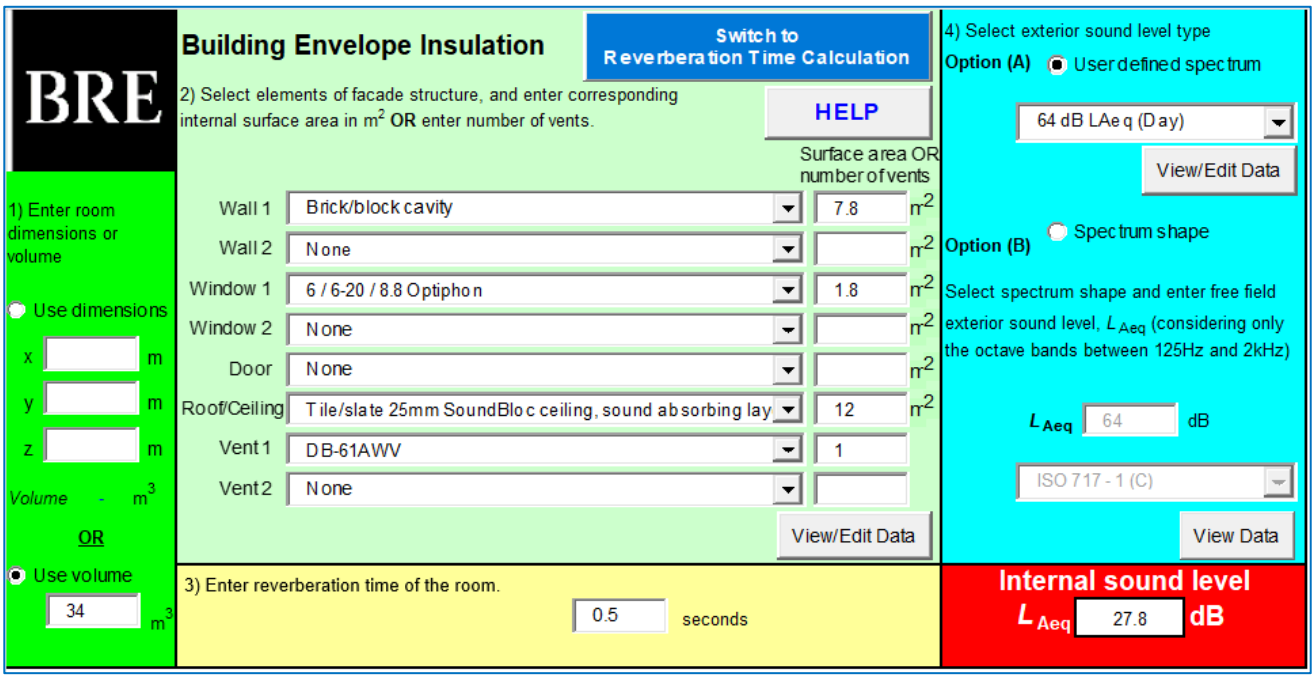
Single Event Level / Sound Exposure Level (SEL or L_{AE})
The energy produced by a discrete noise event averaged over one second, regardless of the event duration. This allows for comparison between different noise events which occur over different lengths of time.

Weighted Sound Reduction Index (R_W)
Single number quantity which characterises the airborne sound insulation properties of a material or building element over a defined range of frequencies (R_W is used to characterise the insulation of a material or product that has been measured in a laboratory).

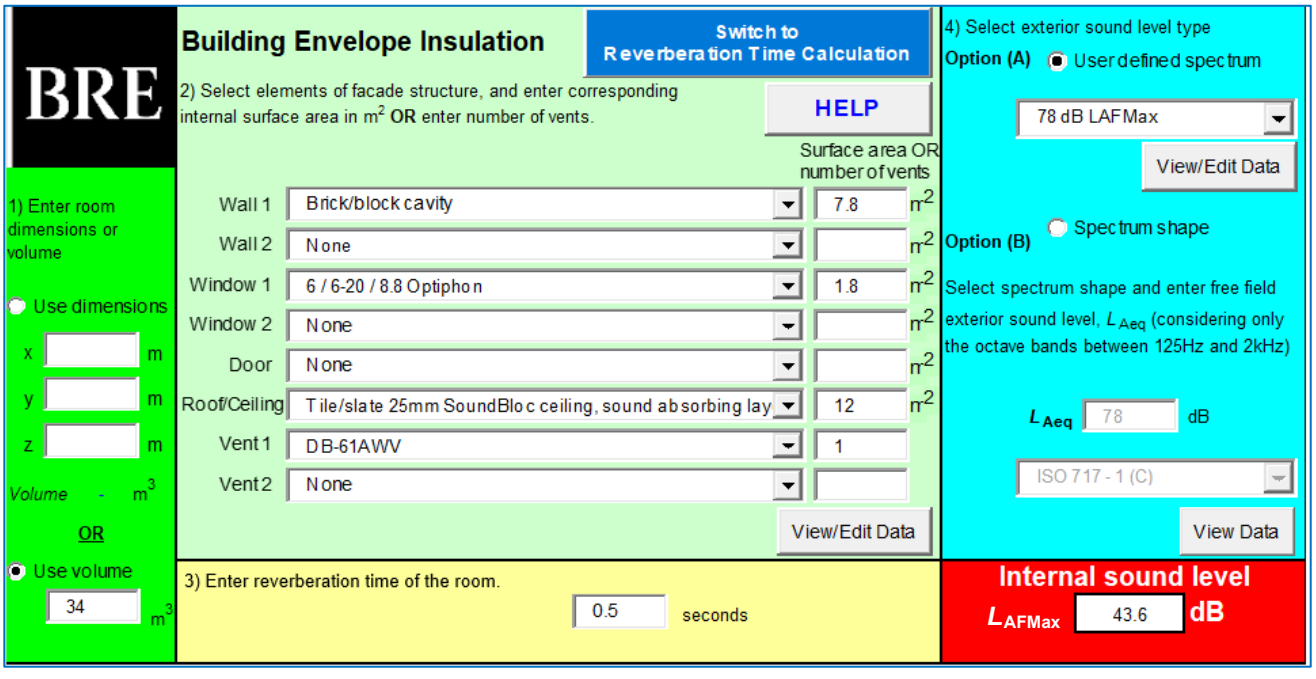
Appendix 2 – Noise Measurement Positions

Appendix 3 – BRE Calculation Sheets

Bedroom 1 – Daytime Ambient Noise Level



Bedroom 1 – Night-Time Maximum Noise Level



Appendix 3 – BRE Calculation Sheets

Living Room – Daytime Ambient Noise Level