Suite 24
Doncaster Business Innovation Centre
Ten Pound Walk
Doncaster
DN4 5HX

Proposed New Residential Over Retail Units

Former NU Well Shopping Centre, Corner of Summer Lane and House Lane, Wombwell, Barnsley, S73 oDQ

Noise Impact Assessment

For:
DPA Planning Ltd

20th January 2025

Ref: NIA-11863-24-12091-v1 NU Well Shopping Centre, Wombwell

Author: S. Jefferson BSc (Hons) MIOA

Contents

1 Introduction

1.1 Overview

Environmental Noise Solutions Ltd (ENS) has been commissioned by DPA Planning Ltd to undertake a noise survey and assessment for a proposed residential development at the former NU Well Shopping Centre, Wombwell, Barnsley, S73 0DQ (hereafter referred to as 'the site').

This report has been written to support planning application (ref: 2024/0879) submitted to Barnsley Metropolitan Borough Council in October 2024.

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
- 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 accompany Planning Application ref: 2024/0879 submitted to BMBC.

The report has been prepared for DPA Planning Ltd 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 DPA Planning Ltd 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 development is located in an urban setting in Wombwell, circa 6 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 site (former NU Well Shopping Centre) comprises 2 no. existing hot food takeaways at lower ground floor, with proposals to erect an addition floor (first floor) consisting of 7 apartments. The ground floor element will be consolidated into 3 no. commercial units with use unknown at this time.

The site is bounded by:

- Summer Lane to the north, along with adjacent existing residential dwellings
- Hough Lane to the south

The ambient noise climate at the site is characterised (dominated) by road traffic on Hough Lane and Summer Lane, with no other significant noise sourced noted.

2 Policy Context and Assessment Guidance

2.1 National Planning Policy Framework

The National Planning Policy Framework (NPPF)[1] was updated in December 2024 and sets out the Government's planning policies for England and how these are expected to be applied.

Where issues of noise impact are concerned the NPPF provides brief guidance in paragraph 187 where it states that planning policies and decisions should contribute to and enhance the natural and local environment by:

'preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of…..noise pollution'.

Paragraph 198 advises that:

'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…..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'.

With regard to extant community noise sources and the potential to affect proposed new developments, Paragraph 200 states that:

'Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed.'

The NPPF also refers to the 2010 DEFRA publication, the Noise Policy Statement for England (NPSE) which reinforces and supplements the NPPF.

2.2 Noise Policy Statement for England

The Noise Policy Statement for England[2] (NPSE) sets out the long-term vision of promoting good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development. This long-term vision is supported by the following aims:

- Avoid significant adverse impacts on health and quality of life
- Mitigate and minimise adverse impacts on health and quality of life
- Where possible, contribute to the improvement of health and quality of life

1 National Planning Policy Framework. Ministry of Housing, Communities and Local Government (2021)
2 Government Department for Environment, Food and Rural Affairs. Noise Policy Statement for England. March 2010.

The NPSE describes the following levels at which noise impacts may be identified:

- NOEL – No Observed Effect Level. This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise
- LOAEL – Lowest Observed Adverse Effect Level. This is the level above which adverse effects on health and quality of life can be detected
- SOAEL – Significant Observed Adverse Effect Level. This is the level above which significant adverse effects on health and quality of life occur

According to the explanatory notes in the statement, where a noise level falls between the lowest observable adverse effect level (LOAEL) and a level which represents a significant observable adverse effect level (SOAEL):

'….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.'

2.3 Planning Practice Guidance on Noise

Planning Practice Guidance[3] (PPG) is an online resource which provides additional guidance and elaboration on the NPPF. It advises that the Local Planning Authority should consider the acoustic environment in relation to:

- Whether or not a significant adverse effect is occurring or likely to occur
- Whether or not an adverse effect is occurring or likely to occur
- Whether or not a good standard of amenity can be achieved

In line with the Explanatory Note of the NPSE, the PPG references the LOAEL and SOAEL in relation to noise impact. It also provides examples of outcomes that could be expected for a given perception level of noise, plus actions that may be required to bring about a desired outcome. However, in line with the NPSE, no objective noise levels are provided for LOAEL or SOAEL.

The PPG also provides general advice on the typical options available for mitigating noise, suggesting that Local Plans may include noise standards applicable to proposed developments within the Local Authority's administrative boundary, although it states that:

'Care should be taken, however, to avoid these being implemented as fixed thresholds as specific circumstances may justify some variation being allowed'.

The subjective nature of noise means that there is not a simple relationship between noise levels and the impact on those affected. This will depend on how various factors combine in any particular situation. The following guidance documents provide some meaningful context.

3 Planning Practice Guidance on Noise: http://planningguidance.planningportal.gov.uk/blog/guidance/noise/

2.4 ProPG Planning and Noise: New Residential Development

ProPG Planning and Noise: New Residential Development (ProPG)[4] was published in 2017 by the Association of Noise Consultants, Institute of Acoustics and the Chartered Institute of Environmental Health.

Stage 2: Element 2 of ProPG sets indoor ambient noise levels for residential dwellings based on the guidance contained in British Standard 8233:2014 'Guidance on Sound Insulation and Noise Reduction for Buildings'[5] (BS 8233), see Table 2.1.

Table 2.1: Indoor Ambient Noise Levels in Dwellings

Activity	Location	Good Indoor Ambient Noise Levels	
Resting	Living Room	35 dB $L_{Aeq\ (0700\text{-}2300)}$	-
Dining	Dining Room/Area	40 dB $L_{Aeq\ (0700\text{-}2300)}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq\ (0700\text{-}2300)}$	30 dB $L_{Aeq\ (2300\text{-}0700)}$ 45 dB $L_{AFMax\ (2300\text{-}0700)}$

Note 4 to the above table states:

'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.'

Note 5 to the above table states:

'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'.

This is consistent with the guidance contained within the PPG, which states that:

'... consideration should also be given to whether adverse internal effects can be completely removed by closing windows and, in the case of new residential development, if the proposed mitigation relies on windows being kept closed most of the time. In both cases a suitable alternative means of ventilation is likely to be necessary. Further information on ventilation can be found in the Building Regulations'.

On the basis of the above, the following criteria (with windows closed and an alternative means of ventilation provided) are considered appropriate for the proposed development and considered to represent good resting and sleeping conditions:

- ≤ 35 dB $L_{Aeq\ (0700\text{-}2300)}$
- ≤ 30 dB $L_{Aeq\ (2300\text{-}0700)}$
- 45 dB L_{AFMax} not exceeded on more than 10 occasions in bedrooms during the night-time

4 '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)

5 British Standards Institution (2014). *British Standard 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings.*

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 during the daytime on Monday 6th and the night-time (early morning) of Tuesday 7th January 2025.

The adopted noise monitoring positions (shown in Appendix 2) were as follows:

- MP1 was located at first floor level overlooking Summer Lane
- MP2 was located at first floor level overlooking Hough Lane
- MP3 was located at the rear of the property at 4 metres above ground level (representative of the rear façade)

Noise measurements were undertaken at 1 metre from the existing building façade using Bruel & Kjaer 2250 and NTI XL3 Type 1 integrating sound level meters. The meters were 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 approximate free field noise levels.

Table 3.1: Summary of Noise Measurement Data

Position	Date	Time	$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{A10,T}$ (dB)	L_{AFMax} (dB)	Comment
MP1	06/01/25	1035–2300	60	44	66	-	Road traffic on Summer Lane and Hough Lane
	06-07/01/25	2300–0700	54	29	57	72*	
	07/01/25	0700–1000	61	48	66	-	
MP2	06/01/25	1049–1149	63	46	68	-	Road traffic on Hough Lane and Summer Lane
		1149–1249	65	48	70	-	
		1249–1349	65	48	70	-	
	06-07/01/25	0529–0700	63	43	68	78	
MP3	06/01/25	1358–1458	47	44	49	-	Road traffic on Hough Lane and Summer Lane
	06-07/01/25	0506–0521	41	36	42	63	
** 11th highest maximum noise level event during the night-time*							

3.3 Analysis

The noise environment at the site was controlled primarily by road traffic on the more heavily trafficked Hough Lane to the south-east of the site.

For the prediction of road traffic noise, the Department of Transport's Memorandum on the Calculation of Road Traffic Noise (CRTN) explains that the following shortened measurement procedure may be used. Measurements of L_{A10} are made over any three consecutive hours between 10:00 and 17:00 hours. Using $L_{A10\ (3\ hour)}$ as the arithmetic mean of the three consecutive values of hourly L_{A10}, the $L_{A10\ (18\ hour)}$ can be calculated from the equation:

$$L_{A10\ (18\ hour)} = L_{A10\ (3\ hour)} - 1\ dB$$

A study prepared by TRL Limited on behalf of the Department for Environment, Food and Rural Affairs (DEFRA) entitled 'Converting the UK Traffic Noise Index $L_{A10\ (18\ hour)}$ to EU Noise Indices for Noise Mapping' presents a methodology for calculating daytime $L_{Aeq\ (0700\text{-}2300)}$ and night-time $L_{Aeq\ (2300\text{-}0700)}$ ambient noise levels based on the $L_{A10\ (18\ hour)}$ noise levels, as follows:

$$L_{Aeq\ (0700\text{-}2300)} = 10 * \log \left(\frac{[(10^{((0.95 * L_{A10\ (18\ hour)} + 1.44)/10)} * 12] + [10^{((0.97 * L_{A10\ (18\ hour)} - 2.87)/10)} * 4]}{16} \right)$$

$$L_{Aeq\ (2300\text{-}0700)} = 0.90 * L_{A10,\ 18\ hour} - 3.77$$

Based on the above formulae, the daytime and night-time ambient noise levels at MP2 are calculated at **67 dB $L_{Aeq\ (0700–2300)}$** and **58 dB $L_{Aeq\ (2300–0700)}$** respectively.

Typical maximum noise levels during the night-time at MP2 are ≤ **78 dB L_{AFMax}** and are associated with vehicle movements along Hough Lane.

4 Noise Assessment

4.1 Design Noise Levels

Design noise levels for habitable rooms on the north-eastern façade (overlooking Summer Lane) are as follows:

- **≤ 60 dB $L_{Aeq\ (0700\text{-}2300)}$** during the daytime
- **≤ 54 dB $L_{Aeq\ (2300\text{-}0700)}$** during the night-time
- **≤ 72 dB L_{AFMax}** during the night-time

Design noise levels for habitable rooms on the south-eastern façade (overlooking Hough Lane) are as follows:

- **≤ 67 dB $L_{Aeq\ (0700\text{-}2300)}$** during the daytime
- **≤ 58 dB $L_{Aeq\ (2300\text{-}0700)}$** during the night-time
- **≤ 78 dB L_{AFMax}** during the night-time

4.2 External Noise Ingress

In order to calculate the sound insulation requirements for habitable rooms at 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.

The calculations indicate that all habitable rooms may be fitted with thermal glazing rated at least **29 dB R_w+C_{tr}** (such as 8 mm glass / 12 mm air gap / 4 mm glass) in conjunction with acoustic wall vents rated at least **57 dB $D_{n,e,w}+C_{tr}$** per 4400 mm² EA (vent open), such as the DB-61AWV, or equivalent.

See Appendix 3 for selected BRE calculation spreadsheets.

General Points

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.

- The ceilings (and side cheeks to the dormer windows) in any room-in-roof bedrooms should be double boarded, with 100 mm (minimum) mineral wool insulation above.

4.3 Proposed Ground Floor Retail Units

The requirements of Approved Document E for dwelling formed by a change of use are for floors separating habitable rooms from other areas of the same building to achieve a sound insulation performance of 43 dB $D_{nT,w}$ + C_{tr}. This applies to the separating floor between the ground floor commercial spaces and the residential dwellings at first floor.

For commercial uses such as shops and offices where the noise sources are comparable to normal domestic uses, such a sound insulation performance would be considered appropriate. However, the proposed use class of the ground floor commercial spaces may include uses which would generate higher noise levels such as food and drink establishments etc.

As such it is generally appropriate to adopt a higher sound insulation performance in the order of 60 dB $D_{nT,w}$ which is the standard adopted by Whitbread Premier Inn (who offer a good night's sleep guarantee) where hotel bedrooms are above the hotel's restaurant and bar areas.

The preferred solution would be to install a new independent ceiling as follows:

1. 22mm tongue & groove chipboard flooring
2. Timber or steel joists with 50-100 mm of mineral wool infill between joists (density ≥10kg/m^3)
3. 1 no. layer 15mm BG FireLine or equivalent dense plasterboard to underside of joists
4. Timber or steel joists on wall hangers
5. Minimum 300 mm cavity between underside of joists and ceiling below, with 100mm dense mineral wool infill (density ≥45kg/m^3)
6. 2 no. layers 15mm BG SoundBloc or equivalent with joints staggered and taped and a skim finish

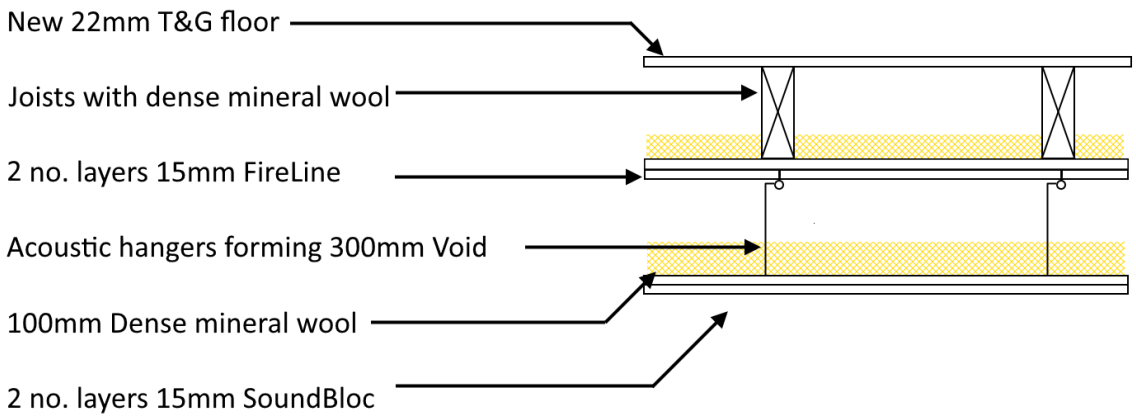
Whilst the build-up set out above is the preferred solution, it is not always practical to install fully independent joists in commercial areas where access to a ceiling void may be required for installing plant etc as well as limits on the maximum unsupported span for floor joists.

As such, an alternative build up may be used incorporating a metal frame ceiling as follows:

1. 22mm tongue & groove chipboard flooring
2. Timber or steel joists with 50-100 mm of mineral wool infill between joists (density ≥10kg/m^3)
3. 2 no. layer 15mm BG FireLine or equivalent dense plasterboard to underside of joists
4. A suspended ceiling consisting of a concealed grid metal frame system (e.g. British Gypsum Casoline or equivalent) incorporating acoustic hangers
5. Minimum 300 mm cavity between underside of joists and ceiling below, with 100mm dense mineral wool infill (density ≥45kg/m^3)
6. 2 no. layers 15mm BG SoundBloc or equivalent with joints staggered and taped and a skim finish

Figure 3.2 below presents illustrates the proposed build-up.

Figure 3.2: Proposed separating floor build up with metal frame ceiling



All structural steelwork within the ceiling void should be boxed in with 2 no. layers of 15mm FireLine, and all cavities fully filled with dense mineral wool.

The proposed separating floor build-ups set out above would achieve a sound insulation performance of 60 dB $D_{nT,w}$ and would provide suitable separation for typical Class E uses at ground floor.

5 Summary and Conclusions

A noise impact assessment has been undertaken for the proposed residential development at the former NU Well Shopping Centre, Wombwell, Barnsley, S73 0DQ.

The noise environment at the site is controlled by road traffic on Summer Lane and Hough Lane, with no other significant noise sourced noted.

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.

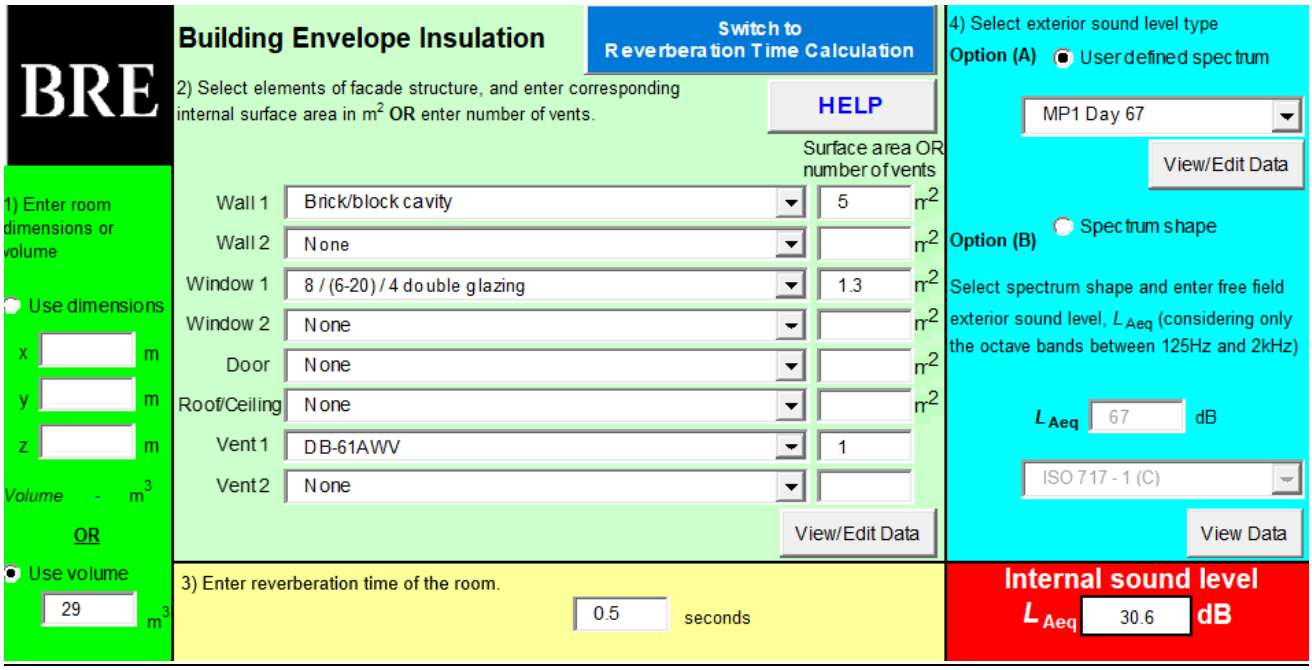
Single Event Level / Sound Exposure Level (SEL or L_{AE})
The energy produced by a discrete noise event averaged over one second, regardless of the event duration. This allows for comparison between different noise events which occur over different lengths of time.

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).

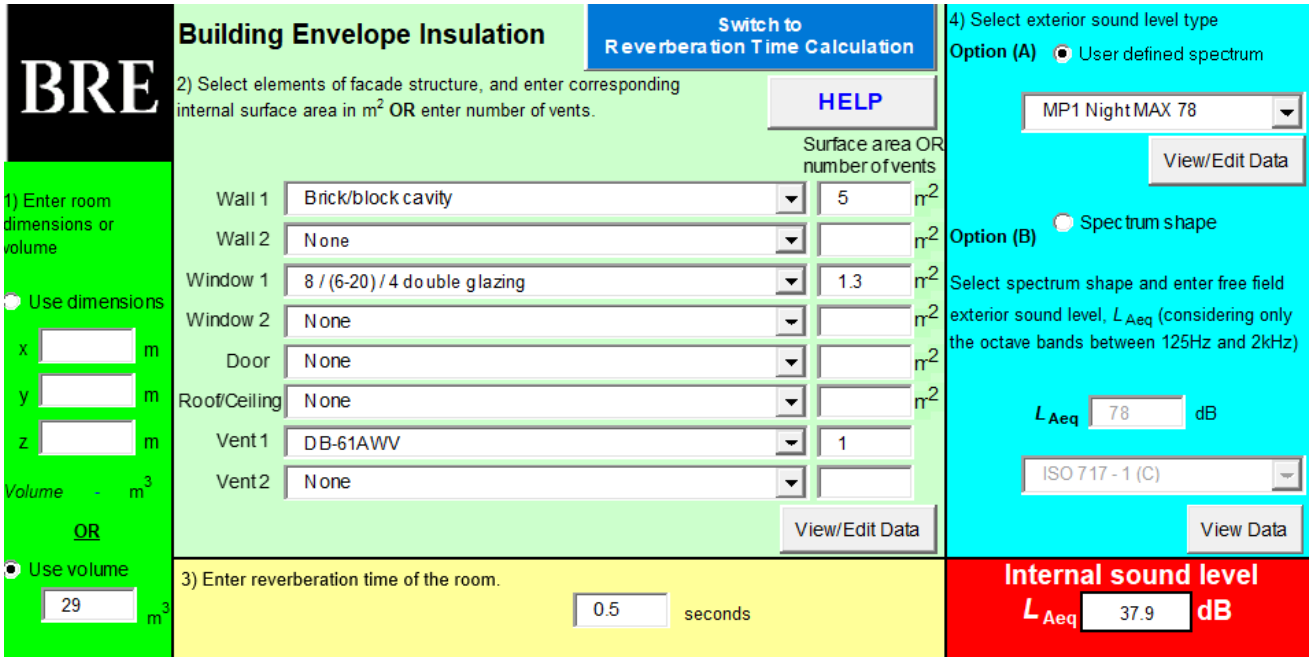
Appendix 2 – Noise Measurement Positions

Appendix 3 – BRE Calculation Sheets

Bedroom (29m3) Fronting Hough Lane (MP2) – Daytime Ambient Noise Level



Bedroom (29m3) Fronting Hough Lane (MP2) – Night-time Maximum Noise Level



Appendix 3 – BRE Calculation Sheets

Living Room (42m³) Fronting Hough Lane (MP2) – Daytime Ambient Noise Level