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Proposed Residential Development Dodworth Road, Barnsley

Noise Impact Assessment

For:
Brewster Bye Architects Limited

6th February 2025

Ref: NIA-11872-25-12122-v1 Dodworth Road
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Contents

1 Introduction

1.1 Overview

Environmental Noise Solutions Limited (ENS) has been commissioned by Brewster Bye Architects Limited to carry out a noise impact assessment for a proposed (outline) residential development at Dodworth Road, Dodworth, Barnsley (hereafter referred to as 'the site').

The objectives of the noise impact assessment were to:

- Determine external noise levels at the site
- Assess the potential impact of the external noise climate on the proposed (outline) residential development with reference to relevant guidelines
- Provide outline 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) and boundary treatments. It has been prepared to accompany a planning application to be submitted to Barnsley Metropolitan Borough Council (BMBC).

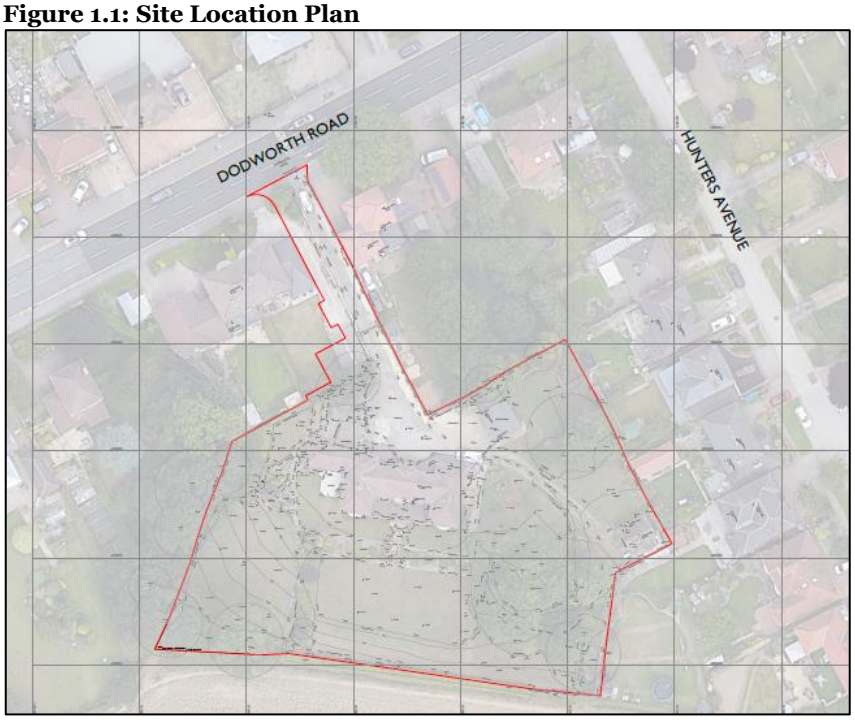
The report has been prepared for Brewster Bye Architects Limited for the sole purpose described above and no extended duty of care to any third party is implied or offered. Third parties referring to the report should consult Brewster Bye Architects Limited and ENS as to the extent to which the findings 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 to the south of Dodworth Road in the Dodworth area of Barnsley, as shown (highlighted in red) in Figure 1.1.

Figure 1.1: Site Location Plan



The site is bound by:

- Existing residential dwellings (No. 262 and No. 266 Dodworth Road) to the north
- Agricultural fields to the south, with the M1 motorway and slip road beyond
- Rear gardens of residential dwellings on Hunters Avenue to the east
- Rear garden of residential dwelling on Dodworth Road to the west

The noise environment at the site was dominated by road traffic on the M1 motorway, with no other significant noise sources noted during the survey.

1.3 Development Proposals

Development proposals are for 5 no. new build residential dwellings with associated landscaping and parking.

Outline planning permission is sought for the proposed residential development. As a consequence, the site layout (contained in Appendix 3) is preliminary. Notwithstanding this, the objective of the noise impact assessment is to assess whether the ambient noise climate represents a constraint to the proposed residential development.

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'.

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

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

1 National Planning Policy Framework. Ministry of Housing, Communities and Local Government (2023)
2 Government Department for Environment, Food and Rural Affairs. Noise Policy Statement for England. March 2010.

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 although the PPG acknowledges that:

'...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 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.

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.

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

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.*

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 $L_{Aeq\ (0700\text{-}2300)}$ in habitable rooms during the daytime
- ≤ 30 dB $L_{Aeq\ (2300\text{-}0700)}$ in bedrooms during the night-time
- 45 dB L_{AFMax} not regularly exceeded during the night-time

With regard to external amenity, ProPG reflects the advice given in BS 8233 as follows:

'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 $L_{Aeq,16hr}$.'

'These guideline values may not be achievable in all circumstances where development might be desirable. In such a situation, development should be designed to achieve the lowest practicable noise levels in these external amenity spaces.'

3 Noise Assessment

3.1 Baseline Noise Levels

Planning permission for a previous residential development at the site was sought under Planning Application ref: 2021/0941, submitted to BMBC in July 2021. The application was accompanied by a noise impact assessment (ref: NIA/9440/20/9447/v3/Dodworth Road, dated June 2021) prepared by ENS.

The noise assessment utilised noise measurements undertaken in November 2020.

The noise environment at the site was characterised by distant road traffic on the M1 motorway. Daytime and night-time ambient noise levels across the site were measured/calculated at **61 dB $L_{Aeq\ (0700–2300)}$** and **58 dB $L_{Aeq\ (2300–0700)}$** respectively.

Data produced by the Department for Transport (DFT)[6] show that traffic volumes during the November 2020 survey were circa 76 % of typical flows due to UK Government measures related to the Covid 19 pandemic.

Using the methodology in the CRTN, a 24 % reduction in traffic volumes equates to 1 dB reduction in ambient noise levels ($L_{Aeq,T}$). As such a 1 dB correction has been robustly applied to the measured noise levels across the site to account for a potential increase in measured noise levels now that traffic flows are back to 'normal'.

Maximum noise levels at the site were measured at up to **68 dB L_{AFMax}** during the night-time. For reference, maximum noise levels are discrete events and are therefore unaffected by traffic flows.

3.2 Internal Noise Amenity

Design noise levels at the site are as follows:

- **≤ 62 dB $L_{Aeq\ (0700-2300)}$** during the daytime
- **≤ 59 dB $L_{Aeq\ (2300-0700)}$** during the night-time
- **≤ 68 dB L_{AFMax}** during the night-time

In order to calculate the sound insulation requirements of the building envelope for habitable rooms throughout 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, typical 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).

Due to elevated noise levels from the M1 motorway, it is recommended that dwellings at the site are provided with a system of decentralised mechanical extract ventilation (dMEV) using continuously running kitchen and bathroom extracts on a 'trickle' rate.

Approved Document F 'Ventilation' (ADF) states that where dMEV 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.

[6] https://www.gov.uk/government/statistics/transport-use-during-the-coronavirus-covid-19-pandemic

All habitable rooms across the site should be provided with glazing rated at least **32 dB R_w+C_{tr}**, such as 10 mm glass / 6-20 mm cavity / 6 mm glass in conjunction with acoustic trickle vents rated at least **38 dB $D_{n,e,w}+C$** per 5000mm² EA, such as the Titon V75 vent (TA5235) with C75 canopy (TA5236) or equivalent.

See Appendix 4 for selected BRE calculation spreadsheets.

A detailed building envelope specification can be provided when the detailed layout is determined (as part of a Reserved Matters application). However, the ambient noise climate does not pose a constraint to the proposed residential development.

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.

- Internal noise levels due to mechanical ventilation plant should not exceed 26 dB(A) in bedrooms and 30 dB(A) in living rooms

- 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 ceilings (and side cheeks to any dormer windows) in any room-in-roof habitable rooms should be double boarded, with 100 mm (minimum) mineral wool insulation above. The glazing specification above is also applicable to 'Velux' windows.

3.3 External Noise Amenity

Daytime noise levels were measured / calculated up to 62 dB $L_{Aeq\ (0700\text{-}2300)}$. Whilst BS8233 recommends an upper guideline value for external amenity of 55 dB $L_{Aeq\ (0700\text{-}2300)}$, it also acknowledges that this may not always be achievable, as follows:

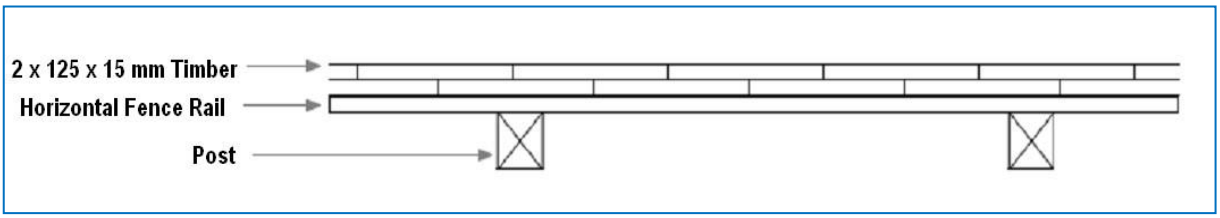
'However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited.'

Slightly elevated external noise levels may reasonably be expected in close proximity to a major transportation route, and these elevated levels should be considered within the wider context of the site as a convenient commuter location, in accordance with the guidance contained in ProPG/BS 8233.

Notwithstanding this, in order to reduce garden levels as low as practicable, it is recommended that the proposed gardens are enclosed using 2.4-metre-high solid timber fence (see Appendix 5 for locations of fences).

It should be ensured that the fence has a mass per unit area of ≥ 10 kg/m². The fence should have no gaps or holes and should be fully sealed at the ground (i.e. include a gravel board).

An indicative acoustic fence detail is illustrated below. The double-thickness solid timber construction is considered robust and appropriate.



A detailed scheme of boundary treatments can be provided when the detailed layout is determined (as part of a Reserved Matters application). The ambient noise climate at the site is, however, suitable for residential development.

3.4 Noise Associated with Proposed Access Road

Concerns have been raised by the LPA previously regarding increased vehicular activity associated with the development impacting on surrounding existing dwellings.

In order to assess the impact of vehicle movements along the access road, the Sound Exposure Level (SEL) is used. The SEL of a single discrete noise event is the level which if maintained constant for a period of one second would contain as much A-weighted sound energy as is contained in the actual noise event.

The SEL of diesel van pass-bys at low speed has previously been measured by ENS at circa **65 dB(A)** at 3 metres.

Based on previous transport assessments, each dwelling would be expected to generate circa 5.2 no. vehicle movements per day (24 hours). This equates to 26 no. vehicle movements per day for the overall development.

Based on the methodology contained in the Design Manual for Roads and Bridges (DMRB), it is expected that 94% of these movements would occur during the daytime period (0700–2300 hours), with the remaining 6% occurring during the night time period (2300–0700 hours).

This equates to 24 no. vehicle movements during the daytime and 2 no. vehicle movements during the night-time.

The following formula may be used for calculating the L_{Aeq} level from the SEL:

$L_{Aeq,\,T} = 10 * \log_{10} [\ (n \times 10^{SEL/10}) / T\ ]$ where:

- SEL is the Single Event Level (65 dB(A))
- n is the number of occurrences
- T is the time period in seconds

Processing the above formula, the resultant sound pressure levels are as follows:

- **31 dB $L_{Aeq\ (0700\text{-}2300)}$** at 3 metres during the daytime
- **23 dB $L_{Aeq\ (2300\text{-}0700)}$** at 3 metres during the night-time

Such levels are very significantly (at least 31 dB) below the existing ambient noise levels across the site. On this basis, noise associated with the development is considered to be wholly negligible.

This is consistent with the conclusions of The Planning Inspectorate in relation to site-generated noise at a comparable residential development within close proximity to the site (BMBC ref: 2015/0199 at 315 Dodworth Road). In the Appeal Decision (ref: APP/R4408/W/15/3141763), the Inspector noted that:

'26. *In the context of the immediate noise environment of Dodworth Road, I conclude that any additional noise and disturbance resulting from the use of the shared drive by the four houses to the rear would not be material. As such it would not cause undue harm to the living conditions of the existing occupiers at no. 313 and it would not result in unsatisfactory living conditions of the intended occupiers of the replacement dwelling at no. 315. In this regard the proposal would be in conformity with the UDP policies and SPD outlined above.'*

4 Summary and Conclusions

A noise impact assessment has been undertaken for the proposed (outline) new build residential development at 264 Dodworth Road, Dodworth, Barnsley.

The ambient noise climate at the site is characterised (dominated) by road traffic on the M1 motorway with no other significant noise sources noted.

An outline scheme of sound attenuation works (fenestration and ventilation), boundary treatment and layout considerations has been developed to protect the proposed residential development from the ambient noise climate in accordance with pertinent guidelines. On this basis, the ambient noise climate does not pose a constraint to the proposed residential development.

Noise associated with site-generated vehicle movements is considered to be negligible.

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.

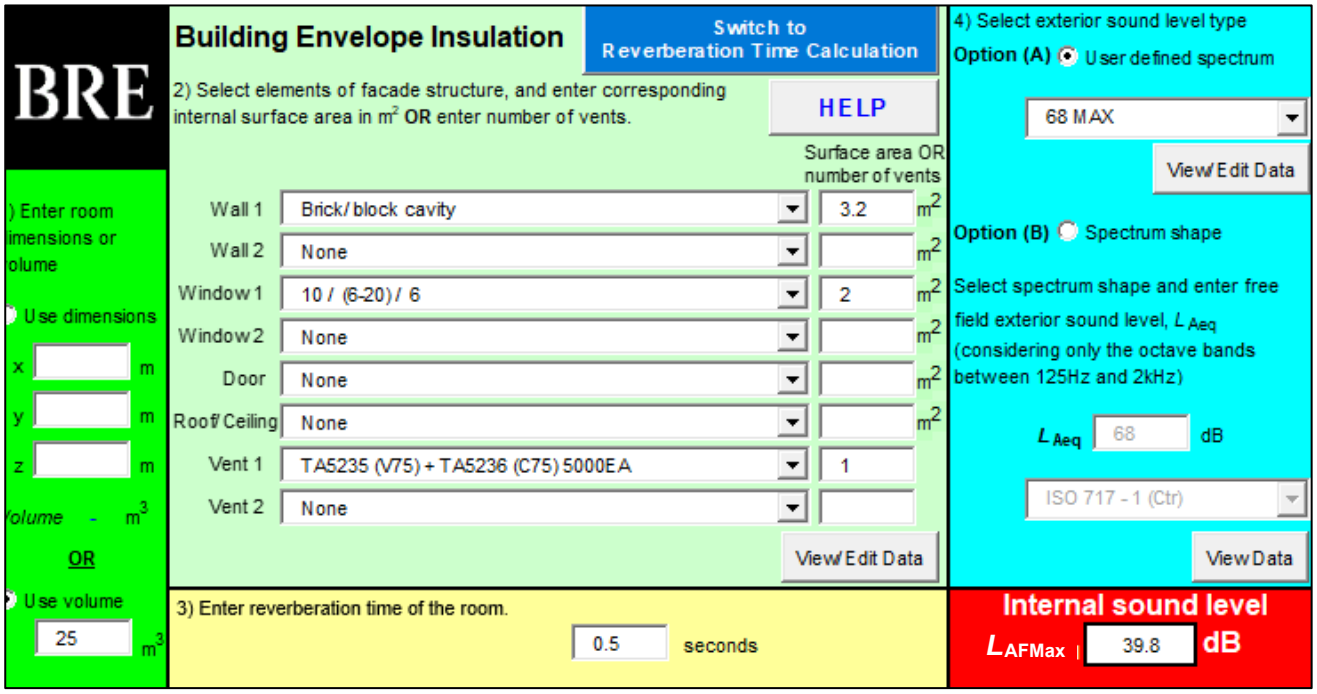
Weighted Sound Reduction Index (R_W)
Single number quantity which characterises the airborne sound insulation properties of a material or building element over a defined range of frequencies (R_W is used to characterise the insulation of a material or product that has been measured in a laboratory).

Appendix 2 – Noise Measurement Positions

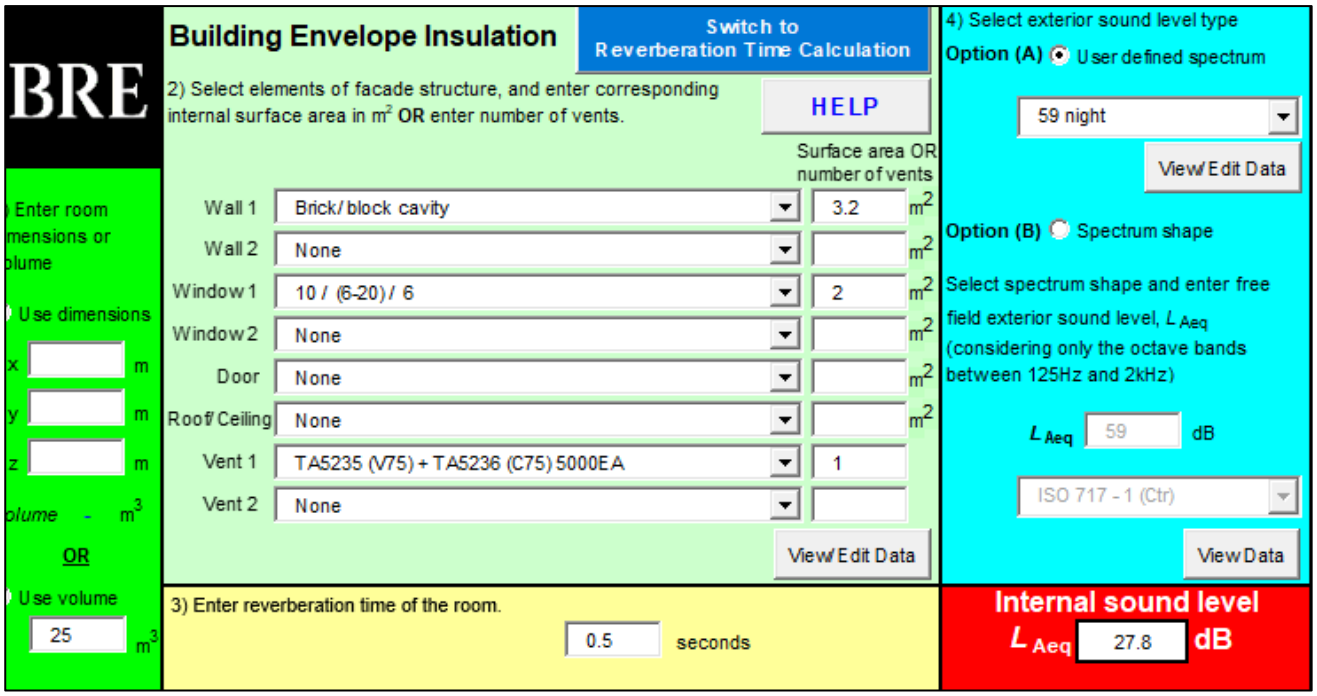
Appendix 3 – Site Layout (Outline)

Appendix 4 – Selected BRE Calculation Spreadsheets

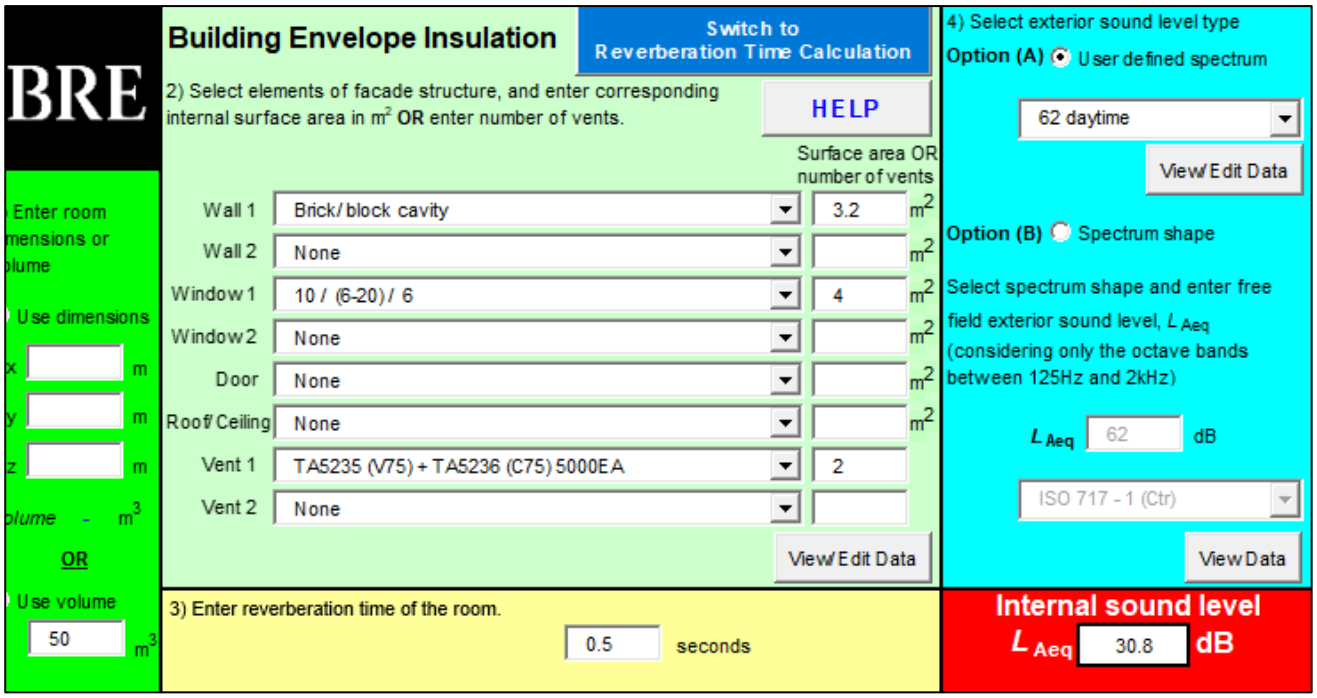
Night-time Maximum Noise Levels - Bedrooms



Night-time Ambient Noise Levels - Bedrooms



Daytime Ambient Noise Levels – Living Rooms



Appendix 5 – Outline Garden Boundary Treatments