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Proposed Residential Development
Land to the west of Brook House Lane, Near Bank, Shelley, HD8 8LU

Noise Impact Assessment

For:
Wood Associates

12th September 2025

Ref: NIA-12093-25-12383-v1 Brook House Lane, Shelley
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1 Introduction

1.1 Overview

Environmental Noise Solutions (ENS) has been commissioned by Wood Associates (the client) to carry out a noise impact assessment for the proposed residential development on land to the west of Brook House Lane, Near Bank, Shelley, HD8 8LU (hereafter referred to as 'the site').

The objectives this report are to:

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

The report has been prepared for the client 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 the client 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 and Development Proposals

The site is located on land to the west of Brook House Lane in a mixed-use setting in the village of Shelley, circa 8.8 km to the south-east of Huddersfield Town centre. The approximate site location is indicated in red on Figure 1.1.

Figure 1.1: Location of Proposed Development

The site is bounded by:

- Open farmland to the north
- Existing residential dwellings to the south
- Existing Barncliffe Mills Business Park car park adjacent to the east
- Open farmland to the west

To the east of the proposed development site is Barncliffe Business Park, the former textile mill features a variety of small businesses, the businesses in closest proximity to the proposed development are listed below:

- KG Auto Engineering (0730-1800 Monday to Saturday)
- 4 x 4 & More (0830-1700 Monday to Saturday)
- Kin Café (0900-1500 Monday to Sunday)
- The Whole Groom (Monday-Tuesday 0800-1600, Wednesday and Friday 0900-1600, Thurs 0800-1600, Sat 1000-1200, Sunday closed)

No significant noise was noted from the businesses listed above or the wider surrounding commercial units.

Development proposals are for the erection of 9 no. residential dwellings with associated landscaping and access roads. Layout plans indicate that the residential footprint is set back approximately 42 metres from the nearside kerb of Brook House Lane and circa 5 metres from the Barncliffe Mills Business Park car park adjacent to the east of the proposed development site.

2 Assessment Guidance

2.1 British Standard 8233:2014

British Standard 8233:2014 'Guidance on Sound Insulation and Noise Reduction for Buildings'[1] (BS 8233) sets indoor ambient noise levels for residential dwellings as summarised in 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 $L_{Aeq\ (2300\text{-}0700)}$

With regard to external amenity, BS 8233 states:

'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 $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ 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. 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.'

2.2 Approved Document O

Approved Document O, 2021 is written in support of Part O of Schedule 1 to the Building Regulations 2010. The approved document details methods of addressing overheating of residential dwellings and is applicable only across England.

The approved document has the following relevant guidance in Section 3 regarding noise ingress into buildings:

'*In locations where external noise may be an issue (for example, where the local planning authority considered external noise to be an issue at the planning stage), the overheating mitigation strategy should take account of the likelihood that windows will be closed during sleeping hours (11pm to 7am).*

Windows are likely to be closed during sleeping hours if noise within bedrooms exceeds the following limits.

- *40 dB $L_{Aeq,T}$, averaged over 8 hours (between 11pm and 7am)*
- *55 dB $L_{Amax,F}$ more than 10 times a night (between 11pm and 7am)'*

1 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 during the daytime on Wednesday 21st May and the night-time (early morning) of Thursday 22nd May 2025.

For the purposes of the assessment, a single monitoring position (MP1) was adopted at a position representative of the nearest façade to Brook House Lane and the car park. (see Appendix 2 for monitoring location).

Noise measurements were undertaken in free field conditions at 4 metres above ground level 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 Brüel & 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 $L_{Amax,F}$ together with linear octave band data.

The noted weather conditions during the surveys 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.

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	20/05/25	1326–1400	48	44	52	-	Vehicles along Brook House Lane dominant with intermittent low level vehicle noise from Barncliffe Mills Business Park car park, bird song
		1400–1500	49	42	54	-	
		1500–1600	50	42	56	-	
		1600–1700	51	42	56	-	
	20-21/05/2025	0453–0700	47	40	54	63	
	21/05/2025	0959–1214	51	43	56	-	

Noise levels at the site were primarily controlled by vehicles along Brook House Lane and occasional low-level sporadic vehicle movements within the Barncliffe Mills Business Park car park. No other significant noise sources noted.

3.3 Analysis

For the prediction of daytime 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:

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

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

Based on the above formulae, the daytime and night-time ambient noise levels at MP1 are calculated at **52 dB $L_{Aeq\,(0700–2300)}$** and **45 dB $L_{Aeq\,(2300–0700)}$** respectively.

Noise levels from individual events during the night time were ≤ **63 dB L_{AFMax}**. As these levels were measured during the final two hours of the night time period they are considered representative of the highest noise levels likely to occur.

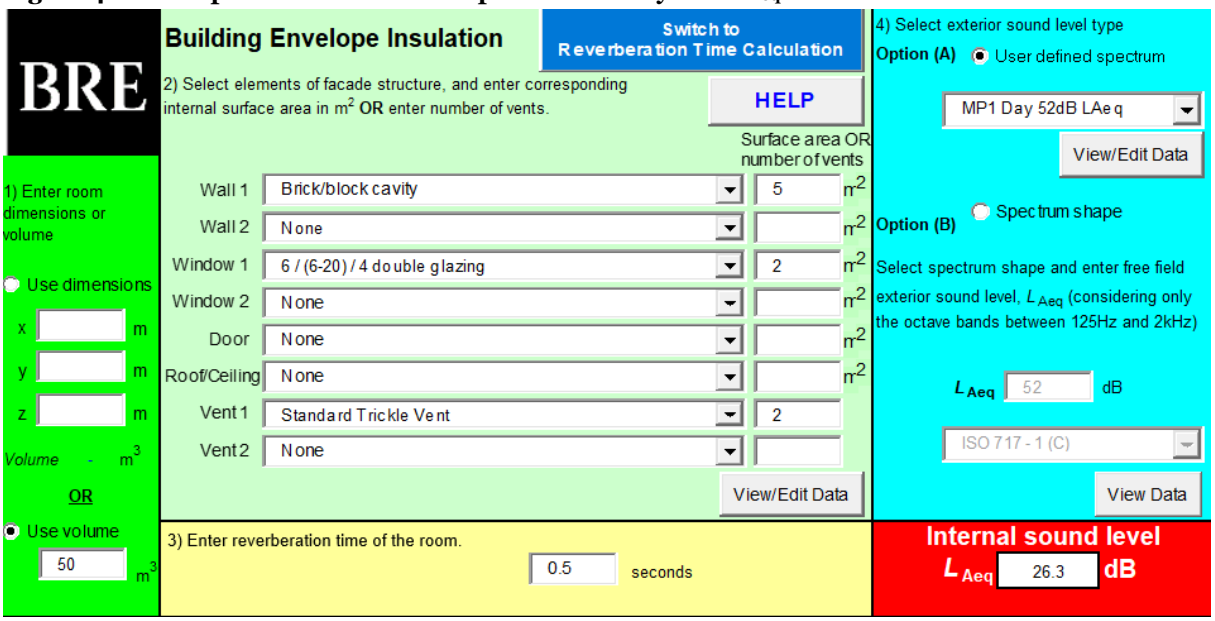
4 Noise Assessment

4.1 Scheme of Sound Attenuation

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 set out in Annex G of 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} in this case).

As evidenced in the calculation sheet below, a typical standard double-glazed window rated at least **28 dB R_w+C_{tr}** (such as 6 mm glass / 12 mm cavity / 4 mm glass) in conjunction with 2 no. standard trickle vents rated at least **32 dB $D_{n,e,w}+C_{tr}$** per 8000 mm² EA (vent open) will provide circa 26 dB(A) level reduction from external to internal at the site.

Figure 4.1: Example BRE Calculation Spreadsheet Daytime L_{Aeq}



The resultant internal noise levels are set out in the table below.

Table 4.1 – External Noise Levels and Resultant Internal Noise Levels

External Noise Level	Reduction	Resultant Internal Level
≤ 52 dB $L_{Aeq\ (0700\text{-}2300)}$ ≤ 45 dB $L_{Aeq\ (2300\text{-}0700)}$ ≤ 63 dB $L_{AFMAX\ (2300\text{-}0700)}$	–26 dB	≤ 26 dB $L_{Aeq\ (0700\text{-}2300)}$ ≤ 19 dB $L_{Aeq\ (2300\text{-}0700)}$ ≤ 37 dB $L_{Aeq\ (2300\text{-}0700)}$

The results set out in Table 4.1 demonstrate that the indoor ambient noise level criteria set out in Section 2 can be achieved for all habitable rooms throughout the development. On this basis, noise is not considered a constraint to the 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.

- 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.

4.2 External Amenity

Daytime ambient noise levels are predicted to be **≤ 52 dB $L_{Aeq\ (0700\text{-}2300)}$**, which would satisfy the upper guideline noise level for external amenity areas set out in Section 2. On this basis, external amenity areas throughout the site are considered suitable for use without specific mitigation.

4.3 Mitigation of Overheating

ADO states that for moderate risk locations (i.e. outside of London) the minimum free area of the open window should be at least 4% of the floor area of the room when used to mitigate against overheating.

As the open area varies as a function of the floor area, for a typical floor-to-ceiling height of 2.4m, a free area of 4% of the floor area equates to an external to internal noise reduction of 10 dB.

With reference to the internal targets contained in ADO, it is assumed that open windows can form the overheating mitigation strategy with no additional ventilation or cooling, providing the external noise levels outside bedrooms at night do not exceed **50 dB $L_{Aeq\ (2300\text{-}0700)}$** and **65 dB L_{AFMax}** (more than 10 times).

Night-time external noise levels at the site were measured at circa **45 dB $L_{Aeq\ (2300\text{-}0700)}$** and **63 dB L_{AFMax}**. As such, bedroom window throughout the site may be opened to the minimum free area of 4% of the floor area, meaning that the overheating mitigation strategy at the site is not constrained by acoustics.

5 Summary and Conclusions

A noise impact assessment has been undertaken for the proposed residential development on land to the west of Brook House Lane, Barncliffe Mills, Near Bank, Shelley, HD8 8LU.

A noise survey was undertaken at the site to assess noise levels from existing noise sources. The noise environment at the site is controlled by vehicles along Brook House Lane, with sporadic low-level noise from the Barncliffe Mills Business Park car park. No other significant noise sources were noted.

Ambient noise levels at the site are relatively low. As a consequence, standard double glazing and standard trickle vents are appropriate throughout the development, the overheating mitigation strategy at the site is not constrained by acoustics, and there are no issues with respect to external amenity.

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.

$L_{Amax,F}$
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