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Residential New Build Development

Land between the Dearne Valley Parkway and Wood Walk, Hoyland, Barnsley

Noise Impact Assessment

For:

Camstead Homes

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Contents

1 Introduction

1.1 Overview

1.1.1 Environmental Noise Solutions Ltd (ENS) has been commissioned by Camstead Homes to undertake a noise survey and assessment for a proposed residential development on land between the Dearne Valley Parkway and Wood Walk, Hoyland, Barnsley (hereafter referred to as 'the site').

1.1.2 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 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

1.1.3 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.

1.1.4 The report has been prepared for Camstead Homes 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 Camstead Homes and ENS as to the extent to which the findings may be appropriate for their use.

1.1.5 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

1.2.1 The site comprises an area of empty land to the west of the Wombwell Wood Roundabout, between Dearne Valley Parkway and Wood Walk, as shown (highlighted in red) in Figure 1.1.

Figure 1.1: Location of Proposed Development

1.2.2 The site is bound by:

- Dearne Valley Parkway to the north and Wood Walk to the south
- Wombwell Wood Roundabout to the east
- Residential estate and Miners Welfare Recreation Ground to the west

1.2.3 The ambient noise climate at the site is predominantly controlled by road traffic noise on Dearne Valley Parkway and Wood Walk.

1.2.4 Development proposals are for 83 no. detached and semi-detached residential units and associated parking and landscaping.

2 Policy Context and Assessment Guidance

2.1 National Planning Policy Framework

2.1.1 The National Planning Policy Framework (NPPF)[1] was updated in 2021 and sets out the Government's planning policies for England and how these are expected to be applied.

2.1.2 Where issues of noise impact are concerned the NPPF provides brief guidance in paragraph 174 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'.

2.1.3 Paragraph 185 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'.

2.1.4 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

2.2.1 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

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

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.

- 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

2.2.3 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

2.3.1 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

2.3.2 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'.

2.3.3 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'.

2.3.4 With regard to the mitigation of extant environmental noise at a proposed residential development, the guidance 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'.

2.3.5 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

2.4.1 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.

2.4.2 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 $L_{Amax,F\ (2300\text{-}0700)}$

2.4.3 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.'

2.4.4 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'.

2.4.5 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'.

2.4.6 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 $L_{Aeq\ (2300\text{-}0700)}$ during the night-time
- 45 dB $L_{Amax,F}$ not regularly exceeded 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.*

2.4.7 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 Survey

3.1 Overview

3.1.1 In order to determine the level of external noise affecting the proposed development, noise monitoring was carried out on Monday 20th and Tuesday 21st November 2023.

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

- MP1 was positioned at 10 metres from Wood Walk on the southern boundary of the site, at heights of 1.5 and 4 metres
- MP2 was positioned at 10 metres distance from the north-east boundary of site at a height of 4 metres in proximity to Dearne Valley Parkway and the roundabout
- MP3 was located at 4 metres height to the west of the site at a distance of 70 metres from Dearne Valley Parkway and 85 metres from Wood Walk
- MP4 was located on the northern boundary at 1.5 metres height and circa 30 metres from Dearne Valley Parkway

3.1.3 Noise measurements were undertaken in free field conditions using Bruel & Kjaer 2250 Type 1 integrating sound level meters. Each meter was connected to a windshield covered microphone positioned at the locations detailed above.

3.1.4 The measurement system calibration was verified immediately before and after the survey period using Bruel & Kjaer Type 4231. No drift in calibration levels greater than 0.1 dB was noted.

3.1.5 Measurements consisted of A–weighted broadband parameters including L_{Aeq}, L_{A10} L_{A90}, and $L_{Amax,F}$ together with linear octave and 1/3rd octave band data.

3.1.6 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

3.2.1 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	Height	Time (hh:mm)	Length (hh:mm)	$L_{Aeq,T}$ (dB)	$L_{Amax,F}$ (dB)	L_{A90} (dB)	L_{A10} (dB)	Comment
MP1	20/11/2023	4m	11:25	03:00	63	82	58	66	Road traffic noise controlling levels, significant peak event levels, noise levels remain high over early morning rush hour period.
		1.5m	11:25	00:30	61	79	56	63	
			14:05	00:15	61	76	58	63	
	21/11/2023	4m	05:08	02:00	60	74	53	63	
MP2	20/11/2023	4m	10:40	04:00	70	79	66	73	
	21/11/2023		05:00	02:00	68	77	60	72	
MP3	20/11/2023	1.5m	10:21	00:30	61	71	56	64	Levels reduced on-site with increased distance from roads.
			12:58	00:30	60	70	56	62	
MP4			12:27	00:30	64	75	61	66	Road noise reduced with distance from roundabout, significant peak noise events
			13:31	00:30	63	73	60	66	

4 Analysis

4.1 Road Traffic Noise

4.1.1 The noise environment over the area of the site was controlled by road traffic noise from the Dearn Valley Parkway and Wood Walk. Levels remained high throughout the daytime period and the early morning rush hour (0500-0700).

4.1.2 For a prediction of average day and night-time 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:

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

4.1.3 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:

Wood Walk

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

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

or

Dearne Valley Parkway (Dual Carriageway)

$$L_{Aeq\ (0700\text{-}2300)} = \frac{10 * \log([(10^{((0.98 * L_{A10\ (18\ hour)} + 0.09)/10)*12}] + [10^{((0.89 * L_{A10\ (18\ hour)} + 5.08)/10)*4}])}{16}$$

$$L_{Aeq\ (2300\text{-}0700)} = 0.87 * L_{A10,\ 18\ hour} + 4.24$$

4.1.4 Based on the above formulae, the daytime and night-time ambient noise levels at MP1 (south) are expected to be circa **63 dB $L_{Aeq\ (0700–2300)}$** and **56 dB $L_{Aeq\ (2300–0700)}$** respectively, with equivalent levels at MP2 (north) of **70 dB $L_{Aeq\ (0700–2300)}$** and **67 dB $L_{Aeq\ (2300–0700)}$**

4.1.5 Maximum noise levels were measured at up to **74 dB $L_{Amax,F}$** during the night-time (early morning) at MP1 and **77 dB $L_{Amax,F}$** at MP2.

4.1.6 Average levels impacting on the southern facades are expected to be equivalent to that measured at MP1, with levels impacting on the northern façades (based on distance correction) circa 5 dB less than the CRTN levels predicted for MP2, which corresponds with the daytime levels measured at MP4. Peak levels would not be expected to exceed 74 dB $L_{Amax,F}$.

5 Noise Assessment

5.1 Design Noise Levels

5.1.1 Design noise levels for the closest facades to the Dearn Valley Parkway to the north, and Wood Walk to the south are therefore expected to be:

- ≤ 65 dB $L_{Aeq\ (0700\text{-}2300)}$ during the daytime
- ≤ 62 dB $L_{Aeq\ (2300\text{-}0700)}$ during the night-time
- ≤ 74 dB $L_{Amax,F}$ during the night-time

5.1.2 In order to assess the propagation of noise from the road across the proposed site, noise level predictions have been performed using iNoise acoustic modelling software. This is a software program specifically developed for the prediction and assessment of environmental noise.

5.1.3 The model calculates noise levels on horizontal and vertical grids with a user defined spacing of receiver points. From these levels, calculated at thousands of points, contour lines of constant noise levels are generated and printed as noise maps.

5.1.4 All scaling was based on direct import from the site plans, with 2nd order reflections considered and absorption coefficients based on the iNoise default for brick-built structures. All relevant heights are taken into account for the site elevation and surrounding roads.

5.1.5 The results for the noise mapping exercise are shown in Appendixes 4 & 5. The mapping results include the provision of a 2.5 m (above ground level) acoustic barriers in the locations indicated in Appendix 3.

5.1.6 Daytime noise levels at 1st floor height reduce to ≤ 55 dB $L_{Aeq\ (0700\text{-}2300)}$ for northern plots set back greater than 40 metres from the northern boundary to Dearne Valley Parkway, and for greater than 20 metres from the boundary on Wood Walk. Night-time noise levels would be circa 2 dB lower for the northern façade for noise from Dearne Vally Parkway, and circa 7 dB lower for the plots facing the south on Wood Walk.

5.1.7 Façade levels are expected to be in the range of 55 to 60 dB $L_{Aeq\ (0700\text{-}2300)}$ for plots (43 to 50) facing the eastern boundary and roundabout.

5.1.8 Individual events during the night time are ≤ 64 dB $L_{Amax,F}$ for properties at 30 metres or more from Wood Walk, and 90 metres or more from Dearn Valley Parkway, for all bedrooms unshielded by other plots to the roadways. It is expected this level is applicable to Plots 8 to 25, with all other plots impacted by peak levels in the range of 64 to 74 dB $L_{Amax,F}$.

5.2 Scheme of Sound Attenuation

5.2.1 Calculations have been performed to determine the configuration of glazing and ventilation required to satisfy the internal noise criteria with closed windows for the most noise affected areas of the site. The calculations have incorporated the measured external noise level data and the noise ingress calculation methodology outlined in Annex G.2 of BS8233:2014. Building footprints are based on the current planning layout, drawing reference: (2180.01.AG – Planning layout (A1)).

5.2.2 In addition to satisfying the requirements of BS 8233, the scheme of sound insulation presented below is expected to control individual noise events in line with the ProPG requirement to not exceed 45 dB $L_{Amax,F}$ internally more than 10 to 15 times per night, as set out in Section 2.

5.2.3 The following has been assumed for assessment purposes:

- Room and façade element dimensions have been estimated based on typical residential rooms (9m² floor area/22m³ volume)
- Reverberation time of 0.5 seconds for habitable areas
- Typical masonry external wall construction (e.g. 100mm brick / 100mm cavity / 100mm block)

- A façade area of 7 m² with 1.2 m² of glazing per room

5.2.4 It was found that double glazing with a performance of at least **30 dB R_w+C_{tr}** (ie 10 mm / 12 mm /4 mm) will achieve satisfactory internal noise levels for the most exposed plots of the development. It is recommended that mechanical ventilation is fitted for all bedrooms of the most exposed façades.

5.2.5 If relying on natural ventilation, a minimum performance of **41 dB $D_{new} + C_{tr}$** is required, achievable with through wall units such as the Ryton AAC125HP.

5.2.6 BRE calculations sheets are shown in Figure 5-1 and 5-2 below for night-time $L_{Aeq,T}$ and $L_{Amax,F}$.

Figure 5.1 – BRE **calculation** $L_{Aeq,T}$

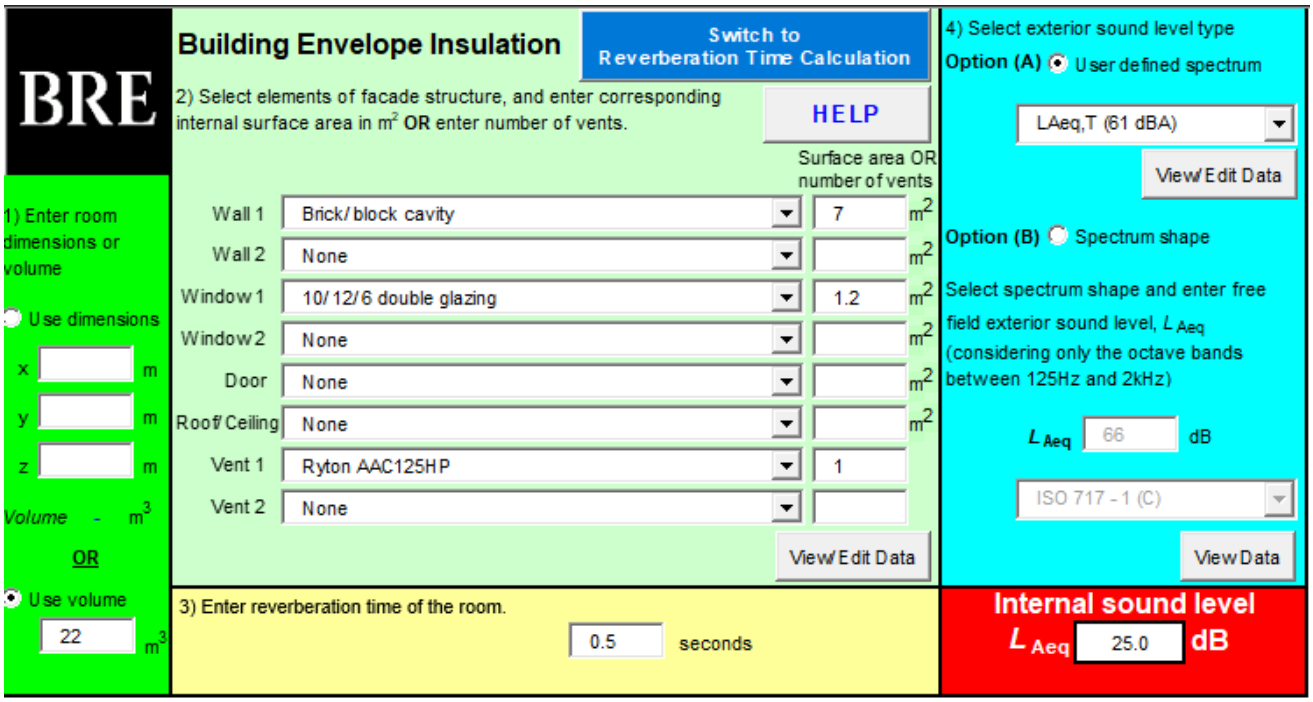
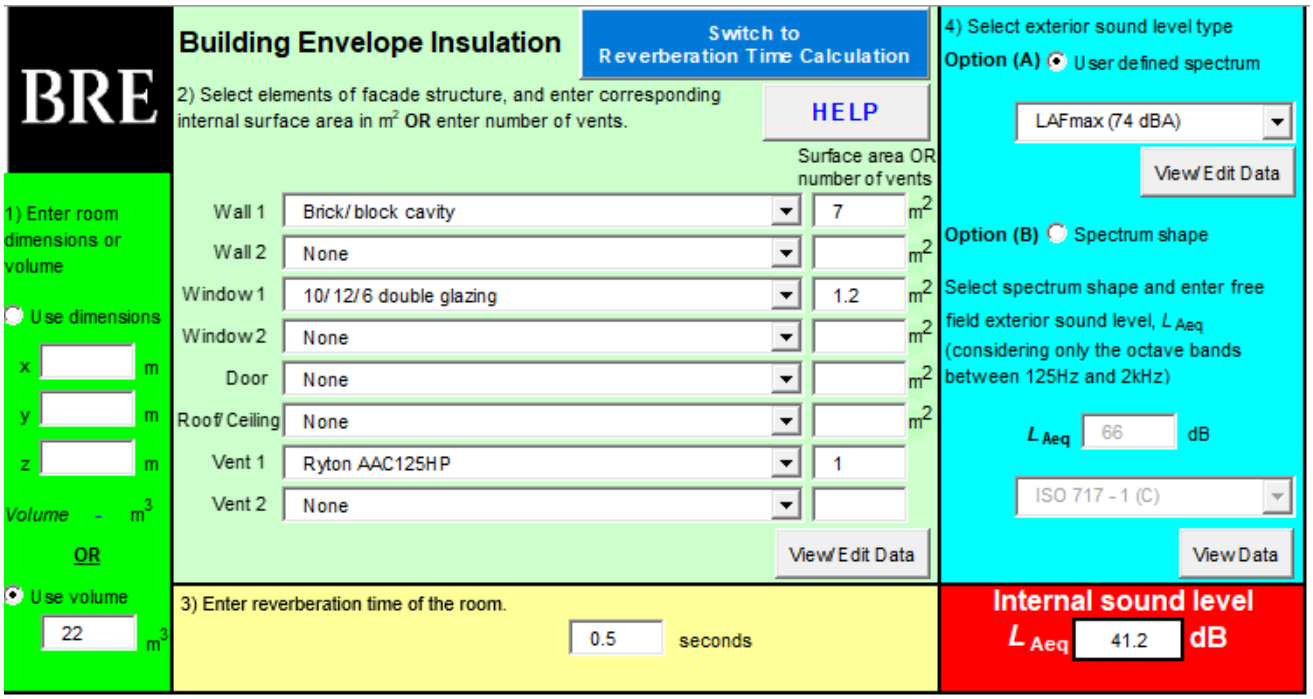


Figure 5.2 – BRE **calculation** $L_{Amax,F}$



5.2.7 Due to elevated noise levels from the surrounding roads, it is recommended that dwellings adjacent to/fronting towards the road noise sources are provided with a mechanical ventilation strategy. Appropriate ventilation solutions include:

- A fully ducted mechanical ventilation system with heat recovery (MVHR)
- A System 3 mechanical extract ventilation (MEV) system

5.2.8 In dwellings where the air permeability is tighter than (<) 5m³/(h.m²), 5000 mm² EA background ventilators may be required where MEV are proposed. Trickle or through-wall vents are not required where an MVHR system is used.

5.2.9 The ceilings (and side cheeks to the dormer windows) in any room-in-roof bedrooms of these plots should be double boarded, with 100 mm (minimum) mineral wool insulation above. The glazing requirements are also applicable to 'Velux' windows.

5.2.10 Plots 8 to 25 at the development appear to be suitable for standard double glazing rated at least **25 dB R_w+C_{tr}** (such as 4 mm glass / 6-20 cavity / 4 mm glass) in conjunction with trickle vents rated at least **33 dB $D_{n,e,w} + C_{tr}$** per 5000 mm² EA (vent open), such as the Titon SFX4000EA/C25 or equivalent (2 no. vents per habitable room).

5.2.11 Plots 8 to 25 are also expected to have external levels suitable for a simple ADO assessment based on partially open windows, with external levels < 49 dB $L_{Aeq,2300-0700}$ and < 64 dB $L_{Amax,F}$.

5.2.12 Table 5.1 contains the minimum recommended specification for the indicated areas of the development.

Table 5.1: Required Sound Reduction of Façade Elements

Element	Required Sound Reduction (dB)						Indicative Specification
	125 Hz	250 Hz	500 Hz	1kHz	2kHz	Weighted R_w ($R_w + C_{tr}$) / $D_{n,e,w}$ ($D_{n,e,w} + C_{tr}$)	
All bedrooms within 40m of the northern site boundary and 20m from the southern site boundary with line of sight to roads							
Glazing	24	21	32	37	41	**35 (30)**	10/12/4 Acoustic double glazing
Ventilation	42	37	37	43	57	**43 (41)** (*open position)*	Ryton AAC125HP wall ventilator or mechanical ventilation
All livingrooms within 40m of the northern site boundary and 20m from the southern site boundary with line of sight to roads							
Glazing	24	21	32	37	41	**35 (30)**	6/16/6 Thermal double glazing
Ventilation	42	37	37	43	57	**43 (41)** (*open position)*	Ryton AAC125HP wall ventilator
Plots 8 to 25 and all other shielded facades – habitable rooms							
Glazing	20	20	30	39	35	**33 (28)**	6/16/6 Thermal double glazing
Ventilation	37	35	32	33	37	**34 (33)**	Titon SFX4000EA/C25 Trickle Ventilator

5.2.13 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

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

5.3 External Amenity

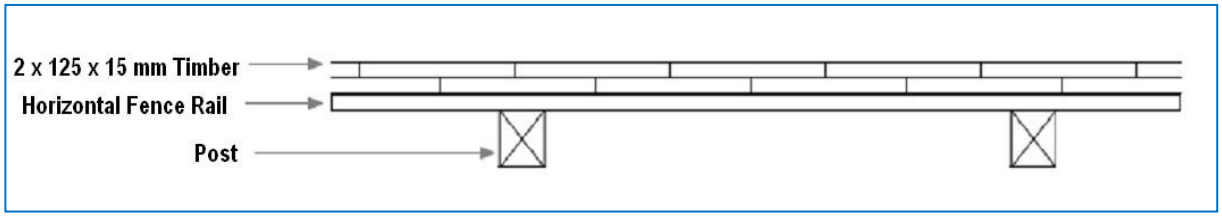
5.3.1 Unmitigated levels across the site are relatively high due to road traffic noise from the surrounding roads, some shielding will be afforded to the garden areas shielded from the road noise on both sides by the development, however in order to achieve noise levels as low as practicably possible, and within the BS 8233 guidance criteria of less than 50 to 55 dB $L_{Aeq,0700-2300}$, for external amenity areas, it is considered necessary to implement noise barriers along the site/garden boundaries as indicated in Appendix 3.

5.3.2 It is recommended that the noise barrier be at least 2500 mm high above the respective ground level for the indicated areas.

5.3.3 A solid timber barrier fence or a brick wall of any construction is appropriate, providing there are no gaps in the construction.

5.3.4 If a solid timber fence is installed, then it should be ensured that it 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).

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



5.3.6 Modelling of garden levels across the site indicates that, with the provision of the screening as specified, daytime noise levels in the proposed garden areas are generally < 50 dB $L_{Aeq\ (0700-2300)}$, with the exception of the gardens along the northern boundary which may experience noise levels of up to 55 dB $L_{Aeq,0700-2300}$ (see Appendix 5 for the daytime noise level contour map at ground floor level).

5.3.7 With cognisance to this, it should be noted that 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.'

5.3.8 Slightly elevated external noise levels may therefore be reasonably expected in close proximity to a dual carriageway and roundabout, 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.

6 Summary and Conclusions

6.1.1 A noise impact assessment has been undertaken for the proposed residential development on land between the Dearne Valley Parkway and Wood Walk, Hoyland, Barnsley.

6.1.2 A noise survey was undertaken at the site on Monday 20th and Tuesday 21st November 2023 with the results summarised in Section 3. The noise environment at the site is predominantly controlled by road traffic noise on Dearne Valley Parkway, Wood Walk and the associated roundabout to the east.

6.1.3 Section 5 of this report presents a scheme of sound insulation works developed to protect the proposed residential development from the ambient noise climate.

6.1.4 Mitigation is recommended for external amenity areas, to reduce noise levels as far as practicably possible.

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 and Scheme of Sound Attenuation

2.4-metre-high brick wall / close boarded timber fence

Blocks recommended for Mechanical Ventilation (with through wall vents rated at 41dB $D_{new}+C_{tr}$ where required)

Appendix 4 – Daytime Noise Contour Map at 1st Floor (4 m) – With Mitigation

Appendix 5 – Daytime Noise Contour Map in Gardens (1.5 m) – With Mitigation