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Proposed Residential Development Former Homestead Care Home, Hurst Knowle, Almondbury, HD5 8SG

Noise Impact Assessment

For: Highstone Building Services

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1 Introduction

1.1 Overview

Environmental Noise Solutions Ltd (ENS) has been commissioned by Highstone Building Services to undertake a noise impact assessment for the proposed residential assisted living development at the former Homestead Care Home, Hurst Knowle, Almondbury, HD5 8SG (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 residential development with reference to relevant guidelines
- Provide recommendations for a scheme of sound attenuation works as necessary

This report details the methodology and results of the assessment and provides recommendations as appropriate. It has been prepared to accompany an application for planning permission to be submitted to Kirklees Council.

The report has been prepared for Highstone Building Services 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 Highstone Building Services 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 in a suburban setting in Almondbury, to the east of Huddersfield, and is bound by Hurst Knowle to the east, and residential properties to the north, south and west. See Figure 1.1 for site location outlined in red.

Figure 1.1: Location of Proposed Development Boundary



Noise levels at the site are relatively low, with limited traffic on Hurst Knowle. The ambient noise climate characterised by local and distant road traffic noise.

The proposals are for the land to be developed to form 28no. new-build residential plots, made up of 8no. bungalows and 20no. apartments. An indicative site layout plan is illustrated in Figure 1.2 below.

Figure 1.2: Proposed Development Layout



Figure 1.3: Proposed Development Perspective Drawings



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 England² (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

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.

- 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 Guidance³ (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) 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’ (BS 8233), see Table 2.1.

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

Table 3.1: Summary of Noise Measurement Data

Activity	Location	Indoor Ambient Noise Level Targets	
Resting	Living Room	35 dB L_{Aeq} (0700-2300)	-
Dining	Dining Room/Area	40 dB L_{Aeq} (0700-2300)	-
Sleeping (daytime resting)	Bedroom	35 dB L_{Aeq} (0700-2300)	30 dB L_{Aeq} (2300-0700) 45 dB L_{AFmax} (2300-0700)

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.'

2.5 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.

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

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 Tuesday 14th January 2025.

The adopted noise monitoring position (shown in Appendix 2) was as follows:

- MP1 – located to the east of the site, set back 5 metres from Hurst Knowle

Noise measurements were made at 4 metres above ground level, in free field conditions using Bruel & Kjaer 2250 and NTi Audio XL3 Type 1 integrating sound level meters. A windshield was fitted for all measurements. The calibration of each measurement system was verified immediately before and after the survey using a Bruel & Kjaer Type 4231 calibrator. No drift in calibration level was noted.

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

Measurements consisted of A-weighted broadband parameters, together with linear octave band data.

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} (dB)	L _{A90} (dB)	L _{A10} (dB)	L _{AFmax} (dB)	Comment
MP1	14/01/25	0500-0600	44	32	45	65	Low traffic flows on Hurst Knowle. Noise levels driven by local and distant road traffic.
	14/01/25	0600-0700	48	37	49	69	
	14/01/25	0918-1018	51	41	53	-	
	14/01/25	1018-1118	51	41	53	-	
	14/01/25	1118-1218	51	40	52	-	

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:

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

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 (0700-2300)} and night-time L_{Aeq (2300-0700)} ambient noise levels based on the L_{A10 (18 hour)} noise levels, as follows:

$$L_{Aeq (0700-2300)} = \frac{10 * \log ([10^{((0.95 * L_{A10 (18 \text{ hour})} + 1.44)/10)^{12}}] + [10^{((0.97 * L_{A10 (18 \text{ hour})} - 2.87)/10)^4}])}{2}$$

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

Based on the above formulae, the daytime and night-time ambient noise levels at MP1 are calculated at **50 dB L_{Aeq} (0700–2300)** and **42 dB L_{Aeq} (2300–0700)** respectively. Typical maximum noise levels are taken to be **68 dB L_{AFMax}** during the night-time.

Noise levels across the site were found to be driven by local and distant road traffic, with limited traffic along Hurst Knowle. Noise levels throughout the remainder of the site reduce with distance from Hurst Knowle.

Plots 7 and 30 are set back circa 5 metres from Hurst Knowle and as such, noise levels measured at MP1 are considered to be representative of these plots. All remaining plots are set back >10 metres from Hurst Knowle.

In order to determine the typical night-time maximum noise level at plots set back >10 metres from Hurst Knowle, a distance attenuation correction of -6 dB has been applied to levels measured at MP1 [i.e. $20 \times \log (5 / 10) = -6 \text{ dB}$]. This gives a typical night-time maximum noise level of \leq **62 dB L_{AFMax}** at plots set back >10 metres from Hurst Knowle.

4 Noise Assessment

4.1 Design Noise Levels

The noise levels measured at the site have been used to determine the design noise levels for the proposed development.

Design noise levels for the plots closest to Hurst Knowle are summarised as follows:

- ≤ 50 dB $L_{Aeq,(0700-2300)}$ during the daytime
- ≤ 42 dB $L_{Aeq,(2300-0700)}$ during the night-time
- ≤ 68 dB L_{AFmax} during the night-time

4.2 Scheme of Sound Attenuation

Standard double glazing (rated at least **25 dB R_w+C_{tr}** (such as 4 mm glass / 6-20 / 4 mm glass) with standard trickle/wall vents rated at least **32 dB $D_{n,e,w}+C_{tr}$** (vent open) is likely to be appropriate for all plots throughout the site. ENS has tested this glazing and ventilation combination on numerous sites and it would typically achieve circa 25 dB reduction in external to internal noise levels.

Table 4.1: External Noise Levels and Resultant Noise Levels

Location	External Noise Level	Reduction	Resultant Internal Level
All Plots	≤ 50 dB $L_{Aeq (0700-2300)}$ ≤ 42 dB $L_{Aeq (2300-0700)}$ ≤ 68 dB L_{AFMax}	-25 dB	≤ 25 dB $L_{Aeq (0700-2300)}$ ≤ 17 dB $L_{Aeq (2300-0700)}$ ≤ 43 dB $L_{AFMax (2300-0700)}$

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.
- The ventilation provision should be checked by a mechanical service engineer before designs are finalised. Should the proposals be insufficient to meet the minimum requirements of ADF, it may be necessary to provide additional ventilators. Where this applies, the required sound reduction of the ventilation units should be considered accordingly.

4.3 External Amenity

BS 8233 recommends a guideline range for external amenity noise of 50-55 dB $L_{Aeq,16-hour}$. The standard also recognises that these guideline values are not achievable in all circumstances.

It is understood that the private gardens of the bungalows are to be provided with boundary fences.

Noise levels at the site are sufficiently low that appropriate external amenity noise levels within gardens are expected to be achievable without any additional mitigation. Noise levels are expected to reduce further due to screening afforded by proposed fences.

4.4 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.

As the free 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} (2300-0700)** and **65 dB L_{AFMax}** (more than 10 times).

On the basis of the measured external noise levels at the site, it is assumed that bedroom windows at plots 7 and 30 would be kept closed during night-time hours (2300-0700 hours), due to the typical maximum noise levels measured at these plots.

This information should be provided to the overheating assessor for the site, in order to determine the extent of additional mitigation required to comply with ADO.

Plots throughout the remainder of the site, which are set back >10 metres from Hurst Knowle, can utilise windows opened to the minimum free area of 4% of the floor area, meaning that the overheating mitigation strategy is not constrained by acoustics.

5 Summary and Conclusions

A noise impact assessment has been undertaken for the proposed residential development at the land at the former Homestead Care Home, Hurst Knowle, Almondbury, HD5 8SG.

Noise monitoring was carried at the site to determine the level of external noise affecting the proposed development. The noise environment was found to be dominated by local and distant road traffic.

Based on the noise levels measured at the site, standard double glazing is considered suitable throughout the site. On this basis, the ambient noise climate does not pose a constraint to the proposed residential development.

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:

$$L_p = 20 \log_{10}(p/p_0)$$

Where L_p = sound pressure level in dB; p = rms sound pressure in Pa; and p_0 = 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

