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Proposed Residential Development Land at Former Priory PH, Whitechapel Road, Cleckheaton, BD19 6HR

Noise Impact Assessment

**For:
Highstone**

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1 Introduction

1.1 Overview

Environmental Noise Solutions (ENS) has been commissioned by Highstone to carry out a noise impact assessment for the proposed new build residential development at land at Former Priory PH, Whitechapel Road, Cleckheaton, BD19 6HR (hereafter referred to as ‘the site’).

The objectives of the noise impact assessment 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 provide residential amenity for future occupants

This report details the methodology and results of the assessment and provides recommendations for the building envelope (fenestration and ventilation). It has been prepared to accompany a planning application to be submitted to Kirklees Council (KC).

The report has been prepared for Highstone 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 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 Proposed Development

The site is located in a mixed-used setting on the western fringe of Cleckheaton, as shown (highlighted in red) in Figure 1.1.

Figure 1.1: Location of Development



The site is bound by:

- Residential dwellings to the west, with the M62 beyond
- Ongoing residential development to the north
- Whitechapel Road to the south
- Whitechapel Church to the east

The noise environment across the site is characterised (dominated) by the M62 motorway.

Development proposals are for the demolition of existing structures and the erection of a single two-storey block containing 8 no. 1-bedroom assisted living apartments with associated staff spaces.

2 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 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
- 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.'

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.

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.

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.

Table 2.1: Indoor Ambient Noise Levels in Dwellings

Activity	Location	Good Indoor Ambient Noise Levels	
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 _{AMax,F} (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.'

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*.

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

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 28th November through to Wednesday 29th November 2024.

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

- MP1 was located at the north-western development footprint (exposed to the M62)
- MP2 was located to the east of the existing building at the site (screened from the M62)

Noise measurements were undertaken in free-field conditions at 4 metres above ground level using NTi XL3 and Bruel & Kjaer 2250 Type 1 integrating sound level meters. Each meter was connected to a windshield covered microphone positioned at the locations detailed above. The measurement system calibration was verified immediately before and after the survey period using a Bruel & Kjaer Type 4231 calibrator. No drift in calibration level was noted.

Measurements consisted of A-weighted broadband parameters including L_{Aeq} , L_{A10} , L_{A90} , and L_{AFMax} together with linear octave band data.

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

3.2 Summary

Table 3.1 presents a summary of the noise data for each measurement session, at each measurement position, rounded to the nearest decibel. Where possible, noise from construction activities on adjacent land parcels has been excluded from the presented summary.

Table 3.1: Summary of Noise Measurement Data

Position	Date	Time	L_{Aeq}	L_{A90}	L_{A10}	L_{AFMax}	Comment
MP1	28/11/24	1103-2300	61	58	63	-	Noise climate controlled by distant road traffic from M62
	29/11/24	0700-0737	61	60	63	-	
	28-29/11/24	2300-0525	57	54	60	65*	
	29/11/24	0525-0700	60	59	62		
MP2	29/11/24	0525-0700	52	50	54	57	

* 11th highest L_{AFMax} event during the night-time period

The ambient noise environment at the site was controlled by road traffic on the M62 over the day and night-time periods.

Daytime and night-time ambient noise levels at MP1 were measured at **61 dB L_{Aeq} (0700-2300)** and **58 dB L_{Aeq} (2300-0700)** respectively. Typical (11th highest) maximum noise levels at MP1 were measured at **65 dB L_{AFMax}** during the night-time.

Comparison of simultaneous measurements undertaken at MP1 and MP2 indicated circa 8 dB difference due to screening afforded by the existing building on the site. This equates to daytime and night-time ambient noise levels of **53 dB L_{Aeq} (0700-2300)** and **50 dB L_{Aeq} (2300-0700)** respectively (with typical maximum noise levels **57 dB L_{AFMax}** during the night-time) for elevations facing away from the M62.

4 Noise Assessment

4.1 Design Noise Levels

Design noise levels at the site are as follows:

- $\leq 61 \text{ dB } L_{Aeq(0700-2300)}$ during the daytime
- $\leq 58 \text{ dB } L_{Aeq(2300-0700)}$ during the night-time
- $65 \text{ dB } L_{AFMax}$ during the night-time

4.2 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 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).

Approved Document F ‘Ventilation’ (ADF) states that where natural ventilation is used, background ventilation of at least 10’000 mm² EA must be provided to each habitable room, with a total of at least 4 no. ventilators required in a 1-bedroom apartment. For the purpose of the calculations, it is assumed that there are 2 no. ventilators in each habitable room.

Habitable rooms throughout the development should be provided with double glazing rated at least **30 dB R_w+C** , such as 6 mm glass / 6-20 mm cavity / 4 mm glass, in conjunction with acoustic trickle vents rated at least **38 dB $D_{n,e,w}+C$** per 5000 mm² EA (vent open) such as the Titon V75 vent (TA5235) with C75 canopy (TA5236) or equivalent.

As evidenced in the calculation sheet below, this configuration will provide circa 31 dB(A) sound insulation from external to internal at the site.

Figure 4.1: Example BRE Calculation Spreadsheet

BRE Building Envelope Insulation

Switch to Reverberation Time Calculation

2) Select elements of facade structure, and enter corresponding internal surface area in m² OR enter number of vents.

	Surface area OR number of vents	Unit
Wall 1	Brick/block cavity	5 m ²
Wall 2	None	m ²
Window 1	6 / (6-20) / 4 double glazing	2.2 m ²
Window 2	None	m ²
Door	None	m ²
Roof/Ceiling	None	m ²
Vent 1	TA5235 (V75) + TA5236 (C75) 5000EA	2
Vent 2	None	

3) Enter reverberation time of the room. 0.5 seconds

4) Select exterior sound level type
 Option (A) User defined spectrum
 61 dB LAeq (Day)
 View/Edit Data

Option (B) Spectrum shape
 Select spectrum shape and enter free field exterior sound level, LAeq (considering only the octave bands between 125Hz and 2kHz)
 LAeq 61 dB
 ISO 717 - 1 (C)
 View Data

Internal sound level
 LAeq 30.1 dB

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
≤ 61 dB L_{Aeq} (0700-2300) ≤ 58 dB L_{Aeq} (2300-0700) ≤ 65 dB L_{AFMax}	-31 dB	≤ 30 dB L_{Aeq} (0700-2300) ≤ 27 dB L_{Aeq} (2300-0700) ≤ 34 dB L_{AFMax}

General Points

The following points should be noted:

- The glazing recommendations apply to the window within a sealed unit. It is the responsibility of the window supplier to ensure that the window frame does not compromise the performance of the glazing.
- When selecting a glazing system to satisfy the requirements outlined above, it is important to ensure that the R_w+C value is achieved (rather than simply the R_w value). Published R_w values tend to be higher than corresponding R_w+C 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 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 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} (2300-0700)** and **65 dB L_{AFMax}** (more than 10 times).

Layout plans indicate that the bedrooms of Apartments 2, 3, 6 and 7 will face towards the M62.

Night-time external noise levels at the façades of habitable rooms facing towards the M62 have been measured/calculated at circa **58 dB L_{Aeq} (2300-0700)** and **65 dB L_{AFMax}**, meaning that the bedroom windows of Apartments 2, 3, 6 and 7 are assumed to be closed during night-time hours.

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.

Night-time external noise levels at the façades of habitable rooms facing away from the M62 have been measured/calculated at circa **50 dB L_{Aeq} (2300-0700)** and **57 dB L_{AFMax}**. As such, the bedroom windows of remaining apartments (1, 4, 5 and 8) may be opened to the minimum free area of 4% of the floor area, meaning that the overheating mitigation strategy for these apartments is not constrained by acoustics.

6 Summary and Conclusions

A noise impact assessment has been undertaken for the proposed residential development at land at the former Priory PH, Whitechapel Road, Cleckheaton, BD19 6HR.

The noise environment at the site is controlled by road traffic on the M62.

Section 4 of this report sets out proposals for a scheme of sound insulation which is considered to achieved suitable residential amenity for the proposed new dwellings.

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.

$L_{Amax, F}$

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 – Measurement Positions

