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Residential New Build Development

Land at Lower Blacup Farm, Cleckheaton, West Yorkshire, BD19 5JB

Noise Impact Assessment

For:

Newett Homes

16 August 2024

Ref: NIA-11577-24-11862-v1 Cleckheaton
Issue: Final
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Contents

1 Introduction

1.1.1 Environmental Noise Solutions Ltd (ENS) has been commissioned by Newett Homes to undertake a noise impact assessment for a residential new build development on land to the south of Lower Blacup Farm, Cleckheaton, West Yorkshire, BD19 5JB (hereafter referred to as 'the site').

1.1.2 This noise impact assessment is intended to accompany a planning application to be submitted to Kirklees Council for the proposed residential development of the site.

1.1.3 The objectives of this noise impact assessment are to:

- Assess external noise levels at the site during relevant time periods.
- Assess the potential impact of the existing ambient noise climate on the proposed residential development with reference to relevant guidelines
- Provide recommendations for a scheme of sound attenuation works, as necessary

1.1.4 This report details the methodology and results of the assessment and provides recommendations for the building envelope (fenestration and ventilation).

1.1.5 This report details the methodology and results of the assessment. It has been prepared for Newett Homes for the sole purpose described above and no extended duty of care to any third party is implied or offered. Third parties making reference to the report should consult the aforementioned and ENS as to the extent to which the findings may be appropriate for their use.

1.1.6 A glossary of acoustic terms used in the main body of the text is contained in Appendix A.

2 Site Setting

2.1.1 The proposals are for 67 dwellings, with associated parking and landscaping, on existing greenfield land off Ashbourne Way, Cleckheaton.

2.1.2 The site is bounded by an existing residential estate to the east and south, with farmland to the west, and the Quarry Road industrial estate to the north. The industrial estate is composed of a number of smaller workshop units with activity conducted internally to the buildings.

2.1.3 An indication of the boundary of the site is given in Figure 2-1 below, with the measurement locations used for the survey given in Appendix B and the site layout shown in Appendix C.

Figure 2-1: Location Plan

3 Assessment Guidance

3.1 National Planning Policy Framework

3.1.1 The National Planning Policy Framework (NPPF)[1] was updated in December 2023 and sets out the Government's planning policies for England and how these are expected to be applied.

3.1.2 Where issues of noise impact are concerned the NPPF provides brief guidance in paragraph 180 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'.

3.1.3 Paragraph 191 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'.

3.1.4 The NPPF also refers to the 2010 DEFRA publication, the Noise Policy Statement for England (NPSE) which reinforces and supplements the NPPF.

3.2 Noise Policy Statement for England

3.2.1 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

3.2.2 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

3.2.3 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.'

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

3.3 Planning Practice Guidance on Noise

3.3.1 Planning Practice Guidance[3] (PPG) is an online resource (last updated 2019) 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

3.3.2 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'.

3.3.3 Table 3-1 summarises the PPG noise exposure hierarchy.

Table 3-1: PPG Noise Exposure Hierarchy

Perception	Examples of Outcomes	Increasing Effect Level	Action
Not Noticeable	No Effect	No Observed Effect	No specific measures required
Noticeable and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

[3] Planning Practice Guidance on Noise, 2014: http://planningguidance.planningportal.gov.uk/blog/guidance/noise/

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'.

3.4 ProPG Planning and Noise: New Residential Development

3.4.1 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.

3.4.2 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' (BS 8233), see Table 3.2.

Table 3.2: Indoor Ambient Noise Levels in Dwellings

Activity	Location	Indoor Ambient Noise Targets	
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 $L_{AMax,F\ (2300\text{-}0700)}$

3.4.3 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.'

3.4.4 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'.

3.4.5 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'.

3.4.6 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 residential development and considered to represent good resting and sleeping conditions:

- ≤ 35 dB $L_{Aeq\ (0700\text{-}2300)}$ during the daytime
- ≤ 30 dB $L_{Aeq\ (2300\text{-}0700)}$ and 45 dB $L_{AMax,F}$ not regularly exceeded 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)

3.4.7 With regard to external amenity, ProPG reflects the advice in BS 8233, which 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.'

3.5 Approved Document O

3.5.1 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.

3.5.2 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)'*

4 Noise Survey and Results

4.1.1 In order to assess the current external noise levels at the subject site, a noise survey was undertaken on Tuesday 9th July through to Wednesday 10th July 2024.

4.1.2 For the purposes of the noise assessment, two measurement locations were taken as follows:

- MP1 was positioned at the northern development footprint (closest to the industrial park)
- MP2 was positioned at the southern development footprint

4.1.3 Noise measurements were made in free field conditions using a Bruel & Kjaer 2250 Type 1 integrating sound level meter. A windshield was fitted for all measurements. The calibration of the measurement system was verified immediately before and after the survey using a Bruel & Kjaer Type 4231 calibrator. No drift in calibration level was noted. Weather conditions throughout the survey were appropriate for monitoring with dry weather and windspeed below 5 ms^{-1} during all periods of measurement.

4.1.4 Measurements consisted of A–weighted broadband parameters, together with linear octave band L_{eq} levels. Table 4-1 presents a summary of the measurement data for each measurement session, rounded to the nearest decibel. All measurements were taken at a height of 4 metres.

Table 4-1 – Summary of Noise Measurement Data

Location	Date	Time (hh:mm)	Length (hh:mm)	L_{Aeq} (dB)	$L_{Amax,F}$ (dB)	L_{A90} (dB)	L_{A10} (dB)	Comment
MP1	09/07/2024	13:25	09:35	45	\	35	48	Distant road traffic noise (M62) over day and night-time periods. No noise from internal activities or external plant noted from industrial estate over day or night-time.
		23:00	08:00	41	60*	33	45	
	10/07/2024	07:00	02:30	45	\	41	46	
MP2	09/07/2024	12:35	02:00	43	\	37	47	Distant road traffic noise only
** 11th highest maximum noise level during the night-time*								

4.1.5 During the daytime, the ambient noise environment on the site is generally controlled by distant road traffic noise, assumed to be from the M62. Birdsong was controlling noise levels over the early morning period. No noise was noted from the industrial estate over the day or night-time periods at the closest location to the industrial estate.

4.1.6 Daytime and night-time noise levels at MP1 were 45 dB $L_{Aeq\ (0700\text{-}2300)}$ and 41 dB $L_{Aeq\ (2300\text{-}0700)}$ respectively, with typical maximum noise levels of 60 dB L_{AFMax} during the night-time.

5 Noise Assessment

5.1.1 Noise levels at the site are as follows:

- ≤ 45 dB $L_{Aeq\ (0700\text{-}2300)}$ during the daytime
- ≤ 41 dB $L_{Aeq\ (2300\text{-}0700)}$ during the night-time
- ≤ 60 dB L_{AFMax} during the night-time

5.1.2 A typical standard double-glazed window rated at least **25 dB R_w+C_{tr}** (such as 4 mm glass / 12 mm cavity / 4 mm glass) in conjunction with 2 no. standard trickle vents rated at least **32 dB $D_{n,e,w}$** per 5000 mm² EA vent open (such as the Greenwood 5000EA, or equivalent) will provide circa 25 dB(A) sound insulation from external to internal.

5.1.3 For reference, the World Health Organisation (WHO) Guidelines for Community Noise (1999) states *"the noise reduction from outside to inside with the window partly open is 15 dB."*

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

Table 5-1: Predicted internal noise levels

External Noise Level	Reduction	Resultant Internal Level	Comment
≤ 45 dB $L_{Aeq\ (0700\text{-}2300)}$ ≤ 41 dB $L_{Aeq\ (2300\text{-}0700)}$ ≤ 60 dB L_{AFMax}	–25 dB (closed windows)	≤ 20 dB $L_{Aeq\ (0700\text{-}2300)}$ ≤ 16 dB $L_{Aeq\ (2300\text{-}0700)}$ ≤ 35 dB L_{AFMax}	Very good internal noise levels with closed windows
	–15 dB (open windows)	≤ 30 dB $L_{Aeq\ (0700\text{-}2300)}$ ≤ 26 dB $L_{Aeq\ (2300\text{-}0700)}$ ≤ 45 dB L_{AFMax}	Good internal noise levels with open windows

5.1.5 On the basis of the above, standard double glazing (i.e. 4 mm glass / 12 mm cavity / 4 mm glass) and standard trickle vents are appropriate throughout the development.

5.1.6 With respect to external amenity, daytime external ambient noise levels throughout the site are ≤ **45 dB $L_{Aeq\ (0700\text{-}2300)}$**. Such levels readily comply with the requirements of ProPG.

6 Mitigation of Overheating

6.1.1 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.

6.1.2 Building in some allowance, this equates to an assumed window opening (S_{open}) area of at least 5% of the floor area. As the open area varies as a function of the floor area, for a typical floor-to-ceiling height of 2.4m, a window open area of 5% of the floor area equates to an external to internal noise reduction of 9 dB.

6.1.3 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 **49 dB $L_{Aeq\ (2300\text{-}0700)}$** and **64 dB L_{AFMax}** (more than 10 times).

6.1.4 As detailed in Section 4, external night-time noise levels across the site were ≤ **41 dB $L_{Aeq\ (2300\text{-}0700)}$** and ≤ **60 dB L_{AFMax}.**

6.1.5 As such, windows of plots throughout the site may be opened to the minimum open area of 5% of the floor area, meaning that the overheating mitigation strategy at the site is not constrained by acoustics.

7 Summary and Conclusions

7.1.1 A noise impact assessment has been undertaken for a proposed residential development on land at Lower Blacup Farm, Cleckheaton, West Yorkshire, BD19 5JB.

7.1.2 The noise environment at the site is generally controlled by distant road traffic noise with no noise noted from the northern industrial estate over the day or night-time periods.

7.1.3 Noise levels throughout the site are relatively low. As a consequence, standard double glazing and standard trickle vents are appropriate throughout the development, and there are no issues with respect to external amenity.

7.1.4 Windows of plots throughout the site may be opened to the minimum open area of 5% of the floor area, meaning that the overheating mitigation strategy at the site is not constrained by acoustics.

Appendix A – 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 B – Noise Measurement Positions

Appendix C – Site Layout