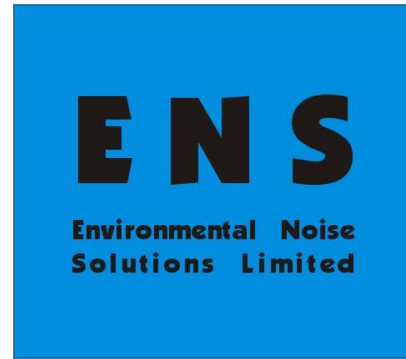




Suite 24
Doncaster Business Innovation Centre
Ten Pound Walk
Doncaster
DN4 5HX

Proposed Residential Development Land to the South of High Street, Grimethorpe, Barnsley, S72 7BD

Noise Impact Assessment

For:
MG Architectural Designs

18th April 2024

Ref: NIA-11387-24-11673-v1 High Street, Grimethorpe
Author: L. Harrison MSc, AMIOA

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1 Introduction

1.1 Overview

Environmental Noise Solutions Ltd (ENS) has been commissioned by MG Architectural Designs to undertake a noise survey and assessment for a proposed residential development at land to the south of High Street, Grimethorpe, Barnsley, S72 7BD (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, to protect future occupants of the proposed residential development from a loss of amenity due to noise

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

The report has been prepared for MG Architectural Designs 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 MG Architectural Designs 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 comprises a land parcel to the south-west of High Street on the western side of Grimethorpe, Barnsley, as shown below (highlighted in red) in Figure 1.1. Irregular in shape, the site is bound by:

- High Street to the north
- A sewage works to the west
- A metal recycling centre and Leggett & Platt spring manufacturers to the south-east

Figure 1.1: Location of Proposed Development

In relation to the adjacent commercial uses, it is noted that operating hours at the recycling centre are restriction by Condition 4 of Planning Permission ref: 2012/0190 to 0830–1700 hours Monday to Friday and 0830–1200 hours on Saturdays with no working on Sundays or Bank Holidays. Operating hours at Leggett & Platt are assumed to be unrestricted.

The ambient noise climate at the site is predominantly due to road traffic noise on the A6195 Park Spring Road, High Street and the surrounding road network, with underlying plant noise and occasional yard activity at the adjacent Leggett & Platt site to the south-east.

Development proposals are for a single residential chalet with associated landscaping and access roads. Whilst the site red line boundary is relatively large, layout plans (as included in Appendix 3) indicate that the proposed chalet is set well back from High Street and circa 60 metres from the adjacent recycling centre.

2 Policy Context and Assessment Guidance

2.1 National Planning Policy Framework

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.

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'.

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'.

With regard to extant community noise sources and the potential to affect proposed new developments, Paragraph 193 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

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.

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.’

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’.

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.

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)

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	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.’

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’.

In addition to the above, Annex B of BS 8233 describes methods for assessing the acceptability of a noise spectrum for a given application through the use of Noise Rating (NR) curves. This is a graphical method for assigning a single-number rating to a noise spectrum, and many local authorities have a requirement to comply with NR30 in habitable rooms during the daytime and NR25 in bedrooms at night where commercial noise may be present.

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) and NR30 in habitable rooms during the daytime
- ≤ 30 dB L_{Aeq} (2300-0700) and NR25 in bedrooms during the night-time
- 45 dB L_{AFMax} not regularly exceeded during the night-time

5 British Standards Institution (2014). *British Standard 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings*.

3 Noise Survey

3.1 Overview

In order to determine the level of external noise affecting the proposed development, noise monitoring was carried out on Wednesday 6th March and Thursday 7th March 2024.

For the purpose of the assessment, a single noise monitoring position (MP1) was adopted in the location of the proposed chalet (see Appendix 2 for approximate location).

Noise measurements were undertaken in free field conditions at 4 metres above ground level using an NTi XL3 Type 1 integrating sound level meter. The meter was connected to a windshield covered microphone positioned at the locations specified 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 levels greater than 0.5 dB was noted.

Measurements consisted of A-weighted broadband parameters including L_{Aeq} , L_{A10} , L_{A90} , and $L_{Amax, F}$ together with linear octave and 1/3rd 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, rounded to the nearest decibel.

Table 3.1: Summary of Noise Measurement Data

Position	Date	Time	$L_{Aeq, T}$ (dB)	$L_{Amax, F}$ (dB)	L_{A10} (dB)	L_{A90} (dB)	Comment
MP1	06/03/24	1159-1603	53	-	56	50	Road traffic noise driving ambient noise climate, with plant contribution from Leggett & Platt, and occasional vehicle movements in the loading bay area.
	07/03/24	0515-0716	51	61	55	49	

3.3 Analysis

The ambient noise climate at the site is predominantly due to road traffic noise on the A6195 Park Spring Road, High Street and the surrounding road network, with underlying plant noise and occasional yard activity at the adjacent Leggett & Platt site to the south-east. No significant noise was noted from the recycling centre or sewage works.

Daytime ambient noise levels at MP1 were circa **53 dB $L_{Aeq, T}$** with short-term levels of up to **55 dB L_{Aeq} (15mins)**. Night-time (early morning) ambient noise levels were circa **51 dB $L_{Aeq, T}$** and up to **53 dB L_{Aeq} (15mins)**. Table 3.2 presents the worst-case 15-minute measured octave band frequency data for the daytime and night-time periods rounded to the nearest decibel.

Table 3.2: MP1 Octave Band Frequency Data

Octave Band L_{eq}									dB L_{Aeq}
Period	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	
Daytime	62	57	53	50	51	49	45	36	55
Night-time	59	51	47	48	48	43	44	41	53

4 Noise Assessment

4.1 Design Noise Levels

Design noise levels for the site are as follows:

- $\leq 55 \text{ dB } L_{Aeq (15 \text{ min})}$ during the daytime
- $\leq 53 \text{ dB } L_{Aeq (15 \text{ min})}$ during the night-time
- $\leq 61 \text{ dB } L_{AFMax}$ during the night-time

4.1 Scheme of Sound Attenuation

The sound insulation requirements of habitable rooms throughout the development have been calculated using the methodology advocated in BS 8233, based on the external noise levels described above, typical room/window dimensions, and parameters for the various elements of the building envelope.

All rooms should be provided with glazing rated at least **32 dB R_w** , such as 6 mm glass / 6-20 mm cavity / 4 mm glass, in conjunction with acoustic wall vents rated at least **43 dB $D_{n,e,w}$** such as the Ryton AAC125HP or equivalent. The inner face of external walls and ceilings should be double-boarded with 2 layers of dense board (e.g. 12.5mm SoundBloc), with 100 mm (minimum) mineral wool insulation in the cavity.

Adopting worst-case octave data as detailed in Table 3.2, the following BS 8233 calculation spreadsheets demonstrates that habitable rooms at the site will readily achieve compliance with the noise rating targets with glazing/ventilation as specified.

Figure 4.1 – NR30 Assessment for Living Room (Volume = 32 m³)

	Octave Frequency Band (Hz)								L_{Aeq}
	63	125	250	500	1000	2000	4000	8000	
Daytime Noise Level	62	57	53	50	51	49	45	36	55
Cladding External Wall (6.2 m ²)	29	32	43	46	53	64	67	67	
6 / (6-20) / 4 double glazing (2 m ²)	18	21	20	26	38	37	39	39	
Ryton AAC125HP (1 no.)	39	42	37	38	43	57	57	57	
Lightweight Roof (13.2 m ²)	27	30	40	46	51	55	55	55	
Total Façade Reduction	-20.9	-23.9	-25.4	-30.6	-39.3	-42.5	-44.1	-44.1	
10 log (S/A)	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	
External to Internal Correction	+3	+3	+3	+3	+3	+3	+3	+3	
INTERNAL NOISE LEVEL	43.1	35.1	29.6	21.4	13.7	8.6	2.9	-6.1	26
NR30	59.2	48.1	39.9	34	30	26.9	24.7	22.9	
Compliant	✓	✓	✓	✓	✓	✓	✓	✓	

Figure 4.2 – NR25 Assessment for Bedroom (Volume = 22 m³)

	Octave Frequency Band (Hz)								L _{Aeq}
	63	125	250	500	1000	2000	4000	8000	
Night-Time Noise Level	59	51	47	48	48	43	44	41	53
Cladding External Wall (7.9 m ²)	29	32	43	46	53	64	67	67	
6 / (6-20) / 4 double glazing (1 m ²)	18	21	20	26	38	37	39	39	
Ryton AAC125HP (1 no.)	39	42	37	38	43	57	57	57	
Lightweight Roof (9.3 m ²)	27	30	40	46	51	55	55	55	
Total Façade Reduction	-23.0	-26.0	-28.2	-32.9	-40.6	-45.5	-47.0	-47.0	
10 log (S/A)	+0.9	+0.9	+0.9	+0.9	+0.9	+0.9	+0.9	+0.9	
External to Internal Correction	+3	+3	+3	+3	+3	+3	+3	+3	
INTERNAL NOISE LEVEL	39.6	28.5	22.5	19.3	11.6	1.5	0.7	-2.4	21
NR25	55	44	35	29	25	22	20	18	
Compliant	✓	✓	✓	✓	✓	✓	✓	✓	

The glazing/ventilation specification for bedrooms provides circa 32 dB noise reduction from external to internal and will therefore also readily control noise ingress of maximum noise levels (i.e. 61 dB L_{AFMax} externally – 32 dB(A) = 29 dB L_{AFMax} internally).

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 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

With the provision of attenuation specified, it is considered that the proposed development will not place any unreasonable constraints on surrounding commercial uses and is therefore in keeping with the aims of Paragraph 193 of the NPPF.

5 Summary and Conclusions

A noise impact assessment has been undertaken for a proposed residential development at land to the south of High Street, Grimethorpe, Barnsley, S72 7BD.

The ambient noise climate at the site is predominantly due to road traffic noise on the A6195 Park Spring Road, High Street and the surrounding road network, with underlying plant noise and occasional yard activity at the adjacent Leggett & Platt site to the south-east.

A scheme of sound insulation works has been developed to protect the proposed residential development from the ambient noise climate.

With the provision of attenuation specified, it is considered that the proposed development will not place any unreasonable constraints on surrounding commercial uses and is therefore in keeping with the aims of Paragraph 193 of the NPPF.

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.

$L_{A \max, F}$

The maximum A-weighted noise level recorded during the measurement period. The subscript 'F' denotes fast time weighting, slow time weighting 'S' is also used.

Single Event Level / Sound Exposure Level (SEL or L_{AE})

The energy produced by a discrete noise event averaged over one second, regardless of the event duration. This allows for comparison between different noise events which occur over different lengths of time.

Weighted Sound Reduction Index (R_w)

Single number quantity which characterises the airborne sound insulation properties of a material or building element over a defined range of frequencies (R_w is used to characterise the insulation of a material or product that has been measured in a laboratory).

Appendix 2 – Noise Measurement Positions



Appendix 3 – Proposed Site Layout & Proposed Dwelling

