Environmental Noise Solutions Limited

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

Proposed Residential Conversion
33 New Street, Barnsley, S70 1SN
Noise Impact Assessment

For:

Mr. Bobby Sangha

12 October 2022

Ref: NIA-10519-22-10693 - v0.1
Issue: Draft
Author: R. Habeshaw MSc, MIOA

Contents

1 Introduction 1

2 Site Layout and Proposed Development 2

3 Assessment Guidance 3

3.1 National Planning Policy Framework 3

3.2 Noise Policy Statement for England 3

3.3 Planning Practice Guidance on Noise 4

3.4 Assessment Guidance 4

4 Noise Survey and Results 6

4.1 Overview 6

4.2 Summary of Baseline Results 6

5 Noise Assessment 7

5.1 Internal Noise Levels 7

5.2 Internal Noise Transfer 8

6 Summary and Conclusions 8

Appendix A – Abbreviations and Definitions 9

Appendix B – Noise Measurement Positions 10

1 Introduction

1.1.1 Environmental Noise Solutions Ltd (ENS) has been commissioned by Mr. Bobby Sangha to undertake a Noise Impact Assessment for a Proposed Residential Conversion of the upper floors of 33 New Street, Barnsley, S70 1SN (hereafter referred to as 'the site').

1.1.2 This noise assessment has been conducted in order to assess the impact of the existing environmental noise in the surrounding area on the proposed residential dwellings and to address any issues which may result. The assessment is intended to accompany the planning application as requested by the Local Planning Authority.

1.1.3 This is assessment is required to satisfy guidance in the National Planning Policy Framework, with the aim of ensuring the future amenity of the residents of the development.

1.1.4 The objectives of the noise impact assessment are to:

- Determine external ambient and background noise levels in the vicinity of the site during relevant time periods.
- Assess the potential impact of the surrounding noise sources on the internal noise climate of the proposed dwellings with reference to relevant guidelines.
- Provide recommendations for a scheme of sound attenuation works, as necessary, to protect the proposed dwellings from a loss of amenity due to noise.

1.1.5 This report details the methodology and results of the assessment. It has been prepared for Mr. Bobby Sangha 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.

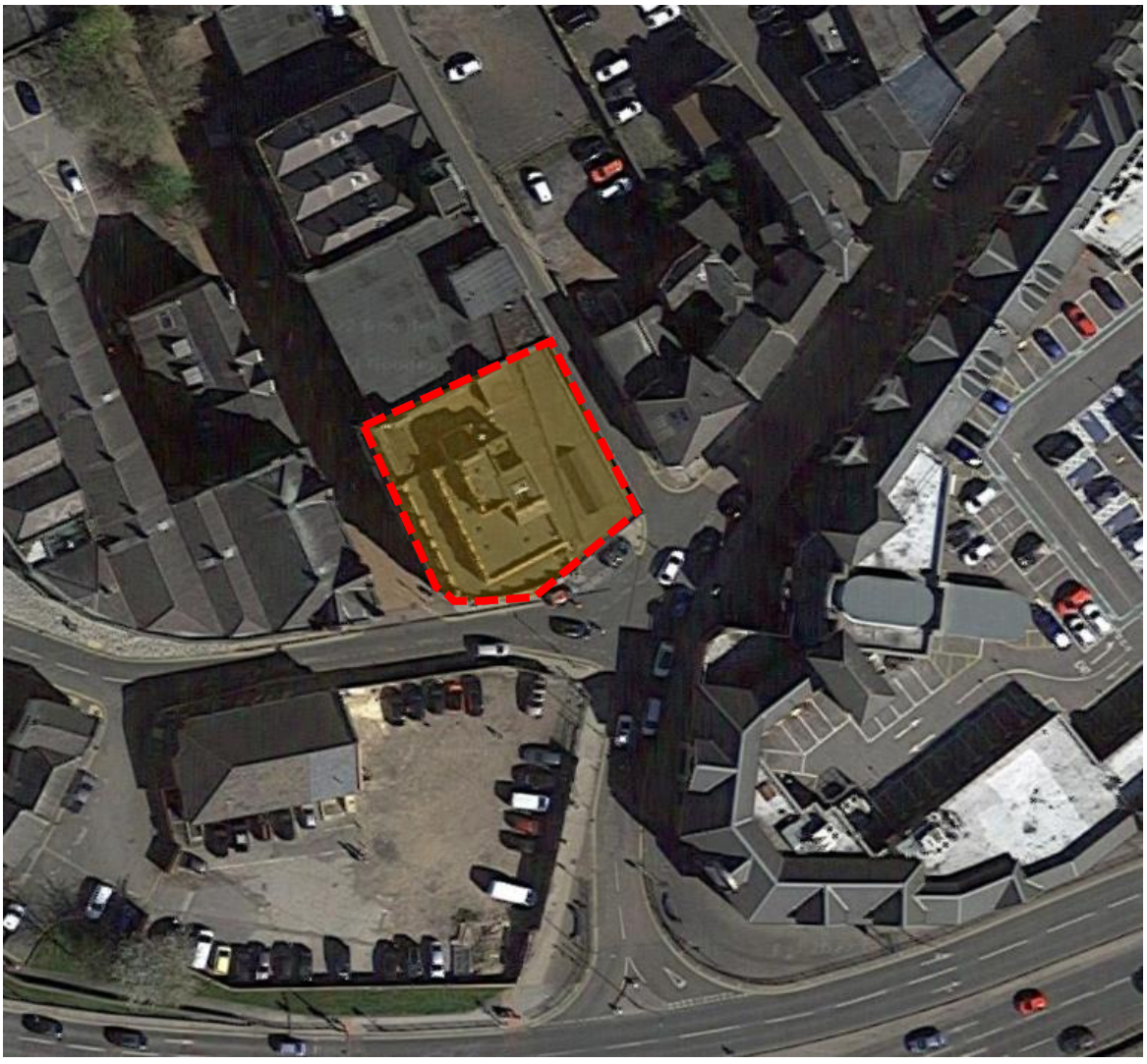
2 Site Layout and Proposed Development

2.1.1 The proposed development is a residential conversion of the upper floors of the building at 33 New Street, Barnsley, S70 1SN to form 21 no. dwelling flats. Ground floor is to remain in office/retail use.

2.1.2 The site is located on the intersection of Wellington Street and the pedestrianised Market Street in Barnsley town centre. The surrounding neighbourhood is mainly mixed commercial with residential above. Potential noise sources are expected to be local traffic movements and pedestrian activity.

2.1.3 An indication of the location of the development is given in Figure 2-1 below, the monitoring positions used in the survey are given in Appendix B.

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 July 2021 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 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'.

3.1.3 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'.

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 (2019)
[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 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'.

3.3.4 The following guidance documents provide some meaningful context.

3.4 Assessment Guidance

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 3.1.

Table 3.1: 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 $L_{AFMax\ (2300\text{-}0700)}$

[3] Planning Practice Guidance on Noise, 2014: 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)

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_{AFMax} not regularly exceeded during the night-time

4 Noise Survey and Results

4.1 Overview

4.1.1 A noise survey was undertaken on Friday 2nd and Saturday 3rd September 2022 to determine the existing noise levels in the vicinity of the development.

4.1.2 For the purposes of the noise assessment, measurements were taken at the following positions (see Appendix B):

- MP1 was located at 1 m from the front façade on Wellington Street at 1st floor height
- MP2 was located at 1 m from the side façade on Market Street at 1st floor height

4.1.3 All noise measurements were undertaken using Bruel & Kjaer 2250 Type 1 integrating sound level meters. Each meter was connected to a windshield covered microphone mounted on a pole out of the windows. Weather conditions throughout the survey were appropriate for monitoring, with data taken during dry conditions throughout and wind speeds of < 5 m/s.

4.1.4 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.

4.1.5 Measurements consisted of A–weighted broadband parameters including L_{Aeq} and L_{A90} together with linear third octave band data. As measurements were taken in close proximity to a façade, -3 dB has been taken off all measurements in order to establish the free-field levels.

4.2 Summary of Baseline Results

4.2.1 Table 4.1 presents a summary of the noise data for each measurement session, at each monitoring location, rounded to the nearest decibel.

Table 4-1: Summary of Noise Measurement Data

Location	Date	Time	$L_{Aeq,T}$ (dB)	L_{Amax} (dB)	L_{A90} (dB)	L_{A10} (dB)	Comment
MP1	02/09/22	1130-2300	59	87	52	62	Local road traffic noise dominant (A628 and New Street)
	03/09/22	0700-1025	60	89	51	62	
	02-03/09/22	2300-0700	56	77*	41	59	Local road traffic noise dominant, pedestrian noise from nearby pubs virtually inaudible
MP2	02/09/22	1055-2300	54	84	49	57	Local road traffic noise dominant (A628 and New Street)
	03/09/22	0700-1020	54	84	47	56	
	02-03/09/22	2300-0700	51	71*	42	54	Local road traffic noise dominant, some pedestrian noise from nearby pubs

* 11th highest maximum noise level event during the night-time

4.2.2 The ambient noise climate to the front and side of the development is dominated by traffic noise from the local road network with some noise from nearby pubs/restaurants audible over the evening period at MP2.

4.2.3 Average daytime noise levels at the front façade (MP1) were 59 dB $L_{Aeq,T}$ with night-time levels of 56 dB $L_{Aeq,(2300\text{-}0700)}$ and an 11th highest $L_{Amax\ of}$ 77 dBA over the night-time period.

4.2.4 Due to increased distance and screening to the A628, noise levels to the side of the development on Market Street (MP2) were lower with daytime and night-time levels of 54 dB $L_{Aeq,T}$ respectively, and an 11th highest L_{Amax} event of 71 dBA at night.

5 Noise Assessment

5.1 Internal Noise Levels

5.1.1 The design noise levels, taken to be the highest measurements during each period of the survey, are as follows:

- ≤ 59 dB $L_{Aeq\ (0700\text{-}2300)}$ during the daytime
- ≤ 56 dB $L_{Aeq\ (2300\text{-}0700)}$ during the night-time
- ≤ 77 dB L_{AFmax} during the night-time

5.1.2 In order to calculate the sound insulation requirements of the building envelope for habitable rooms throughout the development, the calculation methodology advocated in BS 8233 for predicting internal levels was used. The calculation allows for input of external noise levels based on octave data, room dimensions and reverberation time together with test data for the various elements of the building envelope, calculating the internal noise level in terms of the external noise level metric (L_{Aeq} and L_{AFMax} in this case).

5.1.3 In order to control discrete event maxima during the night-time, bedrooms throughout the development should be provided with glazing rated at least **33 dB R_w+C_{tr}** (such as Pilkington Enhanced 6 mm glass /16 mm Argon cavity / 6.8 mm Optiphon).

5.1.4 Through-frame trickle vents are not appropriate for bedrooms due to the high external noise levels. Ventilation to bedrooms should therefore be provided via:

- Acoustic over-frame trickle vents rated at least **42 dB $D_{n,e,w}$** per 8000 mm² EA (vent open), such as the Invisivent EVO AK Ultra, or equivalent. Ryton AAC125HP; or
- Acoustic wall vents rated at least **42 dB $D_{n,e,w}$** per 8000 mm² EA (vent open), such as the Ryton AAC125HP, or equivalent.

5.1.5 Living/dining rooms should be provided with enhanced glazing rated at least **29 dB R_w+C_{tr}** (such as 8 mm float glass / 6-20 mm cavity / 4 mm glass) in conjunction with acoustic trickle vents rated at least **39 dB $D_{n,e,w}$** per 5000 mm² EA (vent open), such as the Greenwood 5000EAW.AC1, or equivalent.

5.1.6 A glazing/ventilation markup is contained in Appendix C for reference.

5.1.7 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 Rw 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.

5.1.8 The inner face of any lightweight external walls or ceilings should be upgraded with 1 x 12.5 mm layer of dense plasterboard (e.g. SoundBloc or FireLine board).

Grade II Listing Considerations

5.1.9 If the existing windows/frames have to be retained within the Grade II listed part of the building, then the existing glazing should be upgraded with a scheme of secondary glazing.

5.1.10 The secondary glazing should consist of a 6 mm pane of glass in a separate frame to create a (minimum) 100 mm cavity from the original single glazing. The existing single glazed frames should be made good (no gaps etc.) and the top and side reveals formed between the existing window and the secondary glazing should be lined with an acoustically absorbent tile.

5.1.11 The sound insulation of a secondary glazed unit (in conjunction with the existing single glazed window) is likely to be at least **39 dB R_w+C_{tr}**. This far exceeds the minimum requirements for both bedrooms and living rooms at the development.

5.1.12 If it is not possible to install window/wall vents within the Grade II listed part of the building (and/or if the existing windows are secondary glazed), then consideration should be given to an alternative scheme of mechanical ventilation, such as:

- A System 3 mechanical extract ventilation (MEV) system
- A whole house positive input ventilation (PIV) system (e.g. Nuaire Drimaster 365)

5.1.13 Due to the nature and age of the existing building envelope, sufficient trickle ventilation (in accordance with Building Regulations ADF) may be provided via infiltration (natural air leakage). This should be confirmed with a ventilation specialist.

5.2 Internal Noise Transfer

5.2.1 It is understood that the ground floor will remain in retail/office use. The likely noise sources associated with these uses are comparable to normal domestic use and, as a consequence, the minimum performance requirement set out in Approved Document E (ADE) 2003 is considered appropriate. Many local authorities adopt ADE 2003 in such cases.

5.2.2 On the basis of the above, there is no issue with respect to internal noise transfer.

6 Summary and Conclusions

6.1.1 A noise survey and assessment has been conducted for the proposed residential conversion at 33 New Street, Barnsley, S70 1SN.

6.1.2 Section 3 details the relevant guidance regarding recommended noise limits for residential dwellings and the assessment of environmental noise sources.

6.1.3 Section 4 details the external noise levels measured at the development which were established during noise monitoring conducted overnight on Friday 2nd and Saturday 3rd September 2022. Levels were found to be commensurate with the setting, with noise from traffic on the local road network, with some pedestrian noise during the late evening and night-time period.

6.1.4 Section 5 provides recommendations for a noise mitigation strategy, to protect potential future residential development at the site from the existing noise climate using relevant guidance.

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

