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Proposed Mixed Use Development Coal Drops, St Mary's Street, Penistone, S36 6DT

Noise Impact Assessment

For:
Axis Architecture

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Ref: NIA-11677-25-11902-v1 Coal Drops, Penistone
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1 Introduction

1.1 Overview

Environmental Noise Solutions Limited (ENS) has been commissioned by Axis Architecture to carry out a noise impact assessment for a proposed mixed-use development at Coal Drops, St Mary's Street, Penistone, S36 6DT (hereafter referred to as 'the site').

The objectives of the noise impact assessment were therefore to:

- Determine the existing ambient and background noise levels at the site during representative periods of the daytime and night-time
- Assess the potential impact of the external noise climate on the proposed residential aspect of the development with reference to relevant guidelines
- Assess the potential impact of the proposed commercial aspect of the development on proposed/existing noise sensitive receptors with reference to relevant guidelines
- Provide recommendations for a scheme of sound attenuation works, as necessary, to protect existing and future occupants from a loss of amenity due to noise

This report details the methodology and results of the assessment and provides recommendations as appropriate. It has been prepared to accompany a planning application to be submitted to Barnsley Metropolitan District Council.

The report has been prepared for Axis Architecture 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 Axis Architecture 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

The site comprises the Grade 2 listed Coal Drops railway arches, a signal house (Regency House) and former industrial brownfield land, and is located in a mixed-use setting in Penistone, as shown highlighted in red in Figure 1.1.

Figure 1.1: Location of Proposed Development



The site is bound by:

- Existing residential dwellings to the north
- Existing commercial and residential units to the south
- The B6462 Bridge Street to the east
- Penistone Showground to the west

The commercial units adjacent to the southern boundary of the site are CD Autos (vehicle repair), which operates 0830–1730 hours, Monday to Friday, and Stottercliffe Garage (body shop), which operates 0830–1800 hours Monday to Friday and 0800–1400 hours Saturday.

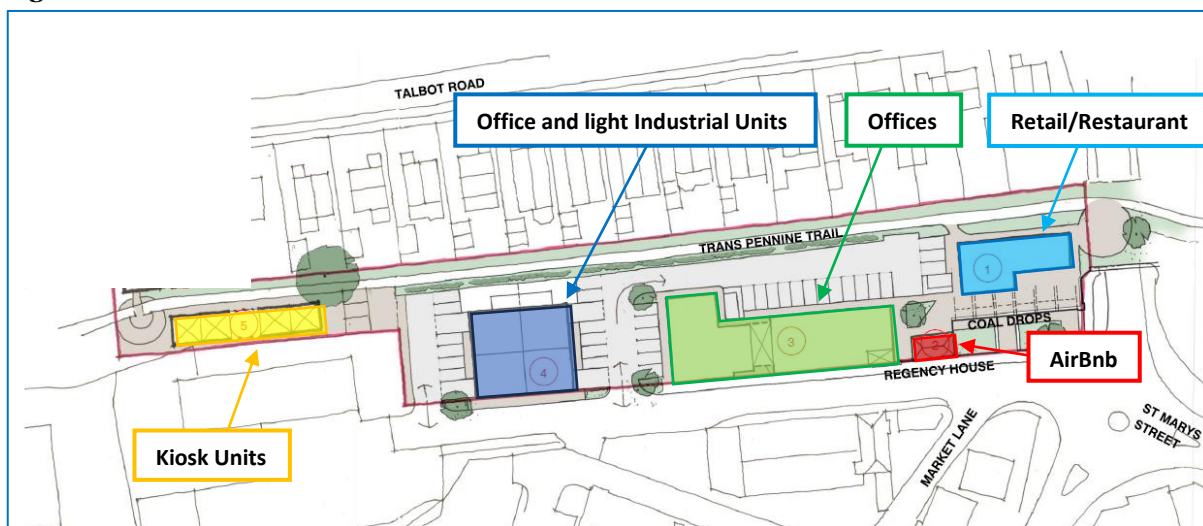
The ambient noise climate at the site is controlled by road traffic on Bridge Street and St Mary's Street, with no other significant noise sources noted.

1.3 Development Proposals

Development proposals are as follows (see Figure 1.2 for annotated layout):

- Conversion/extension of the Grade 2 Listed Coal Drop Arches into Class E retail and restaurant
- Conversion of existing Regency House into an Airbnb unit
- New-build offices and Class E(g)(iii) light industrial units
- New build kiosk units for bike hire

Figure 1.2: Location of commercial and residential units



The residential aspect of the development comprises the conversion of the existing Regency House signal house to form a 1-bedroom Air BNB residential unit.

The commercial aspect of the proposal consists of 1 no. Use Class E(g)(iii) light industrial unit, along with 1 no. restaurant, 1 no. office block, with 5 no. kiosk style units located towards the western extremity of the site.

For reference, Class E(g)(iii) is defined as ‘any industrial process, being a use, which can be carried out in any residential area without detriment to the amenity of that area by reason of noise, vibration, smell, fumes, smoke, soot, ash, dust or grit. (Light Industrial)’.

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

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.

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.

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.

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

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_{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'.

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 in bedrooms 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)

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

2.5 British Standard BS 4142:2014+A1:2019

BS 4142:2014+A1-2019 'Methods for Rating and Assessing Industrial and Commercial Sound' (BS 4142)⁶ describes methods for determining, at the outside of a building, noise levels from factories or industrial premises and a method for assessing whether the noise is likely to give rise to adverse impacts, and states:

'The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs. Typically, the greater this difference, the greater the magnitude of the impact. For example:

A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context

A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context

The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context'

The rating level is described as the specific sound level (the equivalent continuous A-weighted sound pressure level at the assessment position (NSR) produced by the specific sound source over the given reference time interval) plus any adjustment for the characteristic features of the sound. The character correction relates to whether and to what degree the specific sound is assessed to have an element of tonality, impulsivity and/or characteristics that are readily distinctive against the residual acoustic environment.

The background noise level is the A-weighted sound pressure level of the residual noise at the assessment position that is exceeded for 90 percent of a given time interval, T, measured using time weighting 'F' and quoted to the nearest whole number of decibels.

The reference time interval of the specific sound is 1 hour during the daytime and 15 minutes during the night-time.

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 Thursday 5th August through to Friday 6th August 2024.

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

- MP1 was located at the eastern façade of Regency House (proposed Airbnb) at first floor level and at 1 metre from the existing building façade
- MP2 was located towards the northern boundary of the site in a free field position at 1.5 metres above ground level (representative of the existing dwellings on Talbot Road)

Noise measurements were undertaken using Bruel & Kjaer 2250 and NTi XL3 Type 1 integrating sound level meters 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 levels greater than 0.5 dB 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. As measurements at MP1 were made at 1 metre from an existing building façade, a –3 dB façade enhancement correction has been applied to the measured levels at MP1 order to establish the free field levels.

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	06/08/24	1056–2300	61	45	60	-	Road traffic on the B6462 and distant A628
		2300–0700	48	31	51	67*	
	07/08/24	0700–0905	58	51	59	-	
MP2	06/08/24	1115–2300	52	44	56	-	
		2300–0700	43	31	47	-	
	07/08/24	0700–1310	51	48	54	-	
* 11 th highest maximum noise level during the night-time (2300-0700)							

3.3 Analysis

Ambient noise levels at MP1 were controlled by road traffic on the B6462 and the surrounding road network. No significant noise was noted from Stottercliffe Garage by the survey engineer throughout the course of the survey.

Daytime and night-time ambient noise levels at MP1 were measured at **61 dB L_{Aeq} (0700–2300)** and **48 dB L_{Aeq} (2300–0700)** respectively. Typical (11th highest) maximum noise levels were measured at **67 dB L_{AFMax}** during the night-time at MP1.

Background noise levels at the site were primarily due to distant road traffic on the A628 and the surrounding road network.

Typical daytime and night-time background noise levels at MP2 were **48 dB L_{A90} (15 min)** and **32 dB L_{A90} (15 min)** respectively.

4 Noise Assessment

4.1 Residential Aspect of the Development

Design noise levels at the proposed residential apartment are as follows:

- $\leq 61 \text{ dB } L_{Aeq} (0700-2300)$ during the daytime
- $\leq 48 \text{ dB } L_{Aeq} (2300-0700)$ during the night-time
- $\leq 67 \text{ dB } L_{AFMax}$ during night-time

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).

It is understood that the development is to be provided with a decentralised mechanical extract ventilation (dMEV) system using continuously running kitchen and bathroom extracts on a 'trickle' rate. Due to the nature and age of the existing building envelope, it is assumed that sufficient trickle ventilation (in accordance with Building Regulations ADF) should be provided via infiltration without the need for ventilators.

Habitable rooms at the proposed Airbnb the development should be fitted with double glazing rated at least $30 \text{ dB } R_w$ (such as 4 mm glass / 6-20 mm air gap / 4 mm). As evidenced in the calculation sheet below, this configuration will provide circa 32 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		4) Select exterior sound level type	
1) Enter room dimensions or volume <input type="radio"/> Use dimensions x <input type="text"/> m y <input type="text"/> m z <input type="text"/> m Volume <input type="text"/> m ³ OR <input checked="" type="radio"/> Use volume <input type="text"/> m ³		2) Select elements of facade structure, and enter corresponding internal surface area in m ² OR enter number of vents.		HELP		Option (A) <input checked="" type="radio"/> User defined spectrum	
		Wall 1 <input type="text" value="Brick/block cavity"/> <input type="text" value="5"/> m ² Wall 2 <input type="text" value="None"/> <input type="text" value=""/> m ² Window 1 <input type="text" value="4/12/4 double glazing"/> <input type="text" value="2"/> m ² Window 2 <input type="text" value="None"/> <input type="text" value=""/> m ² Door <input type="text" value="None"/> <input type="text" value=""/> m ² Roof/Ceiling <input type="text" value="None"/> <input type="text" value=""/> m ² Vent 1 <input type="text" value="None"/> <input type="text" value=""/> m ² Vent 2 <input type="text" value="None"/> <input type="text" value=""/> m ²		View/Edit Data		<input type="text" value="67 dB LAFMax"/> <input type="button" value="View/Edit Data"/>	
		3) Enter reverberation time of the room.		<input type="text" value="0.5"/> seconds		Option (B) <input type="radio"/> Spectrum shape	
						Select spectrum shape and enter free field exterior sound level, L_{Aeq} (considering only the octave bands between 125Hz and 2kHz) L_{Aeq} <input type="text" value="67"/> dB <input type="text" value="ISO 717 - 1 (C)"/> <input type="button" value="View Data"/>	
						Internal sound level L_{AFMax} <input type="text" value="35.3"/> dB	

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

Table 4.2 – External Noise Levels and Resultant Internal Noise Levels

External Noise Level	Reduction	Resultant Internal Level
≤ 61 dB L_{Aeq} (0700-2300) ≤ 48 dB L_{Aeq} (2300-0700) ≤ 67 dB L_{AFMax}	-32 dB	≤ 29 dB L_{Aeq} (0700-2300) ≤ 16 dB L_{Aeq} (2300-0700) ≤ 35 dB L_{AFMax}

4.2 Commercial Aspect of the Development

As stated, use Class E(g)(iii) light industrial units are defined as ‘any industrial process, being a use, which can be carried out in any residential area without detriment to the amenity of that area by reason of noise, vibration, smell, fumes, smoke, soot, ash, dust or grit. (Light Industrial)’.

It is therefore clear that, by definition, the units will not result in adverse effects at any nearby residential receptors.

Notwithstanding the above, it is assumed that the proposed development may include fixed installations (including AHUs and condensers). However, details of the proposed type, location and number of mechanical and electrical plant items are not available at this stage. It is therefore considered appropriate to specify suitable noise limits to which any such plant items should conform.

Daytime and night-time background levels in the vicinity of the nearest receptors on Talbot Road were measured at circa **49 dB L_{A90} (15 min)** and **34 dB L_{Aeq} (15 min)** respectively.

It is therefore considered that the cumulative noise rating level of fixed installations at the proposed care should not exceed the following noise rating levels at the nearest NSRs.

- **49 dB L_{Ar} (1 hour)** during the daytime
- **34 dB L_{Ar} (15 min)** during the night-time

It is considered that the operation of any fixed installations of mechanical and electrical plant items can be controlled by a suitably worded planning condition, and that compliance with such limits would be readily achievable with judicious selection of plant, equipment, building envelope and/or standard noise mitigation techniques.

5 Summary and Conclusions

A noise impact assessment has been undertaken for the proposed mixed-use development at Coal Drops, land at St Mary's Street, Penistone, S36 6DT.

The ambient noise climate at the site is controlled by road traffic on the B6462, with no other significant noise sources.

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

It is considered that the operation of any fixed installations of mechanical and electrical plant items can be controlled by a suitably worded planning condition.

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 μ Pa 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 μ Pa).

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

