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Proposed Residential Development Land to the South-West of Coal Pit Lane, Lower Cumberworth

Noise Impact Assessment

For:
Northern Event Structures Ltd

8th August 2023

Ref: NIA-10990-23-11185-v1 Huddersfield
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1 Introduction

1.1 Overview

Environmental Noise Solutions Ltd (ENS) has been commissioned by Northern Event Structures Ltd to undertake a noise survey and assessment for a proposed residential development on land to the south-west of Coal Pit Lane, Lower Cumberworth, Huddersfield, HD8 8PL (hereafter referred to as 'the site').

Planning permission (ref: 2017/62/91774/E) for the development was granted by Kirklees Council in May 2023, subject to conditions. Condition 15 relates to the control of noise as follows:

15. *Details of the measures to be taken to safeguard future occupiers of the dwellings from noise from significant external noise sources shall be submitted to, and approved in writing by, the Local Planning Authority. The approved measures shall be completed in full before the dwellings are first occupied and shall, thereafter, be satisfactorily and permanently retained.*

Reason: *To safeguard future occupiers of the dwellings from excessive external noise, in accordance with the requirements of Policy LP24 of the Kirklees Local Plan and Chapter 15 of the National Planning Policy Framework.*

The objectives of the noise impact assessment were therefore 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 aid in the discharge of Condition 15 of Planning Permission ref: 2017/62/91774/E.

The report has been prepared for Northern Event Structures Ltd 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 Northern Event Structures Ltd 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 derelict dwelling (to be demolished) with an area of open woodland, on land to the south-west of Coal Pit Lane, near Lower Cumberworth, Huddersfield. The site boundary is shown (highlighted in red) in Figure 1.1.

Figure 1.1: Location of Proposed Development



The site is bound by:

- Coal Pit Lane to the north-east
- Commercial units to the south-west and south-east
- Open farmland to the north-west

With regards to the commercial units to the south, a consultation response from Pollution and Noise Control at Kirkless Council (ref: WK/201711224) in June 2017, and commented as follows:

'The application site is immediately adjacent to an large industrial building/complex that is involved in the hire of temporary structures for outdoor events. Due to the nature of this business there is the potential for HGV's to be using the site at all hours when collecting/delivering to customers.'

I am also aware that a large wind turbine was consented on 21-04-2016 (Wes 80Kw- 2013/93228) around 185m from this site. Whilst this as yet is not operational the noise from this should be considered.'

With cognisance to this, it should be noted that the marquee hire company (Northern Event Structures) no longer operate from the commercial site.

The majority of the commercial complex is now operated by Barden Freight, who use the units for the storage and distribution of bottled water for Shepley Spring. Operating hours at Barden Freight are 0700-1700 hours Monday-Sunday, with no night-time operations or deliveries. Goods vehicles at Barden Freight are loaded on the southern elevation of the main warehouse and therefore loading operations are significantly screened from the proposed development.

Additionally, there is a stand-alone repair garage on the western tip of the complex, which is used solely for the maintenance of Barden Freight vehicles, and a stand-alone warehouse at the southern end of the complex, which is used by Roberts Graphics. Both these stand-alone buildings are significantly screened from the site by the intervening warehouse, and operate during daytime business hours only.

Figure 1.2 contains an annotated site plan.

Figure 1.2: Annotated Site Plan



For reference, the Wes 80kw wind turbine referenced in the consultation response is now built and operational.

The ambient noise climate at the site is due to road traffic noise on the surrounding road network and intermittent noise from vehicle movements at Barden Freight.

Development proposals are for the demolition of the 2 no. derelict buildings and for the erection of 2 no. residential dwellings with associated landscaping and access roads on the same footprint. Draft layout plans indicate that the residential footprint is set back circa 30 metres from Coal Pit Lane, and circa 10 metres from boundary of Barden Freight.

2 Policy Context and Assessment Guidance

2.1 National Planning Policy Framework

The National Planning Policy Framework (NPPF)¹ was updated in 2021 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 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'

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'

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

2.2 Noise Policy Statement for England

The Noise Policy Statement for England² (NPSE) sets out the long-term vision of promoting good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development. This long-term vision is supported by the following aims:

- Avoid significant adverse impacts on health and quality of life
- Mitigate and minimise adverse impacts on health and quality of life
- Where possible, contribute to the improvement of health and quality of life

The NPSE describes the following levels at which noise impacts may be identified:

- NOEL – No Observed Effect Level. This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise
- LOAEL – Lowest Observed Adverse Effect Level. This is the level above which adverse effects on health and quality of life can be detected
- SOAEL – Significant Observed Adverse Effect Level. This is the level above which significant adverse effects on health and quality of life occur

According to the explanatory notes in the statement, where a noise level falls between the lowest observable adverse effect level (LOAEL) and a level which represents a significant observable adverse effect level (SOAEL):

'...all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life whilst also taking into consideration the guiding principles of sustainable development. This does not mean that such effects cannot occur.'

1 National Planning Policy Framework. Ministry of Housing, Communities and Local Government (2021)

2 Government Department for Environment, Food and Rural Affairs. Noise Policy Statement for England. March 2010.

2.3 Planning Practice Guidance on Noise

Planning Practice Guidance³ (PPG) is an online resource which provides additional guidance and elaboration on the NPPF. It advises that the Local Planning Authority should consider the acoustic environment in relation to:

- Whether or not a significant adverse effect is occurring or likely to occur
- Whether or not an adverse effect is occurring or likely to occur
- Whether or not a good standard of amenity can be achieved

In line with the Explanatory Note of the NPSE, the PPG references the LOAEL and SOAEL in relation to noise impact. It also provides examples of outcomes that could be expected for a given perception level of noise, plus actions that may be required to bring about a desired outcome. However, in line with the NPSE, no objective noise levels are provided for LOAEL or SOAEL 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’.

With regard to the mitigation of extant environmental noise at a proposed residential development, the guidance 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’.

The subjective nature of noise means that there is not a simple relationship between noise levels and the impact on those affected. This will depend on how various factors combine in any particular situation. The following guidance documents provide some meaningful context.

2.4 ProPG Planning and Noise: New Residential Development

ProPG Planning and Noise: New Residential Development (ProPG)⁴ was published in 2017 by the Association of Noise Consultants, Institute of Acoustics and the Chartered Institute of Environmental Health.

Stage 2: Element 2 of ProPG sets indoor ambient noise levels for residential dwellings based on the guidance contained in British Standard 8233:2014 ‘Guidance on Sound Insulation and Noise Reduction for Buildings’⁵ (BS 8233), see Table 2.1.

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

4 ‘ProPG Planning and Noise: New Residential Development (ProPG)’, 2017. Association of Noise Consultants (ANC), Institute of Acoustics (IOA) and the Chartered Institute of Environmental Health (CIEH)

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

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) habitable rooms during the daytime
- ≤ 30 dB L_{Aeq} (2300-0700) in bedrooms during the night-time
- 45 dB L_{AFMax} not exceeded on more than 10 occasions in bedrooms during the night-time

With regard to external amenity, ProPG reflects the advice given in BS 8233 as follows:

'The acoustic environment of external amenity areas that are an intrinsic part of the overall design should always be assessed and noise levels should ideally not be above the range 50–55 dB $L_{Aeq,16hr}$.'

'These guideline values may not be achievable in all circumstances where development might be desirable. In such a situation, development should be designed to achieve the lowest practicable noise levels in these external amenity spaces.'

3 Noise Survey

3.1 Overview

In order to determine the level of external noise affecting the proposed development, noise monitoring was carried out on Tuesday 4th through to Wednesday 5th July 2023.

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

- MP1 was located at the north-eastern façade of the existing building
- MP2 was located at the south-western façade of the existing building

Noise measurements were undertaken at 4 metres above ground level at 1 metre from the existing building façade using a Bruel & Kjaer 2250 Type 1 integrating sound level meter. The meter was connected to a windshield covered microphone positioned at the locations detailed above.

The measurement system calibration was verified immediately before and after the survey period using a Bruel & Kjaer Type 4231 calibrator. No drift in calibration 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 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, at each measurement position, rounded to the nearest decibel. As noise measurements were made at 1 metre from the existing building façade, a –3 decibel façade enhancement correction has been applied to the measured levels in order to establish the free field level.

Where feasible, noise from birdsong in close proximity to the microphone has been excluded using Bruel & Kjaer Evaluator software.

Table 3.1: Summary of Noise Measurement Data

Position	Date	Time	$L_{Aeq,T}$ (dB)	L_{AFmax} (dB)	L_{A90} (dB)	L_{A10} (dB)	Comment
MP1	04/07/23	1001–1106	42	64	34	45	Road traffic on Coal Pit Lane, birdsong, occasional distant HGV movements at Barden Freight during the daytime
		1432–2300	42	71	26	43	
	04-05/07/23	2300–0700	35	59	18	38	
MP2	04/07/23	1108–1428	45	69	34	47	Distant road traffic, occasional Barden Freight HGVs on access road (6 in, 4 out)
	05/07/23	0703–0800	42	68	34	45	Distant road traffic, 1 no. Barden Freight HGVs out on access road

3.3 Analysis

Road Traffic at North-east façade (MP1)

Noise at this façade was primarily due to road traffic on Coal Pit Lane and birdsong, with occasional noise audible from yard movements at Barden Freight along the access road to the east.

Daytime and night-time ambient noise levels at MP1 were **42 dB LAeq (0700-2300)** and **35 dB LAeq (2300-0700)** respectively, with maximum noise levels of \leq **59 dB LA_FMax** during the night-time.

Commercial Activity and Distant Road Traffic at the South-west façade (MP2)

Noise at this part of the site was primarily due to distant road traffic with occasional noise audible from HGV movements associated with Barden Freight.

Daytime ambient noise levels at MP2 were up to **45 dB LAeq, T**. It was noted that vehicle movements at Barden Freight were worst-case on the day of the survey, as the Shepley Spring production line was down and this necessitated the retrieval of stored stock from the units. The site was locked up with a gate during night-time hours, with no internal or external operations.

No noise was audible from the operational Wes 80kw wind turbine. Manufacturer's data for the turbine provides a noise level of 45 dB(A) at 100m (at 8 m/s wind speed), which equates to circa 40 dB(A) at 185 metres. Such external levels are very low in absolute terms, and are likely to be masked by residual wind/vegetation noise at these wind speeds.

4 Noise Assessment

Design noise levels at the site are as follows:

- $\leq 45 \text{ dB } L_{Aeq} (0700-2300)$ during the daytime
- $\leq 35 \text{ dB } L_{Aeq} (2300-0700)$ during the night-time
- $\leq 59 \text{ dB } L_{AFMax}$ during the 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).

As evidenced in the calculation sheet below, 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 at the site.

Figure 4.1: Example BRE Calculation Spreadsheet

BRE Building Envelope Insulation

Switch to Reverberation Time Calculation

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

Element	Material/Type	Surface area OR number of vents	Unit
Wall 1	Brick/block cavity	5	m ²
Wall 2	None		m ²
Window 1	4/12/4 double glazing	2	m ²
Window 2	None		m ²
Door	None		m ²
Roof/Ceiling	None		m ²
Vent 1	Greenwood 5000EA	2	
Vent 2	None		

1) Enter room dimensions or volume

Use dimensions

x [] m

y [] m

z [] m

Volume [] m³

OR

Use volume

[25] m³

3) Enter reverberation time of the room.

[0.5] seconds

4) Select exterior sound level type

Option (A) User defined spectrum

[45 dB LAeq (Day)]

View/Edit Data

Option (B) 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} [45] dB

[ISO 717 - 1 (Ctr)]

View Data

Internal sound level

L_{Aeq} [20.1] dB

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.”

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

Table 4.1 – External Noise Levels and Resultant Internal Noise Levels

External Noise Level	Reduction	Resultant Internal Level	Comment
≤ 45 dB L_{Aeq} (0700-2300) ≤ 35 dB L_{Aeq} (2300-0700) ≤ 59 dB L_{AFMax}	-25 dB (closed windows)	≤ 20 dB L_{Aeq} (0700-2300) ≤ 10 dB L_{Aeq} (2300-0700) ≤ 34 dB L_{AFMax}	Very good internal noise levels with closed windows
	-15 dB (open windows)	≤ 30 dB L_{Aeq} (0700-2300) ≤ 20 dB L_{Aeq} (2300-0700) ≤ 44 dB L_{AFMax}	Good internal noise levels with open windows

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.

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.
- 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 R_w 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.

On the basis of the low external noise levels measured at the site, windows can remain open in bedrooms during sleeping hours (2300 to 0700 hours) as part of an overheating mitigation strategy.

Daytime ambient noise levels throughout the application site are ≤ 45 dB $L_{Aeq, T}$. Such levels are below the desirable value described in ProPG/BS 8233 for gardens. On this basis, there is no issue with respect to external amenity.

5 Summary and Conclusions

A noise impact assessment has been undertaken for the proposed residential development on land to south-west of Coal Pit Lane, Cumberworth, Huddersfield.

The noise environment at the site is due to road traffic noise on the surrounding road network and occasional noise from vehicle movements at Barden Freight.

Ambient noise levels throughout the site are relatively low. As a consequence, standard double glazing and standard trickle vents are appropriate throughout the development.

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



