Environmental Noise Solutions Limited

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

Devour Restaurant, The Dyehouse, Luke Lane, Thongsbridge, Holmfirth, HD9 7TB

Noise Impact Assessment

For:
Paul Robinson

8th January 2025

Ref: NIA-10956-23-11166-v3-Devour Kitchen Extraction
Author: Rob Ashby BSc (Hons), MIOA

Contents

1 Introduction

1.1 Overview

Environmental Noise Solutions Ltd (ENS) has been commissioned by Mr. Paul Robinson to undertake a noise impact assessment for the installation of new extraction plant at the Devour Restaurant, Luke Lane, Thongsbridge, Holmfirth (hereafter referred to as 'the site').

The objectives of the noise impact assessment were to:

- Determine the existing background noise levels in the vicinity of the site.
- Determine the noise levels associated with the proposed extraction plant.
- Assess the noise impact of the plant on the nearest noise sensitive receptors (surrounding residential uses) in accordance with relevant guidance.

This report details the methodology and results of the assessment and provides recommendations for noise attenuation as appropriate. It has been prepared to accompany a planning application to be submitted to the local planning authority.

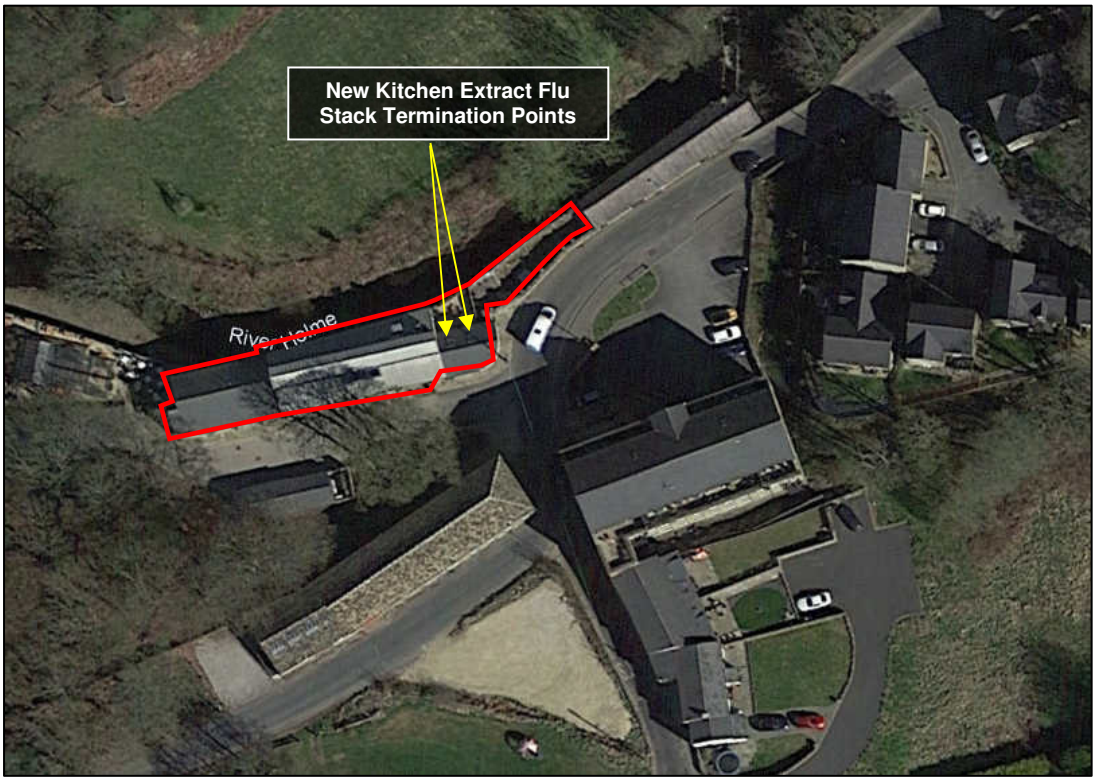
The report has been prepared for Mr. Paul Robinson for the sole purpose described above and no extended duty of care to any third party is implied or offered. Third parties referring to the report should consult Mr. Paul Robinson and ENS as to the extent to which the findings may be appropriate for their 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

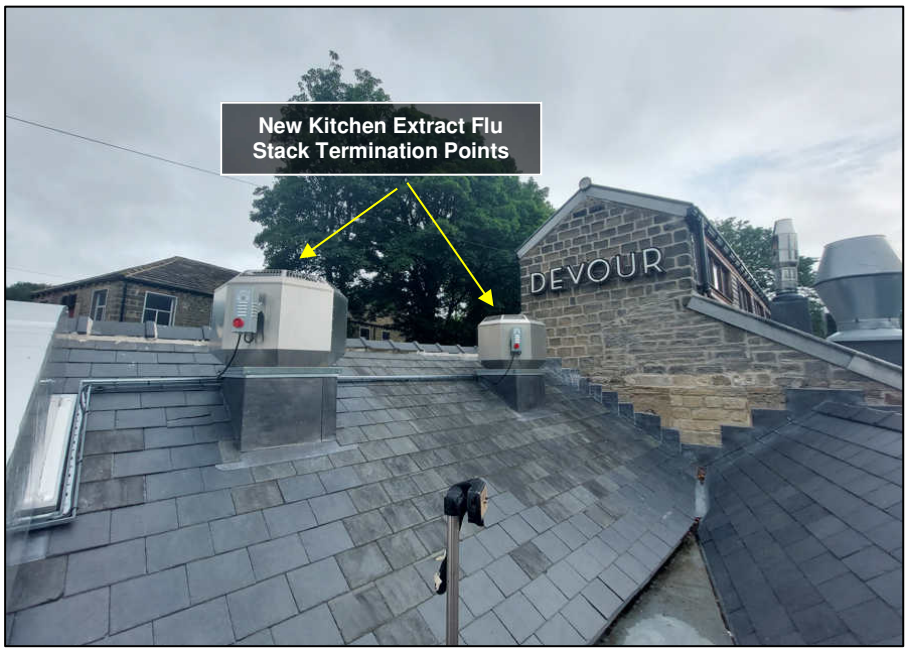
The Devour restaurant is located on Luke Lane, Thongsbridge. The approximate site boundary and kitchen extraction plant location is indicated on Figure 1.1 below.

Figure 1.1: Location of Development and New Kitchen Extraction



Planning permission is sought for the replacement and relocation of kitchen extraction plant. The extraction fan ductwork has two chimney termination points which terminate approximately 400mm above roof height (shown in Figure 1.2 below)

Figure 1.2: Location of New Kitchen Extraction Termination Points



The nearest noise sensitive receptors are identified as follows (locations shown in appendix 2):

- Residential apartments to the south-east on Luke Lane (NSR A).
- Residential dwellings to the south on Woodlands Avenue (NSR B).

2 Policy Context and Assessment Guidance

2.1 National Planning Policy Framework

The National Planning Policy Framework (NPPF) 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 England[1] (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

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

- 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 Guidance[2] (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'.

Table 2.1 summarises the PPG noise exposure hierarchy.

Table 2.1: PPG Noise Exposure Hierarchy

Perception	Examples of Outcomes	Increasing Effect Level	Action
Not Noticeable	No Effect	No Observed Effect	No specific measures required
Noticeable and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in	Significant Observed Adverse Effect	Avoid

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

Perception	Examples of Outcomes	Increasing Effect Level	Action
	getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.		
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

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.

2.4 BS 4142 'Methods for Rating and Assessing Industrial and Commercial Sound'

BS 4142[3] presents methods for rating and assessing the potential impact of commercial and industrial sound upon noise sensitive receptors. The Standard is appropriate for the consideration of industrial and manufacturing processes, fixed installations which comprise mechanical and electrical plant and equipment and mobile plant / vehicles that form an intrinsic part of the industrial/commercial including the loading and unloading of goods and materials at the premises.

The noise impact magnitude is derived from the numerical subtraction of the representative[4] background noise level from the measured or calculated rating level of the specific sound under consideration. Typically, the greater this difference, the greater the magnitude of the impact:

- 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' must be determined considering the need for any 'character corrections' to the specific industrial/commercial noise level to account for tonal qualities, impulsive qualities, other sound characteristics and/or intermittency. This can be done using a subjective, objective or reference methods. Where multiple features are present the corrections should be added in a linear fashion to the specific level.

The subjective method is based on the corrections presented in Table 2.1.

Table 2.1: BS4142 Subjective Method 'Acoustic Feature' / Rating Corrections

Level of Perceptibility	Tonal Correction	Impulsivity Correction	Intermittency Correction	Other
None	0 dB	0 dB	+3 dB Where intermittency is readily identifiable	+3 dB Where neither tonal nor impulsive but clearly identifiable against prevailing soundscape
Just Perceptible	+ 2 dB	+ 3 dB		
Clearly Perceptible	+ 4 dB	+ 6 dB		
Highly Perceptible	+ 6 dB	+ 9 dB		

BS 4142 requires separate analysis for day and night time periods, evaluating the Rating level over an appropriate reference time interval (T_r) of:

- 1 hr during the day (between 07:00 – 23:00 hrs)
- 15 min during the night (between 23:00 – 07:00 hrs)

[3] British Standard 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound. British Standards Institution (2019)

[4] 'Representative' is generally considered to be 'typical' (e.g. formed by analysis of modal / mean average values) rather than the lowest measured

3 Noise Survey

3.1 Overview

A noise survey was undertaken on Friday 30th June 2023 to assess noise levels in the vicinity of nearby noise sensitive receptors.

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

- MP1 was located on Luke Lane in the vicinity of NSR1.
- MP2 was located on Woodland Avenue in the vicinity of NSR2.

Noise measurements were undertaken using a Bruel & Kjaer 2250 Type 1 integrating sound level meter in free field conditions and at 1.5 metres above ground level (AGL). 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. The noted weather conditions during the survey were dry with wind speeds < 5 m/s. Weather conditions were therefore considered appropriate for noise monitoring.

Measurements consisted of A–weighted broadband parameters including L_{Aeq} and L_{A90}, together with linear 1/3rd octave band data.

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.

Table 3.1: Summary of Noise Measurement Data

Position	Date	Time	Measured sound pressure level (dB)		Comment
			$L_{Aeq,T}$	$L_{A90,T}$	
1	30/06/23	22:27-23:06	58	42	Noise climate controlled by local and distant road traffic noise
2	30/06/23	23:08-23:53	45	37	

Background noise levels measured during the survey were controlled by local and distant road traffic noise at both positions.

3.3 Fixed Plant Noise Limits

With reference to the BS 4142 guidance set out in Section 2, where the rating noise level from an item or items of fixed plant exceeds the existing background noise level by 5 dB or more, this is an indication that the noise would have an adverse impact at the noise sensitive receptors. On this basis, fixed plant noise should not exceed a rating noise level which is 5 dB above the existing representative background noise level.

The extract plan will operate during daytime hours only, when the Devour kitchen is operational.

Table 3.2 below presents a summary of the daytime background noise levels and proposed Rating limits. The noise level presented below should be achieved at 1m from the façade of nearby noise sensitive receptors.

Table 3.2: BS 4142 Rating Noise Limits

NSR	Period	Representative background noise level (dB $L_{A90,T}$)	Proposed Rating Noise Limit (dB $L_{Ar,Tr}$)
A	Daytime (07:00-23:00)	42	≤ 47
B	Daytime (07:00-23:00)	37	≤ 42

4 Noise Assessment

4.1 Noise Associated with the New Kitchen Extraction

It is understood that the kitchen extract fans comprise 2 no. eDVC 500-4-3 (120), ducted to the roof of the existing Devour kitchen. Noise levels for the fans have been derived from manufacturer's datasheet, with octave band noise levels set out in Table 4.1 below.

Table 4.1: Kitchen Extract Plant Noise Levels

	Sound pressure level (dB L_w) at octave band centre frequency (Hz)								
Parameter	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	**dB LwA**
In-duct outlet	79	88	84	79	73	70	66	60	81

To calculate specific noise levels at the nearest noise sensitive receptors, a three-dimensional Cadna-A noise model has been developed. Noise model geometry is based on Ordnance Survey mapping data and drawings supplied by the client.

Propagation of noise has been calculated in octave bands according to ISO 9613: 1996, at a height of 4m above ground level, representative of a first-floor bedroom. All buildings within the model are assumed to be acoustically reflective, and second order reflections have been considered. All plant is assumed to be operating continuously and concurrently throughout the assessment period.

A noise contour plot illustrating the propagation of noise from the site is presented as Figure C1 in Appendix 3 with predicted specific noise levels at each NSR presented as Table 4.2 below.

Table 4.2: BS 4142 Specific noise levels

NSR	Specific noise level (dB $L_{Aeq,T}$)
A	42
B	25

With regard to potential 'acoustic feature' corrections, the following is considered:

- The extract fans will operate continuously whilst the kitchen is in operation, and would therefore be expected to operate continuously throughout the assessment periods. The assessment also assumes all plant is operating concurrently, representing worst case noise emission.
- Plant of this type is generally not impulsive, and typically produces a steady noise level when operating.
- Source noise levels used in the assessment are not considered tonal, therefore no correction is required.

Notwithstanding the above, noise from the extract may be audible in the vicinity of NSR A in the absence of traffic. On the basis that plant noise is likely to be distinguishable against the prevailing background noise level, a rating correction of +3 dB is considered appropriate.

The calculated plant noise levels have been assessed in accordance with the methodology set out in BS 4142.

The results are presented as Table 4.3 below.

Table 4.3: BS 4142 Kitchen Extract Plant Noise Assessment

Parameter	NSRA	NSRB
Typical background sound level (dB $L_{Aeq,1hr}$)	42	38
Specific noise level (dB $L_{Aeq,1hr}$) (see Table 4.2)	42	25
Acoustic feature correction (dB)	+3	+3
Rating Level (dB $L_{Ar,Tr}$)	45	28
Excess of rating level over background sound level (dB)	+3	-10

The results presented in Table 4.3 indicate that rating noise levels at NSR A would exceed the existing representative background noise level by ≤ 3 dB.

With reference to the BS 4142 guidance set out in Section 2, the predicted noise level is below the level at which adverse impacts are expected.

Rating noise levels at NSR B, which benefits from the acoustic screening provided by the building massing of intervening properties are not predicted to exceed the background noise level. This is indicative of a 'low impact' according to BS 4142.

With reference to the PPG guidance set out in Section 2, noise levels at NSR A are considered to represent no observed adverse effect level (NOAEL), in that noise is likely to be audible at a level at which there is not likely to be a change in the quality of life or result in a change in behaviour.

Noise levels at NSR B are considered to be NOEL, on the basis that plant noise is unlikely to be audible.

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:

$L_p = 20 \log_{10}(p/p_o)$

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.

$L_{Amax,F}$
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 / NSR Locations

Appendix 3 – Noise Contour Plot