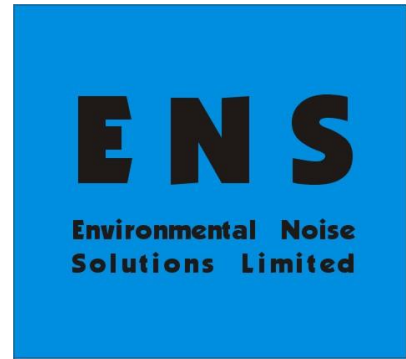




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Proposed Residential Development Abb Street, Marsh, Huddersfield, HD1 4PB

Noise Impact Assessment

For:
Farrar Bamforth Associates

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1 Introduction

1.1 Overview

Environmental Noise Solutions Ltd (ENS) has been commissioned by Farrar Bamforth Associates Ltd to undertake a noise impact assessment for a proposed new-build residential development at land to the west of Abb Street, Marsh, Huddersfield, HD1 4PB (hereafter referred to as ‘the site’).

Outline planning permission¹ for the development was granted by Kirklees Council in July 2019 subject to conditions. Condition 8 relates to the control of noise, as follows:

8. *A report specifying the measures to be taken to protect future occupiers from noise from Marsh Conservative Club shall be submitted to and approved in writing by the Local Planning Authority before works to construct the superstructure of the building(s) commences.*

The report shall:

- (i) Determine the existing noise climate;*
- (ii) Predict the noise climate in gardens (daytime), bedrooms (night-time) and other habitable rooms of the development;*
- (iii) Detail the proposed attenuation/design necessary to protect the amenity of the occupants of the new residences (including ventilation if required).*

The development shall not be occupied until all works specified in the approved report have been carried out in full and such works shall be thereafter retained.

The objectives of the noise impact assessment were therefore to:

- Determine external noise levels at the site
- Assess the potential impact of the Marsh Conservative Club on the proposed residential development with reference to relevant guidelines
- Provide recommendations for a scheme of sound attenuation works, as necessary, to protect future occupants of the proposed residential development from a loss of amenity due to noise

This report details the methodology and results of the assessment and provides recommendations for the building envelope (fenestration and ventilation). It has been prepared to accompany Planning Application ref: 2022/62/93245/W submitted to Kirklees Council.

The report has been prepared for Farrar Bamforth Associates 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 Farrar Bamforth Associates 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. Kirklees Planning Permission Ref: 2019/60/91609/W

1.2 Site Description and Development Proposals

The site is located on land adjacent to the Marsh Conservative Club to the west of Abb Street, Marsh, Huddersfield, HD1 4PB as shown (highlighted in red) in Figure 1.1.

Figure 1.1: Location of Proposed Development



The Marsh Conservative Club is located adjacent to the application site to the north.

The opening hours of the Marsh Conservative Club are listed as 1900 to 2330 hours Monday to Friday, with no opening on Saturdays and Sundays. The club does not have parking provision or a beer garden, but does contain a first floor function room which is hired out for private functions (e.g. birthdays).

Development proposals are for the construction of 2 no. semi-detached dwellings.

2 Policy Context and Assessment Guidance

2.1 National Planning Policy Framework

The National Planning Policy Framework (NPPF)² 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 England³ (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.'

² National Planning Policy Framework. Ministry of Housing, Communities and Local Government (2021)

³ Government Department for Environment, Food and Rural Affairs. Noise Policy Statement for England. March 2010.

2.3 Planning Practice Guidance on Noise

Planning Practice Guidance⁴ (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.

⁴ Planning Practice Guidance on Noise: <http://planningguidance.planningportal.gov.uk/blog/guidance/noise/>

2.4 Assessment Guidance

ProPG Planning and Noise: New Residential Development

ProPG Planning and Noise: New Residential Development (ProPG)⁵ 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' (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 residential development and considered to represent good resting and sleeping conditions:

- ≤ 35 dB L_{Aeq} (0700-2300) during the daytime
- ≤ 30 dB L_{Aeq} (2300-0700) and 45 dB L_{AFMax} not regularly exceeded 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 $L_{Aeq,16hr}$.'

⁵ '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 Noise Survey

3.1 Overview

In order to determine the level of external noise affecting the proposed development, noise monitoring was carried out during the late evening on Wednesday 4th January 2023.

For the purpose of the assessment, a single noise monitoring position (Position 1, as shown in Appendix 2) was adopted at 5 metres from the Marsh Conservative Club façade (representative of the nearest proposed façade).

Noise measurements were undertaken using a Bruel & Kjaer 2250 Type 1 integrating sound level meter. The meter was connected to a windshield covered microphone at a height of 4 metres above ground.

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} and L_{A90} with linear octave band data.

Weather conditions during the survey were dry with wind speeds < 5 m/s. Weather conditions were therefore considered appropriate for noise monitoring.

3.2 Summary

Table 3.1 presents a summary of the noise data for each measurement session, rounded to the nearest decibel.

Table 3.1: Summary of Noise Measurement Data

Date	Time	L_{Aeq} (dB)	L_{A90} (dB)	L_{A10} (dB)	Comment
04/01/2023	1800-1900	50	47	52	Dominated by distant road traffic on Westbourne Road to the south
	1900-2000	50	46	52	
	2000-2100	50	46	52	
	2100-2200	49	45	52	
	2200-2300	50	45	53	

Noise levels were measured between 49–50 dB L_{Aeq} during the late evening and were characterised by distant road traffic from the south on Westbourne Road.

No significant noise was noted from the Marsh Conservative Club, with no breakout noise noted, and noise events limited to occasional patron access/egress. The club closed early at circa 22:30hrs during the noise survey.

3.3 Noise Associated with the Marsh Conservative Club

Whilst no noise was noted from the Marsh Conservative Club, the club does occasionally host private functions with amplified music within the first floor function room.

In relation to potential music breakout from the function room, ENS has previously measured internal reverberant music noise levels of up to **90 dB L_{Aeq} (15 min)** within a larger function room during a busy event. This is robustly adopted as a worst-case internal reverberant noise level within the function room.

The function room is located in the northern half of the building, whilst the southern portion (nearest to the site) is significantly lobbied internally. Therefore, the weakest acoustic element is considered to be the windows along the western and eastern elevations of the function room, facing the site, with circa 7 m² of glazing on each side. The function room windows are set back at least 17 metres from the proposed dwellings.

The predicted noise break-out level from the function room at the proposed dwellings is predicted using the following formula (which is commonly referred to as 'Woods' formula and its use is common place and its accuracy widely accepted):

$$SPL_2 = SPL_1 - R + [10 \log S_p] - [20 \times \log d] - 14$$

Where:

SPL_2	=	Noise level at the receptor
SPL_1	=	Internal reverberant noise level (taken as 90 dB L _{Aeq} (15 min))
R	=	Sound reduction of double-glazed window (typically 30 dB R _w)
S_p	=	Total area of glazing (circa 7 m ²)
d	=	Distance between source and receptor (17 m)
- 14	=	Diffusivity correction (reverberant field to free field)

Processing the above formula, the predicted noise breakout level at the proposed development associated with a function at the club is calculated at circa **30 dB L_{Aeq} (15 min)**.

Such levels are significantly (20 dB) below the evening ambient road traffic noise level at the northern development footprint.

4 Noise Assessment

Ambient noise levels at the site were measured at up to **50 dB L_{Aeq,T}** during the late evening

Based on measurements taken at numerous sites, a typical standard double-glazed window with standard trickle vents provides circa 27 dB(A) sound insulation from external to internal.

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
≤ 50 dB L _{Aeq} (0700-2300)	–27 dB (closed windows)	≤ 23 dB L _{Aeq} (0700-2300)	Very good internal noise levels with closed windows
	–15 dB (open windows)	≤ 35 dB L _{Aeq} (0700-2300)	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.

Gardens throughout the site will readily satisfy the desirable guideline value for external amenity areas as described in BS8233 with no specific measures required.

Predicted noise levels associated with events at the Marsh Conservative Club are significantly (20 dB) below the evening ambient road traffic noise level at the site. It is therefore evident that the mitigation measures required to control general road traffic noise ingress will readily mitigate infrequent music noise breakout from the club.

5 Summary and Conclusions

A noise impact assessment has been performed for a proposed residential development at land to the south of The Marsh Conservative Club, Abb Street, Marsh, Huddersfield, HD1 4PB.

Noise monitoring was carried out during the evening of Wednesday 4th January 2023, to determine the existing noise climate at the site.

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

Predicted noise levels associated with events at the Marsh Conservative Club are significantly (20 dB) below the evening ambient road traffic noise level at the site. It is therefore evident that the mitigation measures required to control general road traffic noise ingress will readily mitigate infrequent music noise breakout from the club.

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.

$L_{AF \max}$

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

