REPORT TITLE:

Chads Farm Barn, TN157JY

Noise survey and Acoustic Assessment

CLIENT DETAILS:

Tricia and John Warner

DATE:

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REPORT REFERENCE:

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PREPARED BY:

Joan Carles Blanco BSc (Hons) MIOA

CHECKED/AUTHORISED BY:

Martin Jones BSc (Hons) MIOA

Southern Office
Oyster House, Severalls Lane
Colchester, Essex CO4 9PD
t: 0845 241 0142

Northern Office
The Core, Bath Lane, Newcastle Helix
Newcastle upon Tyne, NE4 5TF
t: 0845 872 3540

info@paceconsult.co.uk
www.paceconsult.co.uk

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-	Checked & Authorised	19/11/23	JCB	MJ

1 Executive Summary

The prevalent noise levels at Chads Farm Barn, TN157JY have been measured over a working day period to assess the impact of the existing noise sources on the proposed residential development.

The site is affected mainly by sporadic traffic noise, and noise from the use of the stable, which is located adjacent to the proposed development. The measured noise levels from these main noise sources are considered low.

It is considered that using guidelines from the World Health Organisation alongside levels provided in BS8233:2014 for indoor noise conditions within dwellings will ensure that 'significant adverse impacts on health and quality of life' are avoided as required by the Noise Policy Statement for England.

Consequently, an adequate level of noise mitigation measures will be required to ensure that future residents of the proposed site are protected from the existing noise levels.

If mitigation measures are included (as given by Section 7.3) to achieve the specified internal noise levels, future residents of the proposed development will be protected from the dominant noise sources. Mitigation measures should include the use of appropriate glazing coupled with trickle ventilation.

2 Introduction

Pace Consult was commissioned by Tricia and John Warner to undertake an assessment of the noise impact associated with the proposed development to be located at Chads Farm Barn, TN157JY.

There is a potential for road traffic noise, and noise emission of the retained stable to have an impact on the proposal. Therefore, the impact of the existing noise levels has been considered in assessing the site's suitability for residential use.

The assessment was undertaken in accordance with national standards and guidelines for residential dwellings.

3 The Site

3.1 Location and Description

The site is bounded by residential dwellings to the Eastern and Western boundaries, open plan agricultural land to the southern boundary, and Field Rd to the Northern boundary.

The main noise sources affecting the proposed residential development is sporadic traffic noise along the Field Rd, and noise emission from the use of the stable.

The noise survey recorded the noise levels during “typical usage” of the stable, which consist of the noise emission of two horses (maximum occupancy), and a small horsebox used during transportation.

Figure 1 below shows the location of the site relative to the surrounding area with survey locations indicated (MP1 and MP2).

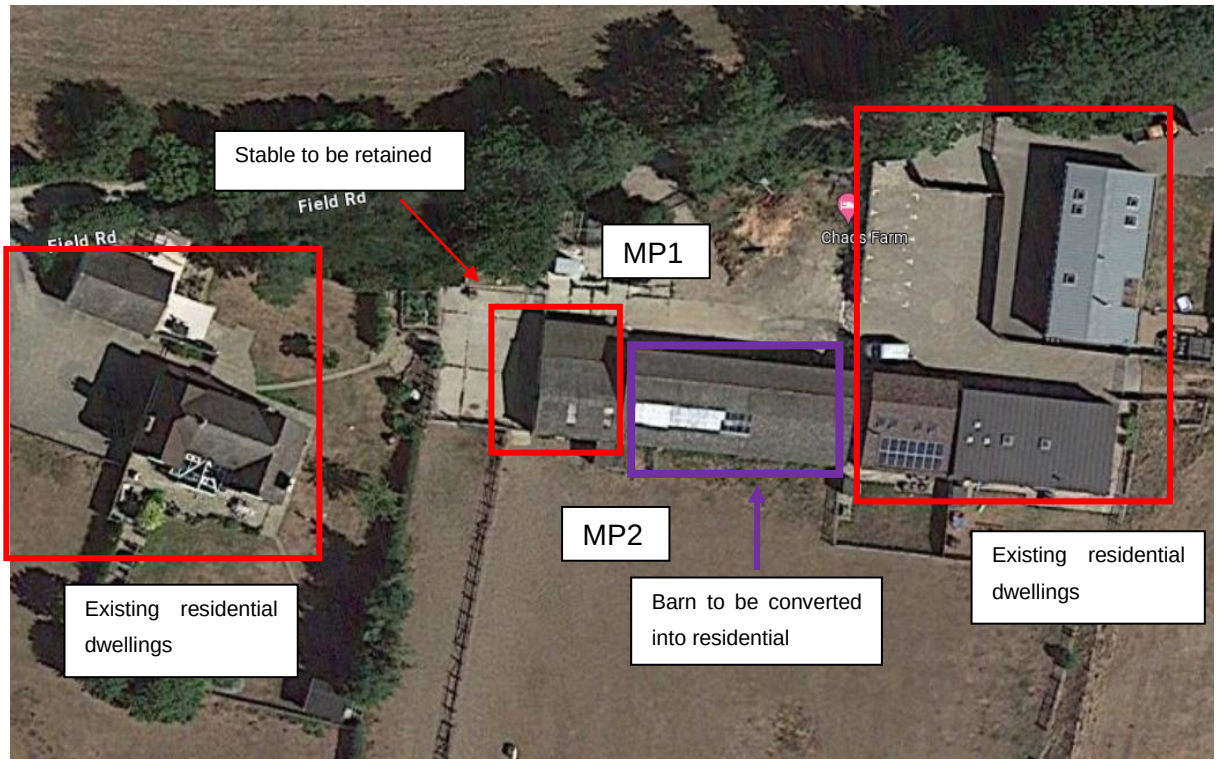


Figure 1. Noise Measurement positions

3.2 Proposed Development

The proposal is to convert the existing barn into a residential dwelling adjacent to the existing stable.

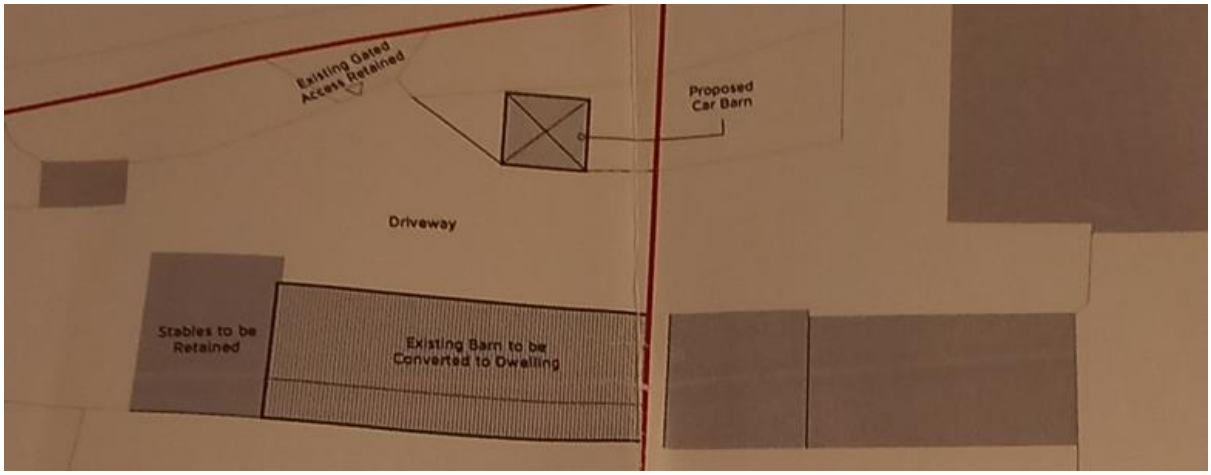


Figure 3. Proposed development.

4 Assessment Methodology

4.1 National Planning Policy Framework and the Noise Policy Statement for England

National Planning Policy Framework and the Noise Policy Statement for England

The National Planning Policy Framework (NPPF) sets out the general requirements for gaining planning permission. Comments regarding noise found within the document are as follows.

S15. Para 174

Planning policies and decisions should contribute to and enhance the natural and local environment by:
e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability.

S15. Para 185

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:
a) 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 60;
b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; andSee Explanatory Note to the Noise Policy Statement for England (Department for Environment, Food & Rural Affairs, 2010).

The NPPF references the Noise Policy Statement for England (NPSE) which intern references two concepts used by the World Health Organisation (WHO) which can be used to ascertain relevant noise levels for individual sites. The concepts are LOAEL (Lowest Observed Adverse Effect Level) and SOAEL (Significant Observed Adverse Effect Level).

The NPPF then gives three aims to adhere to:

Aim 1 – Avoid significant adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.
Aim 2 – Mitigate and minimise adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy of sustainable development.
Aim 3 – Where possible, contribute to the improvement of health and quality of life through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

To avoid 'significant adverse impacts on health and quality of life', by creating a situation where the impact of noise lies below the SOAEL we will refer to both BS8233 : 1999 – Sound Insulation and noise Reduction for buildings and the World Health Organisation (WHO) 'Guidelines for Community Noise' which both provide good criteria for internal noise levels for residential buildings.

In the context of assessing noise impact from the site, acceptable amenity levels for gardens are discussed within WHO Guidelines for Community noise, these criteria are also taken up by BS 8233: 2014 'Guidance on sound insulation and noise reduction for buildings'.

4.2 British Standard BS8233:2014 – Guidance on Sound Insulation and Noise Reduction for Buildings

The scope of BS8233 is the provision of recommendations for the control of noise in and around buildings. It suggests appropriate criteria and limits for different situations, which are primarily intended to guide the design of new or refurbished buildings undergoing a change of use rather than to assess the effect of changes in the external noise climate.

BS8233 suggests suitable internal noise levels within different types of buildings, including residential dwellings. It suggests an internal noise level of 35 dB $L_{Aeq,T}$ during day time, and 30 dB $L_{Aeq,T}$ during night time within bedrooms. In the daytime, the standard recommends 35 dB $L_{Aeq,T}$ in living rooms and in 40 dB $L_{Aeq,T}$ dining rooms. Table 4 below is extracted from this document.

Table 4 **Indoor ambient noise levels for dwellings**

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	35 dB $L_{Aeq,16hour}$	—
Dining	Dining room/area	40 dB $L_{Aeq,16hour}$	—
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

4.3 World Health Organisation (WHO) 'Guidelines for Community Noise'

This document states that, in dwellings, the critical effects of noise are on sleep, annoyance and speech interference. According to this document, to protect the majority of people from being seriously annoyed during the daytime, the sound pressure level on balconies, terraces and outdoor living areas should not exceed 55 dB L_{Aeq} for a steady, continuous noise. To protect the majority of people from being moderately annoyed during the daytime, the outdoor sound pressure level should not exceed 50 dB L_{Aeq}. To avoid any possibility of sleep disturbance, indoor guideline values for bedrooms are 30 dB L_{Aeq} for continuous noise and 45 dB L_{Amax} for single sound events. These indoor noise levels correspond to sound pressure levels at the outside façades of the living spaces of 45 dB L_{Aeq} and 60 dB L_{Amax}.

These values have been obtained by assuming that the noise reduction from outside to inside with the window partly open is 15 dB.

4.4 ProPG: Planning & Noise Professional Practice Guidance on Planning & Noise.

This document encourages improvements in the consistency and quality of planmaking and decision-taking in relation to acoustic matters. The context is primarily development control, although some of the content is relevant to strategic planning. The preparation of this ProPG acknowledges and reflects the Government's overarching Noise Policy Statement for England (NPSE), the National Planning Policy Framework (NPPF) and Planning Practice Guidance (including PPG-Noise), as well as other authoritative sources of guidance. This ProPG provides advice for Local Planning Authorities (LPAs) and developers, and their respective professional advisers.

The primary goal of this ProPG is to assist the delivery of sustainable development by promoting good health and wellbeing through the effective management of noise. It seeks to do that through encouraging a good acoustic design process in and around proposed new residential development having regard to national policy on planning and noise.

The recommended approach is also considered suitable where some industrial or commercial noise contributes to the acoustic environment provided that it is "not dominant".

This ProPG advocates a systematic, proportionate, risk based, 2-stage, approach.

Stage 1 – an initial noise risk assessment of the proposed development site; and
Stage 2 – a systematic consideration of four key elements.

The four key elements to be undertaken in parallel during Stage 2 of the recommended approach are:

- *Element 1 – demonstrating a "Good Acoustic Design Process";*
- *Element 2 – observing internal "Noise Level Guidelines";*
- *Element 3 – undertaking an "External Amenity Area Noise Assessment"; and*
- *Element 4 – consideration of "Other Relevant Issues".*

The two stages are described below:

Stage 1:

This section illustrates how an initial noise risk assessment is linked with an increasing risk of adverse effect from noise and how this in turn is broadly associated with indicative noise levels derived from current guidance and experience. The indicative noise levels are intended to provide a sense of the noise challenge at a potential residential development site and should be interpreted flexibly having regard to the locality, the project and the wider context. The figure 1 is included below.

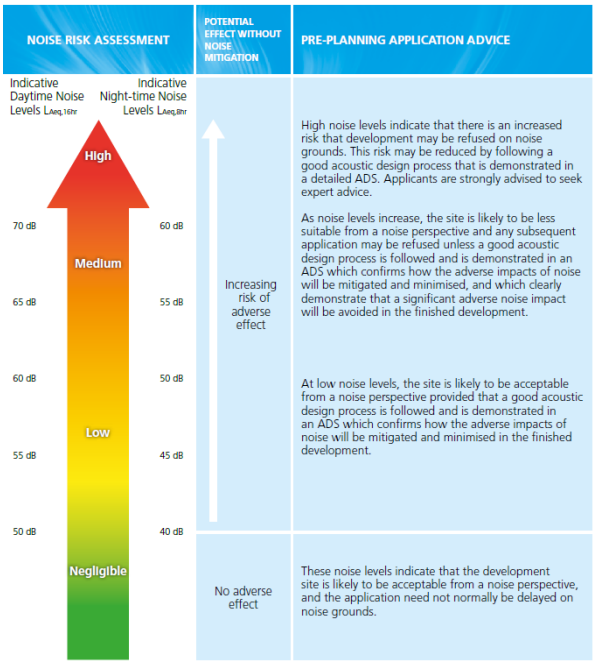


Figure notes.

a. Indicative noise levels should be assessed without inclusion of the acoustic effect of any scheme specific noise mitigation measures.
b. Indicative noise levels are the combined free-field noise level from all sources of transport noise and may also include industrial/commercial noise where this is present but is "not dominant".
c. LAeq,16hr is for daytime 0700 – 2300, LAeq,8hr is for night-time 2300 – 0700.

d. An indication that there may be more than 10 noise events at night (2300 – 0700) with LAmax,F > 60 dB means the site should not be regarded as negligible risk.

Stage 2: The four key elements.

Stage 2: Element 1 – Good Acoustic design Process.

Good acoustic design should provide an integrated solution whereby the optimum acoustic outcome is achieved, without design compromises that will adversely affect living conditions and the quality of life of the inhabitants or other sustainable design objectives and requirements.

Stage 2: Element 2 – Internal Noise Levels Guidelines.

The recommended ProPG internal noise level guidelines are included below.

ACTIVITY	LOCATION	07:00 – 23:00 HRS	23:00 – 07:00 HRS
Resting	Living room	35 dB $L_{Aeq,16\,hr}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16\,hr}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16\,hr}$	30 dB $L_{Aeq,8\,hr}$ **45 dB $L_{Amax,F}$** (Note 4)

NOTE 1 The Table provides recommended internal LAeq target levels for overall noise in the design of a building. These are the sum total of structure-borne and airborne noise sources.
NOTE 2 The internal LAeq target levels shown in the Table are based on the existing guidelines issued by the WHO and assume normal diurnal fluctuations in external noise.
NOTE 3 These internal LAeq target levels are based on annual average data and do not have to be achieved in all circumstances. For example, it is normal to exclude occasional events, such as fireworks night or New Year's Eve.
NOTE 4 Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or LAmax,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 LAmax,F more than 10 times a night. However, where it is not reasonably practicable to achieve this guideline then the judgement of acceptability will depend not only on the maximum noise levels but also on factors such as the source, number, distribution, predictability and regularity of noise events (see Appendix A).
NOTE 5 Designing the site layout and the dwellings so that the internal target levels can be achieved with open windows in as many properties as possible demonstrates good acoustic design. 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 LAeq target levels should not normally be exceeded, subject to the further advice in Note 7.
NOTE 6 Attention is drawn to the requirements of the Building Regulations.
NOTE 7 Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal LAeq target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved. The more often internal LAeq levels start to exceed the internal LAeq target levels by more than 5 dB, the more that most people are likely to regard them as "unreasonable". Where such exceedances are predicted, applicants should be required to show how the relevant number of rooms affected has been kept to a minimum. Once internal LAeq levels exceed the target levels by more than 10 dB, they are highly likely to be regarded as "unacceptable" by most people, particularly if such levels occur more than occasionally. Every effort should be made to avoid relevant rooms experiencing "unacceptable" noise levels at all and where such levels are likely to occur frequently, the development should be prevented in its proposed form (see Section 3.D).

Stage 2. Element 3 – External Amenity Area Noise Assessment.

The ProPG external amenity area noise assessment reflects and extends the advice contained in BS8233:2014 and the current Government guidance in PPGNoise as detailed in the Element 3 box below.

3(i) "If external amenity spaces are an intrinsic part of the overall design, the acoustic environment of those spaces should be considered so that they can be enjoyed as intended".
3(ii) "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 LAeq,16hr."
3(iii) "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(iv) Whether or not external amenity spaces are an intrinsic part of the overall design, consideration of the need to provide access to a quiet or relatively quiet external amenity space forms part of a good acoustic design process.
3(v) Where, despite following a good acoustic design process, significant adverse noise impacts remain on any private external amenity space (e.g. garden or balcony) then that impact may be partially off-set if the residents are provided, through the design of the development or the planning process, with access to:

- *a relatively quiet facade (containing openable windows to habitable rooms) or a relatively quiet externally ventilated space (i.e. an enclosed balcony) as part of their dwelling; and/or*
- *a relatively quiet alternative or additional external amenity space for sole use by a household, (e.g. a garden, roof garden orlarge open balcony in a different, protected, location); and/or*
- *a relatively quiet, protected, nearby, external amenity space for sole use by a limited group of residents as part of the amenity of their dwellings; and/or*
- *a relatively quiet, protected, publically accessible, external amenity space (e.g. a public park or a local green space designated because of its tranquillity) that is nearby (e.g. within a 5 minutes walking distance). The local planning authority could link such provision to the definition and management of Quiet Areas under the Environmental Noise Regulations.*

Stage 2: Element 4 – Assessment of Other Relevant Issues.

This element seeks to build upon relevant national and local planning and noise policies (item 4(i)) to provide a systematic list of recommendations for the issues that should be considered before making a judgement about the noise aspects of a particular planning proposal for new residential development. The recommended relevant issues are included below.

4(i) compliance with relevant national and local policy
4(ii) magnitude and extent of compliance with ProPG
4(iii) likely occupants of the development
4(iv) acoustic design v unintended adverse consequences
4(v) acoustic design v wider planning objectives

5 Survey Method and Equipment

5.1 Survey

The noise survey was carried out between Thursday 16th and Friday 17th November 2023 to measure representative noise and vibration levels at the site of the proposed development during a typical weekday period.

The noise survey comprised of two unattended monitoring locations on site which are described in detail below:

- Northen Boundary (MP1): Unattended continuous monitoring position recorded the noise levels from Field Rd, and the stable. The sound level meter was positioned at a height of 1.5 m above ground level and 3 metres from any reflective surface. The image below shows the measurement location.

Figure 4. Position MP1.

- Southern Boundary (MP2): Unattended continuous monitoring position recorded the noise levels from the stables. The sound level meter was positioned at a height of 1.5 m above ground level and 3 metres from any reflective surface. The image below shows the measurement location.

Figure 5. Position MP2.

Note: The assessment also includes sufficiently attendance on site to ensure that the sound meter recorded the typical noise levels affecting the proposed development.

Noise measurements were made with a calibrated precision grade sound level meter which achieves the requirements of BS EN 61672. The survey was carried out in accordance with the principles of BS 7445 Parts 1-3, 'Description and Measurement of Environmental Noise', and British Standard BS4142: 2014: *Methods for rating and assessing industrial and commercial sound.*

5.2 Equipment

- Svantek 971 precision grade sound level meters. Serial number 34927 and 34937.
- Norsonic Sound Calibrator 1251. Serial number 32199.
- Environmental wind shields

The sound level meters were calibrated before and after the survey. No significant drift was noted between the two reference checks.

5.3 Weather

In order to evaluate the weather conditions three weather check measurements were undertaken on site. During the weather checks, it was noted that the climatic conditions were stable during the whole measurement period. The sky was cloudy during Thursday, and clear on Friday morning..

Table 1. Weather condition.			
	°C	Wind speed m/s	Relative Humidity %
1st visit (14:00) Thursday	10.2	0.9	85
2nd visit (19:00) Thursday	9.3	1.1	80
3rd visit (13:00) Friday	11.8	0.9	83

The weather condition was taken using a Pocket weather tracker KESTREL 4500.

6 Survey Results

6.1 Noise measurement results.

The measurement survey at all monitoring locations comprised of consecutive measurement periods in terms of the most relevant standards and guidelines.

The Tables below show the period noise levels measured at all monitoring locations. These have subsequently been used as the basis for establishing the dominant noise levels across the site. The full set of survey data is available on request.

Table 2. Measured continuous noise level			
Time	**Period $L_{Aeq,\,T}$ dB** (Log Average)	**$L_{Amax(fast),\,T}$ dB 95th Percentile**	**$L_{A90,T}$ dB** Statistic Mode
MP1			
Day (07:00 – 23:00)	49	N/A	35
Night (23:00 – 07:00)	38	95th Percentile 62 Average 58	30
MP2			
Day (12:41 – 21:43)	42	N/A	30
Night (23:00 – 07:00)	35	95th Percentile 55 Average 45	29

The table below includes the frequency analysis of the measurement results, which have been employed to recommend the sound reduction of the building envelope.

Table 3 Example noise level octave spectrums used for building envelope calculation (MP1)								
Freq. Hz	63	125	250	500	1 k	2 k	4 k	dBA
Day-time L_{eq}	55	49	47	45	43	41	39	49
Night-time L_{eq}	52	43	38	32	32	26	27	35
Night-time $L_{max(fast)}$	59	55	53	51	41	49	61	62

Table 4 Example noise level octave spectrums used for building envelope calculation (MP2)								
Freq. Hz	63	125	250	500	1 k	2 k	4 k	dBA
Day-time L_{eq}	51	48	44	40	35	31	25	42
Night-time L_{eq}	46	42	38	34	29	21	23	35
Night-time $L_{max(fast)}$	63	66	52	52	44	48	63	55

7 Site Suitability for Residential Development

7.1 Noise Assessment according to ProPG methodology.

The noise measurements show that the proposed development is within the low noise risk as declared by ProPG methodology.

ProPG states the following for developments affected by medium noise risk.

At low noise levels, the site is likely to be acceptable from a noise perspective provided that a good acoustic design process is followed, and is demonstrated in an ADS with confirms how the adverse impact of noise will be mitigated and minimized in the finish development.

Section 7.3 of this report includes the recommended acoustic building envelope to demonstrate that using a good acoustic design process the effect of noise is mitigated and minimized as recommended by proPG.

7.2 External Amenity Area Noise Assessment.

The noise levels at the proposed amenity areas are considered low, and in line with the criteria recommended by WHO, and relevant acoustic guidelines (outdoor amenity areas noise levels ≤50 LAeq dB).

7.3 Building Envelope Sound Insulation

The recommended sound insulation of each component of the envelope construction are included in the table overleaf.

Table 5 – Specification for the building envelope.								
Freq. Hz	63	125	250	500	1 k	2 k	4 k	**Single Figure**
Window – **Bedrooms**	19	27	29	31	32	38	47	**34 dB R_w**
vent **Bedroom**	32	37	41	43	39	42	45	**42 Dn,w**
Window – **Living Rooms**	18	21	17	25	35	37	31	**29 dB R_w**
vent **Living Rooms**	32	37	41	43	39	42	45	**42 Dn,w**
External Wall	43	46	44	46	54	62	68	**52 dB R_w**
Roof	22	35	48	56	60	56	60	**56 dB R_w**

The example wall specification used in the calculations was a cavity brick construction and Dryliner (12.5 mm soundbloc plasterboard).

Roof specification is roof sheeting, rafters, insulation 150 mm and 2 x layers of sound bloc on resilient layers.

Various other construction types may be acceptable however the sound insulation of the alternative build up should be equal to or above those included in the table 5.

By employing the above attenuating measures, it will be possible to attain the internal noise levels within dwellings recommended in British Standard BS 8233:2014 *Guidance on sound insulation and noise reduction for buildings,* WHO, and ProPG*.* Nighttime noise levels resulting from single sound events are not expected to regularly exceed the recommended level of 45 dB $L_{Amax(fast)}$ by the relevant acoustic guidelines in bedrooms and L_{Aeq} 35 dB in living rooms during daytime.

7.4 Noise intrusion assessment.

This section includes a noise intrusion assessment to demonstrate that using a good acoustic design process the effect of noise is mitigated and minimized as recommended by proPG.

The noise intrusion calculations in habitable spaces (bedrooms and living rooms) are included in the overleaf tables, the calculation is executed according to the methodology recommended by BS8233:2014 (*Section G.2 Typical design problem: More rigorous calculation*).

The table below includes the noise intrusion in bedrooms exposed to the highest individual noise events ($L_{Amax,\ fast}$ dB). The calculation assumes a bedroom of 34 m^3.

BS8233:2014 Calculation of Sound transmission into a building

Project:		**Date:**	
Client:		**Consultant:**	

Building elements & Areas	**Total M^2**
S_{ew} - External Wall Area	9.00
S_{wi} - Area of Windows within Room	1.00
S_{rr} - Area of Ceiling within Room	12.00
Total Façade Area:	**10.00**
Total Area of transmitting elements:	**22.00**

Constants	
A0	10
A (0.16v/T)	10.752
No. Vents	2

	W	L	H	V	Rt (s)
Room Data	4	3	2.8	33.6	0.5

Constructions & Performance Data:

Construction	*63*	*125*	*250*	*500*	*1K*	*2K*	*4K*
Window: Double glazing	19	27	29	31	32	38	47
Vent:	32	37	41	43	39	42	45
Wall:Cavity Block + Drylining	43	46	44	46	54	62	68
Roof	22	35	48	56	60	56	60

Source Noise & Element Contributions

	63	*125*	*250*	*500*	*1K*	*2K*	*4K*
Source Lp	59	55	53	51	41	49	61
Window	-32.4	-40.4	-42.4	-44.4	-45.4	-51.4	-60.4
Vent	-32.4	-37.4	-41.4	-43.4	-39.4	-42.4	-45.4
Wall	-46.9	-49.9	-47.9	-49.9	-57.9	-65.9	-71.9
Ceiling	-24.6	-37.6	-50.6	-58.6	-62.6	-58.6	-62.6
Cumulative SRI	**-23.4**	**-33.4**	**-38.1**	**-40.3**	**-38.4**	**-41.8**	**-45.2**
Plus 10log S/A	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Façade Effect	3	3	3	3	3	3	3
RESULT	41.7	27.7	21.0	16.8	8.7	13.3	21.9

A weighted Internal Level	25.2

Figure 6. Noise intrution assessment in bedrooms affected by the highest individual noise events.

As can be seen from the above table, the calculated internal noise intrusion is 25 $L_{Amax(fast)}$ dBA, which is below and therefore compliant with the recommended levels by WHO and ProPG (≤45 $L_{Amax(fast)}$ dB).

The table below includes the noise intrusion in living rooms based on the measured L_{Aeq} dB during daytime. The calculation assumes a living room of 56 m^3.

BS8233:2014 Calculation of Sound transmission into a building

Project:		**Date:**	
Client:		**Consultant:**	

Building elements & Areas	**Total M^2**
S_{ew} - External Wall Area	11.00
S_{wi} - Area of Windows within Room	2.00
S_{rr} - Area of Ceiling within Room	14.00
Total Façade Area:	**13.00**
Total Area of transmitting elements:	**27.00**

Constants	
A0	10
A (0.16√T)	17.92
No. Vents	4

	W	L	H	V	Rt (s)
Room Data	5	4	2.8	56	0.5

Constructions & Performance Data:

Construction	*63*	*125*	*250*	*500*	*1K*	*2K*	*4K*
Window: Double glazing	18	21	17	25	35	37	31
Vent:	32	37	41	43	39	42	45
Wall:Cavity Block + Drylining	43	46	44	46	54	62	68
Ceiling:Resi floor above	22	35	48	56	60	56	60

Source Noise & Element Contributions

	63	*125*	*250*	*500*	*1K*	*2K*	*4K*
Source Lp	55	49	47	45	43	41	39
Window	-29.3	-32.3	-28.3	-36.3	-46.3	-48.3	-42.3
Vent	-30.3	-35.3	-39.3	-41.3	-37.3	-40.3	-43.3
Wall	-46.9	-49.9	-47.9	-49.9	-57.9	-65.9	-71.9
Ceiling	-24.9	-37.9	-50.9	-58.9	-62.9	-58.9	-62.9
Cumulative SRI	**-22.7**	**-29.8**	**-27.9**	**-34.9**	**-36.7**	**-39.6**	**-39.7**
Plus 10log S/A	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Façade Effect	3	3	3	3	3	3	3
RESULT	37.1	24.0	23.9	14.9	11.1	6.2	4.1

A weighted Internal Level: 19.7

Figure 7. Noise intrution assessment in living rooms affected by the highest everage noise levels during day time.

As can be seen from the above table, the calculated internal noise intrusion is 20 L_{Aeq} dB, which is below the levels recommended by BS8233:2014 and ProPG (≤35 L_{Aeq} dB daytime).

Potential suppliers of construction elements must be able to satisfy the design team that the acoustic performance information supplied must relate to the products on offer for this project and should show laboratory test acoustic information measured in accordance with BS EN ISO 10140.

8 Conclusions

The impact of noise associated with the proposed development at Chads Farm Barn, TN157JY has been assessed. Throughout, the assessment has been undertaken with reference to British Standards and national and international guidance on noise impacts.

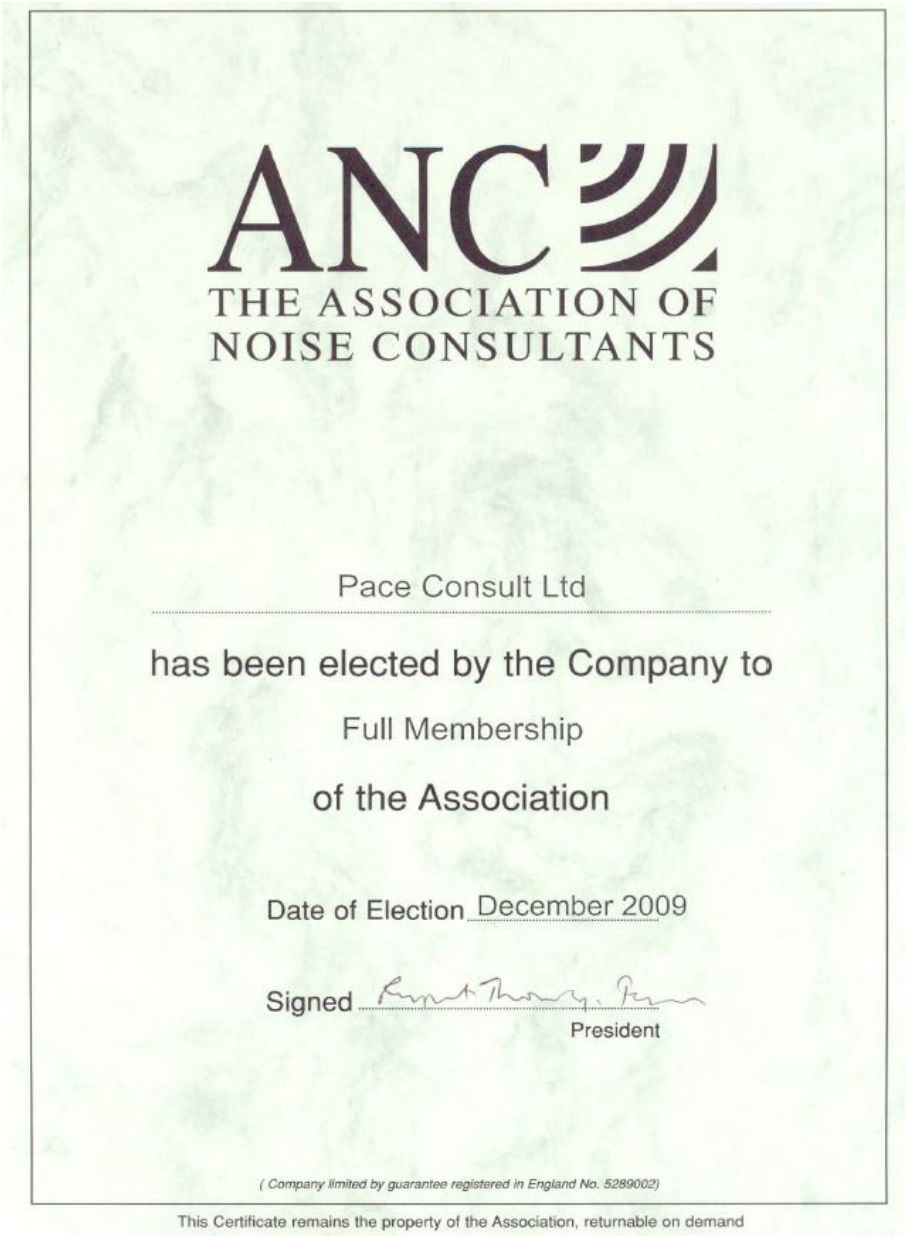
The noise levels have been assessed with consideration to the National Planning Policy Framework and the Noise Policy Note for England. Following these policies, figures from the WHO's 'Guidelines for Community Noise', ProPG, and BS8233 '*Sound Insulation and Noise Reduction for Buildings*' have been used to assure that 'significant adverse impacts on health and quality of life' are avoided. To achieve these internal noise levels envelope constructions have been recommended.

9 References

1. National Planning Policy Framework
2. Noise Policy Statement for England
3. World Health Organisation Criteria – Environmental criteria
4. BS8233:2014 "Guidance on sound insulation and noise reduction for buildings"
5. ProPG: Planning & Noise Professional Practice Guidance on Planning & Noise.

Appendix 1 ANC Membership.

The author is a corporate member of the Institute of Acoustics (IOA) which satisfies the experience and qualification requirements for a 'suitably qualified acoustician'. Pace Consult are also full member of the Association of Noise Consultants.



ANC

THE ASSOCIATION OF NOISE CONSULTANTS

Pace Consult Ltd

has been elected by the Company to

Full Membership

of the Association

Date of Election December 2009

Signed

President

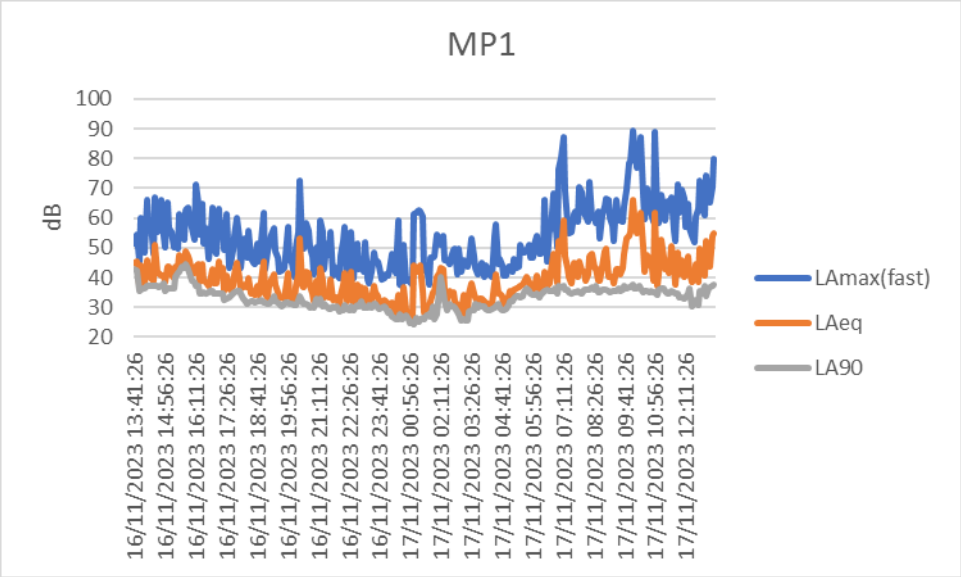
(Company limited by guarantee registered in England No. 5289002)

This Certificate remains the property of the Association, returnable on demand

Appendix 2 Noise measurements.

The figures included below shows the sound levels at intervals of 15 minutes during the 24 hr noise survey.

Position MP1



Position MP2