

AMENDED

Our ref: NIA/10269/22/10410/v2 Sturton

11th April 2022

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ANC
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NOISE IMPACT ASSESSMENT FOR PROPOSED RESIDENTIAL DEVELOPMENT AT LAND TO THE SOUTH OF MAIN STREET, STURTON, SCAWBY, DN20 9DL

NORTH LINCOLNSHIRE COUNCIL PLANNING APPLICATION REFERENCE PA/2021/1755

1.00 INTRODUCTION

1.01 Environmental Noise Solutions Limited (ENS) has been commissioned by Qudos Homes to carry out a noise impact assessment for a proposed residential development at land to the south of Main Street, Sturton, Scawby, DN20 9DL (hereafter referred to as the application site).

1.02 Planning permission for the development is sought under Planning Application ref: PA/2021/1755 submitted to North Lincolnshire Council (NLC) in October 2021. The following comments relating to noise at the application site were received from the Environmental Protection Team at NLC in December 2021:

*'The proposed site is located within 20m of an existing farm to the west and there is therefore the potential for adverse noise to impact the application site. **At this stage this department does not have sufficient information from the applicant to assess the likely impact of noise.***

*Therefore **prior to determination** of this application, this department would request a noise impact assessment is submitted for approval:*

The Noise Impact Assessment shall be carried out with reference to:

- *National Planning Policy Framework (2021)*
- *National Planning Practice Guidance (2014)*
- *BS 4142:2014 + A1:2019 Methods for rating and assessing industrial and commercial sound.*
- *World Health Organisation Guidelines for Community Noise (1999)*
- *World Health Organisation Night Noise Guidelines for Europe (2009)*
- *BS8233:2014 Guidance on sound insulation and noise reduction for buildings*
- *BS7445-2:1991, ISO1996-2:1987 Description of environmental noise. Part 2: Guide to acquisition of data pertinent to land use.*

The Noise Impact Assessment report shall provide details of existing background noise levels, likely noise sources which will impact upon the proposed development, mitigation methods to be employed and the resulting predicted level of noise at sensitive locations. Any approved mitigation measures shall be carried out in their entirety before the use of the site commences and shall be retained thereafter.'

1.03 The objectives of the noise impact assessment were therefore to:

- Determine the ambient noise climate at the application site
- Assess the potential impact of the ambient noise climate on the proposed residential development with reference to relevant guidelines
- Provide recommendations for a scheme of sound attenuation works, as necessary

- 1.04 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: PA/2021/1755.
- 1.05 This report has been prepared for Qudos Homes for the sole purpose described above and no extended duty of care to any third party is implied or offered. Third parties making reference to the report should consult Qudos Homes and ENS as to the extent to which the findings may be appropriate for their use.
- 1.06 A glossary of acoustic terms used in the main body of the text is contained in Appendix 1.

2.00 APPLICATION SITE SETTING AND PROPOSED RESIDENTIAL DEVELOPMENT

- 2.01 The application site, irregular in shape, is located in a rural area in the village of Sturton, near Scawby, and is bound by (see site location plan in Appendix 2):
- Main Street and existing residential dwellings to the north
 - Residential dwellings to the east
 - Ongoing new-build residential development to the west with Manor Farm beyond
 - Open land to the south
- 2.02 Development proposals are for 15 no. detached dwelling house with associated access roads and landscaping.
- 2.03 Whilst the site boundary of the application site is circa 25 metres from the southern field of Manor Farm, the main farm buildings and yards are significantly further from the application site. The southern field is former agricultural land associated with the farm, which now appears to be used for storage only.
- 2.04 In relation to relevant planning history in the vicinity of the application site, it is noted that outline planning permission (ref: PA/2018/569) was granted by NLC in August 2018 for the adjoining residential development to the west. Despite being in much closer proximity to the main yards/buildings at Manor Farm, there were no comments or conditions relating to noise impacting on future occupants of the development.
- 2.05 The ambient noise climate at the application site is characterised by distant road traffic on the surrounding road network, and birdsong, commensurate with the rural location. Occasional activity (e.g. tractor movements) was noted at Manor Farm to the west, but due to the significant separation distance this was not significant or measurable.

3.00 BASELINE NOISE SURVEY

- 3.01 In order to establish the ambient noise levels at the application site, a baseline noise survey was carried out on Wednesday 23rd March through to Thursday 24th March 2022.
- 3.02 For the purpose of the assessment, the following noise monitoring positions were adopted (the approximate location of the noise monitoring positions is contained in Appendix 2 for reference):
- MP1 was located at the western boundary of the site
 - MP2 was located at the northern boundary of the site, set back 10 metres from Main Street
- 3.03 Noise measurements were made in free field conditions at 1.5 metres above ground level using a Bruel & Kjaer 2250 Type 1 integrating sound level meter. A windshield was fitted for all measurements. The measurement system calibration was verified immediately before the commencement of the measurement sessions and again at the end, using a Bruel & Kjaer Type 4231 calibrator. No drift in calibration level was noted. Weather conditions throughout the survey were appropriate for monitoring.

3.04 Measurements consisted of A-weighted broadband parameters, together with linear octave band L_{eq} levels. Table 3.1 presents the measurement 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	L_{Aeq} (dB)	L_{A90} (dB)	L_{A10} (dB)	Comment
MP1	23/03/22	1030–1045	46	38	50	Distant road traffic and birdsong, no significant noise from Manor Farm
MP1	23/03/22	1045–1100	48	39	51	
MP1	23/03/22	1100–1115	44	37	58	
MP1	23/03/22	1200–1215	47	40	49	
MP1	23/03/22	1215–1230	46	40	49	
MP1	23/03/22	1230–1245	43	38	45	
MP1	23/03/22	1245–1300	43	39	46	
MP1	23/03/22	1300–1313	42	38	42	
MP1	23/03/22	2330–2345	36	27	40	Distant road traffic and vegetation noise, no significant noise from Manor Farm
MP1	23/03/22	2345–0000	40	34	44	
MP1	24/03/22	0000–0015	36	31	39	
MP1	24/03/22	0015–0030	37	30	40	
MP1	24/03/22	0030–0045	35	27	39	
MP1	24/03/22	0045–0100	34	28	37	
Daytime and night time ambient noise levels ≤ 48 dB $L_{Aeq, T}$ and ≤ 40 dB $L_{Aeq, T}$ respectively						
Maximum noise levels ≤ 54 dB L_{AFMax} during the night time						
MP2	23/03/22	1006–1022	50	36	48	Distant road traffic, sporadic vehicle passes on Main Street, birdsong, no significant noise from Manor Farm
MP2	23/03/22	1137–1157	47	37	48	
MP2	23/03/22	1402–1420	49	38	49	
Daytime ambient noise levels ≤ 50 dB $L_{Aeq, T}$						

3.05 Noise levels across the site were characterised by road traffic on Main Street, Station Road and the wider surrounding road network, and occasional birdsong. Some limited farm activity was noted on land at least 110 metres to the west of the application site however it was not significant or measurable.

3.06 Daytime and night-time ambient noise levels throughout the application site were measured at ≤ 50 dB $L_{Aeq, T}$ and ≤ 40 dB $L_{Aeq, T}$ respectively. Such levels are considered to be very low.

4.00 NATIONAL PLANNING POLICY FRAMEWORK PLANNING PRACTICE GUIDELINES ON NOISE AND OTHER RELEVANT GUIDANCE

National Planning Policy Framework

4.01 The National Planning Policy Framework (NPPF) was updated in July 2021 and sets out the Government's planning policies for England and how these are expected to be applied.

4.02 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'.

4.03 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'.

4.04 With regard to extant community noise sources and the potential to affect proposed new developments, paragraph 187 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.'

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

Noise Policy Statement for England

4.06 The Noise Policy Statement for England (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.

4.07 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.

Planning Practice Guidance – Noise

4.08 Planning Practice Guidance (PPG) is an online resource (last updated 2019) 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.

4.09 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’.

4.10 The PPG also provides general advice on the typical options available for mitigating noise. It goes on to suggest 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’.

ProPG Planning and Noise: New Residential Development

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

4.12 Stage 1 of ProPG comprises an initial site noise risk assessment which correlates external noise levels at the site with the risk of an adverse impact. For reference, Figure 1 of ProPG indicates that daytime noise levels of ≤ 55 dB L_{Aeq} (0700-2300) are assessed as between a **low risk** and a **negligible risk** in terms of adverse impacts.

4.13 In relation to determining the dominance of noise from farm activities to the west of the site, Paragraph 2.15 of ProPG states: *‘In low risk cases a subjective judgement of dominance, based on audibility, would normally be sufficient’.* As noise levels at MP1 were < 55 dB $L_{Aeq, T}$ (low risk), a subjective judgement of dominance is adequate for farm noise at the application site.

4.14 With cognisance to this, noise associated with Manor Farm was considered to be wholly negligible at the application site boundary.

4.15 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 below).

Table 4.1 – 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)

- 4.16 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.’
- 4.17 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.’
- 4.18 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’.*
- 4.19 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
- 4.20 With respect to external amenity, ProPG reflects the advice contained in BS 8233, as follows:

For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited.’

5.00 SOUND ATTENUATION SCHEME PROPOSALS

- 5.01 Daytime and night-time ambient noise levels throughout the application site were measured at ≤ 50 dB $L_{Aeq, T}$ and ≤ 40 dB $L_{Aeq, T}$ respectively. Maximum noise levels during the night-time were ≤ 54 dB L_{AFMax} .
- 5.02 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.
- 5.03 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."*
- 5.04 The resultant internal noise levels are set out in the table below.

Table 5.1 – External Noise Levels and Resultant Internal

External Noise Level	Reduction	Resultant Internal Level	Comment
≤ 50 dB L_{Aeq} (daytime) ≤ 40 dB L_{Aeq} (night) ≤ 54 dB L_{AFMax} (night)	-27 dB (closed windows)	≤ 23 dB L_{Aeq} (daytime) ≤ 13 dB L_{Aeq} (night) ≤ 27 dB L_{AFMax} (night)	Very good internal noise levels with closed windows
	-15 dB (open windows)	≤ 35 dB L_{Aeq} (daytime) ≤ 25 dB L_{Aeq} (night) ≤ 39 dB L_{AFMax} (night)	Good internal noise levels with open windows

- 5.05 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.
- 5.06 Daytime ambient noise levels throughout the application site were measured at ≤ 50 dB $L_{Aeq, T}$. Such levels do not exceed the desirable garden level described in BS 8233 and there is therefore no issue with respect to external amenity.

6.00 CONCLUSIONS

- 6.01 A noise impact assessment has been undertaken for the proposed residential development at land to the south of Main Street, Sturton.
- 6.02 The ambient noise climate at the application site is characterised by distant road traffic on the surrounding road network, and birdsong.
- 6.03 Ambient noise levels throughout the application site are relatively low. As a consequence, standard double glazing and standard trickle vents are appropriate throughout the development.

I trust the foregoing is sufficient for your needs. Should you have any queries regarding the above, please do not hesitate to contact me.

Yours sincerely

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Appendix 1 Glossary of Acoustic Terms

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:

$$L_p = 20 \log_{10}(p/p_0)$$

Where L_p = sound pressure level in dB; p = rms sound pressure in Pa; and p_0 = reference sound pressure (20 μPa).

A-weighting Network

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.

Sound Exposure Level (SEL or L_{AE})

The energy produced by a discrete noise event averaged over one second, no matter how long the event actually took. 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
Drawings (Site Location Plan / Noise Monitoring Positions)

