



Acoustic Survey and Assessment for Proposed conversion of farm buildings at Ripon Hall Farm, Catterall Lane, Catterall, Preston, PR3 0PA.

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February 2022



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1. Introduction

- 1.1. Martin Environmental Solutions has been commissioned to undertake an acoustic survey and assessment to support a planning application to convert an existing cattle shed to industry use (B2) at Ripon Hall Farm, Catterall Lane, Catterall.

Site Location and Context

- 1.2. The development site is situated at Ripon Hall Farm. The rest of the building to which the development forms part of has previously been converted to industrial units. Farming activities continue in the buildings to the east and west of the site. Open farm land surrounds the site to the east, north and east, with the A6 running to the west approx. 140m away. To the south of the site is the Franklaw water treatment works together with a number of residential properties. The nearest one being 80m from the site.
- 1.3. An aerial Photograph is enclosed in Figure 1.
- 1.4. Concern has been raised over the potential impact of the proposed unit on the nearby residential properties.



2. Policy and Guidance

- 2.1. The impact of noise can be a material consideration in the determination of planning applications. The planning system has the task of guiding development to the most appropriate locations. It is recognised that on occasions it will be difficult to reconcile some land uses, such as housing, hospitals, or schools, with other activities that generate high levels of noise. However, the planning system is tasked to ensure that, wherever practicable, noise-sensitive developments are separated from major sources of noise (such as road, rail and air transport and certain types of industrial development).
- 2.2. The Government's publication of the National Planning Policy Framework (NPPF), updated in July 2021, states that planning policies and decisions should prevent new and existing development from contributing to or being put at unacceptable risk from, of being adversely affected by unacceptable levels of noise pollution.
- 2.3. The Government have also issued the Noise Policy Statement for England (NPSE). The NPSE clarifies the Government's underlying principles and aims in relation to noise and sets a vision to promote good health and a good quality of life through the effective management of noise while having regard to the Government's sustainable development strategy. The NPSE aims to mitigate and minimise adverse impacts on health and quality of life through the effective management and control of noise.
- 2.4. The NPSE introduces the following terms, although no sound levels are given to represent these, many authorities have identified the sound level criteria in line with the World Health Organisation, BS8233:2014 and BS4142: 2014 levels. The terms introduced by the NPSE are:
- NOEL – No Observed Effect Level (<30dB(A) inside <50dB(A) outside, 10dB below background)
 - LOAEL – Lowest Observed Adverse Effect Level (30-35dB(A) inside 50-55dB(A) outside, background to +5dB)
 - SOAEL – Significant Observed Adverse Effect Level (>35dB(A) inside, >55dB(A) outside, >+10dB above background)
- 2.5. The sound levels within the brackets of the previous paragraph are those determined as appropriate levels to indicate the relevant effect levels represented by the NPSE.



- 2.6. Other commonly used examples of standards utilised by Local Planning authorities for the consideration of noise impacts include comparison of the likely noise levels to be experienced at a development, with levels that have been recommended by the World Health Organisation (WHO) as Guidelines for the prevention of Community Noise Annoyance and within BS8233: 2014.
- 2.7. The WHO recommended noise levels for outdoor amenity areas (gardens) that should not be exceeded are 55dB(A) $L_{Aeq,16hr}$ in order to avoid 'Serious Community Annoyance' or 50dB(A) $L_{Aeq,16hr}$ to avoid 'Moderate Community Annoyance' during the day. For indoor levels WHO set 35dB(A) $L_{Aeq,16hr}$ during the day to prevent Moderate Annoyance and 30 dB(A) $L_{Aeq,8hr}$ at night to prevent sleep disturbance.
- 2.8. The WHO guidance also recommends that maximum sound levels at night should not regularly exceed 45dB(A) within bedrooms to prevent sleep disturbance. Regularly is considered to be more than 10 times during any 8-hour night-time period.
- 2.9. BS 8233:2014 'Guidance on sound insulation and noise reduction for buildings' also specifies desirable noise levels to be achieved inside dwellings.
- 2.10. BS 8233:2014 'Sound insulation and noise reduction for buildings – Code of Practice' also specifies desirable noise levels to be achieved inside dwellings. BS 8233 presents two levels, the first between the hours of 07:00 – 23:00 and the second between 23:00 -07:00.
- 2.11. The daytime period suggests internal noise levels of 35dB $L_{Aeq,16hr}$, for resting in living rooms and bedrooms while for night-time a level of 30dB $L_{Aeq,8hr}$ is recommended. Criteria for external areas mirrors that within the WHO guidance.
- 2.12. Another commonly used standard is British Standard 4142:2014 'Method for rating industrial and commercial sound' compares the sound predicted by the source in question against the background, L_{A90} sound levels.
- 2.13. The "residual" L_{Aeq} measurement is then subtracted from the "ambient" L_{Aeq} measurement (with the sound source) to calculate the sound level created by the "problem" sound alone -termed the "specific" sound level.



- 2.14. If the "problem" sound is tonal, such as whine or hum, or if it is impulsive such as bangs or clatters or if it is irregular enough to attract attention a correction is added to the "specific level" to produce the "rating level". The "background" L_{A90} measurement is then compared against the "rating level".
- 2.15. If the "rating level" exceeds the "background" by around 10dB(A) or more this "indicates a significant adverse impact". A difference of around 5dB(A) 'indicates an adverse impact. The lower the commercial noise level is, the lower the likely impact. In addition, the published 'ProPG Planning & Noise, Professional Practice Guidance on Planning & Noise, New Residential Development' provides a 4-staged approach to undertaking a risk assessment in relation to anticipated sound levels at new residential development and the provision of mitigation measures. The guidance is principally aimed at sites exposed predominantly to noise from transportation sources.
- 2.16. In addition, the 'ProPG Planning & Noise, Professional Practice Guidance on Planning & Noise, New Residential Development' provides a 4-staged approach to undertaking a risk assessment in relation to anticipated sound levels at new residential development and the provision of mitigation measures. The guidance is principally aimed at sites exposed predominantly to noise from transportation sources.
- 2.17. The first stage consists of an initial noise risk assessment, based on indicative day and night-time *noise* levels. Simply put, the higher the ambient noise in an area the greater the impact. The levels given are shown below although it should be noted that these are in excess of both the Lancashire guidance, WHO and BS 8233: 2014.



Noise Risk Category*	Potential Effect if Unmitigated	Pre-Planning Application Guidance
0 – Negligible $L_{Aeq,16hr} < 50dB$ $L_{Aeq,8hr} < 40dB$	May be noticeable but no adverse effect on health and quality of life	In this category the development is likely to be acceptable from a noise perspective, nevertheless a good acoustic design process is encouraged to improve the existing environment and/or safeguard against possible future deterioration and to protect any designated tranquil areas. A noise assessment may be requested to demonstrate no adverse impact from noise. Application need not normally be delayed on noise grounds.
1 – Low $L_{Aeq,16hr} 50-63dB$ $L_{Aeq,8hr} 40-55dB$	Adverse effect on health and quality of life	In this category the development may be refused unless a good acoustic design process is followed and is demonstrated via a Level 1 Acoustic Design Statement which confirms how the adverse impacts of noise on the new development will be mitigated and minimised and that a significant adverse impact will not arise in the finished development. Planning conditions and other measures to control noise may be required.
2 – Medium $L_{Aeq,16hr} 63-69dB$ $L_{Aeq,8hr} 55-60dB$ $L_{AFmax} > 80dB^{**}$	Significant adverse effect on health and quality of life	In this category the development is likely to be refused unless good acoustic design process is followed and is demonstrated via a Level 2 Acoustic Design Statement which confirms how the adverse impacts of noise on the new development will be mitigated and minimised, and clearly demonstrates that a significant adverse noise impact will not arise in the finished development. Planning conditions and other measures to control noise will normally be required.
3 – High $L_{Aeq,16hr} > 69dB$ $L_{Aeq,8hr} > 60dB$ $L_{AFmax} > 80dB^{**}$	Unacceptable adverse effect of health and quality of life	In this category the development is very likely to be refused on noise grounds, even if a good acoustic design process is followed and is demonstrated via a Level 2 Acoustic Design Statement. Applicants are advised to seek expert advice on possible mitigation measures. Advice on the circumstances when the refusal of a new housing on noise grounds should normally be anticipated is included in the ProPG.

2.18. Stage 2, consists of a full assessment of the prevailing ambient noise and requires 4 elements to be considered:

- I. Element 1 – Good Acoustic Design
- II. Element 2 – Internal Noise Level Guidelines
- III. Element 3 – External Amenity Area Noise Assessment
- IV. Element 4 – Assessment of Other Relevant Issues

2.19. A good acoustic design is implicit in meeting the requirements of the NPPF and can help to resolve many potential acoustic issues.

2.20. Details of the criteria considered suitable are provided above for both internal and external sound levels. Element 4 includes such issues as local and national policy, likely occupants, wider planning objectives.



3. The Assessment

Identification of nearby Noise Sensitive Receptors.

3.1 The nearest noise sensitive receptors have been identified as the residential properties south of the site adjacent to the water treatment works. These are located 80m away from the site to the boundary and 87m to the facade of the house.

The Proposed Development

3.2 The proposed development will consist of an extension to the adjacent business. The new unit will be utilised for storage purposes, allowing some of the externally stored material to be kept inside, protecting it from adverse weather.

3.3 There will be no equipment within the proposed development and the only sources of noise will be the existing forklift truck on site, which will occasionally be used to move stock into and out of the development into the existing business or from a delivery truck. This is currently occurring outside in the adjacent yard area and will therefore be moved further away from nearby residential properties. Deliveries will continue to be made to the existing site, where the forklift will be used to transfer goods to the development as required.

3.4 As such there will be no additional delivery noise associated with the development.

3.5 In addition, the site will be fitted with a roller shutter door, which will be opened once at the start of the day as required and closed at the end of the day. This will not generate a significant amount of the noise and the operation of the door will last for less than a minute.

3.6 The forklift on site has been identified as a Toyota Tonero 25 unit with a sound level of 79dB(A) at the drivers ear. Over the minimal distance boundary to boundary of the site and the nearby residential property of 50m the sound level at the property will be 45dB(A).

3.7 In addition, the forklift is used infrequently throughout the day and for less than 10minutes an hour. This would equate to an hourly sound level of 37dB $L_{Aeq,1hr}$ at the residential property.



- 3.8 In line with BS4241:2014 a correction factor of 3dB for intermittency can be applied to this figure producing a rating level of 40dB(A). this is still some 3.8dB(A) below the lowest identified daytime background sound level during the working day.
- 3.9 While no machinery or noise generating activities are to be undertaken inside the development, it is, as part of the conversion, going to be have the structure altered slightly. The barn is currently open to the southern elevation and this elevation is to be enclosed creating the building. A composite structural metal cladding system is to be used.
- 3.10 This has a standard sound reduction of around 40dB R_w ¹ based on a 19/1000 liner, 120mm rockwool and 32/1000 outer. In contrast a single skin construction will provide a reduction of 24dB R_w ².
- 3.11 A standard roller shutter door will provide a reduction of around 20dB R_w .
- 3.12 Therefore, should operations change in the future and the building be used for other activities, an assessment of the impact can be made. Taking an internal sound level of 85dB(A) equivalent to the upper value with in the Control of Noise at Work Regulations 2005, and using the roller shutter door attenuation as a worse case, 20dB R_w , over the distance attenuation the sound level at the neighbour receptors will be 21dB(A).

$$SPL_{ext@1m} = SPR_{int} - attenuation (R_w) - 6$$

$$SPL_{ext@1m} = 85 - 20 - 6$$

$$SPL_{ext@1m} = 59dB$$

$$Dist att = 20 \log \left(\frac{r}{R} \right)$$

$$Dist att = 20 \log \left(\frac{1}{80} \right)$$

$$Dist att = 20 \log(-38.1)$$

$$SPL_{rep} = 59 - 38.1$$

$$SPL_{rep} = 20.9dB(A)$$

¹ <https://www.coverworld.co.uk/wp-content/uploads/2015/09/Coverworld-UK-Ltd-Acoustic-Performance-Built-Up-Standard.pdf>

² <https://www.coverworld.co.uk/acoustic-performance/single-skin/>



- 3.13 Monitoring on site has identified typical daytime background sound level during a standard 07:00-19:00 working day to range from 43.8-50.4 L_{A90}.
- 3.14 Any future activities from within the building therefore will not result in a significant impact on the nearby residential properties. Even with correction factors being applied in line with BS4142:2014 the rating level at the receptor gardens will be significantly below the prevailing background sound level and the recommended levels within BS8233:2014 and from the World Health Organisation.



4 Conclusion

- 4.1 A consideration of the proposed activities has been undertaken and the impact of these on the nearby residential receptors undertaken. This has been compared to the existing background sound levels as measured on site.
- 4.2 The results of this assessment have identified that operations will not have any adverse impact on the residential properties with sound levels being below both the prevailing background sound level on site and those recommended values within BS8233:2014 and from the World Health Organisation.
- 4.3 The development will therefore result in a No Observe Effect on the future residents in line with the Noise Policy Statement for England.
- 4.4 As such the development will meet the objectives of the National Planning Policy Framework in ensuring that no significant adverse impact is experienced by the future residents. The development is therefore considered to be acceptable in terms of noise.



Figure 1 - Aerial Photograph





Appendix A – Full Monitoring Results

Time	L _{Aeq} (dB)	L _{AMax} (dB)	L _{A90} (dB)
25/11/2021 11:00	54.6	77.0	46.8
25/11/2021 12:00	54.8	82.3	46.2
25/11/2021 13:00	55.6	77.8	46.6
25/11/2021 14:00	55.4	76.3	47.9
25/11/2021 15:00	55.8	74.8	47.7
25/11/2021 16:00	53.4	76.7	46.3
25/11/2021 17:00	53.1	76.6	47.0
25/11/2021 18:00	51.7	74.6	43.8
25/11/2021 19:00	50.6	74.1	41.5
25/11/2021 20:00	47.4	75.6	39.2
25/11/2021 21:00	45.1	67.3	38.8
25/11/2021 22:00	45.2	69.1	36.1
25/11/2021 23:00	45.9	71.8	38.0
26/11/2021 00:00	47.6	66.0	41.2
26/11/2021 01:00	52.2	68.9	44.5
26/11/2021 02:00	53.4	71.1	46.5
26/11/2021 03:00	54.2	72.0	45.1
26/11/2021 04:00	56.5	73.3	48.8
26/11/2021 05:00	70.6	114.2	52.3
26/11/2021 06:00	58.3	76.0	51.1
26/11/2021 07:00	55.4	74.9	49.6
26/11/2021 08:00	55.2	73.9	50.0
26/11/2021 09:00	55.2	74.1	50.4
26/11/2021 10:00	54.7	73.8	49.4
26/11/2021 11:00	54.8	78.6	47.0