



Acoustic Assessment for a proposed Residential Development at, Dean Farm, Pudding Pie Nook Lane, Preston, PR3 2JL.

Prepared for:

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Updated Report

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1. Introduction

- 1.1. This report provides an update to the original report produced by Martin Environmental Solutions, ref 1872-1, dated January 2020. The original report provided an assessment of the likely sound levels to be experienced by the proposed development on land at Dean Farm, Pudding Pie Nook Lane, Preston, PR3 2JL.
- 1.2. Following the completion of that report it has now been possible to undertake onsite monitoring of the background sound level to provide a more robust and accurate assessment of the surrounding sound environment on the proposed dwellings.
- 1.3. This report therefore considers this monitoring and the impact on the development.

Site Location and Context

- 1.2. The site currently consists of farm land, a paddock, small stable building, a pond and woodland. It covers an area of approx. 0.98ha. To the northwest is Dean Farm house and beyond the busy Whittingham Lane, the property 58 Common Edge Road to the north of the larger site, Pudding Pie Nook Lane runs to the west of the site. the surrounding lane is primarily agricultural in nature. To the south of the site a new industrial building is currently being erected.
- 1.4. An aerial Photograph is enclosed in Figure 1.



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 February 2019, 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 including those within Lancashire 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 by Lancashire authorities as appropriate levels to indicate the relevant effect levels represented by the NPSE. These levels are detailed with in the Lancashire Planning



Guidance document on noise which is in the process of being finalised and is currently used by a number of Lancashire authorities.

- 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, LA90 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" LA_{90} 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

- 3.1 As part of the application for the distribution unit to the southeast of the site, Application 06/2018/0700 at Oak Nurseries, an acoustic report was submitted along with the planning application, ref R1002-REP01-PB, produced by Red Acoustics. This report identified background sound levels in the area and anticipated levels from the use of the distribution centre once complete and operational.
- 3.2 The report identified 5min sound levels in the area ranging from 53-65dB L_{Aeq} during the day and 39-61dB L_{Aeq} at night with background sound levels of 50-64dB L_{A90} during the day and 40-62dB L_{A90} at night. Having visited the area it can be confirmed that the dominant sound source is the nearby M6 motorway.
- 3.3 Sound levels from the building were assessed based on an internal level of 85dB(A) and a minimum attenuation from the building of 25dB R_w from the Kingspan KS1000 RW profile cladding. The nearest proposed property is located 60m from the building to the garden and 79m to the house. Based on standard calculations this would result in sound levels of 18.4dB(A) in the garden and 16dB(A) at the house.
- 3.4 The report also included a 6dB penalty in line with BS4142:2014, following this approach the resulting sound levels from the activities inside the building will be 24.4dB(A) in the garden and 22.0dB(A) at the façade of the house.
- 3.5 Passing traffic associated with the distribution unit includes 55 light goods vehicles. Sound levels being provided within the report. The report calculates a level of 44.4dB(A) daytime and 45.4dB(A) night-time at 148 Whittingham Lane, the property located on the corner of the Pudding Pie Nook Lane. This property is located 12m from the road. The nearest of the proposed dwellings is 15m from the access road. Thus the levels to be experienced will be below this at 42.4 & 43.4dB(A) respectfully.
- 3.6 Based on the above information it is clear that the prevailing worse-case ambient sound levels of 65dB(A) during the day and 61dB(A) at night will be the dominate sound in the area. It must be understood that these levels reflect 5-minute average measurements over the period and when converted into the guidance time periods of 16hrs day and 8hrs night the levels will be reduced.
- 3.7 On site monitoring was undertaken over the 5th to 7th February 2020 by Martin Environmental Solutions. Due to a power shortage some data was missing on the 6th,



however a 24-hour period has been assessed. The full results are available in Appendix 1, with a summary in the table below.

3.8 The sound level meter was placed along the southern boundary of the site to the edge of the existing paddock, at a height of 1.3m. the meter was field calibrated before and after the measurements and no significant deviation was noted. Calibration certificates are available on request.

3.9 The summary of the monitoring results

Start Time	End Time	Duration	L _{Aeq}	L _{A90}	L _{AMax}
05/02/2020 08:11	05/02/2020 23:00	14:48:13	56.3	52.0	81.8
06/02/2020 07:00	06/02/2020 23:00	04:59:09	54.0	50.0	71.8
06/02/2020 23:00	07/02/2020 07:00	08:00:00	51.3	47.2	69.6
07/02/2020 07:00	07/02/2020 17:00	10:00:01	56.2	53.8	67.1

3.10 The background sound environment was dominated by the distant motorway traffic and the above results identify the daytime some level to be above the recommended external sound level of 50dB L_{Aeq,16hr} at 56.3dB(A), with night-time levels at 51.3dB(A). the maximum sound level at night, regularly exceeded has been identified as 61.6dB L_{Amax}.

3.11 An open window only provides 15dB attenuation¹ and therefore the internal sound levels will be 41.3dB L_{Aeq,16hr} during the day, 36.3dB L_{Aeq,8hr} at night, with a regularly exceeded maximum of 46.6dB L_{Amax}. These levels are above the recommended guidance levels and as such further mitigation measures are required to ensure a suitable internal sound level in all habitable rooms to the property.

3.12 A standard 6/12/6 double glazing unit will provide a sound reduction, R_w(C;C_{tr}), of 33(-1;-3). Thus, for this project a reduction of 30dB when closed. This would be adequate to the protect the properties during the day and night from the average sound levels and ensure a maximum night-time level of 45dB(A) is nit regularly exceeded.

3.13 In order to be able to keep windows closed additional ventilation provision must be made for the property. As such it is recommended that a ventilation system is used incorporating acoustic trickle ventilators for all windows to habitable rooms to the

¹ BS8233: 2014; Guidance on sound insulation and noise reduction for buildings



proposed properties. The ventilators must achieve a similar or better performance to the windows when open and a number of suitable models are available from suppliers including the Greenwood DN Vent providing 34dB (C_{tr}) attenuation or the Titon, Trimvent Select S13 Ventilator providing 33dB (C_{tr}) attenuation. Other models and manufacturers are available.

- 3.14 For the external area BS8233:2014 and the World Health Organisation recommend a lower level of 50dB $L_{Aeq,16hr}$, with an upper level of 55dB $L_{Aeq,16hr}$. However, BS8233:2014 identifies that it is not always possible to obtain the levels and, in such situations, development should be designed to achieve the lowest practicable levels in external amenity areas.
- 3.15 The above information identifies that the current external sound levels exceed these recommendations and therefore additional measures are required. Based on the dominant noise source being the motorway meet the upper limit of these guidelines, a 2m high close boarded acoustic fence around each rear garden amenity area will reduce the sound level by 10-15dB achieving the required external sound levels.



4 Conclusion

- 4.1 Previous monitoring undertaken for the adjacent development has identified the background sound levels in the area. The report also identified the expected levels from the adjacent development once operational. These have been used to assess the impact on the proposed dwellings.
- 4.2 As a result, mitigation measures in the form of enhanced glazing specifications, trickle ventilation have been identified to protect the internal environment of the properties together with a 2m high close boarded fence around the rear garden amenity areas.
- 4.3 The above mitigation measures will ensure that the recommended sound levels given in the guidance discussed in section 2 of the report will be achieved and the internal sound levels will have no observed effect in line with the Noise Policy Statement for England.
- 4.4 Overall the development with the identified mitigation measures will achieve the requirements of the National Planning Policy Framework by ensuring no significant adverse effect is to be experienced by future residents. The development is therefore in terms of sound acceptable.



Figure 1 - Aerial Photograph



Figure 2 – Proposed Layout





Appendix 1 – Full Monitoring Results

Time	Duration	L _{Aeq} (dB)	L _{AMax} (dB)	L _{A90} (dB)
05/02/2020 08:11	00:48:14	60.6	81.8	59.3
05/02/2020 09:00	01:00:00	59.7	63.7	58.4
05/02/2020 10:00	01:00:00	52.7	71.3	48.9
05/02/2020 11:00	01:00:00	52.1	67.0	49.6
05/02/2020 12:00	01:00:00	54.7	71.2	52.9
05/02/2020 13:00	01:00:00	54.8	68.3	52.9
05/02/2020 14:00	01:00:00	55.3	71.5	53.4
05/02/2020 15:00	01:00:00	54.5	66.9	53.5
05/02/2020 16:00	01:00:00	55.8	68.4	53.8
05/02/2020 17:00	01:00:00	56.6	60.7	55.7
05/02/2020 18:00	01:00:00	58.5	62.9	57.0
05/02/2020 19:00	01:00:00	56.6	63.0	54.1
05/02/2020 20:00	01:00:00	55.2	60.1	53.7
05/02/2020 21:00	01:00:00	55.1	61.7	53.3
05/02/2020 22:00	01:00:00	54.0	59.1	51.9
06/02/2020 18:00	00:59:10	56.3	71.8	54.5
06/02/2020 19:00	01:00:00	55.1	60.0	53.8
06/02/2020 20:00	01:00:00	53.4	60.9	51.4
06/02/2020 21:00	01:00:00	52.3	59.5	50.2
06/02/2020 22:00	01:00:00	50.7	58.1	48.1
06/02/2020 23:00	01:00:00	50.0	60.4	47.8
07/02/2020 00:00	01:00:00	50.7	66.5	47.1
07/02/2020 01:00	01:00:00	49.3	61.3	46.3
07/02/2020 02:00	01:00:00	49.3	57.1	46.3
07/02/2020 03:00	01:00:00	49.4	57.6	46.6
07/02/2020 04:00	01:00:00	49.9	59.4	47.0
07/02/2020 05:00	01:00:00	52.5	58.9	50.4
07/02/2020 06:00	01:00:00	55.3	69.6	53.1
07/02/2020 07:00	01:00:00	57.4	66.5	56.3
07/02/2020 08:00	01:00:00	57.1	63.5	55.9
07/02/2020 09:00	01:00:00	55.8	59.6	54.3
07/02/2020 10:00	01:00:00	54.5	65.9	53.1
07/02/2020 11:00	01:00:00	54.3	63.2	53.0
07/02/2020 12:00	01:00:00	54.7	62.8	53.6
07/02/2020 13:00	01:00:00	55.2	63.3	53.5
07/02/2020 14:00	01:00:00	56.5	65.1	54.7
07/02/2020 15:00	01:00:00	57.2	67.1	55.8
07/02/2020 16:00	01:00:00	57.3	64.8	56.1