
Residential Development
Lydiate Farm, Briargrove Road

Noise Assessment Report



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Authorised by	Ryan Swales, BSc, MIOA Director & Principal Consultant
Signature	

This report has been prepared for the exclusive use of Mark Davis for the purpose described herein. The findings are based on site observations, measurements and information available at the time of the survey. Noise levels may vary due to changes in environmental conditions, operational activities and other external influences.

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RS Acoustic Engineering Ltd
76 Marple Road
Stockport
SK2 5QH
Web: www.rsacoustic.co.uk
Email: info@rs-acoustic.co.uk

A company registered in England & Wales (No.07604309)
Corporate Member of the Institute of Acoustics (MIOA No.43109)

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1. Introduction

- 1.1 RS Acoustic Engineering Ltd has been appointed by Mark Davis to undertake a noise assessment with regard to a new residential property at Lydiate Farm, Briargrove Road, Birch Vale, SK22.
- 1.2 The former agricultural barn has undergone a material change of use to create a single detached self-contained dwelling.
- 1.3 A Lawful Development Certificate has been recently granted by the Local Authority confirming that the building project and use of land is lawful for planning purposes.
- 1.4 A noise assessment has been undertaken taking into consideration the guidance contained in British Standard (BS) 8233:2014 *Guidance on sound insulation and noise reduction for buildings* and also the guidance contained in the Professional Practice Guidance document (ProPG) *Planning & Noise*.
- 1.5 An environmental noise survey has been conducted to establish the existing ambient noise levels impacting on the property during the daytime, evening and night-time period.
- 1.6 The property is located within a quiet rural setting and therefore experiences relatively low ambient sound levels. The prevailing acoustic environment is subjectively desirable and mostly consists of birdsong and running water associated with the adjacent stream.
- 1.7 The measured sound level data has been used to determine the resulting internal ambient sound levels with windows open and closed.
- 1.8 The composite sound insulation of the building envelope has been determined taking into consideration the building elements (roof, masonry and glass), acoustic performance and building dimensions.
- 1.9 The survey and assessment were conducted by Mr Ryan Swales (BSc(Hons), MIOA), Principal Acoustic Consultant and Member of the Institute of Acoustics.
- 1.10 The results of the noise survey have been presented, along with the assessment criteria and a discussion of the results with respect to the appropriate guidance and targets.

2. Assessment Guidance & Acoustic Criteria

British Standard 8233:2014: Guidance on sound insulation and noise reduction for buildings

- 2.1 BS 8233 provides guidance regarding acoustic criteria and noise levels appropriate for various types of space that have different functions.
- 2.2 With regard to dwellings, appropriate internal ambient sound levels are given in Table 2.1 for bedrooms, living rooms and dining rooms. The guidelines take into consideration the effect of internal noise on sleep and also the effect of noise on resting, listening and communicating.

Table 2.1 - 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}

- 2.3 Note 7 of the standard states the following:
- Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved.*
- 2.4 Note 5 also states:
- If relying on closed windows to meet the guide values, there needs to be appropriate alternative ventilation that does not compromise the facade insulation or the resulting noise level. If applicable, any room should have adequate ventilation (e.g. trickle ventilators should be open) during assessment.*

Professional Practice Guidance on Planning & Noise (2017)

- 2.5 Professional Practice Guidance on Planning and Noise (ProPG) has been produced in order to provide practitioners with guidance on a recommended approach to the management of noise within the planning system in England.
- 2.6 The NPPF encourages improved standards of design. This guidance document encourages better acoustic design for new residential development and aims to protect people from the harmful effects of noise.
- 2.7 The scope of ProPG is restricted to the consideration of new residential development that will be exposed predominantly to airborne noise from transportation sources.

Internal noise level guidelines

- 2.8 The recommended ProPG internal noise level guidelines are presented in Table 2.2. The guidelines reflect and extend current practice contained within BS 8233:2014.

Table 2.2 - ProPG internal noise level guidelines

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 $L_{Aeq,8hour}$ 45 dB $L_{Amax,F}$

- 2.9 Where the local planning authority accepts that there is a justification that the internal target noise levels can only be practically achieved with windows closed, which may be the case in urban areas and at sites adjacent to transportation noise sources, special care must be taken to design the accommodation so that it provides good standards of acoustics, ventilation and thermal comfort without unduly compromising other aspects of the living environment.

World Health Organisation: Guidelines for community noise (1999)

- 2.10 To help avoid sleep disturbance within bedrooms, this historical guidance document recommends that the night-time internal ambient sound level should not exceed 30 dB $L_{Aeq,T}$ and the maximum sound level should not typically exceed 45 dB $L_{AFmax,T}$.
- 2.11 The corresponding values directly outside of open bedroom windows are therefore 45 dB $L_{Aeq,8hour}$ and 60 dB $L_{AFmax,T}$. This is based on the assumption that a partially open window provides approximately 15 dB of sound attenuation (from external noise).
- 2.12 With regard to sleep disturbance and maximum L_{AFmax} sound levels, the study undertaken by Vallet & Vernet (1991) suggests that for good sleep, indoor sound pressure levels should not exceed approximately 45 dB L_{Amax} more than 10-15 times per night.

3. Environmental Noise Survey

Survey methodology

- 3.1 Continuous sound level monitoring was conducted over a 68-hour period to determine the existing ambient sound pressure levels during the daytime and night-time period.
- 3.2 The measurement microphone was tripod mounted and installed on the balcony of the northeast facing elevation.
- 3.3 Measurements were conducted from 15:00 hours on Saturday 09 through to 11:00 hours on Tuesday 12 May 2026.
- 3.4 Measurements were subject to reflections from the building façade (as opposed to free-field) and both octave band and A-weighted broadband sound pressure levels were recorded during the survey.
- 3.5 The property location and survey measurement position are shown in Figure 3.1 and Figure 3.2 overleaf. The floor plans and elevations are shown in Appendix A.

Figure 3.1 - Site location and survey measurement position (source: Google Earth)



Figure 3.2 - Photographs showing survey measurement position



Survey equipment

- 3.6 The survey was conducted using the following Class-1 specification equipment:
- Brüel & Kjaer 2250 sound level meter, microphone type 4189, pre-amplifier type ZC0032.
 - Larson Davis CAL200 Acoustic calibrator.
- 3.7 Calibration of the sound level meter and microphone used for the measurements is traceable to UKAS accredited laboratories.
- 3.8 The calibration of both sound level meter and microphone was checked using a 1 kHz tone at 94 dB prior to and following the measurements performed. Calibration drift was less than 0.1 dB.

Weather conditions

- 3.9 The weather conditions during the survey were generally dry and fine with sunny intervals and intermittent light cloud cover. There were intermittent light showers on Friday afternoon.
- 3.10 There was an occasional light breeze and wind speed measurements taken outside of the property were between 0.1 and 1.0 m/s⁻¹.
- 3.11 The air temperature during the survey ranged between 2°C and 11°C. The overall weather conditions were suitable to obtain representative measurements.

Observations and comments regarding the acoustic environment

- 3.12 The property is located within a quiet rural setting and therefore experiences relatively low ambient sound levels. The prevailing acoustic environment is subjectively desirable and mostly consists of birdsong and running water.
- 3.13 There are infrequent vehicle movements on Briargrove Road which are audible at the property, however the noise level is negligible and is partially masked by the sound from the adjacent stream.
- 3.14 There is a small woodland/forest school approximately 70 to 80 metres southeast from the balcony of the property (Being Outdoors CIC). It is understood that the school accommodates small groups of children several times per week and runs outdoor classes/activities such as woodland crafts, forest art, campfire cooking and shelter building. Several site visits were conducted to observe the activities of the school, however there were no visible or audible activities during the visits. It is understood that there were children at the school on the Monday morning of the survey (circa 10:00 – 11:00 hours), however there was a negligible change in the measured ambient sound level during this period.

- 3.15 There was no audible industrial or commercial related noise at the property (e.g. due to machinery, equipment or building services plant).
- 3.16 Other noted sound sources include high-altitude aircraft, sporadic domestic activity and car movements at the neighbouring dwelling.

Measured noise indices

- 3.17 Although a wide range of statistical sound level data was recorded during the survey, the L_{Aeq} and L_{AFmax} indices are of most interest for this assessment:
- $L_{Aeq,T}$ - The A-weighted equivalent continuous sound pressure level over a period of time, T. Representative of the average sound pressure level over a given period and commonly used to describe the 'ambient' sound level.
 - $L_{AFmax,T}$ - The A-weighted 'maximum' sound pressure level that occurred during a given period, T. Commonly used for the assessment of instantaneous and transient loud noises.
- 3.18 Sound pressure level measurements are taken with an A-weighting (denoted by a subscript 'A', e.g. L_{Aeq}) to approximate the frequency response of the human ear.
- 3.19 Further information regarding the basic quantities used for the description of noise in community environments can be found within BS 7445-1:2003.

Results summary

- 3.20 Table 3.1 presents a summary of the measured ambient sound pressure levels on the balcony of the northeast facing elevation. Measured values have been rounded to the nearest whole number.

Table 3.1 - Summary of continuously measured sound pressure levels

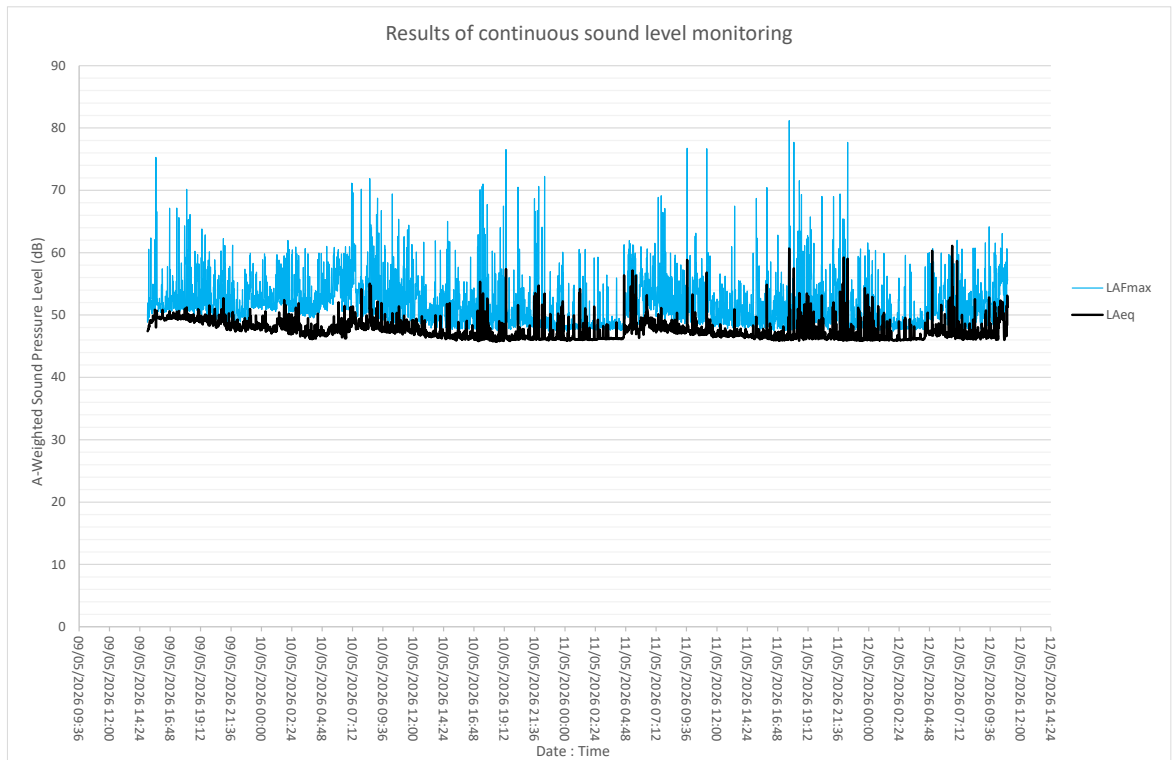
Date	Period	Duration, T (hours)	$L_{Aeq,T}$ dB	10 th Highest ¹ $L_{AFmax,T}$ dB	15 th Highest ² $L_{AFmax,T}$ dB
Saturday 09/05/2026	Daytime (15:00-23:00)	8	49	---	---
	Night-time (23:00-07:00)	8	48	60	59
Sunday 10/05/2026	Daytime (07:00-23:00)	16	48	---	---
	Night-time (23:00-07:00)	8	48	60	60
Monday 11/05/2026	Daytime (07:00-23:00)	16	48	---	---
	Night-time (23:00-07:00)	8	48	60	59
Tuesday 12/05/2026	Daytime (07:00-11:00)	4	48	---	---

¹The 10th highest measured value. ²The 15th highest measured value (note: indoor sound pressure levels should ideally not exceed 45 dB L_{Amax} more than 10-15 times per night). ---Daytime values are not presented since there is no L_{AFmax} target for the daytime period.

- 3.21 The 16-hour daytime ambient sound pressure level was 48 dB $L_{Aeq,16hour}$ and the 8-hour night-time ambient sound pressure level was 48 dB $L_{Aeq,8hour}$.

3.22 The measured ambient sound pressure levels are presented graphically in Figure 3.3.

Figure 3.3 - Graph showing results of continuous sound level monitoring



4. Assessment & Discussion

Building envelope construction and acoustic performance

- 4.1 The external walls are of a traditional double-leaf masonry construction. The sound insulation performance is expected to be approximately 50 to 60 dB R_w .
- 4.2 The roof and ceiling construction consists of a pitched tiled roof, mineral wool (loft) insulation and plasterboard ceiling. The roof and ceiling combination is expected to provide a sound insulation performance of approximately 40 to 50 dB R_w .
- 4.3 The glazing to the front, rear and gable elevations appear to be standard thermal double glazing consisting of 4 mm clear glass / 12 – 20 mm cavity / 4 mm clear glass. The sound insulation performance of the glazing is expected to be approximately 28 to 29 dB R_w .
- 4.4 Purge and background ventilation is currently achieved by opening windows and doors (i.e. via natural means).

Figure 4.1 - Photographs of front, rear and gable elevations



Noise ingress with windows closed

- 4.5 Noise ingress calculations are presented below for the bedroom on the gable end with standard thermal double glazing (4 mm clear glass / 12 – 20 mm cavity / 4 mm clear glass).
- 4.6 A façade sound pressure level of 48 dB $L_{Aeq,16\text{hour}}$ has been used in the calculation.
- 4.7 The calculation takes into account the sound insulation performance of each building element, surface area and internal room dimensions.
- 4.8 The measured octave band sound levels and the typical reverberation time for a habitable room have also been taken into consideration.

Table 4.1 - L_{Aeq} noise ingress calculation: bedroom with standard double glazing

Bedroom Noise Break In (ISO 12354-3)												
Formula/Comment	Single Value		63	125	250	500	1000	2000	4000	8000	Rw	(C,C _{tr})
				21.8	19.1	27.0	36.4	38.7	33.2			
L _{in}				20.2	19.9	16.0	7.6	2.3	1.8			
Materials												
4mm glass/12 - 20mm cavity/4mm glass	6.4										29	(-1,-4)
Masonry wall	8.2										51	(-1,-4)
Tiled roof, insulation, plasterboard ceiling	13.0										44	(-2,-5)
L _{out,s}											L _{Aeq}	
L _{out,2m}		Add Element									48	
L _{out,free field}											45	
Element 1												
Plane façade	ΔL _{fs}	27.5										
Visible	X _{fs}	0.0										
L _{p,out,2m}											48	
L _{p,in}											17	dBA

- 4.9 The calculation results indicate an internal sound pressure level of approximately 17 dB $L_{Aeq,T}$ with standard double glazing.
- 4.10 The daytime sound level target of 35 dB $L_{Aeq,16\text{hour}}$ and the night-time sound level target of 30 dB $L_{Aeq,8\text{hour}}$ will therefore be easily achieved within the bedrooms.
- 4.11 Additional calculations are presented below for the bedroom taking into consideration the maximum (instantaneous) façade sound pressure level during the night-time period (60 dB $L_{AFmax,T}$).

Table 4.2 - L_{AFmax} noise ingress calculation: bedroom with standard double glazing

Bedroom Noise Break In (ISO 12354-3)												
Formula/Comment	Single Value		63	125	250	500	1000	2000	4000	8000	Rw	(C,C _{tr})
				21.8	19.1	27.0	36.4	38.7	33.2			
L _{in}				24.2	25.9	21.0	10.6	10.3	24.8			
Materials												
4mm glass/12 - 20mm cavity/4mm glass	6.4										29	(-1,-4)
Masonry wall	8.2										51	(-1,-4)
Tiled roof, insulation, plasterboard ceiling	13.0										44	(-2,-5)
L _{out,s}											L _{AFm ax}	
L _{out,2m}	Add Element										60	
L _{out,free field}											57	
Element 1												
Plane façade	ΔL _{fs}	27.5										
Visible	X _{fs}	0.0										
L _{p,out,2m}											60	
L _{p,in}											27	dBA

- 4.12 The calculation results indicate a night-time sound pressure level of approximately 27 dB $L_{AFmax,T}$ with standard double glazing.
- 4.13 The maximum sound level target of 45 dB L_{AFmax} will be easily achieved during the night-time period.
- 4.14 This assessment demonstrates that the recommended sound level targets will be easily achieved within all habitable rooms during the daytime and night-time with the existing glazed units. There will be a notable improvement on the recommended targets.
- 4.15 Noise mitigation in the form of acoustically laminated glazing is therefore unnecessary.

Noise ingress with windows open

- 4.16 The level of sound attenuation through an open window is dependent on the type and size of window, the extent of opening, the angle of sound incidence and the characteristics of the noise source in question.
- 4.17 It is reasonable to assume a sound attenuation performance of approximately 15 dB for a partially open window or door.
- 4.18 BS 8233 provides the following guidance regarding the sound insulation from an open window:
If partially open windows were relied upon for background ventilation, the insulation would be reduced to approximately 15 dB³. ³⁾ Note that the level difference through a window partially open for ventilation can vary significantly depending on the window type and the frequency content of the external noise. If the specific details of the window and external noise are known the value for insulation may be adjusted accordingly.
- 4.19 The survey results indicate that the daytime and night-time façade sound pressure levels are approximately 48 dB $L_{Aeq,T}$.
- 4.20 When assessing noise ingress through an open window, it is appropriate to correct the measured sound levels at the façade by approximately -3 dB to give an equivalent 'free-field' sound level.
- 4.21 The corresponding free-field sound pressure level is therefore 45 dB $L_{Aeq,T}$.
- 4.22 On this basis, the internal ambient sound pressure level is therefore expected to be approximately 30 dB $L_{Aeq,16hour}$ during the daytime and 30 dB $L_{Aeq,8hour}$ during the night-time.

Daytime

- 45 dB $L_{Aeq,16hour}$ – 15 dB (open window) = 30 dB $L_{Aeq,16hour}$

Night-time

- 45 dB $L_{Aeq,8hour}$ – 15 dB (open window) = 30 dB $L_{Aeq,8hour}$

- 4.23 The daytime sound level target of 35 dB $L_{Aeq,16hour}$ and the night-time sound level target of 30 dB $L_{Aeq,8hour}$ will therefore be achieved with windows partially open.
- 4.24 The maximum sound level target of 45 dB L_{AFmax} will also be achieved during the night-time period.
- 4.25 Taking into consideration the measured ambient sound levels and predicted internal sound levels with windows/doors open, noise mitigation in the form of sound attenuating (acoustically rated) ventilator units is unnecessary for the habitable rooms.
- 4.26 It is worth noting that BS 8233 provides the following comment regarding ventilation:
The Building Regulations' supporting documents on ventilation recommend that habitable rooms in dwellings have background ventilation. Where openable windows cannot be relied upon for this ventilation, trickle ventilators can be used and sound attenuating types are available. However, windows may remain openable for rapid or purge ventilation, or at the occupant's choice.

- 4.27 If required, standard non-acoustic ventilator units could be installed to the external walls/frames of the habitable rooms to provide additional background ventilation.

Ambient sound levels within outdoor living areas

- 4.28 With regard to outdoor living areas (gardens and balconies), BS 8233 provides the following comments:

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 recognised 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.

- 4.29 ProPG also states the following with regard to noise levels:

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 $L_{Aeq,16hr}$.

- 4.30 The measured daytime ambient sound pressure level was consistently 48 dB $L_{Aeq,16hour}$.
- 4.31 The recommended upper guideline values of 50 to 55 dB $L_{Aeq,16hour}$ are therefore being easily achieved, both on the balcony and at ground level.
- 4.32 It is also important to note that the guideline values of 50 to 55 dB $L_{Aeq,16hour}$ apply to transportation sources of 'noise' and not from acoustically pleasing sounds such as birdsong and running water.
- 4.33 Noise mitigation in the form of additional acoustic screening/fencing is therefore unnecessary.

Operational noise from woodland school

- 4.34 There is a small woodland school approximately 70 to 80 metres southeast from the balcony of the property (Being Outdoors CIC).
- 4.35 Several site visits were conducted to observe activity associated with the woodland school, however there were no visible or audible activities during the visits.
- 4.36 It is understood that there were children at the school on the Monday morning of the survey (circa 10:00 – 11:00 hours), however there was a negligible change in the measured ambient sound level during this period.
- 4.37 For this assessment, it is considered appropriate to use measured sound pressure levels from an educational setting where there is a combination of children and staff present.
- 4.38 Previous measurements conducted at two nursery premises indicate ambient sound pressure levels ranging from 65 to 69 dB $L_{Aeq,15min}$.
- 4.39 The higher sound level of 69 dB $L_{Aeq,15min}$ corresponds to approximately 32 children and 5 members of staff within a nursery learning/play area at No.30 Palatine Road and the lower sound level of 65 dB $L_{Aeq,15min}$ corresponds to a slightly lower number of children within a nursery learning/play area at No.43 Marple Road.
- 4.40 Assuming a typical sound level of 69 dB $L_{Aeq,15min}$ is generated at the woodland school and taking into consideration the attenuation of sound due to distance separation, the resulting sound level at the balcony of the property is approximately 32 dB $L_{Aeq,15min}$.

- $69 \text{ dB } L_{Aeq,15\text{min}} - 37 \text{ dB (distance attenuation)} = 32 \text{ dB } L_{Aeq,15\text{min}}.$

- 4.41 The resulting sound level is considerably below the prevailing ambient sound level at the property ($48 \text{ dB } L_{Aeq,T}$) and therefore operational sound generated by the woodland school is expected to be generally inaudible.
- 4.42 Occasional shouting by a member of staff may be just audible (e.g. in an emergency), however such events are likely to be very sporadic and of a limited duration.
- 4.43 It should be noted that sound associated with children playing/learning is not necessarily deemed to be 'noise', in other words a disturbing, annoying and unwanted sound. On the contrary, such sound is often considered to be acoustically pleasing.
- 4.44 When the type of sound, resulting sound level, frequency and duration of the activity is taken into consideration, it is considered highly unlikely that the future occupants of the property will be adversely impacted by the presence of the woodland school.

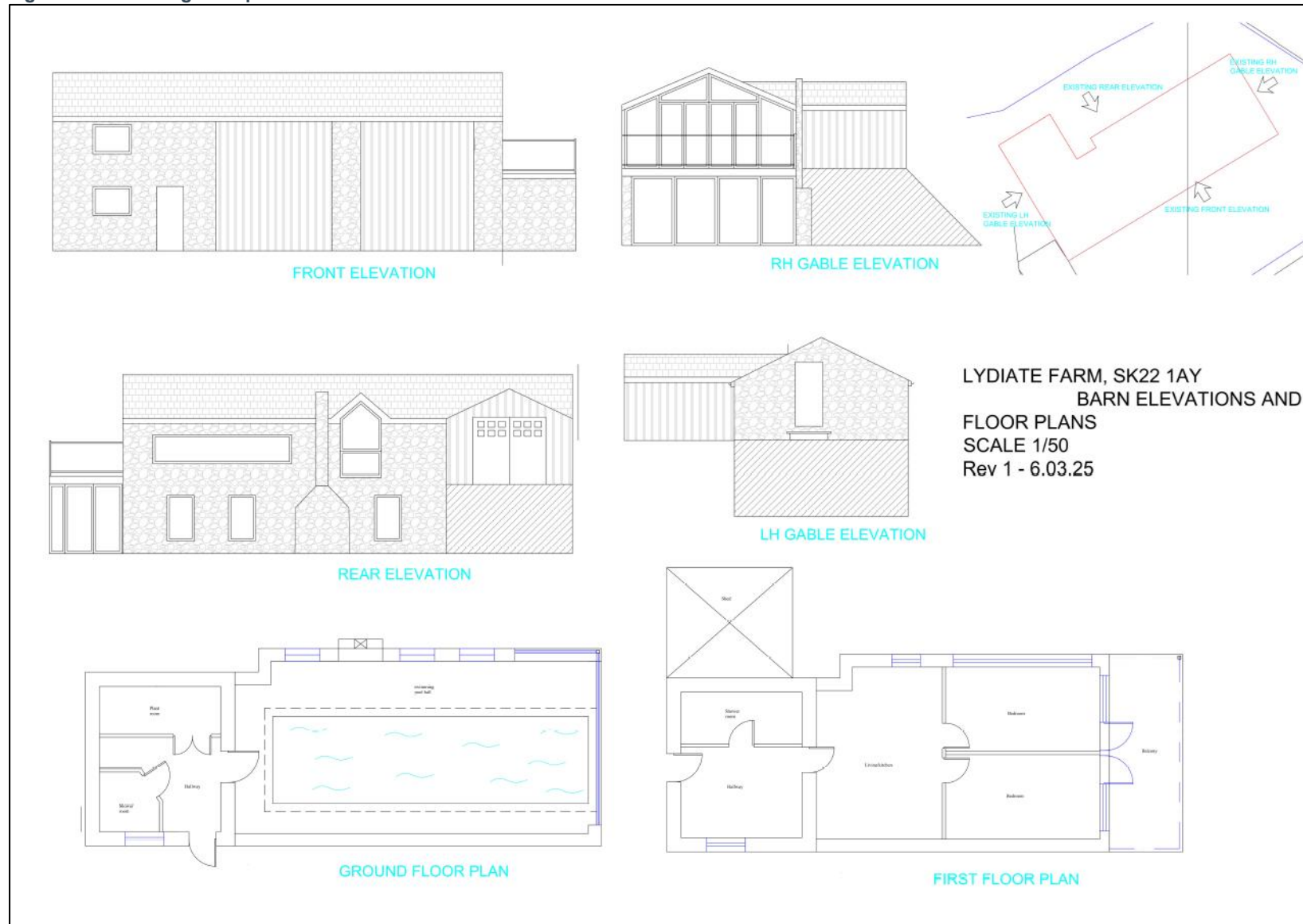
5. Conclusion

- 5.1 The property is located within a quiet rural setting and therefore experiences relatively low ambient sound levels. The prevailing acoustic environment is subjectively pleasant and mostly consists of birdsong and running water.
- 5.2 The current building fabric is providing sufficient sound insulation from environmental noise and does not require acoustic enhancement.
- 5.3 The daytime sound level target of 35 dB $L_{Aeq,16hour}$ and the night-time target of 30 dB $L_{Aeq,8hour}$ is being easily achieved with the existing standard double glazing. The night-time maximum target of 45 dB L_{AFmax} is also being achieved.
- 5.4 Since the targets are being easily achieved, noise mitigation in the form of acoustically laminated glazing is unnecessary for the habitable rooms.
- 5.5 The sound level targets will also be achieved with the windows and doors partially open. Noise mitigation in the form of sound attenuating ventilator units to walls/frames are therefore unnecessary. If required, standard non-acoustic ventilator units can be installed to provide additional background ventilation.
- 5.6 The guideline values for outdoor living areas are being easily achieved, both on the balcony and at ground level. Noise mitigation in the form of additional acoustic screening/fencing is unnecessary.
- 5.7 The resulting sound level from the woodland school is expected to be considerably below the prevailing ambient sound level at the property. When the type of sound, resulting sound level, frequency and duration of the activity is taken into consideration, it is considered highly unlikely that the future occupants of the property will be adversely impacted by the presence of the woodland school.
- 5.8 From a noise perspective, planning permission should not be refused for the new dwelling.

Appendix A

Floor plans & elevations

Figure A.1 - Existing floor plans and elevations



Appendix B

Assessment terminology

Assessment terminology

Term	Description
dB (decibel)	The scale on which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio between the root-mean-square pressure of the sound field and a reference pressure ($2 \times 10^{-5} \text{Pa}$).
dB(A)	The most widely used weighting mechanism that best corresponds to the response of the human ear is the 'A'-weighting scale. This is widely used for environmental noise measurement, and the levels are denoted as dB(A) or L_{Aeq} , L_{A90} etc, according to the parameter being measured.
Acoustic environment	Sound from all sources as modified by the environment.
Ambient sound level	The totally encompassing sound in a given situation at a given time; it is usually composed of sound from many sources, near and far.
Equivalent continuous sound level - $L_{Aeq,T}$	The A-weighted equivalent continuous sound pressure level over a period of time, T. Representative of the 'average' sound pressure level over a given period (commonly used to describe the 'ambient' sound level).
Maximum sound level - $L_{AFmax,T}$	The A-weighted 'maximum' sound pressure level that occurred during a given period, T (commonly used for the assessment of intermittent loud noises).
Background sound level - $L_{A90,T}$	The sound pressure level that is exceeded for 90% of the measurement time interval, T. $L_{A90,T}$ is often used to describe the 'background' sound level.
Habitable room	Any room used or intended to be used for sleeping, cooking, living or eating purposes (enclosed spaces such as bath or toilet facilities, service rooms, corridors, laundries, hallways, utility rooms or similar spaces are excluded from this definition).
R_w	The weighted sound reduction index expressed in dB. A single number quantity for airborne sound insulation rating.
Free-field level	A sound field determined at a point away from reflective surfaces other than the ground with no significant contributions due to sound from other significant reflective surfaces. Generally as measured outside and away from buildings (>3.5metres).