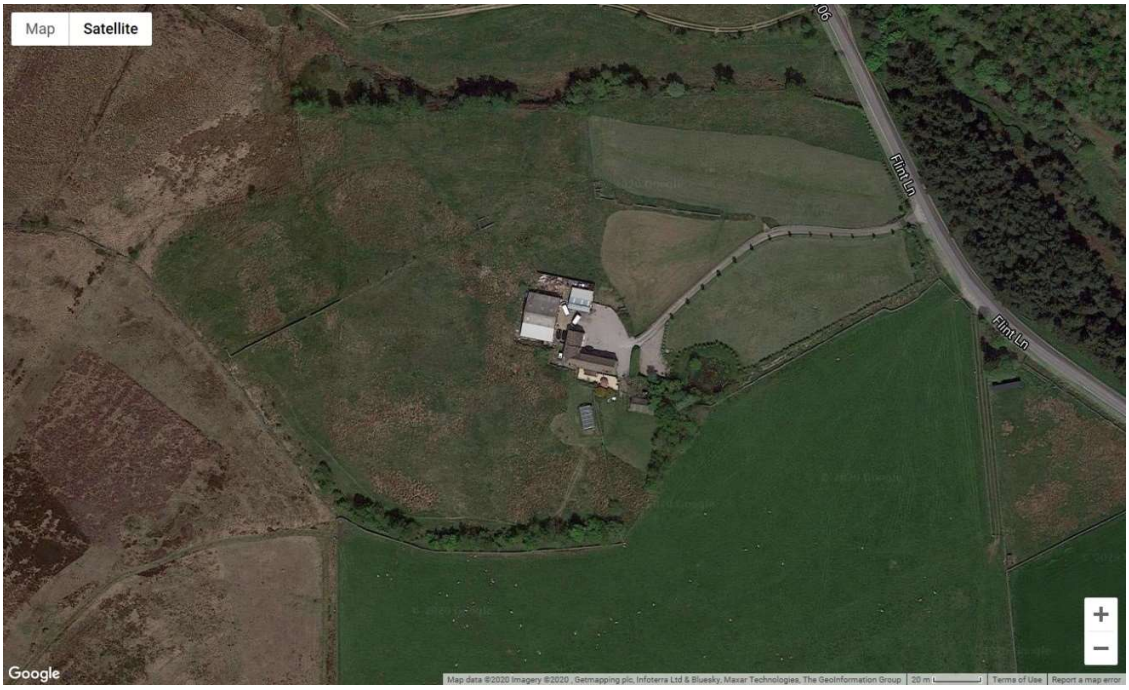
NOISE SURVEY LTD

Noise Assessment Report for Riddle Pit Farm

Report Ref:	229HOLMFIRTH
Client:	Mr Philip Lofthouse
Site Location:	Eiddle Pit Farm Flint Lane Holmfirth HD9 2TR
Date of Issue:	Friday 25th September 2020 3rd May 2022 revision in the Appendix
Date of Assessment:	Monday 14th September 2020 (12:18 – 17:15 day time measurements)
Report Author:	Donald Angir MIoA www.noisesurveyltd.co.uk



Picture 1: Riddle Pit Farm, Flint Lane

Summary

The noise level is Leq 29dB, when all noise levels from the music in the barn is restricted to Leq 75dB, and includes vehicles arriving and limited noise around the pond area

when measured at adistance of 130m away from the barn. At a distance of 110m from the barn the noise level is Leq 28dB. This noise level is above the prevailing background level of LAF90 (3 hours) 27dB. This demonstrates that the noise from the wedding venue would add to the noise environment. However, the noise level is below the residual noise of LAeq(3hours) 37dB. Noise from the wedding venue has a low likely hood of adverse impact on the prevailing noise environment during the day.

Uncertainty is assessed at ± 6dB because of variations in the background noise level during the day to night time. In addition, variation in noise levels from changes in celebration noise such as shouting, singing, clapping and cheering from one wedding party to the next.

Source under Assessment

The Client proposes to use a farm barn as a wedding venue for indoor entertainment. A limited number of car parking space is provided on site. External entertainment area includes a pond.

Picture 2: Measurements obtained at four locations around the barn. The blue circles represent the measurement locations 26m from the barn.

Close to the proposed barn and wedding venue are protected wading birds known a curlew and common snipe. These birds forage close to or near the proposed wedding venue. This assessment has assed the likely impact on the birds from the proposed wedding venue, by assessing the likely increase in the noise level to the noise environment, that the birds forage and breed.

Picture 3: Source noise generated and repeated inside the barn on thef4 top landing.

Methodology

Two class 1 sound level meters were calibrated and used to take measurements, of the ambient back ground and residual noise at Riddle Pit Farm. Background measurements were obtained at a single location 26m from the barn at ML2. The meter was positioned 1.3m above ground level. Background measurements were obtained from 12:18pm – 15:18 during the day time on Monday 14th September 2020. Back ground measurements were obtained when no music was played and no wedding activities were taking place.

After the background measurements were completed. Music was set to play inside the barn on the 1st floor landing. All doors and openings to the barn were closed. A sound level meter was placed inside the barn 2m from the speaker, due to the limited space on the landing. The music track “God is a DJ” by Faithless, was played on repeat. It took 4 seconds from the track finishing to starting again.

Measurements of the music was obtained inside the barn and at 4 locations outside the barn. All external measurements were at 26m from the barn.

The barn measures 13.5m x 13m. It is a rectangular building with a pitched roof. The highest internal height inside the barn from floor to the pitch of the roof is 5.2m. Measurements were obtained 26m from the barn because this was close to double its largest dimension. This increases the reliability of the sound power calculation.

Note: It has been assumed that the background level measured during the day between 12:18 – 15:18 is the same all day till 23:00. In practice the levels may be lower due to lower road traffic noise. Further no measurements of night time background levels between 23:00 – 02:00 have been obtained.

Date and Time of Measurements

Measurements were conducted on Monday 14th September 2020 from the time of 12:18 – 17:00 on the day of the assessment. Only day time measurements were obtained.

Façade Correction

Façade measurements occur when the meter is outside but in front of a large reflective surface at a distance of less than 3.5m away from the reflective surface. The sound level meter was over 3.5m from the nearest façade. A façade correction is not required and one has not been applied.

Residual & Background Noise

Date	Start Time	Duration min	LAeq dB	LAF90 dB	LAFmax dB
14-Sep-20	12:18	15	35	27	64
	12:33	15	33	27	54
	12:48	15	31	26	55
	13:03	15	32	27	49
	13:18	15	38	26	56
	13:33	15	40	27	56
	13:48	15	36	28	56
	14:03	15	38	29	67
	14:18	15	39	31	53
	14:33	15	37	29	47
	14:48	15	36	28	54
	15:03	15	37	28	65

Table 1: Residual and background noise measurements taken at ML2 at 26m from the barn when no music was playing. Measurements obtained from 12:18 – 15:18.

The residual noise level is LAeq(3 hours) 37dB and the background noise level is LAF90(3 hours) 27dB LAFmax reached 67dB.

The day time background level was influenced by road traffic noise. The dominant noise source during the background measurements was road traffic noise.

Music Level inside the Barn on the first Floor Landing

Octave measurements inside the barn on the first floor landing 2m from the speaker

Freq. Hz	31.5	63	125	250	500	1K	2K	4K	8K	16K
LAeq dB	27	56	67	66	76	73	65	68	63	41

Table 2: octave measurements of the sound track “God is a DJ” by Faithless. Measurements obtained inside the barn at 2m from the speaker on the first floor landing. Measurements were for a duration of 1 hour 41min.

Noise Survey Limited 3 Sude Hill New Mill Holmfirth HD9 7BL

www.noisesurveyltd.co.uk Tel: 0800 772 0431

The internal broadband noise level is:

LAeq(1 hour 41min) 79dB

LAFmax 87dB

LAF90 70dB

Ambient noise levels

This measurement was taken at the measurement locations ML1 to ML4 as shown in picture 2. Measurements are of the noise level at those locations when the music was playing inside the barn.

Location	Duration Min	Laeq dB	LAF90 dB	LAFmax dB
ML2	26	42	34	60
ML3	16	40	34	63
ML1	18	45	37	60
M4	18	45	39	62

Table 2: Ambient noise measurements taken at ML1 – ML4 at 26m from the barn when music was playing inside the barn. Measurements obtained from 15:30 – 17:00.

The average noise level from all 4 ambient noise measurements is 43dB.

The sound power level is Lw = Lp + 20log(26) + 11
The sound power level is LwA 82dB.

Music Inside the Barn

The benefit of measuring noise from inside to outside is that it automatically includes the natural attenuation from the sound insulation provided by the building façade and includes its sound absorption characteristics. It also correctly accounts for the sound absorption of the ground.

At a distance of 26m from the barn, the internal level of LAeq(1 hour 41min) 79dB falls to 43dB. This is a reduction of 36dB.

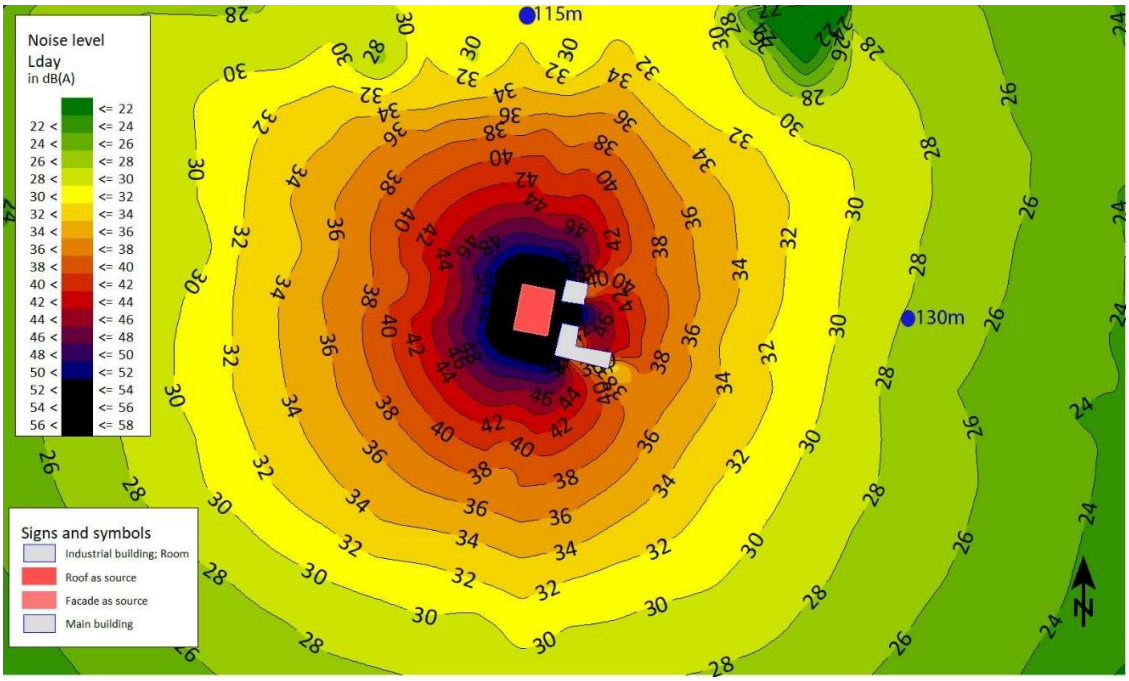
The calculated sound power from the façade of the building is LwA 82dB. At a distance of 130m from the barn, the music will be 29dB. At 110m from the barn the music level is 30dB.

The measured background LAF90(3 hours) is 27dB. By reducing the amplified music and entertainment noise to an internal level of 75dB, the entertainment noise will be below the background level of LAF90 27dB at 130m from the barn. The birds are less likely to be disturbed because;

- Residual noise from road traffic and other environmental sources is LAeq(3 hours) 37dB. This is the environmental noise level that prevails in this environment. The birds and other wild life breed and forage in this noise environment.
- The prevailing background level falls to LAF90(3 hours) at its quietest day time level. If the music can be reduced to below the background level, the noise is unlikely to be a significant contribution to the noise environment.

Assumptions: It has been assumed that the background noise level is the same at ML2 as it is at a distance of 130m from the barn. This is because the environment is mainly grassland with a limited number of noise sources.

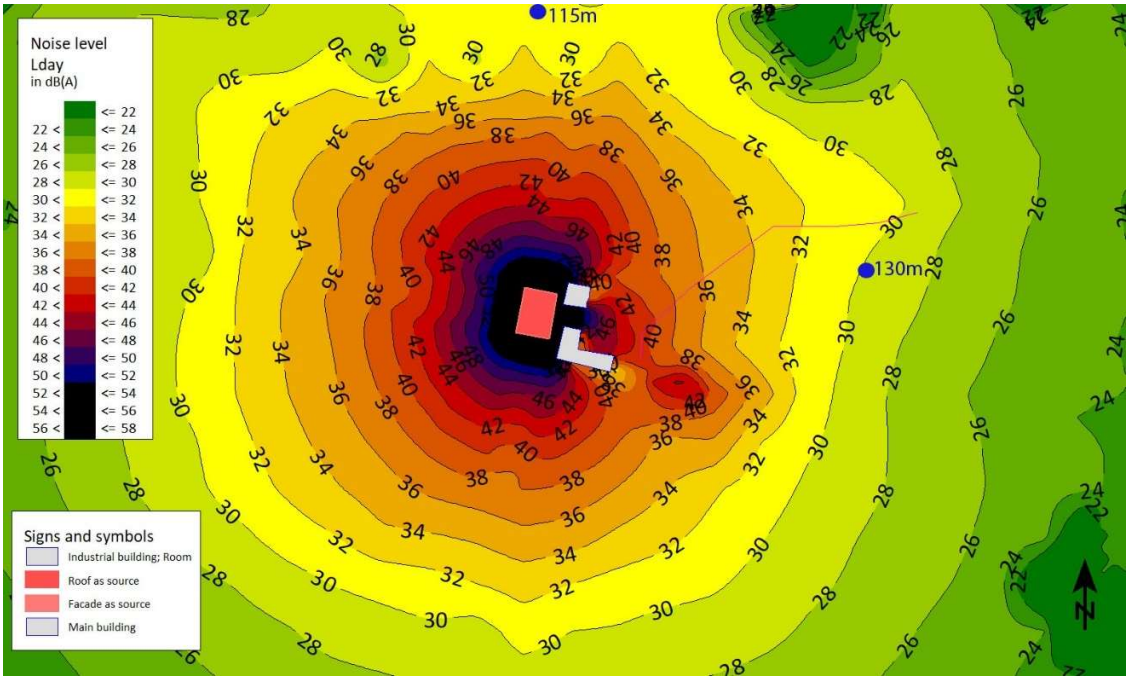
External Noise Levels



Noise map 1: Spread of noise from inside the barn at LAeq(1 hour 41Min) 79dB inside the barn. The blue circles are distance from the barn. The noise model includes the geometry and layout of the land. This does not include noise from celebrations around the pond or cars arriving.

Noise Survey Limited 3 Sude Hill New Mill Holmfirth HD9 7BL

www.noisesurveyltd.co.uk Tel: 0800 772 0431



Noise map 2: This includes noise from inside the barn, noise around the pond equivalent to people speaking with a raised voice but not shouting. It also includes vehicles driving up the drive at a rate of 10min within the hour.

The noise level is Leq 29dB, when all noise levels from the music in the barn is restricted to Leq 75dB, and includes vehicles arriving and limited noise around the pond area, when measured at a distance of 130m away from the barn. At a distance of 110m from the barn the noise level is Leq 28dB. This noise level is above the prevailing background level of LAF90 (3 hours) 27dB. This demonstrates that the noise from the wedding venue would add to the noise environment. However, the noise level is below the residual noise of LAeq(3hours) 37dB. Noise from the wedding venue has a low likely hood of adverse impact on the prevailing noise environment.

Hours of Operation

The opening hours of the wedding venue are 14:00 till 12:00AM , Monday – Sunday

Receptor Sensitivity

The nearest residential dwelling is The Fox house which also functions as a takeaway. This is located 217m from the barn but it is not the focus of this assessment.

At an approximate distance of 130m of the barn are protected wading birds that feed and forage in the grass land. These species have been identified as curlew and common snipe. Both these protected birds were heard over 130m from the barn in a Bird and Bat Assessment dated 20th March 2020 prepared by Middleton Bell Ecology of 33 Wilthorpe Rd, Barnsley S75 1JA.

Elevated noise levels do have an adverse impact on the location of nests, foraging range and population density of birds as noted in Ahrig, Lenore and Trina Rytwinski (2009).

Whilst it is accepted that elevated noise levels do cause disturbance, the level at which this disturbance occurs has not been stated. Studies have used road traffic noise to demonstrate adverse impact on wild life. Road traffic noise is much greater and more persistent than that demonstrated by the proposed wedding venue. A busy A road can have an Leq of 69dBA at 20m, Watson, R and Downey, O (2013).

The habitat of the birds is approximately 130m from the barn. The noise level when it reaches the birds at Leq 29dB is below the prevailing residual noise level of LAeq(3 hours) 37dB but greater than the background level of LAF90 (3 hours) 27dB. The exact level of the entertainment noise depends on the location of the measurement.

The Specific Noise

The entertainment noise level depends on the location of the measurement and the distance from the source as observed in noise map 1 and noise map 2 above.

The combined noise from gatherings around the pond, cars arriving and music from the barn result in a noise level of LAeq(1 hour) 29dB at a distance of 130m from the noise source.

Context of the Noise Environment

- The noise environment is characterized by road traffic noise from Penistone Road
- The measured residual noise level in the absence of music from inside the barn was LAeq(3hours) 37dB. This was dominated by road traffic noise.
- The prevailing background noise level when no music was played was LAF90(3hours) 27dB, this level is the lowest 10% of noise that occurred during the measurement duration.
- The area is characterized as predominantly residential rural farm land with some commercial noise sources.

Uncertainty

The noise levels were obtained by direct onsite measurements. The sound level meter was fitted with a wind shield and maintained on a tripod during the measurement period. Once readings were began, the sound level meter was free from human interference. This was done to minimize uncertainty in the readings. In addition, the data used was taken during suitable weather conditions. Each measurement was conducted for a duration sufficient to provide a representation of the background and residual noise levels.

Uncertainty arises because the background noise level can be greater or lower depending on the level of road traffic noise and wind level and direction. For example, it is likely that the background level is likely to be lower at night than during the day. This variation can cause the noise from the wedding venue to stand out more or less depending on the level of traffic noise and wind direction.

Additional uncertainty arises from the noise generated by actual individuals attending the wedding. Variations in the loudness of speech, clapping, shouting and general celebration noise will vary from group to group. The noise levels of vehicles will differ depending on the type of vehicle and the speed at which it is driven. It is likely that different wedding party guests will generate different levels of noise.

Further, the level of noise at which wading birds are disturbed is not known and the distance of the birds to the barn will change month to month.

A combined uncertainty factor of ± 6 dB has been added to the uncertainty calculation.

Laboratory calibration uncertainty of the sound level meter ± 1 dB

$$u = \sqrt{a^2 + b^2 + c^2 ...etc}$$

U = ± 6 dB

Conclusion

The combined noise including music within the barn, people celebrating around the pond and cars travelling along the drive way is LAeq(1 hour) 29dB at a distance of 130m from the barn. This noise level is above the measured background level, representing the lowest 10% of noise during the measurement duration, and is LAF90(3 hours) 27dB. The noise from the venue is lower than the residual noise level, representing the average noise level during the measurement duration of LAeq(3 hours) 37dB. It represents a low likely hood of adverse impact during the day on the wading birds.

Signed:

Donald I Angir

Donald Angir MIoA BA(Hons)

Noise Consultant

Noise Survey Limited, www.noisesurveyltd.co.uk

BIBLIOGRAPHY

Ahrig, Lenore and Trina Rytwinski (2009). "**Effects of Roads on Animal Abundance: An Empirical Review And Synthesis.** "Ecology & Society14. 1(2009):1-20.

Watson, R and Downey, O (2013) **The Little red Book of Acoustics A Practical Guide Third Edition**: Blue Tree Acoustics, UK

APPENDIX A

Measuring Equipment

- Casella Cel 490 type 1 sound level meter serial 230643 (ML1). Last calibrated by Pennine Instrument Services cert no. 045963-1 traceable to UKAS standards on 14th July 2020.
- Casella cel 63X class 1 sound level meter, serial 2670932. Last calibrated July 2020 by Casella Group.
- Casella Acoustic Calibrator Cel-110/1 Serial No. 458507. Last calibrated 14th July 2020 by Pennine Instrument Services Cert No. 045963-3
- Digitron TM-22 Thermostat Serial 53042209655RC Cert No. UK_34558 on 10th Dec 2018
- Kestral 1000 Anemometer serial 2140575.

Measuring Equipment & Calibration

On each occasion at the beginning and at the end of measurements the meter was calibrated with an acoustic calibrator before and after the measurements with negligible deviation (≤ 0.5dB).

Weather Conditions

	Wind	Cloud Cover (Subjective)	Temperature	Precipitation
12:10 (Start)	0.7m/s	10%	23°C	None
17:15 (End)	0.8m/s	50%	22°C	None

Table 5: Weather conditions on Monday 14th Sept 2020 at the start and end of measurements.

Sound Propagation from the Barn to Fox House (calculated on 3rd May 2022).

Fox House is the nearest noise sensitive receptor and lies 217m to the North of the barn. The ground between the barn and the receiver is soft agricultural field. There is a clear line of sight between the barn and the Fox House. The noise propagates in free field conditions. The music from the barn is played above ground on the first floor approximately 3.3m above ground level. The sound does not propagate over a single reflective surface because of the height at which it is generated and the fact that the ground is soft and not highly reflective.

Uncertainty of Fox House propagation (3rd May 2022)

The propagation shown below is based on measurements taken whilst the music was played inside the barn as shown in Table 2 above. It uses measurements at ML2 which has no intervening buildings between the source and the measurement location. Measurements were taken at 1.5m above ground however the music is played at approximately 3.3m above ground.

In addition, there is some reflection from immediate farm buildings between the barn and Fox House. This means that the noise level at first floor and above ground floor level, of Fox House, may be different from those calculated here based on standard noise propagation formula. Uncertainty of the calculation is estimated at ±4dB.

Noise Level inside Barn	Distance from Barn in meters	Noise LAeq,T
79	26	42
	52	36
	104	30
	208	24
	217 (Fox House)*	24
	260	22

Noise Survey Limited 3 Sude Hill New Mill Holmfirth HD9 7BL

www.noisesurveyltd.co.uk Tel: 0800 772 0431

Table 6: Noise inside the barn at 79 LAeq(15min) propagating towards 'The Fox House.' Google maps measurement shows the Fox House at a distance of 217m from the barn.

Noise Level inside Barn	Distance from Barn in meters	Noise LAeq,T
90	26	53
	52	47
	104	41
	208	35
	217 (Fox House)*	35
	260	33

Table 7: Noise inside the barn at 90 LAeq(15min) propagating towards 'The Fox House.' Google maps measurement shows the Fox House at a distance of 217m from the barn.

Noise Level inside Barn	Distance from Barn in meters	Noise LAeq,T
100	26	63
	52	57
	104	51
	208	45
	217 (Fox House)*	45
	260	43

Table 7: Noise inside the barn at 79 LAeq(15min) propagating towards 'The Fox House.' Google maps measurement shows the Fox House at a distance of 217m from the barn.

Background Noise Level

The measured day time background noise level is LAF90 (3 hours) 27dB (see original report above). It is assumed that the daytime background level is the same at Fox House. A night time background noise level is not provided.

The calculations using standard noise propagation formula in freefield conditions shows that a noise level of LAeq(15min) 80 dB inside the barn results in a level at Fox House of LAeq(15min) 25dB. This level is below the daytime noise level of LAF90(3hours) 27dB.