MATRIX ACOUSTIC DESIGN CONSULTANTS

Proposed Poultry Unit Expansion
at Land North of Redhouse Farm
Oakley Road
Wix
Manningtree
Essex
CO11 2SF

NOISE IMPACT ASSESSMENT

Acoustics Report M1935/R02
8th March 2022

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1. Introduction

This acoustic report documents a noise impact assessment for the proposed expansion of the poultry development at land north of Redhouse Farm, Oakley Road, Wix, Manningtree; Figure 1 and 2.

The report is divided into the following sections:

- Section 2: Overview of the Development
- Section 3: BS4142:2014+A1:2019
- Section 4: Background Noise survey
- Section 5: Noise Impact Assessment
- Section 6: Conclusion
- Appendix A: Noise monitor and weather station data
- Appendix B: Calculations
- Appendix C: Fan noise data

2. Overview of the Development

The proposal is for the expansion of the poultry development at land north of Redhouse Farm, Oakley Road, Wix, Manningtree from 2 to 5 sheds; Figure 1 and 2.

The additional sheds, which will be identical to the existing 2 poultry units in both terms of size and ventilation system, will be located to the east of the enlarged concrete apron.

The closest dwellings, labelled A and B in Figure 2, are approximately 365m and 235m respectively from the proposed enlarged poultry development.

For the noise impact assessment, the noise sources generated by the proposed scheme have been split into two categories, namely:

- **Plant noise:** Each shed (existing and proposed) will have 17 x Fancom 3680 extract fans, with ridge mounted ducts terminating at 6.5m above local ground; Figure 1. Manufacturers' data sheet for the fans is provided in Appendix C. There will be an unobstructed noise path between the duct terminations and both Dwellings A and B.
- **Transport noise:** Transport noise includes commercial vehicles manoeuvring and loading/unloading stock on the concrete apron at the centre of the enlarged poultry development; Figure 1. An electric forklift will be used for the loading/unloading of HGVs. Vehicles will access the site via the existing access road as shown in Figure 1. Though the majority of the concrete apron will be fully shielded by the existing poultry units themselves for Dwelling A, for the assessment it has been assumed that there will be an unobstructed noise path between the activities on the concrete apron and Dwellings A and B. Both dwellings will have a view of the access road.

The noise emissions from the proposed additional poultry units are within context of the existing poultry development.

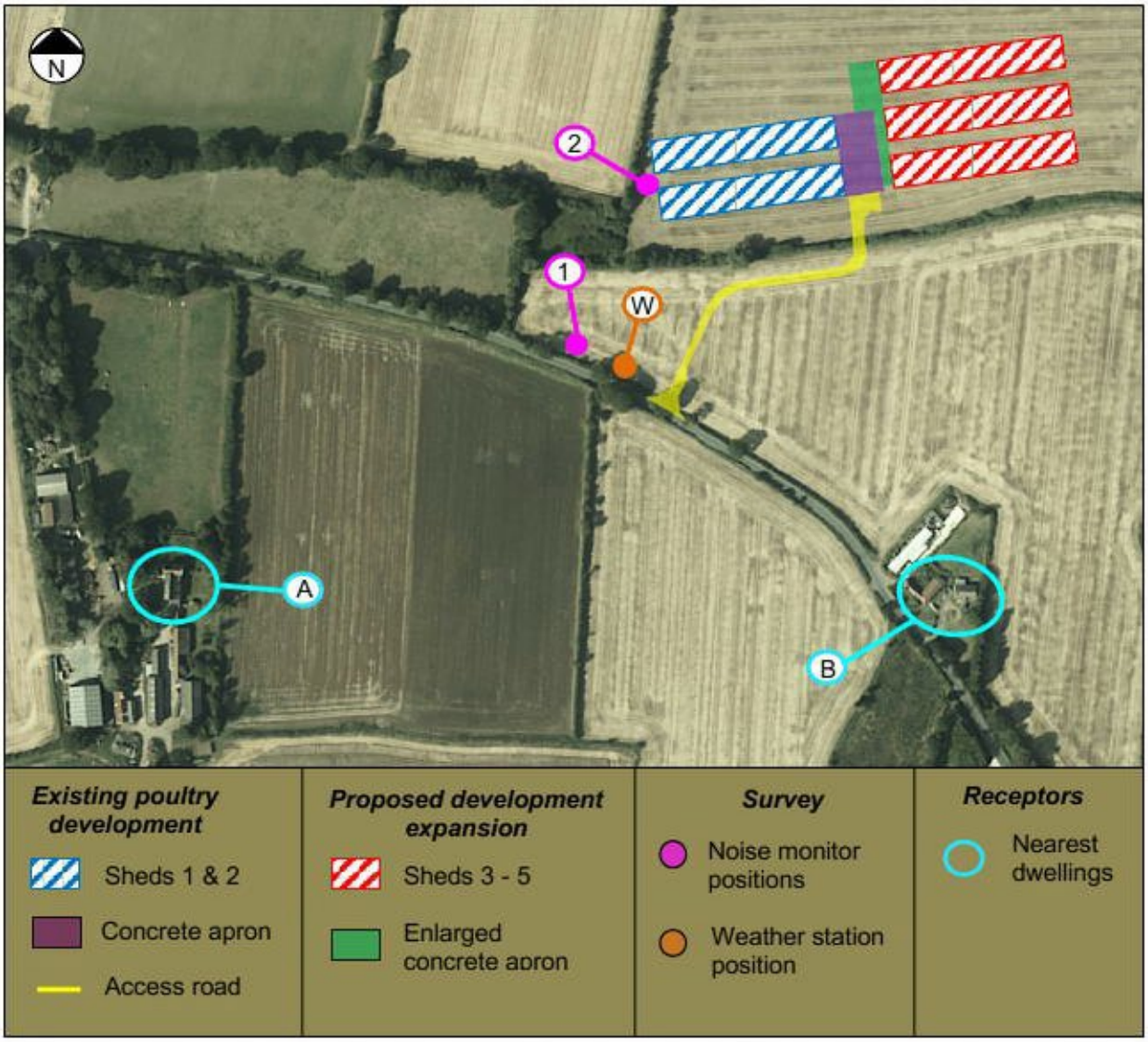


Figure 1. Aerial view (source: www.bing.com) showing footprint of existing and proposed additional poultry units, nearest dwellings and noise monitor and weather station positions

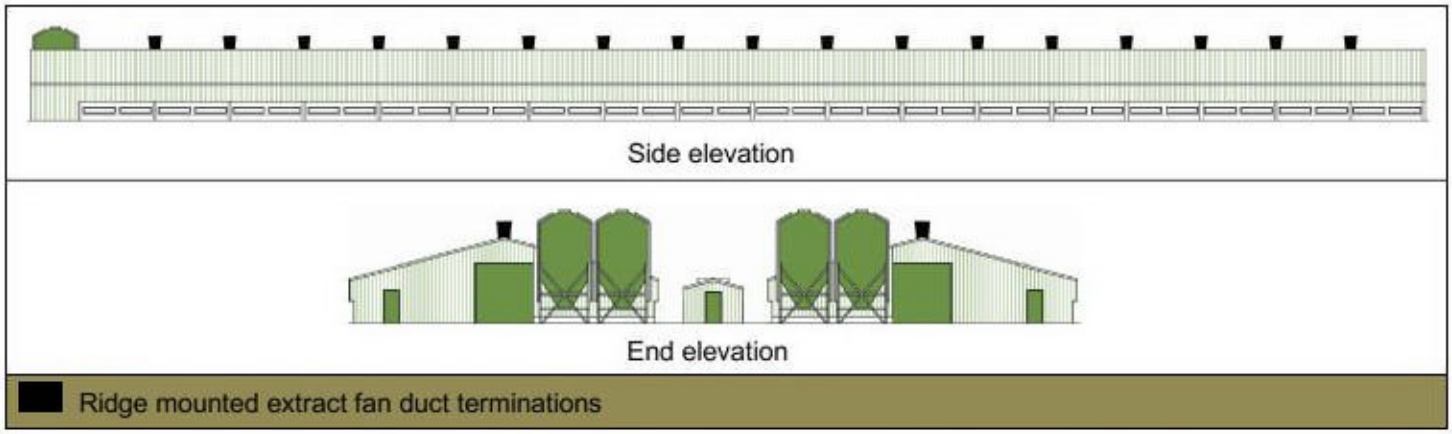


Figure 2. Side and end elevations of existing and proposed additional poultry units

3. BS4142:2014+A1:2019

The noise assessments detailed in this report of the plant and transport activities within the concrete apron have been conducted in accordance of BS4142:2014+A1:2019 'Methods for Rating and Assessing Industrial and Commercial Sound'.

3.1 BS4142

BS4142 provides a methodology to assess the impact of industrial and commercial noise affecting dwellings, whereby the 'typical' background noise level is deducted from the industrial noise Rating Level (industrial noise corrected to account for the 'on-time' and noise character of the noise source; see sections 3.2 and 3.3 below). The following guidance is given based on the established difference:

- A difference of around +10dB or more is likely to be an indication of significant adverse impact, depending on context
- A difference of +5dB is likely to be an indication of an adverse impact, depending on context
- The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on context

Context, as defined in BS4142, includes the consideration of the following factors:

- The absolute level of the noise emissions
- Character and level of the residual sound compared to the character and level of the Specific Level
- Sensitivity of the receptor and any acoustic design measures (e.g. façade sound insulation, use of mechanical ventilation and acoustic screening) incorporated at premises used for residential purposes

Where background noise and Rating Levels are low, BS4142:2014 states that *'absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night'*. Low background noise and rating levels are not defined. However, in BS4142:1997 it states that '*background noise levels below 30dB and rating levels below about 35dB are considered to be very low*'.

3.2 On-time correction

To take account of industrial/commercial noise sources that do not operate continually an 'on-time' correction is applied using:

$$- 10 \log (r/r_{ref})$$

Where:

$r_{ref.}$ = reference time (1hr between 07:00 – 23:00hrs and 15 minutes between 23:00 – 07:00hrs)

r = total 'on-time' during the reference period

Note that the shorter reference time interval between 23:00 – 07:00hrs is designed to penalise industrial/commercial noise events that occur during the night.

3.3 Noise character correction

BS4142 provides four noise character correction categories with associated penalties that must be applied when determining the Rating Level, namely:

- **Tonality:**
  - Not perceptible = 0dB
  - Just perceptible = +2dB
  - Clearly perceptible = +4dB
  - Highly perceptible = +6dB
- **Impulsivity:**
  - Not perceptible = 0dB
  - Just perceptible = +3dB
  - Clearly perceptible = +6dB
  - Highly perceptible = +9dB
- **Intermittency:** +3dB if the intermittency of operation is readily distinctive against the residual noise environment
- **Other:** +3dB applied if the specific sound is neither tonal or impulsive but features noise characteristics that are readily distinctive against the residual noise environment

4. Background Noise Survey

- **Survey dates**: 15th – 16th July 2019
- **Weather;** Table A2, Appendix A:
  - Precipitation: Dry
  - Wind Speed: Highest recorded wind speed of 2.2m/sec, with a median of 0.0m/s
- **Noise monitor locations:** With the microphones attached to tripod the noise monitors were located at Positions 1 and 2 as shown in Figure 1
- **Weather station location:** Weather station, mounted on a tripod, located at position W; Figure 1
- **Equipment:**
  - Weather Station: Kestrel type 4500
  - Noise monitors: Brüel & Kjær Type 2238 (Positions 1 & 2)
- **Monitor configuration:**
  - Weather station: Configured to measure the average wind speed and temperature over consecutive 10-minute periods
  - Noise Monitors: configured to measure consecutive 15-minute samples of noise.
- **Calibration:** Noise monitors calibrated before and after the survey using a Brüel & Kjær Type 4231 calibrator with no deviations found

All noise measurements are free-field. Full tabulated results are given in Tables A1 and A2, Appendix A.

The weather conditions will not have adversely affected the noise measurements.

Note that due to battery failure the noise monitor at Position 2 did not record for the entire survey period. Sufficient noise data however was obtained for the purpose of the assessment.

The noise survey was conducted prior to the operation of the two existing poultry units.

4.1 Survey observations

During the setting up and collection of the noise monitors it was observed that the noise sources affecting the area was road traffic on Oakley Road and the A120 (which lies approximately 2km to the north of the site), birdsong and agricultural activity (tractor movements within nearby

fields). The dominant underlying noise source was observed to be the constant road traffic on the A120.

The general noise environment was considered to be quiet.

4.2 Typical background noise level, L_{A90}, at Dwellings A and B

Figures 3 and 4 show the variation in the measured maximum ($L_{Amax,F}$), ambient (L_{Aeq}) and background (L_{A90}) noise levels obtained at Positions 1 and 2 respectively.

As can be seen the measured ambient and background noise levels follow the same fluctuation over the survey period. This indicates that they were exposed to the same general noise environment.

The ambient noise levels at Position 1 were generally higher than the corresponding values recorded at Position 2; this will be due to Position 1's proximity to Oakley Road. The background noise levels however returned comparable values at both measurement positions; this indicates that they were exposed to the same dominant underlying noise, which was observed to be the constant traffic on the A120.

Figure 3. Position 1 noise monitor data (free-field)

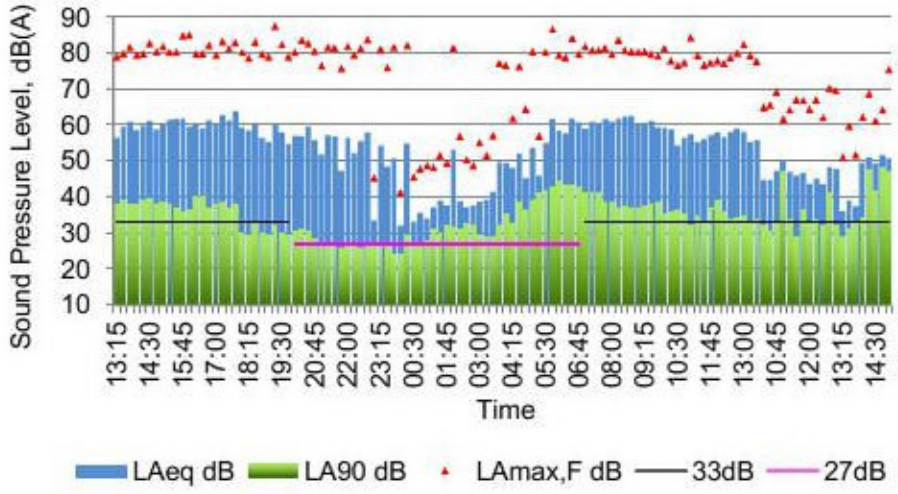
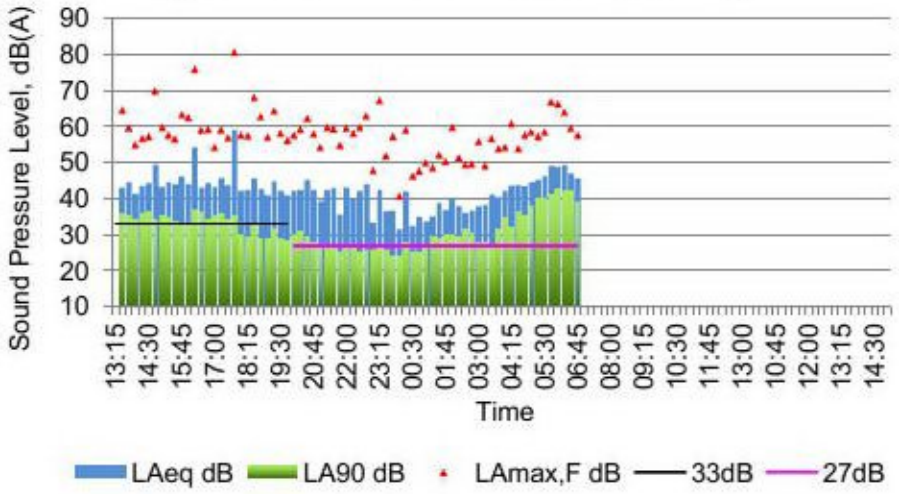


Figure 4. Position 2 noise monitor data (free-field)



Using the noise data, the typical background noise levels at Positions 1 and 2 have been established as:

- Day (07:00 – 20:00hrs): L_{A90} 33dB
- Evening and night (20:00 – 07:00hrs): L_{A90} 27dB

The above low typical background noise levels are considered representative to those that will occur at Dwellings A and B.

5. Noise Impact Assessment

5.1 Calculation of aggregate extract fan and transport noise at Dwellings A and B

The full calculations of the extract fan and transport noise are provided in Tables B1 – B4, Appendix B. The resultant BS4142 Rating and Assessment Level at Dwellings A and B are given in Table 3.

5.2 Source noise data

- **Extract fans (existing and proposed poultry units):**
  - Fan type: Fancom 3680
  - Duct terminations: ridge mounted ducts, terminating 6.5m above ground
  - Total number of fans: 17 per shed
  - Sound pressure level: 70dB(A) at 2m, 45° lateral; see Appendix C for manufacturers data sheet
- **Transport noise:**
  - HGV movements: HGV manoeuvring on concrete apron - L_{Aeq} 72dB & $L_{Amax,F}$ 80dB at 5m , HGV pass on access road – SEL 87dB at 5m; source levels derived by measurements made by Matrix Acoustics during poultry catching at Parton Poultry Farm, Herefordshire on 9/1/14
  - HGV loading/unloading using an electric forklift: L_{Aeq} 63dB & $L_{Amax,F}$ 84dB at 5m; source levels derived by measurements made by Matrix Acoustics at B&Q Trowbridge on 13/6/17 of an electric forklift loading an HGV with laden pallets.

5.3 Extract fan operation

The temperature within the sheds is determined by a combination of the heat generated by the birds themselves, the external temperature and the ventilation provided by the extract fans.

To provide sufficient ventilation of the bird generated heat, as required to maintain the ideal internal operating temperature of around 20°C, up to 25% of the roof extract fans will be required to operate (either intermittently or on variable speed).

With the influence of the external temperature additional extract fans may be required in order to maintain the ideal operating internal temperature. Here the fans are operated in Stages, triggered with each 1°C rise above the ideal internal temperature. The highest Stage will typically only be triggered when the internal temperature rises above 23°.

The operation of 100% of the roof extract fans are only expected to occur during the day period when the external temperatures have the potential to be higher.

During the evening and night, when the external temperature will fall, there will be a corresponding decrease in the number of roof extract fans needed above those for bird generated heat alone; the expected percentage of ridge extract fans required to maintain the set temperature are 50% and 25% for the evening and night periods respectively.

The calculation has therefore been based on:

- Day (07:00 – 20:00hrs): 100% extract fans operating
- Evening (20:00 – 23:00hrs): 50% extract fans operating
- Night (23:00 – 07:00hrs): 25% extract fans operating

Table 1. Proposed Commercial Traffic Generation for Proposed Poultry Unit Expansion									
Day	Activity	Vehicle Size	Existing Frequency	Proposed Frequency	Day	Activity	Vehicle Size	Existing Frequency	Proposed Frequency
1	Fertile Egg Delivery	16.5m HGV	1	2	28	Feed Delivery	16.5m HGV	0	1
2					29	Feed Delivery	16.5m HGV	0	1
3					30	Feed Delivery	16.5m HGV	1	1
4					31	Feed Delivery	16.5m HGV	0	1
5						Carcass Collection	Box Van	1	1
6					32	Feed Delivery	16.5m HGV	0	1
7					33	Catching Gang	Mini Bus	1	1
8	Feed Delivery	16.5m HGV	0	1		Bird Removal (Thinning)	16.5m HGV	4	10
9					34	Feed Delivery	16.5m HGV	1	1
10	Carcass Collection	Box Van	1	1	35	Feed Delivery	16.5m HGV	0	1
	Feed Delivery	16.5m HGV	1	1	36	Feed Delivery	16.5m HGV	1	1
11					37	Feed Delivery	16.5m HGV	0	1
12	Feed Delivery	16.5m HGV	0	1	38	Carcass Collection	Box Van	1	1
13						Feed Delivery	16.5m HGV	1	1
14	Feed Delivery	16.5m HGV	1	1	39	Feed Delivery	16.5m HGV	0	1
15					40	Catching Gang	Minin Bus	0	1
16	Feed Delivery	16.5m HGV	0	1		Bird Removal (final clearance)	16.5m HGV	0	10
17	Carcass Collection	Box Van	1	1	41	Catching Gang	Mini Bus	1	1
18	Feed Delivery	16.5m HGV	1	1		Bird Removal (final clearance)	16.5m HGV	9	10
19					42	Carcass Collection	Box Van	1	1
20	Feed Delivery	16.5m HGV	0	1	43	Manure Removal	Articulated HGV	4	9
21					44	Washing Gang	Mini Bus	1	1
22	Feed Delivery	16.5m HGV	1	1	45				
23					46	Shavings Delivery	16.5m HGV	1	1
24	Feed Delivery	16.5m HGV	0	1	47	Dirty Water Removal	Tanker	2	4
	Carcass Collection	Box Van	1	1	48	Chick Crumb	16.5m HGV	1	2
25	Feed Delivery	16.5m HGV	0	1	49				
26	Feed Delivery	16.5m HGV	1	1	50				
27	Feed Delivery	16.5m HGV	0	1	51				

5.4 Transport vehicle operation

Table 1 provides the frequency and type of commercial vehicles over a single flock cycle for both the existing and proposed enlarged poultry development. In total the proposed poultry development expansion will result in an increase in the number of commercial vehicles per flock cycle from the existing 41 (82 movements) to 81 (162 movements). There will be 7.2 flocks per annum.

Though there will be an increase in the overall number of commercial of vehicles over a flock cycle, there will be no increase in the number of vehicles within any 1hr period i.e., there will be no change in the frequency of vehicles visiting the site during a BS4142 assessment period (1hr during the day and 15-minutes during the night).

The majority of transport movements will only occur during the working day (07:00 – 20:00hrs). However, in order to avoid stressing the birds catching is typically undertaken during the night. Loading/unloading of the HGVs will be undertaken using an electric forklift on the concrete apron at the centre of the enlarged poultry development.

5.5 Derivation of aggregate Specific Level

The individual noise level of each noise source has been calculated at Dwellings A and B; Figure 1. The following corrections have been applied to the source noise data:

- **Directivity correction (extract fans only):** correction to convert the fan noise data from the manufacturers stated level at 45° lateral to 90° lateral (the propagation angle for the assessed dwellings), determined using the corrections given in Duct Directivity Index Applications (Day H. Hansen C & Bennett B, Acoustics Australia 96 Vol. 37 December (2009) No. 3). For the calculation a frequency spectra has been used
- **Reflections (extract fans only):** 3dB added to account for reflections off the poultry shed roof
- **Attenuators:** Atmosphere side attenuators fitted to each extract fan (existing and proposed) that meet the insertion losses given in Table 2.

Table 2. Insertion loss for atmosphere side attenuators on each extract fan; Figure 2

Octave Band Centre Frequency			
63Hz	125Hz	250Hz	500Hz
3	5	9	13

- **Distance correction:** 20 x log (d_1/d_0), where d_1 = distance between receptor and the proposed extract fan and d_0 = reference distance.
- **Shielding attenuation:** Where the line of sight between the noise source and dwelling is fully blocked by a solid barrier 10dB shielding correction has been applied in accordance with BS5228-1 2009.
- **Ground absorption correction:** ISO 9613-2: Attenuation of sound during propagation

$$A_{gr} = 4.8 - (2h_m/d)[17 + (300/d)]$$

Where,

h_m = mean height of the propagation path above ground

d = distance from source to receptor

In accordance with ISO 9613-2 the ground absorption correction is assumed to be zero when the line of sight of the noise source is partially or fully blocked by a solid body (i.e. when a shielding correction is applicable)

- **Atmospheric attenuation:** ISO 9613-2: Attenuation of sound during propagation outdoors, Formula 8:

$$A_{atm} = \alpha d/100$$

Where: α = is the atmosphere attenuation coefficient for a temperature of 10°C and 70% relative humidity, d = distance from source to receptor

In accordance with ISO 9613-2 the attenuation at 500Hz has been used as only the dB(A) value of the extract fans are known

- **On-time correction:** The following on-times have been used:
  - Extract fans: it has been assumed that the fans are operating continuously and consequently no 'on-time' correction has been applied
  - Transport movements:
    - Day (over any 1-hour period): 45-minutes for loading/unloading and 2 minutes for manoeuvring
    - Night (over any 15-minute period): 15-minutes for loading/unloading and 2 minutes for manoeuvring

Tables B1 – B3, Appendix B provide the full calculations with the resultant aggregate Specific Levels at the Dwellings A and B.

5.6 Derivation HGVs access road movements Specific Level

The Specific Level of HGV movements on the access road have been calculated using:

$$L_{Aeq(T)} = SEL - 20 \times Log((d_1/d_0) - A_{gnd} - A_{atmos} + 10 \times Log(N) - 10 \times Log(T)$$

Where,

SEL = Sound Exposure Level; measured level as given in Table B3
d_1 = distance between receptor and the noise source
d_0 = measurement distance from the noise source (5m)
A_{gnd} = ground absorption correction as detailed is section 5.5
A_{stmos} = atmospheric attenuation as detailed is section 5.5
N = number of HGV passes in time period T; 4/hr during the day (arriving and departing) and 1 with a 15-minute night assessment period
T = Time period in seconds; 3600 seconds during the day/evening periods and 900 seconds during the night

The calculation of the Specific Levels are given in Table B4, Appendix B.

5.7 Rating Level

To establish the Rating Levels the following BS4142 character corrections have been applied to the established Specific Levels.

- **Extract fans:**
  - Tonality: 0dB; measurements of in-situ Fancom fans at other poultry sites confirm that they are not tonal according to BS412's objective assessment methodology
  - Impulsivity: 0dB; The proposed extract fans will not contain an impulsive noise element such as bangs or a very sudden jump in sound output due to quick start-up/change in fan speed.
  - Intermittency: 0dB; the starting/stopping of individual fans will not be readily distinctive against the residual noise environment and consequently an intermittency penalty is not applicable
  - Other: 3dB; though no 'other' noise characteristics of the fans are expected, as a precaution measures a 3dB penalty has been applied

- **Stock collection/delivery**
  - Tonality: 0dB; in-house measurements confirm that stock collections/deliveries are not tonal.
  - Impulsivity: 6dB; the use of a forklift has the potential to generate 'highly perceptible' impulsive noise. Note that we have observed that with careful

operation of the forklift (i.e., slowing loading crates) impulsive noise can be minimised.

- Intermittency: 3dB; stock collections and HGV movements will be intermittent.
- Other: 0dB; no 'other' noise characteristics are expected/have been identified

As is standard practice, the total character corrections have been capped at 6dB

Note that it is a bit of a grey area with regard to the suitability of BS4142 assessments for determining the impact of transport movements on access roads. As a robust approach however, we have included HGV movements on the access road.

The resultant aggregate Rating Levels are provided in Table 3.

5.8 Assessment Level

We define Assessment Level = RL – min L_{A90} dB, where:

RL = Rating Level, dB(A)

L_{A90} dB = the typical background noise level, L_{A90}, derived from the noise survey data

Table 3 provides the resultant Assessment Levels at Dwellings A and B.

Table 3. Typical background and calculated Rating and Assessment Levels at Dwellings A and B; Figure 1

Noise source	Dwelling	100% ridge extract fans operating			50% ridge extract fans operating			25% ridge extract fans operating		
			Day: 07:00 - 20:00hrs			Evening : 20:00 - 23:00hrs			Night : 23:00 - 07:00hrs	
		[A] Rating Level, dB	[B] Typical L_{A90} dB	[A] - [B] Assessment Level, dB	[C] Rating Level, dB	[D] Typical L_{A90} dB	[C] - [D] Assessment Level, dB	[E] Rating Level, dB	[F] Typical L_{A90} dB	[E] - [F] Assessment Level, dB
Extract fans	A	24	33	-9	21	27	-6	18	27	-9
	B	29	33	-4	26	27	-1	24	27	-3
Loading HGVs	A	23	33	-10	N/A			26	27	-1
	B	29	33	-4	N/A			32	27	5
HGVs on access	A	18	33	-15	N/A			18	27	-9
	B	23	33	-10	N/A			23	27	-4
Aggregate	A	27	33	-6	21	27	-6	18	27	-9
	B	33	33	0	26	27	-1	33	27	6

As can be seen the highest calculated Assessment Levels during the day and evening are:

- Extract fans: -1dB
- Transport activities within the concrete aprons: -4dB
- Transport movements on access road: -10dB
- Aggregate: 0dB

Where the Rating Level is at parity with the typical background noise level (Assessment Level = 0 dB) BS4142 states that the Specific Level will have a low impact; an adverse impact is indicated where the Rating Level is ≥ 5dB and <10dB above the typical background noise level. On this basis that we conclude that the aggregate noise impact according to BS4142 will be **low**.

During the night period (23:00 – 07:00hrs) both the typical background noise levels and extract fan/transport activity Rating Levels at Dwellings A and B are very low. We therefore consider, in accordance with BS4142, that the absolute noise levels at the nearest dwellings during the night are of more relevance in determining the noise impact than the Assessment Levels in this case.

We consider it is reasonable to assume that the occupiers of nearest dwellings will be within their house during the night period. A room with an open window will provide 10 – 15dB sound reduction. Using the lower 10dB reduction the highest noise ingress would be:

- Extract fans: L_{Aeq} 11dB
- Transport activities within the concrete apron: $L_{Aeq,5min}$ 17dB, $L_{Amax,F}$ 45dB

The above ambient noise ingress levels are >10dB below BS8233 L_{Aeq} 30dB noise ingress limits for bedrooms (noise limit applicable to road traffic noise and continuous operating plant).

ProPG: Planning & Noise (2017) provides guidance with regard to maximum noise events and sleep quality. Where individual noise events do not normally exceed 45dB more than 10 times a night within a bedroom ProPG states that this represents a reasonable threshold below which the effects of individual noise events on sleep can be regarded as negligible; the maximum noise ingress levels generated by the transport activities fall below this threshold.

We therefore conclude that during the night both the extract fans and transport activities within will result in a **low** noise impact.

5.9 Site management

Though a low noise impact has been determined for the assessed noise sources, site management will still be important to minimise noise emissions. This should include:

- Drivers of HGVs instructed to avoid leaving engines running or excessive revving of engines.
- Forklift drivers instructed to move stock carefully, avoiding unnecessary scraping and to slowly lift/place crates in order to minimise impact noise
- Maintenance and repair of the concrete apron/access road to ensure that they are as smooth as practicable to minimise impact noise

5.10 Calculation uncertainty

With all calculations there is a level of uncertainty, which in this case we do not expect to be greater than +/-3dB (3dB is a just perceptible change in noise level). This small level of uncertainty is not considered to have any significance to the outcome of the assessment.

The established typical background noise levels are low, being in line with the observed noise environment. No significant variation in the underlying noise environment from that surveyed is expected.

We have measured transport activity noise levels at various poultry and other commercial developments. These have returned results comparable to the source data used in this assessment. We therefore conclude that the source noise data is suitably robust and representative for the purpose of the assessment.

6. Conclusion

The noise emissions and BS4142 Rating Levels of the plant (roof extract fans) and transport activities (stock deliveries and HGVs on the access road) as a result of the proposed enlarged poultry development (Figures 1 and 2) have been determined by calculation (Appendix B).

For the assessment the following mitigation measure have been included:

- attenuators fitted to each extract fan (existing and proposed) that meet the insertion losses given in Table 2
- use of an electric forklift for moving stock

The established aggregate (extract fans + transport activities) Rating Levels during the day and evening in all cases do not exceed the surveyed typical background noise levels of the area. According the BS4142 this indicates a **low** noise impact.

Due to the very low Rating Levels and typical background noise levels during the night the absolute noise emission levels have been assessed to review acceptability; this is in accordance with guidance given in BS4142.

During the night the ambient noise ingress via an open window of both the extract fan and transport activities will be >10dB below BS8233's noise ingress limits for bedrooms (note the limits are applicable to road traffic and continuous operating plant).

The individual maximum noise events generated by the HGVs loading/unloading will result in noise ingress levels via an open window of no greater than $L_{Amax,F}$ 45dB. In accordance with ProPG (2017) this indicates a negligible noise impact with regard to sleep disturbance.

We therefore conclude that during the night the absolute noise levels will result in a **low** noise impact.

Site management with regard to minimising noise emissions has been discussed.

On the basis that the proposed enlarged poultry development, with the implementation of the two identified mitigation measures, will not result in an adverse noise impact at the nearest dwellings, we conclude that on noise grounds it is acceptable.

Table A1. Noise monitor data (free-field)

Start Time	Position 1			Position 2			Start Time	Position 1			Position 2		
	$L_{Amax,F}$ dB	L_{Aeq} dB	L_{A90} dB	$L_{Amax,F}$ dB	L_{Aeq} dB	L_{A90} dB		$L_{Amax,F}$ dB	L_{Aeq} dB	L_{A90} dB	$L_{Amax,F}$ dB	L_{Aeq} dB	L_{A90} dB
13:15	78.9	56.6	38.2				01:30	51.6	39.1	30.4	52.2	38.8	29.0
13:30	79.9	59.6	39.0	64.6	43.2	36.0	01:45	49.5	37.7	32.2	50.4	36.9	30.0
13:45	81.6	60.9	38.2	59.7	44.6	35.5	02:00	81.4	53.2	31.8	59.8	40.3	30.0
14:00	79.5	58.7	38.0	55.0	41.4	34.5	02:15	56.9	39.0	31.0	51.5	38.0	29.5
14:15	79.8	59.9	39.2	56.8	43.5	36.0	02:30	50.3	37.2	32.6	49.5	36.1	31.5
14:30	82.7	61.1	39.6	57.4	44.4	36.5	02:45	48.7	37.7	32.0	49.7	36.8	30.5
14:45	80.3	58.8	38.0	70.0	49.6	34.5	03:00	55.1	38.8	29.6	56.0	37.9	28.0
15:00	81.8	60.1	38.8	59.9	43.4	35.5	03:15	51.5	39.3	29.0	49.2	38.3	28.0
15:15	80.2	61.5	38.0	57.8	44.6	35.0	03:30	57.1	41.4	29.0	56.9	41.2	27.5
15:30	80.2	61.6	37.0	56.6	44.1	34.0	03:45	77.2	49.8	32.2	54.0	40.4	31.5
15:45	84.8	61.8	36.0	63.5	46.2	33.0	04:00	76.6	49.4	35.6	54.3	42.2	35.0
16:00	85.0	59.6	36.4	62.7	44.1	33.0	04:15	61.9	48.2	32.6	60.9	43.6	32.0
16:15	79.8	60.4	40.4	76.0	54.4	37.0	04:30	76.3	52.0	38.8	54.0	43.9	36.5
16:30	79.9	59.2	39.8	59.2	43.1	36.5	04:45	64.3	45.4	36.8	57.7	43.5	35.5
16:45	82.2	61.4	36.6	59.4	44.4	34.5	05:00	80.4	53.6	39.4	58.7	44.6	38.0
17:00	79.4	60.2	38.2	54.4	43.3	35.5	05:15	56.9	46.0	41.6	57.4	45.3	40.5
17:15	83.2	62.7	38.8	59.1	45.8	36.0	05:30	80.1	55.1	42.0	58.6	46.3	40.5
17:30	81.3	61.4	37.2	57.1	43.9	34.5	05:45	86.6	61.7	42.8	67.0	49.2	41.5
17:45	82.8	63.8	37.8	80.9	59.1	35.5	06:00	79.4	58.4	44.4	66.5	48.9	43.0
18:00	80.2	59.3	30.0	57.7	42.3	30.0	06:15	78.8	57.8	43.0	64.2	49.3	42.5
18:15	78.5	58.5	29.6	57.6	42.5	29.5	06:30	84.1	61.9	43.0	59.6	47.1	42.5
18:30	83.1	60.1	32.8	68.2	45.7	33.0	06:45	79.7	60.8	43.2	57.7	45.6	39.0
18:45	79.6	56.5	30.4	62.9	42.7	29.0	07:00	81.8	59.1	41.0			
19:00	79.0	55.3	29.8	57.2	41.0	29.0	07:15	80.8	61.0	41.6			
19:15	87.5	60.0	32.0	64.4	44.9	31.5	07:30	80.8	60.7	41.2			
19:30	82.4	58.0	30.0	58.3	42.2	29.0	07:45	81.5	61.7	38.8			
19:45	79.0	54.7	29.4	56.3	41.0	28.5	08:00	79.7	60.9	38.4			
20:00	80.1	57.1	30.6	57.8	42.2	30.0	08:15	83.5	61.9	37.2			
20:15	83.5	56.9	31.0	59.3	42.5	31.0	08:30	80.7	62.4	37.6			
20:30	82.6	59.6	30.2	62.4	45.2	29.5	08:45	80.3	62.6	37.2			
20:45	80.5	55.8	28.4	58.0	42.4	28.0	09:00	80.1	60.3	37.2			
21:00	76.5	51.9	27.6	54.3	39.4	27.0	09:15	80.4	60.7	37.4			
21:15	81.6	57.2	27.0	59.9	42.4	27.0	09:30	79.7	61.2	38.2			
21:30	81.4	56.9	27.6	59.5	42.9	27.5	09:45	79.2	59.3	38.4			
21:45	75.7	47.3	25.8	54.8	35.6	25.5	10:00	81.3	59.4	35.2			
22:00	81.7	56.6	27.0	59.7	43.1	26.5	10:15	77.9	58.9	36.0			
22:15	79.5	52.2	26.8	58.2	40.2	26.5	10:30	76.6	54.4	36.4			
22:30	81.3	55.6	26.0	59.9	42.3	25.0	10:45	77.3	56.5	35.4			
22:45	83.8	57.9	26.8	63.1	44.0	26.0	11:00	84.2	57.4	32.2			
23:00	45.4	33.6	26.4	47.9	33.4	26.0	11:15	79.3	55.3	34.8			
23:15	81.1	54.4	27.6	67.4	42.4	27.5	11:30	76.7	56.1	33.0			
23:30	76.0	48.5	26.4	52.1	36.5	26.0	11:45	77.4	57.2	36.6			
23:45	81.6	50.8	24.0	57.4	36.8	24.0	12:00	77.9	58.0	39.4			
00:00	41.3	32.2	24.0	40.8	31.6	24.0	12:15	77.1	56.7	36.0			
00:15	82.1	55.0	29.2	59.1	42.1	28.0	12:30	78.8	58.2	33.4			
00:30	45.5	33.3	26.4	46.3	32.4	25.0	12:45	80.0	59.0	34.2			
00:45	47.9	35.7	26.2	47.7	34.9	25.5	13:00	82.3	58.2	34.6			
01:00	48.7	34.2	28.2	50.1	33.7	27.0	13:15	79.3	55.3	33.0			
01:15	48.2	37.1	31.2	48.6	35.1	29.5	13:30	77.7	55.8	34.0			

Table A2. Weather station data

Start Time	Wind Speed, m/s	Temp, °C	Start Time	Wind Speed, m/s	Temp, °C	Start Time	Wind Speed, m/s	Temp, °C	Start Time	Wind Speed, m/s	Temp, °C
13:10	2.2	16.6	19:10	0.0	16.5	01:10	0.0	9.8	07:10	0.0	19.2
13:20	0.0	17.9	19:20	0.0	15.5	01:20	0.0	10.0	07:20	0.0	18.2
13:30	1.1	17.1	19:30	0.0	15.2	01:30	0.0	10.3	07:30	0.0	19.9
13:40	0.9	17.3	19:40	0.0	15.1	01:40	0.0	10.3	07:40	0.0	20.6
13:50	1.5	17.2	19:50	0.0	14.4	01:50	0.0	10.8	07:50	0.0	22.8
14:00	0.6	17.1	20:00	0.0	13.8	02:00	0.0	10.6	08:00	0.0	22.2
14:10	1.5	17.3	20:10	0.0	13.1	02:10	0.0	10.5	08:10	0.0	24.0
14:20	1.6	17.2	20:20	0.0	12.8	02:20	0.0	10.6	08:20	0.8	20.8
14:30	1.8	16.9	20:30	0.0	12.0	02:30	0.0	10.6	08:30	0.7	20.4
14:40	2.0	17.2	20:40	0.0	11.2	02:40	0.0	10.4	08:40	0.0	21.3
14:50	0.0	18.2	20:50	0.0	11.3	02:50	0.0	10.5	08:50	0.0	22.9
15:00	2.2	17.3	21:00	0.0	11.1	03:00	0.0	10.4	09:00	0.0	22.2
15:10	1.2	17.5	21:10	0.0	10.9	03:10	0.0	10.3	09:10	0.7	20.5
15:20	0.3	17.9	21:20	0.0	10.4	03:20	0.0	10.2	09:20	0.0	21.8
15:30	0.7	17.9	21:30	0.0	10.8	03:30	0.0	10.1	09:30	0.0	23.4
15:40	1.3	17.5	21:40	0.0	10.9	03:40	0.0	10.4	09:40	0.0	23.8
15:50	0.0	18.4	21:50	0.0	10.5	03:50	0.0	10.1	09:50	0.9	24.2
16:00	0.4	18.0	22:00	0.0	10.2	04:00	0.0	10.0	10:00	0.0	23.5
16:10	0.7	17.8	22:10	0.0	10.1	04:10	0.0	10.2	10:10	0.0	22.2
16:20	1.9	17.5	22:20	0.0	10.1	04:20	0.0	10.1	10:20	0.0	24.3
16:30	0.8	17.8	22:30	0.0	10.3	04:30	0.0	11.1	10:30	2.0	24.1
16:40	0.6	17.9	22:40	0.0	10.2	04:40	0.0	12.2	10:40	0.0	24.2
16:50	0.0	18.9	22:50	0.0	9.6	04:50	0.0	13.4	10:50	0.0	25.1
17:00	0.8	17.7	23:00	0.0	9.7	05:00	0.0	16.3	11:00	0.0	24.3
17:10	0.5	17.7	23:10	0.0	9.6	05:10	0.0	15.4	11:10	0.0	27.7
17:20	0.0	18.4	23:20	0.0	9.5	05:20	0.0	19.1	11:20	0.0	27.0
17:30	0.4	17.2	23:30	0.0	9.4	05:30	0.0	18.1	11:30	0.8	24.0
17:40	0.0	17.5	23:40	0.0	9.8	05:40	0.0	17.5	11:40	0.0	23.9
17:50	0.6	17.5	23:50	0.0	9.9	05:50	0.0	18.1	11:50	0.0	25.6
18:00	0.5	17.1	00:00	0.0	10.9	06:00	0.0	17.3	12:00	0.0	31.3
18:10	1.0	16.9	00:10	0.0	11.0	06:10	0.0	16.4	12:10	0.0	31.0
18:20	0.0	16.9	00:20	0.0	10.9	06:20	0.0	16.8	12:20	0.0	30.6
18:30	0.0	17.1	00:30	0.0	10.7	06:30	0.0	16.2	12:30	0.0	29.6
18:40	0.0	17.0	00:40	0.0	10.7	06:40	0.0	16.8	12:40	0.0	28.9
18:50	0.0	16.6	00:50	0.0	10.7	06:50	0.0	17.6	12:50	0.0	28.2
19:00	0.0	16.7	01:00	0.0	10.5	07:00	0.0	17.6	13:00	0.0	27.7

Table B1. Calculation of aggregate extract fan noise from existing and proposed poultry units at Dwelling A

Extract fans: Fancom 3680

	Octave Band Centre Frequency, Hz							
	63	125	250	500	1k	2k	4k	dB(A)
[A] Lp at 2m on-axis:	70	68	66	65	66	63	60	70
[B] directivity correction (45° to 90°):	0	1.5	3	5	9	11	18	
[C] Reflection off poultry shed roof:	3	3	3	3	3	3	3	3
[D] generic attenuator, 600mm, 40% free area:	3	5	9	13	15	16	11	
[A] - [B] + [C] - [D] L_p at 2m, 90° lateral:	70	65	57	51	45	39	34	54

Fa	Direct distance, m	Shed 1	Shed 2	Shed 3	Shed 4	Shed 5	Distance correction, dB	Shed 1	Shed 2	Shed 3	Shed 4	Shed 5	Shielding attenuation, dB	Shed 1	Shed 2	Shed 3	Shed 4	Shed 5	Ground absorption, dB	Shed 1	Shed 2	Shed 3	Shed 4	Shed 5	Atmospheric attenuation, dB	Shed 1	Shed 2	Shed 3	Shed 4	Shed 5	Sound pressure level at dwelling, dB	Shed 1	Shed 2	Shed 3	Shed 4	Shed 5
1		379.4	364.8	523.6	511.1	499.9		45.6	45.2	48.4	48.1	48.0		0	0	0	0	0		4.3	4.3	4.4	4.4	4.4		0.7	0.7	1.0	1.0	0.9		3.6	4.0	0.4	0.7	0.9
2		384.6	370.1	529.0	516.6	505.6		45.7	45.3	48.4	48.2	48.1		0	0	0	0	0		4.3	4.3	4.4	4.4	4.4		0.7	0.7	1.0	1.0	1.0		3.5	3.9	0.3	0.5	0.8
3		389.7	375.5	534.5	522.2	511.3		45.8	45.5	48.5	48.3	48.2		0	0	0	0	0		4.3	4.3	4.4	4.4	4.4		0.7	0.7	1.0	1.0	1.0		3.4	3.7	0.2	0.4	0.7
4		394.9	380.9	539.9	527.8	517.0		45.9	45.6	48.6	48.4	48.2		0	0	0	0	0		4.3	4.3	4.4	4.4	4.4		0.8	0.7	1.0	1.0	1.0		3.2	3.6	0.1	0.3	0.5
5		400.1	386.3	545.4	533.4	522.7		46.0	45.7	48.7	48.5	48.3		0	0	0	0	0		4.3	4.3	4.4	4.4	4.4		0.8	0.7	1.0	1.0	1.0		3.1	3.5	0.0	0.2	0.4
6		405.3	391.7	550.9	539.0	528.4		46.1	45.8	48.8	48.6	48.4		0	0	0	0	0		4.3	4.3	4.4	4.4	4.4		0.8	0.7	1.0	1.0	1.0		3.0	3.3	-0.1	0.1	0.3
7		410.5	397.1	556.4	544.6	534.2		46.2	46.0	48.9	48.7	48.5		0	0	0	0	0		4.3	4.3	4.5	4.4	4.4		0.8	0.8	1.1	1.0	1.0		2.8	3.2	-0.2	0.0	0.2
8		415.8	402.6	561.9	550.2	539.9		46.4	46.1	49.0	48.8	48.6		0	0	0	0	0		4.3	4.3	4.5	4.4	4.4		0.8	0.8	1.1	1.0	1.0		2.7	3.0	-0.3	-0.1	0.1
9		421.1	408.1	567.4	555.9	545.7		46.5	46.2	49.1	48.9	48.7		0	0	0	0	0		4.3	4.3	4.5	4.5	4.4		0.8	0.8	1.1	1.1	1.0		2.6	2.9	-0.4	-0.2	0.0
10		426.4	413.6	572.9	561.5	551.4		46.6	46.3	49.1	49.0	48.8		0	0	0	0	0		4.3	4.3	4.5	4.5	4.5		0.8	0.8	1.1	1.1	1.0		2.5	2.8	-0.5	-0.3	-0.1
11		431.8	419.1	578.5	567.2	557.2		46.7	46.4	49.2	49.1	48.9		0	0	0	0	0		4.3	4.3	4.5	4.5	4.5		0.8	0.8	1.1	1.1	1.1		2.3	2.6	-0.6	-0.4	-0.2
12		437.1	424.6	584.0	572.9	563.0		46.8	46.5	49.3	49.1	49.0		0	0	0	0	0		4.4	4.3	4.5	4.5	4.5		0.8	0.8	1.1	1.1	1.1		2.2	2.5	-0.7	-0.5	-0.3
13		442.5	430.2	589.6	578.6	568.7		46.9	46.7	49.4	49.2	49.1		0	0	0	0	0		4.4	4.3	4.5	4.5	4.5		0.8	0.8	1.1	1.1	1.1		2.1	2.4	-0.8	-0.6	-0.4
14		447.9	435.7	595.2	584.2	574.5		47.0	46.8	49.5	49.3	49.2		0	0	0	0	0		4.4	4.4	4.5	4.5	4.5		0.9	0.8	1.1	1.1	1.1		2.0	2.3	-0.9	-0.7	-0.5
15		453.3	441.3	600.8	589.9	580.3		47.1	46.9	49.6	49.4	49.3		0	0	0	0	0		4.4	4.4	4.5	4.5	4.5		0.9	0.8	1.1	1.1	1.1		1.9	2.1	-1.0	-0.8	-0.6
16		458.7	446.9	606.4	595.6	586.1		47.2	47.0	49.6	49.5	49.3		0	0	0	0	0		4.4	4.4	4.5	4.5	4.5		0.9	0.8	1.2	1.1	1.1		1.7	2.0	-1.1	-0.9	-0.7
17		464.2	452.5	612.0	601.4	591.9		47.3	47.1	49.7	49.6	49.4		0	0	0	0	0		4.4	4.4	4.5	4.5	4.5		0.9	0.9	1.2	1.1	1.1		1.6	1.9	-1.2	-1.0	-0.8

	BS4142 character correction	3
Day (07:00 - 20:00hrs): 100% ridge fans operating	Specific Level, dB	21
	Rating Level, dB	24
Evening (20:00 - 23:00hrs): 50% ridge fans operating Note 1	Specific Level, dB	18
	Rating Level, dB	21
Night (23:00 - 07:00hrs): 25% ridge fans operating Note 2	Specific Level, dB	15
	Rating Level, dB	18

Note 1: Assumed only odd numbered fans operating
Note 2: Assumed only 1, 5, 9, 13 & 17 numbered fans operating

Table B2. Calculation of aggregate extract fan noise from existing and proposed poultry units at Dwelling B

Extract fans: Fancom 3680

	Octave Band Centre Frequency, Hz							
	63	125	250	500	1k	2k	4k	dB(A)
[A] Lp at 2m on-axis:	70	68	66	65	66	63	60	70
[B] directivity correction (45° to 90°):	0	1.5	3	5	9	11	18	
[C] Reflection off poultry shed roof:	3	3	3	3	3	3	3	3
[D] generic attenuator, 600mm, 40% free area:	3	5	9	13	15	16	11	
[A] - [B] + [C] - [D] L_p at 2m, 90° lateral:	70	65	57	51	45	39	34	54

Fa	Direct distance, m						Distance correction, dB						Shielding attenuation, dB						Ground absorption, dB						Atmospheric attenuation, dB						Sound pressure level at dwelling, dB				
		Shed						Shed						Shed						Shed						Shed						Shed				
		1	2	3	4	5		1	2	3	4	5		1	2	3	4	5		1	2	3	4	5		1	2	3	4	5		1	2	3	4	5
1		305.4	279.2	304.5	275.0	245.7		43.7	42.9	43.7	42.8	41.8		0	0	0	0	0		4.2	4.1	4.2	4.1	4.0		0.6	0.5	0.6	0.5	0.5		5.8	6.7	5.8	6.8	8.0
2		302.6	276.1	304.7	275.2	245.9		43.6	42.8	43.7	42.8	41.8		0	0	0	0	0		4.1	4.1	4.2	4.1	4.0		0.6	0.5	0.6	0.5	0.5		5.9	6.8	5.8	6.8	8.0
3		299.9	273.2	305.0	275.6	246.3		43.5	42.7	43.7	42.8	41.8		0	0	0	0	0		4.1	4.1	4.2	4.1	4.0		0.6	0.5	0.6	0.5	0.5		6.0	6.9	5.8	6.8	7.9
4		297.3	270.4	305.4	276.0	246.9		43.4	42.6	43.7	42.8	41.8		0	0	0	0	0		4.1	4.1	4.2	4.1	4.0		0.6	0.5	0.6	0.5	0.5		6.1	7.0	5.8	6.8	7.9
5		294.8	267.7	306.0	276.7	247.6		43.4	42.5	43.7	42.8	41.9		0	0	0	0	0		4.1	4.1	4.2	4.1	4.0		0.6	0.5	0.6	0.5	0.5		6.1	7.1	5.8	6.8	7.9
6		292.4	265.1	306.7	277.4	248.4		43.3	42.4	43.7	42.8	41.9		0	0	0	0	0		4.1	4.0	4.2	4.1	4.0		0.6	0.5	0.6	0.5	0.5		6.2	7.2	5.7	6.7	7.8
7		290.2	262.6	307.4	278.3	249.4		43.2	42.4	43.7	42.9	41.9		0	0	0	0	0		4.1	4.0	4.2	4.1	4.0		0.6	0.5	0.6	0.5	0.5		6.3	7.3	5.7	6.7	7.8
8		288.0	260.2	308.4	279.3	250.6		43.2	42.3	43.8	42.9	42.0		0	0	0	0	0		4.1	4.0	4.2	4.1	4.0		0.5	0.5	0.6	0.5	0.5		6.4	7.4	5.7	6.7	7.8
9		286.0	258.0	309.4	280.5	251.9		43.1	42.2	43.8	42.9	42.0		0	0	0	0	0		4.1	4.0	4.2	4.1	4.0		0.5	0.5	0.6	0.5	0.5		6.4	7.5	5.7	6.6	7.7
10		284.1	255.9	310.5	281.7	253.3		43.0	42.1	43.8	43.0	42.1		0	0	0	0	0		4.1	4.0	4.2	4.1	4.0		0.5	0.5	0.6	0.5	0.5		6.5	7.6	5.6	6.6	7.7
11		282.3	253.9	311.8	283.1	254.9		43.0	42.1	43.9	43.0	42.1		0	0	0	0	0		4.1	4.0	4.2	4.1	4.0		0.5	0.5	0.6	0.5	0.5		6.6	7.6	5.6	6.5	7.6
12		280.6	252.1	313.2	284.7	256.6		42.9	42.0	43.9	43.1	42.2		0	0	0	0	0		4.1	4.0	4.2	4.1	4.0		0.5	0.5	0.6	0.5	0.5		6.6	7.7	5.5	6.5	7.5
13		279.0	250.4	314.6	286.3	258.4		42.9	42.0	43.9	43.1	42.2		0	0	0	0	0		4.1	4.0	4.2	4.1	4.0		0.5	0.5	0.6	0.5	0.5		6.7	7.8	5.5	6.4	7.5
14		277.6	248.8	316.2	288.1	260.4		42.8	41.9	44.0	43.2	42.3		0	0	0	0	0		4.1	4.0	4.2	4.1	4.0		0.5	0.5	0.6	0.5	0.5		6.7	7.8	5.4	6.4	7.4
15		276.3	247.4	318.0	290.0	262.5		42.8	41.8	44.0	43.2	42.4		0	0	0	0	0		4.1	4.0	4.2	4.1	4.0		0.5	0.5	0.6	0.6	0.5		6.8	7.9	5.4	6.3	7.3
16		275.1	246.1	319.8	292.0	264.7		42.8	41.8	44.1	43.3	42.4		0	0	0	0	0		4.1	4.0	4.2	4.1	4.0		0.5	0.5	0.6	0.6	0.5		6.8	7.9	5.3	6.2	7.2
17		274.1	245.0	321.7	294.1	267.0		42.7	41.8	44.1	43.3	42.5		0	0	0	0	0		4.1	4.0	4.2	4.1	4.1		0.5	0.5	0.6	0.6	0.5		6.9	8.0	5.3	6.2	7.1

	BS4142 character correction	3
Day (07:00 - 20:00hrs): 100% ridge fans operating	Specific Level, dB	26
	Rating Level, dB	29
Evening (20:00 - 23:00hrs): 50% ridge fans operating Note 1	Specific Level, dB	23
	Rating Level, dB	26
Night (23:00 - 07:00hrs): 25% ridge fans operating Note 2	Specific Level, dB	21
	Rating Level, dB	24

Note 1: Assumed only odd numbered fans operating
Note 2: Assumed only 1, 5, 9, 13 & 17 numbered fans operating

Table B3. Calculation of HGVs loading/unloading BS4142 Assessment Level at Dwellings A and B					
Source noise levels		L_{Aeq} dB		$L_{Amax,F}$ dB	
	HGV manoeuvring at 5m	72		80	
	HGV loading/unloading using an electric forklift at 5m	63		84	
Dwelling		A		B	
Noise Event		HGV manoeuvring	HGV loading/ unloading using electric forklift	HGV manoeuvring	HGV loading/ unloading using electric forklift
Corrections	Distance, m	479	479	258	258
	Distance correction, dB	39.6	39.6	34.3	34.3
	Shielding correction, dB	0	0	0	0
	Ground absorption, dB	4.6	4.6	4.4	4.4
	Atmospheric attenuation, dB	0.9	0.9	0.5	0.5
BS4142 Specific Level					
Day Period Specific Level	On time, mins	2	45	2	45
	On time correction, dB	-14.8	-1.2	-14.8	-1.2
	Specific Level, dB	12.1	16.6	18.0	22.5
Night Period Specific Level	On time, mins	2	15	2	15
	On time correction, dB	-8.8	0.0	-8.8	0.0
	Specific Level, dB	18.1	17.9	24.0	23.8
BS4142 Rating & Assessment Level					
	BS4142 character corrections	3	6	3	6
Working Day Rating Level, dB	Noise event Rating Level	15	23	21	29
	Aggregate Rating Level	23		29	
Night Rating Level, dB	Noise event Rating Level	21	24	27	30
	Aggregate Rating Level	26		32	
Noise ingress via open window (assumed 10dB sound insulation)					
	$L_{Aeq,15minutes}$ dB	11		17	
	$L_{Amax,F}$ dB	39		45	

Table B4. Calculation of Rating & Assessment Levels of HGVs on the access road			
		Dwelling A	Dwelling B
	HGV pass SEL dB	87	87
	Distance to dwelling, m	380	210
	Distance correction, dB	37.6	32.5
	Shielding attenuation, dB	0	0
	Ground absorption, dB	4.6	4.4
	Atmospheric attenuation, dB	0.7	0.4
Day (07:00 - 20:00hrs)	No. HGVs movments per hr.	4	4
	No. HGVs correction, dB	6	6
	Time correction, dB	35.6	35.6
	Specific Level, dB	14.6	20.2
Night (23:00 - 07:00hrs)	No. HGVs movments per hr.	1	1
	No. HGVs correction, dB	0	0
	Time correction, dB	29.5	29.5
	Specific Level, dB	14.6	20.2
BS4142 character correction	Tonality	0	0
	Impulsivity	0	0
	Intermittency	3	3
	Other	0	0
Rating Level, dB	Day	18	23
	Night	18	23
Day (07:00 - 20:00hrs)	Typical L_{A90}	33	33
	Assessment Level	-15	-10
Night (23:00 - 07:00hrs)	Typical L_{A90}	27	27
	Assessment Level	-9	-4

AGRICULTURAL FANS

Fancom fans are specially developped for the use in livestock buildings and they have an IP66 classification. Fancom fans have an aluminium motor housing, synthetic or coated steel housing and synthetic fan blades. The fans combine high air flow capacity with low energy consumption and noise levels. The low energy consumption and superb controllability mean that the motors run at a lower temperature - which also benefits the durability.

Complete fan

The complete fan from Fancom is extremely easy to mount either in or on a wall. The fans in the 35 to 56cm diameter series are supplied in a robust synthetic housing. Fans with diameters of 63, 71 and 80 cm are solidly housed in steel . The coated housing prevents corrosion.

Modular fan

To mount fans underneath a chimney module Fancom's fans are supplied in a robust, shape retaining synthetic module with the Fancom quick mounting system. Fancom measuring and damping units complete the ventilation system. The control valve and air flow transmitter have been built into the same module which can be directly connected to the fan module.

Central exhaust systems

Fancom has specially developed the 3480P and 3480D fans for central air exhaust systems and other installations which operate with high counter pressures. The maximum counter pressures are 270Pa, resp. 320Pa. This fan is notable for it large air displacement capacity. Noise production and energy consumption are, however, kept to a minimum.

	Diameter	Voltage (+/- 10%)	Revolutions	Motor current (50Hz - Imax)	Power (50Pa)	Axis power (50Pa)	Noise level (3Pa backwall)		Control	Airflow in m3/h Pressure in Pa (Pascal)								
TYPE	cm	V	RPM	A	W	W	dBA|2m	dBA|7m		0	30	50	100	150	200	250	300	Débit max/pression max
1435	35	200-240	1404	0.96	211	111	61	50	T.E	3940	3580	3250						3660 / 78
1440	40	200-240	1347	1.19	273	165	64	53	T.E	5040	4630	4250						5300 / 92
1445	45	200-240	1326	1.6	372	235	65	54	T.E	6690	6140	5760	4400					4310 / 102
1450	50	200-240	1317	2.08	474	314	66	55	T.E	8650	7900	7500	5780					5710 / 102
1450P	50	200-240	1381	2.99	720	566	69	58	T.E	9720	9250	8970	7950					6900 / 126
1456	56	200-240	1368	3.16	741	569	70	59	T.E	12060	11260	10830	9250					8520 / 113
1656	56	200-240	954	2.23	486	378	66	55	T.E	10360	9250	8340						6920 / 67
1463	63	200-240	1381	3.1	721	566	68	57	T.E	14600	13200	12380	9070					8660 / 101
1671	71	200-240	901	4.19	924	635	68	57	T.E	18030	16410	15320						11620 / 92
1680	80	200-240	903	4.64	1091	756	69	58	T.E	20750	19050	17820	14100					13020 / 113
1692	92	200-240	905	4.64	1068	778	68	57	T.E	24400	21840	19940	13767					13340 / 103
3435	35	Y400 Δ230	1428	Y0.94 Δ0.99	157	116	61	50	F	3710	3400	3140						2520 / 66
3440	40	Y400 Δ230	1376	Y0.42 Δ0.73	227	175	64	53	F	5120	4750	4370						3430 / 96
3445	45	Y400 Δ230	1297	Y0.55 Δ0.95	312	220	65	54	F	6940	6510	5470						4020 / 99
3450	50	Y400 Δ230	1304	Y0.72 Δ1.25	414	305	66	55	F	8240	7530	7010	5440					5240 / 105
3456	56	Y400 Δ230	1364	Y1.17 Δ2.03	667	567	70	59	F	11830	10920	10200	8490					7700 / 120
3656	56	Y400 Δ230	936	Y1.05 Δ1.82	384	322	65	54	F	10190	9080	8030						6690 / 65
3463P	63	Y400 Δ230	1439	Y2.75 Δ4.76	1361	1224	74	63	F	17530	16740	16270	15150	13930	12370	10240		10240 / 250
3663	63	Y400 Δ230	951	Y1.38 Δ2.56	687	512	67	56	F	14180	12920	12080						9000 / 97
3671	71	Y400 Δ230	949	Y1.69 Δ3.27	864	741	69	58	F	17970	16500	15450	12190					11320 / 110
3680	80	Y400 Δ230	941	Y2.03 Δ3.52	1047	850	70	59	F	22220	20555	19380	15910					14070 / 122
3480P	80	Y400 Δ230	1429	Y4.66 Δ7.93	2299	2150	77	66	F	28650	27582	26870	25290	23580	21225	18655		17440 / 268
3480D	80	Y400 Δ230	1438	Y4.26 Δ7.38	1981	1520	69	58	F	21810	21130	20810	19990	19050	17920	16495	14770	11050 / 380
3692	92	Y400 Δ230	936	Y2.16 Δ3.74	1033	859	68	57	F	24970	23570	20840	15470					14110 / 110
3692P	92	Y400 Δ230	929	Y3.64 Δ6.3	1850	1324	71	60	F	28080	26600	25580	22810	17820				15200 / 167