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NOISE IMPACT ASSESSMENT

Acoustics Report 2415/R01
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1. Introduction

This acoustic report provides a noise impact assessment with regard to the proposed change of use of an agricultural building at Fenn Lane Farm, Nuneaton to aircraft maintenance and the associated intensification of use of the adjacent existing private airstrip; Figure 1.

The report is divided into the following sections:

- Section 2: Overview of the Development
- Section 2: Noise Criteria
- Section 3: Noise Survey & Analysis
- Section 4: Noise Impact Assessment
- Section 5: Conclusion
- Appendix A: Survey Data

2. Overview of the Development

The proposal is for the change of use of an agricultural building to aircraft maintenance and the intensification of use of the adjacent existing private airstrip; Figure 1.

Aircraft will enter/leave the building via a new 20m wide entrance on the south gable end, with a new grass strip link through the existing earth bund to the airstrip.

The aircraft maintenance company, AeroTech, have informed us they look after 80 light aircraft per year. 75% of the these are serviced once a year; the other 25% are flying school aircraft, which are serviced once a month.

The aircraft maintenance activities undertaken within the building will be akin to those of a typical car garage, using standard workshop equipment such as compressors and small power tools.

On average there will be 4-5 AeroTech related take offs/landings from the airstrip per a week.

The working hours of AeroTech are 09:00 – 17:00hrs Monday to Friday.

The nearest private dwellings, labelled A and B in Figure 1, are approximately 615m and 505m respectively from the south gable end of the proposed change of use of the building. There will be an unobstructed noise path between the airstrip/proposed south gable entrance and Dwellings A and B.

The noise emissions associated with the proposed scheme are in context of the existing use of the private airstrip and the activities of the car garage adjacent to the proposed change of use building.

Figure 1. Aerial view (source: ww.bing.com) showing proposed change of use building, existing airstrip, monitor positions and nearest private dwellings

Photo 1. View of south and west elevations of proposed change of use building

Photo 2. View of light aircraft taking off from the existing airstrip

Figure 2. Photos of proposed change of use building and surveyed light aircraft taking off from the existing airstrip

3. Noise Criteria

The noise emissions as a result of the proposed scheme fall into two categories:

- *Workshop activity and equipment:* Assessed in accordance with BS4142:2014+A1:2019
- *Plane movements, including landing and takeoff:* assessed with reference to guidance given by the Civil Aviation Authority, the Department of Transport's 'Air Navigation Guidance (2017)' and the Institute of Environmental Management & Assessment 'Guidelines for Environmental Noise Impact Assessment (2014)'

It should be highlighted that Section 79(6) of the Environmental Protection Act 1990, as amended, specifically exempts aircraft noise from the general noise nuisance controls which exist under that legislation. This is the case, irrespective of whether an airfield in question is small and unlicensed or a major UK airport.

3.1 BS4142:2014+A1:2019

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). 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 BS4142:2014, 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

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)

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

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

3.2 Civil Aviation Authority (CAA)

The CAA provides a number of studies and documents covering the assessment and impact of aircraft noise.

For the assessment of aircraft noise CAA provides the following measurement parameters:

- Maximum sound level ($L_{Amax,S}$): The simplest measure of a noise event such as the over-flight of an aircraft is the maximum sound level recorded. The measurements of L_{Amax} should be undertaken with the meter set to the 'slow' response. L_{Amax} measurements do not take into account the duration of the noise event and therefore cannot be taken to be representative of the disturbance due to the entire noise event. However, they are useful in reviewing potential sleep disturbance during the night (WHO advises that regular maximum noise levels above L_{Amax} 42dB can lead to sleep disturbance). They are also often reported as they are easier to measure and are considered simpler for the lay person to understand.
- Sound Exposure Level (SEL): The SEL of an aircraft noise event is the sound level of a one second burst of steady noise that contains the same total A-weighted sound energy as the whole event. In other words, it is the dBA value that would be measured if the entire event energy were uniformly compressed into a reference time of one second.

  Most of the sound energy recorded from an aircraft is concentrated in the highest sound levels. For a constant level sound event, the SEL increases by 3 dB if the duration is doubled, because the energy is doubled. As most aircraft noise events have durations significantly greater than the reference time of one second, their SEL values are invariably numerically greater than L_{Amax} values, typically by around 10 dB.
- L_{Aeq}: L_{Aeq} can be defined as the hypothetical steady sound, which contains the same sound energy as the actual variable sound, over a defined measurement period, T. As aircraft noise is composed of individual noise events, L_{eq} can be expressed in terms of the number of events N that occur during the measurement period T, and their logarithmic average Sound Exposure Level (SEL): L_{eq} = Average SEL + 10 x log (N) – 10 x log10 (T)
- Perceived Noise Level (PNL): The PNL is used to capture the complex signature of aircraft noise and enable a review of potential for 'annoying' characteristics. It's use is typically limited to the review of jet and propeller driven heavy aircraft and heavy helicopters.

3.3 Department for Transport

The Department of Transport's 'Air Navigation Guidance (2017)' document advises that for the purposes of assessing noise impacts of airspace changes, the government has set threshold for LOAEL (Lowest Observed Adverse Effect Level: This is the level above which adverse effects on health and quality of life can be detected) of $L_{Aeq,16hr}$ 51dB for daytime noise. Note that we have been informed that these threshold levels are for the aircraft generated noise alone i.e., they do not include the contribution of environmental noise.

3.4 IEMA Guidelines for Environmental Noise Impact Assessments

The Institute of Environmental Management & Assessment (IEMA) document Guidelines for Environmental Noise Impact Assessment (2014) provides descriptors for noise effects based on the change in sound level and sensitivity of the receptor; Table 1.

Table 1. IEMA guideline effect descriptors	
Effect Descriptor	Change in sound level
Very substantial	Greater than 10 dB L_{Aeq} change in sound level perceived at a receptor of great sensitivity to noise
Substantial	Greater than 5 dB L_{Aeq} change in sound level at a noise-sensitive receptor, or a 5 to 9.9dB L_{Aeq} change in sound level at a receptor of great sensitivity to noise
Moderate	A 3 to 4.9 dB L_{Aeq} change in sound level at a sensitive or highly sensitive noise receptor, or a greater than 5 dB L_{Aeq} change in sound level at a receptor of some sensitivity
Slight	A 3 to 4.9 dB L_{Aeq} change in sound level at a receptor of some sensitivity
Non/Not significant	Less than 2.9 dB L_{Aeq} change in sound level and/or all receptors are of negligible sensitivity to noise or marginal to the some of influence of the proposals

4. Noise Survey & Analysis

A noise survey has been undertaken to establish the general environmental noise at the nearest dwellings and the noise emissions generated by a light aircraft using the existing airstrip.

Note that the single propeller light aircraft used for the survey was piloted by AeroTech and represents the typical type of plane that will use the airstrip.

- **Survey dates**: Tuesday 13th August 2024
- **Weather;** Table A2, Appendix A:
  - Precipitation: Dry
  - Wind Speed: Highest recorded wind speed of 3m/sec, with a median of 1.5m/s
  - Wind direction: S
  - The weather conditions will not have adversely affected the noise measurements.
- **Noise monitor locations:** With the microphones attached to tripods, the noise monitors were located at Positions 1 - 3 as shown in Figure 1
- **Weather station location:** Weather station, mounted on a tripod, located at Position 1; Figure 1
- **Equipment:**
  - Weather Station: Kestrel type 5000
  - Noise monitors: Brüel & Kjær Type 2238 (Positions 1 & 2) and Brüel & Kjær Type 2260 (Position 3)
- **Monitor configuration:**
  - Weather station: Configured to measure the average wind speed and temperature over consecutive 10-minute periods
  - Noise Monitors: configured to measure consecutive 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 - A3, Appendix A.

The noise levels obtained at Positions 1 and 2 are considered to be representative to those that will occur at Dwellings A and B respectively.

4.1 Survey observations

- *General environmental noise:* The dominant noise source affecting Position 1 was noted to be car passes on the adjacent road. At Position 2, the car generated noise levels were significantly lower; this location however was exposed to intermittent agricultural related activity noise from the adjacent farm.

  Both measurement positions were exposed to numerous overflights of light aircraft, helicopters and commercial jets.

- *Light aircraft noise:* The durations of the assessed plane's landing, taxiing and takeoffs were short, at around 1minute each. The noise emissions were not considered to be tonal. Once in the air, the noise levels generated by the plane were noted to be signifcantley lower.

4.2 General environmental noise at Positions 1 and 2

Figures 3 and 4 show the variation in the consecutive 15-minute measurements of the maximum ($L_{Amax,F}$), ambient (L_{Aeq}) and background (L_{A90}) noise levels obtained at Positions 1 and 2 respectively.

As can be seen, there is limited variation in both the ambient and background noise levels at both measurement positions. The noise levels obtained at Position 1 are consistently higher than the corresponding values recorded at Position 2. This will be due to the greater impact of road traffic due to the measurement's proximity to the road.

Reviewing the survey data, the general ambient and typical background noise levels have been established as:

- Position 1 (represents Dwelling A):
  - L_{Aeq} 56dB
  - L_{A90} 45dB
- Position 2 (represents Dwelling B):
  - L_{Aeq} 43dB
  - L_{A90} 34dB

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

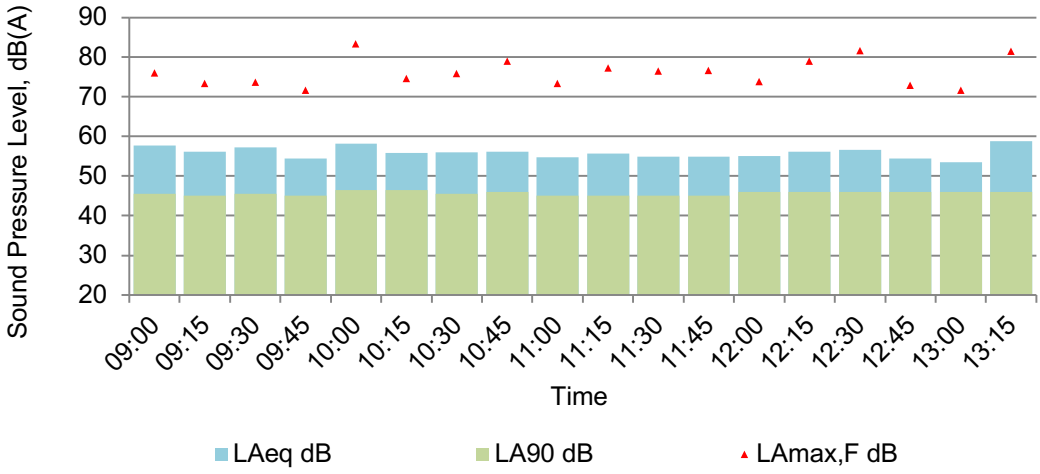
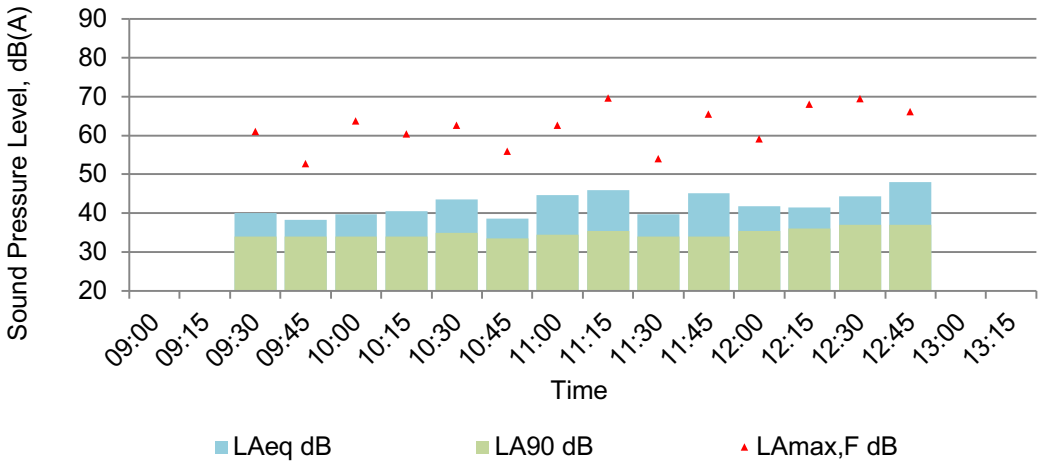


Figure 4. Position 2 noise monitor data (free-field)



4.3 Aircraft noise emissions

The aircraft generated noise emissions from the use of the airstrip consists of landing, taxiing and takeoff. Table 2 provides the highest measured noise level for each of these stages obtained at Position 3 (approximately 15m from the centre of the airstrip, and level with the takeoff/landing location). As observed during the survey, the duration of each of these stages is approximately 1 minute.

Table 2. Highest measured plane noise emissions at Position 3

	$L_{Amax,F}$ dB	L_{Aeq} dB	SEL
Landing	92	81	99
Takeoff	88	77	92
Taxiing	87	79	98

Figure 5 provides the 1/3 octave band measurements of each stage. As can be seen, in each case there is an identifiable peak at 80Hz. However, using the BS4142 objective assessment methodology, the frequency spectrum is not considered to be tonal.

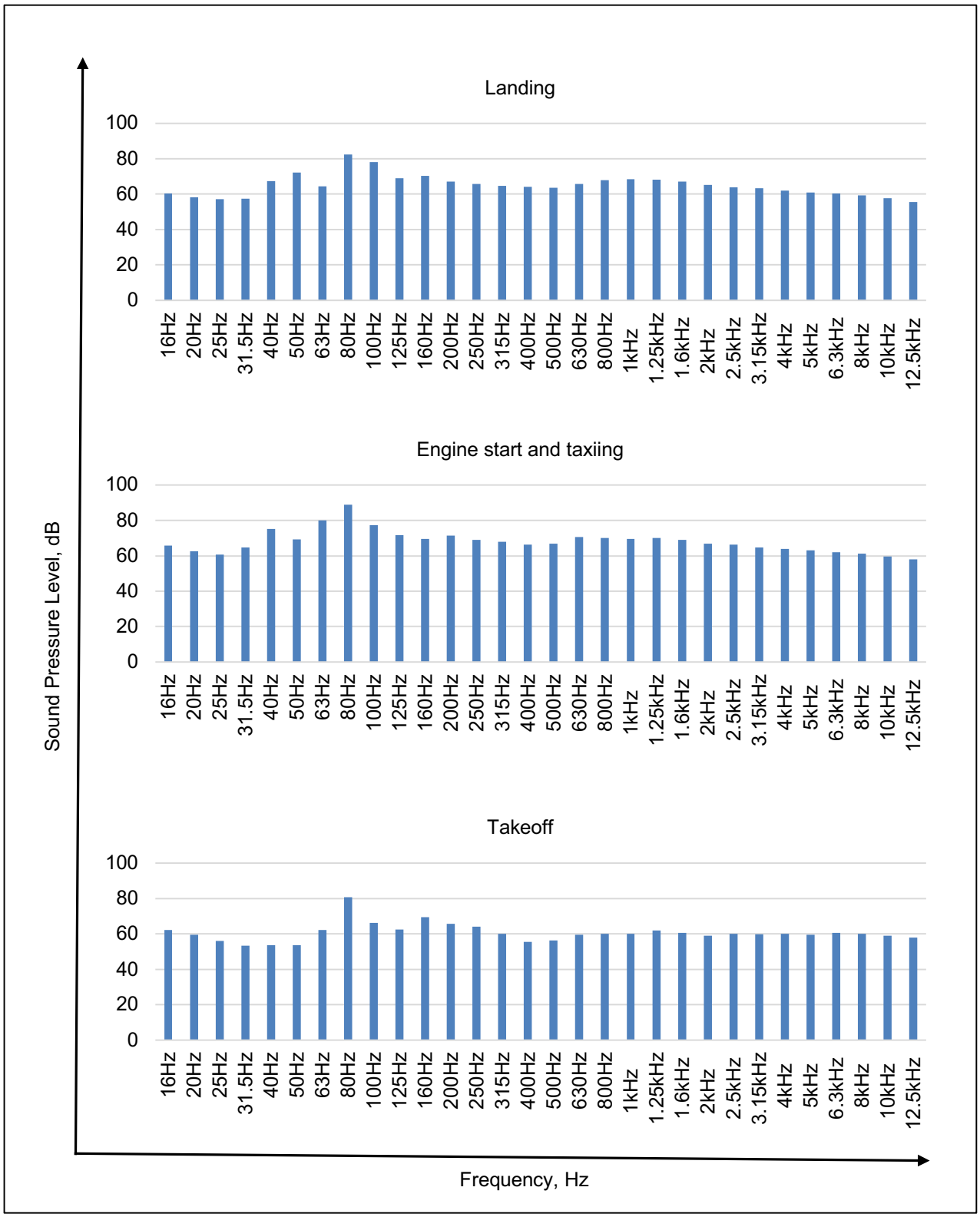


Figure 5. 1/3 octave band measurements at Position 3 of plane movements

Figure 6. Positions 1 - 3 consecutive L_{eq} measurements

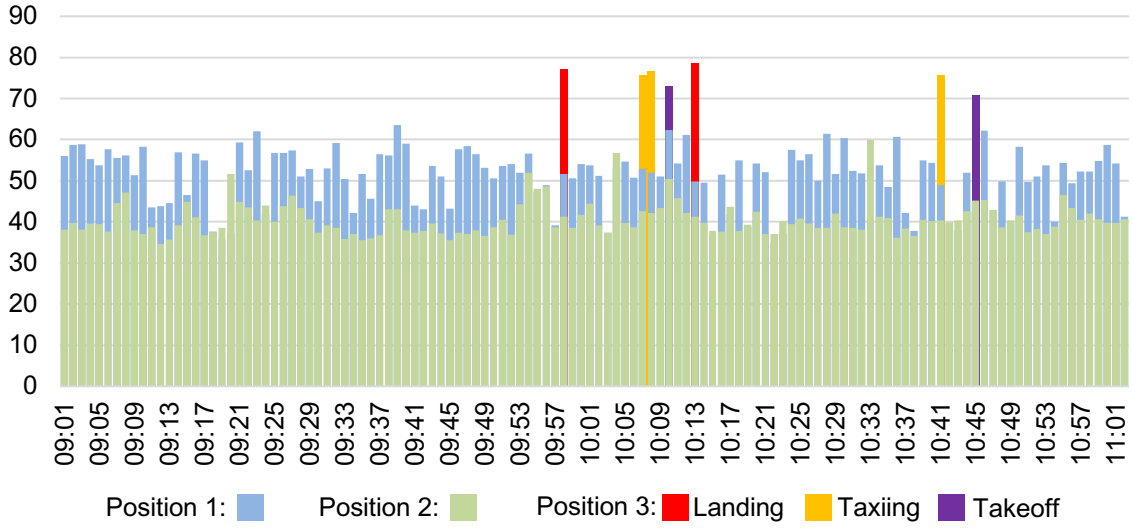


Figure 6 provides shows the consecutive 1-minute L_{eq} measurements obtained at Positions 1 and 2 together with the measurements made at Position 3 during the planes landing, taxiing and takeoff events at the airstrip.

As can be seen in Figure 6, there is no identifiable correlation or increase in the noise levels obtained Positions 1 and 2 during the plane movements. This indicates that the noise emissions from the aeroplane's landings, taxiing and takeoff at the airstrip were not the dominant noise source at Position 1 and 2.

5. Noise Impact Assessment

5.1 Aircraft maintenance noise impact

The noise levels generated by the aircraft maintenance, and the associated character and duration, will vary greatly depending on the work being undertaken. Some of the activities will be near silent (e.g., electrical testing), whereas some noise sources will generate high noise levels that may also be tonal and/or impulsive (e.g., metal grinding).

To establish suitable representative source noise levels within the building, we have reviewed inhouse survey data obtained in two car workshops over an entire working day; Table 3. The car workshops, which accommodated between 3 – 6 vehicles at a time, were busy during the surveys and included the same type of activities that are expected to occur for the aircraft maintenance (note that the activity noise also included radios).

For the purpose of the assessment, and as a robust approach, we have taken the highest 1hr activity noise level generated in either of the surveyed car workshops to be representative of the activity noise level that will occur within aircraft maintenance building.

The noise emissions from the workshop will be dependent on the façade sound insulation of the building fabric and whether the south gable end entrance doors are open. For the assessment we have assumed the worst-case scenario of the entrance doors being fully open, with an open area of 100m^2; for this scenario the noise emissions from the entrance will be dominant i.e., the noise transmission via the building fabric will be insignificant in comparison.

Table 3. Surveyed internal reverberant levels within car workshops		
Start Time	Frampton Garage, South Gloucestershire	VW Citygate Workshop, Watford
	$L_{Aeq,1hr}$ dB	$L_{Aeq,1hr}$ dB
07:00	53.0	68.9
08:00	56.0	68.4
09:00	62.6	68.2
10:00	68.8	68.1
11:00	72.0	69.8
12:00	72.6	73.3
13:00	64.7	74.8
14:00	70.1	76.3
15:00	72.0	76.8
16:00	75.9	75.8
17:00	67.3	74.7
Highest	**76**	**77**
Median	**69**	**73**

To determine the aircraft maintenance activity noise emissions from the building entrance and corresponding Rating Levels at Dwellings A and B, the following corrections have been applied to the representative internal noise level:

- **Entrance area correction:** 10 x log (A), where A is the area of the radiating façade/roof
- **Distance attenuation:** 20 x Log (d) +11, where d = distance between building entrance and dwelling
- ***Ground absorption correction:*** ISO 9613-2: Attenuation of sound during propagation outdoors, Formula 10:

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

  Where,

  h_m = mean height of the propagation path above ground

  d = distance from source to receptor
- **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
- **Character Correction:** The noise generated by the aircraft maintenance activities may on occasion contain impulsive and/or tonal elements, with the higher noise producing elements being intermittent. To account for these potential noise characteristics, a +6dB character correction has been applied to the calculated Specific Level in order to determine the Rating Levels.

Table 4 provide the full calculations with the entrance doors open.

Table 4. Noise emissions from building's entrance		
Reverberant Lp within workshop	77 dB	
Receptor	A	B
Open area of roller shutter door, m2	100	100
Area correction, dB	20	20
Sound power at opening, dB	97	97
Distance, m	615	505
Distance Correction, dB	66.8	65.1
Ground absorption, dB	4.7	4.6
Atmospheric attenuation, dB	1.2	1
Specific Level, dB	24	26
BS4142 Character Correction	6	6
Rating Level, dB	***30***	***32***
Representative background noise level, L_{A90} dB	45	34

Where the Rating Level is at parity with the typical background noise level, 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.

As can be seen in Table 4, the resultant Rating Levels at both Dwellings A and B are below the established representative background noise levels. We therefore conclude that the aircraft maintenance activity noise levels will result in a low noise impact, with no mitigation measures required.

4.1 Airstrip use noise impact

Using the highest measured SEL levels of the landings, taxiing and takeoffs, the aggregate noise emissions of 5 aircraft using the airstrip during the working day period have been calculated at Dwellings A and B; Table 5.

The calculations identify that the aggregate noise emissions of 5 light aircraft using the airstrip will:

- not exceed the Department of Transport's 'Air Navigation Guidance (2017)' LOAEL $L_{Aeq,8hr}$ 51 dB threshold
- not result in a change in the 8hr ambient noise environment, which corresponds to a 'not significant' IEMA effect descriptor

We therefore conclude that the noise emissions generated by the proposed intensification of the airstrip in relation to the aircraft maintenance operations will be acceptable.

Table 5. Calculation of 5 light aircraft airstrip movements and aggregate LAeq						
	Dwelling A			Dwelling B		
	Landing	Taxiing	Takeoff	Landing	Taxiing	Takeoff
SEL at 15m, dB	99	98	92	99	98	92
Distance, m	585	585	585	460	460	460
Distance Correction, dB	31.8	31.8	31.8	29.7	29.7	29.7
Ground absorption, dB	4.7	4.7	4.7	4.6	4.6	4.6
Atmospheric attenuation, dB	1.1	1.1	1.1	0.9	0.9	0.9
No. of events	5	10	5	5	10	5
No. events correction, dB	7	10	7	7	10	7
Time correction, dB	44.6	44.6	44.6	44.6	44.6	44.6
$L_{Aeq,8hr}$ dB	24	26	17	26	28	19
Aggregate $L_{Aeq,8hr}$ dB	28			31		
General environmental noise, $L_{Aeq,9hr}$ dB	56			43		
Aggregate (plane event + environmental), $L_{Aeq,9hr}$ dB	56			43		
Change	0			0		

5.2 Assessment 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 i.e., it would not result in an adverse noise impact being identified.

The assessment of the aircraft maintenance operations has been based on inhouse data of car workshops. As the car workshops used comparable tools/machinery to those that will be used for the aircraft maintenance, a meaningful variation in the used assumed noise levels is not expected.

The review of the noise emissions of light aircraft using the airstrip has been based on the survey of a single airplane, which AeroTech inform represents the typical type of aircraft that will visit the development. There is however the potential for both higher and lower noise emissions with different aircraft types. As the established aggregate noise emissions for 5 light airplanes are comfortably below the LOAEL $L_{Aeq,8hr}$ 51 dB threshold and the existing noise environment, this potential uncertainty is considered acceptable.

6. Conclusion

A noise impact assessment in relation to the proposed change of use of an agricultural building at Fenn Lane Farm, Nuneaton to aircraft maintenance and the related intensification of use of the adjacent existing private airstrip has been undertaken; Figure 1.

The assessment has been based on:

- Survey of the existing noise environment at the nearest dwellings (labelled A and B in Figure 1)
- Survey of an example representative light aircraft using the airstrip
- Calculations of noise emissions generated by the aircraft maintenance operations and light aircraft using the airstrip; Tables 4 & 5

The findings of the assessment established that:

- the aircraft maintenance noise emissions from the building (with south gable end doors open) results in Rating Levels below the established representative background noise level; this indicates a BS4142 low noise impact
- noise emissions of 5 aircraft using the airstrip during the working day will
  - not exceed the Department of Transport's 'Air Navigation Guidance (2017)' LOAEL $L_{Aeq,8hr}$ 51 dB threshold
  - not result in a change in the 8hr ambient noise environment; corresponds to 'not significant' IEMA effect descriptor

On the basis that the proposed aircraft maintenance operations will not result in an BS4142 adverse noise impact at the nearest dwellings and the noise emissions of associated light aircraft using the airstrip do not exceed the LOAEL threshold or result a 'slight' change in noise environment, we conclude that on noise grounds the proposed scheme is acceptable.

Table A1. Positions 1 and 2, 15-minute duration noise data (free-field)						
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
09:00	76.0	57.7	45.5			
09:15	73.3	56.1	45.0			
09:30	73.7	57.2	45.5	61.0	40.0	34.0
09:45	71.7	54.5	45.0	52.8	38.3	34.0
10:00	83.4	58.2	46.5	63.8	39.8	34.0
10:15	74.6	55.9	46.5	60.4	40.5	34.0
10:30	75.9	56.0	45.5	62.7	43.5	35.0
10:45	79.0	56.2	46.0	56.0	38.6	33.5
11:00	73.3	54.7	45.0	62.7	44.6	34.5
11:15	77.3	55.7	45.0	69.6	45.9	35.5
11:30	76.4	54.9	45.0	54.0	39.7	34.0
11:45	76.7	54.9	45.0	65.5	45.1	34.0
12:00	73.8	55.0	46.0	59.2	41.8	35.5
12:15	79.0	56.2	46.0	68.0	41.4	36.0
12:30	81.6	56.6	46.0	69.5	44.4	37.0
12:45	72.9	54.5	46.0	66.2	48.0	37.0
13:00	71.6	53.5	46.0			
13:15	81.4	58.9	46.0			

Table A3. Weather station data							
Start Time	Wind Speed, m/s	Wind Direction	Temp, °C	Start Time	Wind Speed, m/s	Wind Direction	Temp, °C
08:50	1.3	SSE	14.9	11:10	1.4	SSE	18.8
09:00	0.0	SSW	16.8	11:20	2.5	SSE	19.6
09:10	1.3	SSW	15.8	11:30	2.1	SSE	19.6
09:20	1.0	SSW	15.6	11:40	2.3	SSE	20.1
09:30	1.1	SSW	16.1	11:50	2.5	SW	20.2
09:40	0.8	S	17.4	12:00	1.3	S	20.8
09:50	1.9	S	16.7	12:10	1.8	S	20.5
10:00	1.6	S	17.2	12:20	1.3	SSW	20.9
10:10	1.7	SSE	17.3	12:30	1.5	SSW	21.2
10:20	2.1	SE	17.4	12:40	3.0	SW	20.8
10:30	2.2	SSE	18.4	12:50	1.5	W	22.3
10:40	2.3	S	17.7	13:00	2.4	SW	21.8
10:50	1.0	SSW	19.4	13:10	1.4	WSW	21.9
11:00	1.3	S	18.6				

Table A2. Positions 1 and 2, 1-minute duration measurement data (free-field)

Start Time	Position 1		Position 2		Position 3		Start Time	Position 1		Position 2		Position 3		Start Time	Position 1		Position 2		Position 3	
	$L_{Amax,S}$ dB	L_{Aeq} dB	$L_{Amax,S}$ dB	L_{Aeq} dB	$L_{Amax,S}$ dB	L_{Aeq} dB		$L_{Amax,S}$ dB	L_{Aeq} dB	$L_{Amax,S}$ dB	L_{Aeq} dB	$L_{Amax,S}$ dB	L_{Aeq} dB		$L_{Amax,S}$ dB	L_{Aeq} dB	$L_{Amax,S}$ dB	L_{Aeq} dB	$L_{Amax,S}$ dB	L_{Aeq} dB
09:01	68.3	56.0	42.9	38.1	56.4	41.7	09:42	48.2	43.1	47.3	37.8	38.5	34.5	10:23	43.5	37.2	47.9	40.2	41.9	35.7
09:02	69.6	58.7	43.2	39.7	40.8	37.1	09:43	66.1	53.6	44.9	39.6	39.2	35.4	10:24	71.2	57.5	45.2	39.4	45.6	38.1
09:03	71.8	58.8	41.7	38.1	41.9	36.6	09:44	64.8	51.0	40.4	37.2	37.0	33.7	10:25	68.9	54.9	44.7	40.8	46.5	41.0
09:04	65.4	55.2	44.3	39.6	40.6	36.9	09:45	61.8	43.2	38.8	35.6	38.6	34.2	10:26	70.8	56.5	47.1	39.6	40.1	36.0
09:05	68.0	53.7	42.3	39.5	42.0	35.7	09:46	68.1	57.7	41.8	37.3	39.5	36.4	10:27	64.1	50.0	47.6	38.6	37.3	31.5
09:06	68.1	57.7	40.4	37.6	38.0	35.1	09:47	71.6	58.4	38.9	37.0	39.3	35.7	10:28	75.3	61.5	43.5	38.6	38.5	33.8
09:07	67.6	55.5	48.0	44.5	53.1	46.7	09:48	68.2	56.5	44.3	38.0	43.5	37.3	10:29	65.5	51.7	46.9	42.0	43.8	36.2
09:08	67.1	56.2	51.0	47.1	52.9	46.9	09:49	67.2	53.1	38.9	36.6	44.1	34.8	10:30	72.2	60.4	46.3	38.7	40.2	36.2
09:09	63.5	51.4	43.1	37.9	40.9	37.4	09:50	63.6	50.6	42.2	38.7	37.7	34.5	10:31	64.2	52.4	50.3	38.5	36.7	33.3
09:10	69.6	58.3	42.8	37.1	37.5	34.2	09:51	66.7	53.6	46.5	40.5	37.4	34.8	10:32	65.8	51.8	47.2	38.1	38.9	33.0
09:11	47.9	43.5	42.2	38.7	37.7	34.2	09:52	67.0	54.1	42.7	36.9	40.1	34.6	10:33	47.9	39.8	66.2	59.9	39.0	35.2
09:12	47.4	43.8	37.6	34.6	36.2	32.8	09:53	65.9	51.9	51.3	44.2	42.2	36.5	10:34	66.6	53.8	45.8	41.2	39.0	33.6
09:13	48.6	44.6	40.0	35.7	38.6	33.7	09:54	68.7	56.6	60.2	52.0	62.2	51.4	10:35	62.8	48.5	46.2	40.9	41.1	36.4
09:14	68.8	56.9	43.5	39.2	37.4	33.8	09:55	53.3	47.2	58.5	48.0	62.4	52.6	10:36	74.2	60.7	41.6	36.2	40.5	35.7
09:15	51.2	46.5	50.1	44.9	51.2	45.3	09:56	55.5	48.9	54.1	48.7	54.9	48.1	10:37	53.6	42.2	43.1	38.4	42.1	35.9
09:16	70.1	56.6	45.0	41.1	40.6	36.8	09:57	44.3	39.1	43.1	38.7	39.9	36.7	10:38	40.1	37.8	39.7	36.6	43.1	36.7
09:17	66.0	55.0	42.5	36.7	36.2	33.5	09:58	65.6	51.7	47.1	41.3	84.9	77.2	10:39	66.3	54.9	43.7	40.5	50.6	39.7
09:18	44.5	37.6	42.0	37.5	36.4	33.1	09:59	64.2	50.6	46.3	38.6	47.5	40.4	10:40	65.9	54.3	46.2	40.2	62.0	44.9
09:19	43.0	35.8	43.6	38.5	34.4	32.5	10:00	68.3	54.0	49.5	41.7	49.1	40.6	10:41	62.5	49.0	46.3	40.3	78.4	75.7
09:20	43.4	37.3	58.2	51.7	37.5	34.1	10:01	68.0	53.8	52.4	44.4	52.9	40.3	10:42	41.2	39.4	44.3	39.9	66.6	47.8
09:21	70.9	59.3	49.6	44.8	38.1	35.1	10:02	65.1	51.2	45.0	39.2	45.2	38.1	10:43	40.4	37.8	48.0	40.3	37.7	34.7
09:22	66.9	52.6	52.4	43.5	37.5	34.9	10:03	40.9	37.3	42.3	37.3	50.7	40.0	10:44	65.4	52.0	47.1	42.6	41.7	37.4
09:23	74.1	62.0	49.5	40.4	37.2	34.6	10:04	66.4	53.2	67.1	56.8	45.3	37.0	10:45	52.5	42.4	54.3	45.2	84.4	70.7
09:24	53.2	41.7	55.5	44.0	41.8	36.1	10:05	69.2	54.6	47.1	39.7	48.3	37.2	10:46	71.1	62.2	51.0	45.3	48.5	39.3
09:25	70.1	56.7	47.1	40.1	37.8	34.2	10:06	64.3	50.7	45.1	38.7	48.2	38.0	10:47	60.5	42.7	50.8	42.9	44.8	38.8
09:26	68.0	56.8	50.2	43.8	36.6	33.1	10:07	66.1	52.9	47.6	42.6	83.2	75.6	10:48	63.8	49.9	47.5	38.7	45.5	36.2
09:27	69.8	57.4	60.3	46.4	45.3	35.7	10:08	65.5	51.9	46.3	42.1	85.8	76.6	10:49	48.6	39.4	44.5	40.3	36.5	33.8
09:28	64.2	51.0	52.2	43.4	37.4	34.6	10:09	64.5	51.1	47.7	43.4	46.9	39.7	10:50	72.1	58.2	45.8	41.5	41.2	36.7
09:29	67.2	52.9	47.5	40.7	37.1	33.8	10:10	72.3	62.3	58.4	50.4	87.8	73.1	10:51	63.2	49.7	41.2	37.5	42.0	38.7
09:30	49.4	45.0	41.1	37.4	38.9	35.0	10:11	66.9	54.2	54.2	45.8	50.5	42.8	10:52	63.7	51.0	44.5	38.2	40.0	35.5
09:31	65.4	53.0	49.0	39.1	43.6	37.0	10:12	74.9	61.1	49.8	42.1	53.5	42.5	10:53	64.8	53.8	39.7	37.0	40.3	36.5
09:32	72.5	59.1	47.2	38.6	43.5	37.6	10:13	63.7	49.8	47.4	41.3	89.9	78.6	10:54	43.0	40.0	46.6	38.8	43.9	37.6
09:33	64.5	50.5	38.5	35.8	48.6	39.3	10:14	62.5	49.6	43.0	39.8	58.1	42.9	10:55	65.4	54.4	52.6	46.5	47.6	43.9
09:34	55.7	42.2	43.6	37.0	69.9	54.9	10:15	41.5	36.7	41.4	37.8	46.1	39.2	10:56	61.1	49.4	49.8	43.3	47.7	41.2
09:35	64.5	51.7	38.2	35.5	37.5	34.9	10:16	65.5	51.5	42.0	37.6	41.5	36.2	10:57	66.1	52.3	44.1	40.5	41.9	38.5
09:36	51.4	45.6	40.7	36.0	39.4	34.9	10:17	46.3	41.9	51.6	43.6	49.5	42.6	10:58	66.9	52.2	45.6	42.0	42.7	38.4
09:37	67.8	56.4	43.4	36.8	38.0	35.0	10:18	65.7	55.0	44.1	37.8	41.2	36.0	10:59	67.2	54.8	44.7	40.6	43.5	38.3
09:38	68.1	56.2	52.4	43.1	47.9	42.0	10:19	44.7	38.9	45.3	39.3	45.9	39.0	11:00	69.7	58.7	44.3	39.8	44.7	38.8
09:39	77.3	63.6	49.9	43.1	46.5	39.8	10:20	67.7	54.2	48.8	42.5	50.3	45.4	11:01	67.9	54.2	44.7	39.7	43.4	37.8
09:40	66.5	59.0	42.9	38.0	38.4	34.4	10:21	66.1	52.1	46.5	37.1	43.3	36.7	11:02	46.9	41.2	44.0	40.7	44.4	39.3
09:41	47.7	44.0	42.1	37.3	36.4	34.0	10:22	39.0	34.9	44.5	37.1	36.9	33.2							