



Report No. REG/7074

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ENVIRONMENTAL NOISE ASSESSMENT
AT
MANOR COURT,
HARMONDSWORTH,
LONDON

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ENVIRONMENTAL NOISE ASSESSMENT**AT****MANOR COURT,****HARMONDSWORTH,****LONDON****1. INTRODUCTION**

AIRO is retained by Heathrow 1 Ltd to provide independent specialist advice and measurement services to Wakelin Associates in respect of the proposed re-development of Manor Court, High Street, Harmondsworth, London. The proposed works would result in the conversion of 3 existing buildings to form a total of 15 residential properties. Manor Lodge, which is currently a house of multiple occupancy, would be converted into 2 residential houses. In addition, two existing office buildings would become residential: the Stables would become 6 flats and 2 houses and the Barn would be converted to form 5 new houses.

This report presents the results of noise measurements made at the site together with an assessment of those measured levels, in accordance with guidance contained in London Borough of Hillingdon's Supplementary Planning Document (SPD, ref 1). This includes an assessment against Noise Exposure Categories (after PPG 24, ref 2).

Mitigation advice is given where appropriate with a view to achieving internal noise levels within completed dwellings that satisfy the requirements of Table 2 of the SPG. This, in turn, is based on guidance in British Standard BS 8233:1999 (ref 3) and specified by the World Health Organisation (ref 4). It is considered that if the guideline internal noise levels in BS 8233 are satisfied, the general policies relating to noise in the National Planning Policy Framework (ref 5) would also be satisfied.

2. DESCRIPTION OF THE SITE

The Manor Court site is located within the village of Harmondsworth, in the London borough of Hillingdon. It is made up of an approximately rectangular parcel of land (75 x 80 metres) containing the existing Manor Lodge and Stables buildings, with

an additional rectangle (75 x 25 metres) adjoining to the north, containing the existing office barn. Immediately to the north of the Stables (and west of the Office Barn) is Harmondsworth Barn, a Grade 1 listed building owned by English Heritage. Access to Harmondsworth Barn is via a right of way across the Manor Court land.

In addition to the existing buildings, the site is occupied by several paved car parking areas and, to the south of Manor Lodge, a large private garden. The existing offices were disused at the time of the survey, however some of the car parking remained in use by Circle Express, who operated a regular shuttle mini-bus to their premises. An English Heritage car park was located adjacent to Harmondsworth Barn but this was not used during the survey period. The site also contained The Granary, a listed building previously used for storage that is proposed to be retained and an electricity sub-station.

The site is bounded to the east by a 1.5 metre high listed wall, beyond which is St Mary's church. To the south-east is The Five Bells public house and several existing residential properties are adjacent to part of the southern site boundary. The land on all other sides of the site is open, uncultivated meadows and fields, with public footpaths in places.

The wider area of the site includes Heathrow airport, with the nearest runway located approximately 850 metres to the south. The further runway is approximately 800 metres further away. In addition, several major roads are nearby. The M4 motorway is approximately 250 metres to the north, the M25 is 500 metres to the west and the A4 (Colnbrook Bypass) is located around 500 metres to the south.

The environmental noise levels at the site are likely to be dominated by aircraft flyovers and distant road traffic, particularly on the M4 and M25. Other noise sources include birdsong and children playing, particularly from within the Manor Lodge garden, as well as occasional vehicle movements within the on-site car park.

3. MEASUREMENT UNITS

3.1 A-Weighted Equivalent Continuous Sound Level - $L_{Aeq,T}$

Noise levels quoted in this report are, in the main, A-weighted Equivalent Continuous Sound Levels or $L_{Aeq,T}$ in dB.

The $L_{Aeq,T}$ is a measure of the acoustic energy of a fluctuating noise climate over a given period, T , expressed as the single continuous noise level having the same energy as the time varying signal. The 'A' within the descriptor means A-weighted, an internationally agreed frequency response generally similar to that of the human ear so that A-weighted sound levels in dB correspond reasonably well with what is heard.

For assessment purposes, the day is typically divided into a 16-hour daytime period (07:00 to 23:00) and an 8-hour night-time period (23:00 to 07:00). The period values may be derived from the logarithmic average of the relevant hourly values.

3.2 Maximum Noise Level - L_{AFmax} , L_{ASmax}

In some circumstances it is useful to quantify the maximum level of fluctuating noise and a commonly used descriptor is L_{Amax} . The L_{Amax} represents the maximum reading given by a sound level meter for a given event or period of time and is usually qualified by F for 'Fast' or S for 'Slow' according to the response time setting of the meter.

3.3 A-Weighted Percentile Noise Levels - L_{An}

Percentile noise levels are a statistical representation of the time varying level. The value is the noise level L exceeded for $n\%$ of the period T .

To measure background environmental noise levels the statistical index L_{A90} is commonly preferred. The L_{A90} is the Sound Pressure Level that is exceeded for 90% of the measurement period. The L_{A90} therefore discriminates against short duration peaks of noise and is consequently considered to provide a better representation of typical minimum noise levels compared with, for example, the L_{Aeq} .

4. MEASUREMENT SURVEY

Measurements of noise were made at the site during the period commencing 13:00 on Thursday 6 April 2017 and ending at 13:00 on Friday 7 April 2017.

The noise level measurements comprised long-term data logging of the noise level every 2 seconds and logging of hourly values. These were measured at three positions across the site.

Position 1 was located around 5 metres from the western site boundary, to the south-west of the existing Stables building and west of Manor Lodge. As such, sound levels measured at Position 1 are representative of those experienced at the south façade of the Stables or the south or west façade of Manor Lodge. In addition, Position 1 had an unrestricted view of aircraft taking off (particularly when using the northern runway) and so is likely to measure the worst-case aircraft noise levels affecting the site.

Position 2 was on the northern site boundary, around 15 metres from the rear of the existing Office Barn building and so is particularly exposed to noise sources from the north (including the M4 motorway).

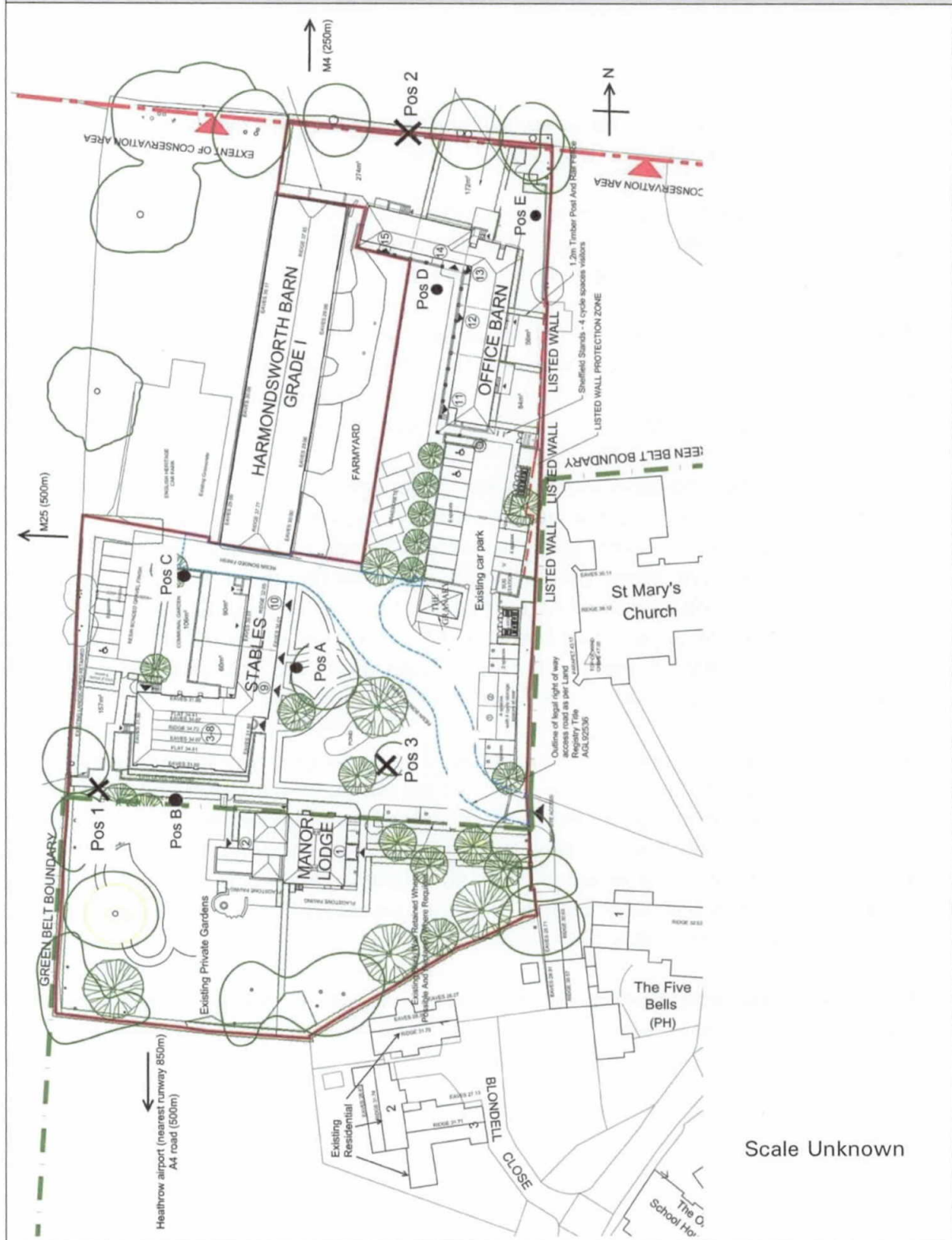
Position 3 was located within the 'courtyard' area, to the north of Manor Lodge and east of the Stables. As such, noise levels measured at Position 3 are likely to be representative of levels on the nearest facades of these buildings and include noise from vehicle movements within the existing car parks.

In addition to the long-term measurements, sample noise levels were measured at five other locations around the site. Position A was within the courtyard, near to Position 3 but only 4 metres from the eastern façade of the Stables and Position B was 5 metres in front of the middle of the southern façade of the Stables. Position C was located to the rear (north-west) of the Stables, such that it was close to the English Heritage car park. Positions D and E were near to the existing Office Barn building, with Position D located 6 metres from the south and west facades and Position E was 5 metres from the north-east corner.

All the measurement positions were located so as to be away from reflective surfaces (except the ground) and so these measured levels can be considered free-field. All measurement positions were at a height of 1.5 metres above local ground level, except Position 2 which was located on a retaining wall, at a height of 2 metres. In addition, further sample measurements were made at Position 1 but at a height of 4 metres (i.e. level with a first floor window) in order to determine any variation in sound level due to receiver height.

All of the measurement positions are shown in Figure 1 and the measured noise levels are presented in Section 5. Details of the measurement equipment used and the recorded weather conditions are given in Appendix A.

Figure 1 – Site Plan showing Measurement Locations



5. RESULTS

Table 1 – Position 1 Hourly Data – Long Term Noise Level Measurements			
Period Commencing	Free-Field Noise Levels (dB)		
	L_{Aeq}	L_{A90}	L_{AFmax}
<u>6 April 2017</u>			
13:00	54	48	74
14:00	51	47	67
15:00	59	48	77
16:00	59	49	80
17:00	59	50	77
18:00	60	51	79
19:00	61	54	77
20:00	60	55	77
21:00	59	54	77
22:00	59	54	76
23:00	56	50	79
<u>7 April 2017</u>			
00:00	50	47	64
01:00	48	45	56
02:00	47	43	54
03:00	49	45	56
04:00	50	47	58
05:00	56	50	73
06:00	60	58	73
07:00	59	56	65
08:00	54	50	65
09:00	51	46	69
10:00	50	46	69
11:00	53	47	76
12:00	52	47	77
Daytime period (07:00 – 23:00)	58	46 – 56	80
Night-time period (23:00 – 07:00)	54	43 – 58	79 (65) *

* The value in brackets is the L_{AFmax} exceeded 10-15 times during the night-time (estimated from Figure 2)

Figure 2 – Position 1 Time History

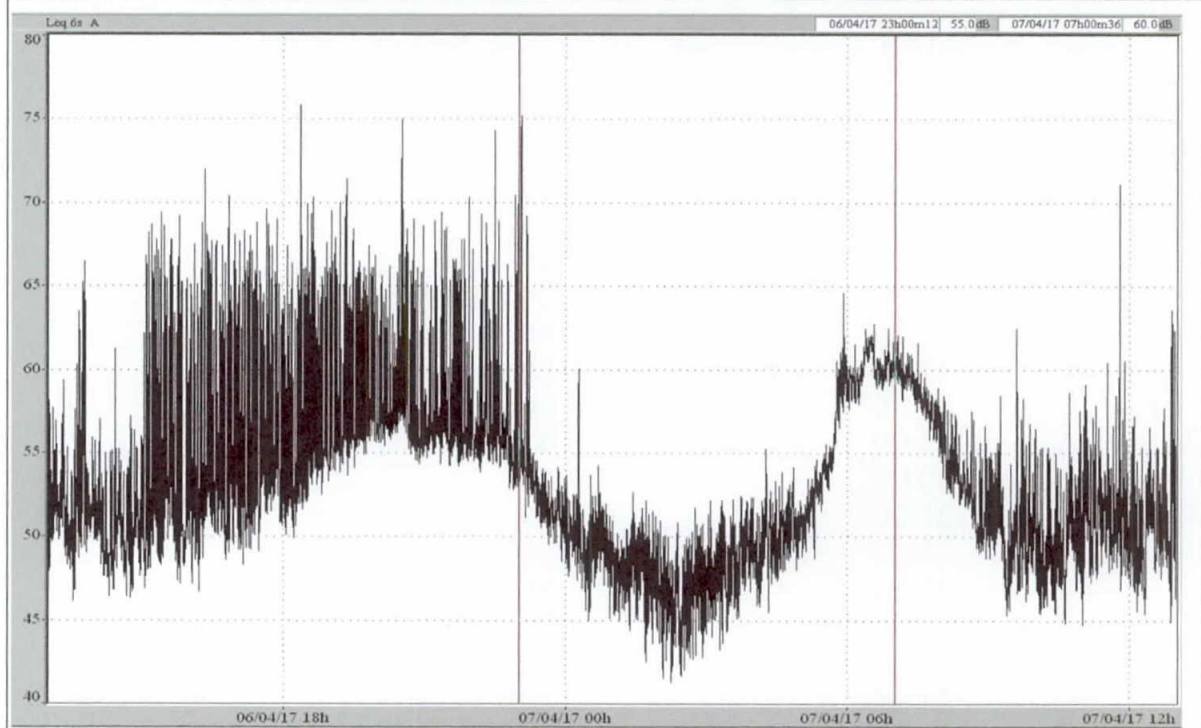


Figure 3 – Position 2 Time History

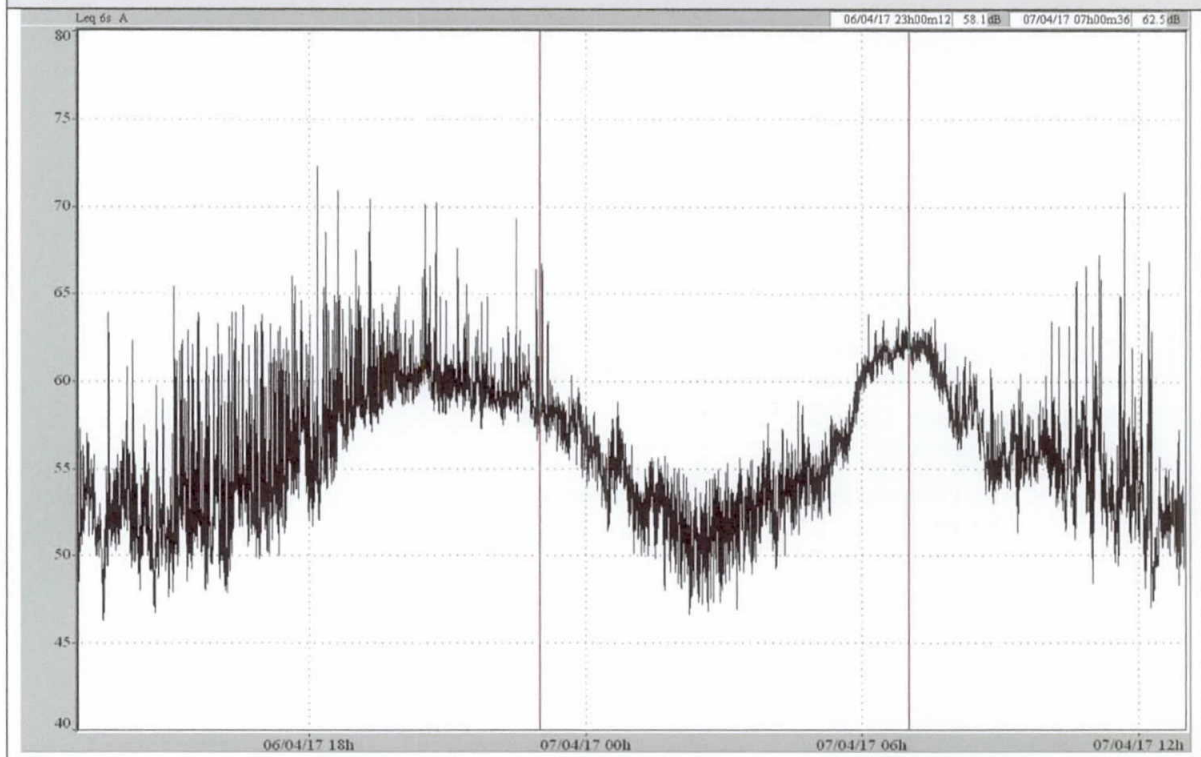


Table 2 – Position 2 Hourly Data – Long Term Noise Level Measurements			
Period Commencing	Free-Field Noise Levels (dB)		
	L_{Aeq}	L_{A90}	L_{AFmax}
<u>6 April 2017</u>			
13:00	53	49	69
14:00	53	48	68
15:00	55	49	72
16:00	55	49	71
17:00	57	51	72
18:00	59	53	82
19:00	61	57	73
20:00	61	58	74
21:00	60	58	69
22:00	60	57	72
23:00	58	56	69
<u>7 April 2017</u>			
00:00	56	53	62
01:00	53	50	60
02:00	51	48	58
03:00	53	50	62
04:00	54	51	63
05:00	57	54	64
06:00	62	60	73
07:00	61	58	69
08:00	58	54	67
09:00	56	54	68
10:00	56	52	73
11:00	56	51	75
12:00	54	49	71
Daytime period (07:00 – 23:00)	58	49 – 58	82
Night-time period (23:00 – 07:00)	57	48 – 60	73 (63) *

* The value in brackets is the L_{AFmax} exceeded 10-15 times during the night-time (estimated from Figure 3)

Table 3 – Position 3 Hourly Data – Long Term Noise Level Measurements

Period Commencing	Free-Field Noise Levels (dB)		
	L_{Aeq}	L_{A90}	L_{AFmax}
<u>6 April 2017</u>			
13:00	52	44	88
14:00	47	43	74
15:00	56	44	75
16:00	55	44	76
17:00	56	45	80
18:00	57	46	80
19:00	64	50	100
20:00	58	52	76
21:00	56	53	73
22:00	57	52	75
23:00	54	51	76
<u>7 April 2017</u>			
00:00	51	47	64
01:00	48	44	55
02:00	45	42	54
03:00	48	44	68
04:00	48	44	73
05:00	52	46	72
06:00	58	55	73
07:00	56	52	76
08:00	50	46	72
09:00	51	47	81
10:00	50	45	77
11:00	49	44	63
12:00	50	44	74
Daytime period (07:00 – 23:00)	56	43 – 53	100
Night-time period (23:00 – 07:00)	52	42 – 55	76 (62)*

* The value in brackets is the L_{AFmax} exceeded 10-15 times during the night-time (estimated from Figure 4)

Figure 4 – Position 3 Time History

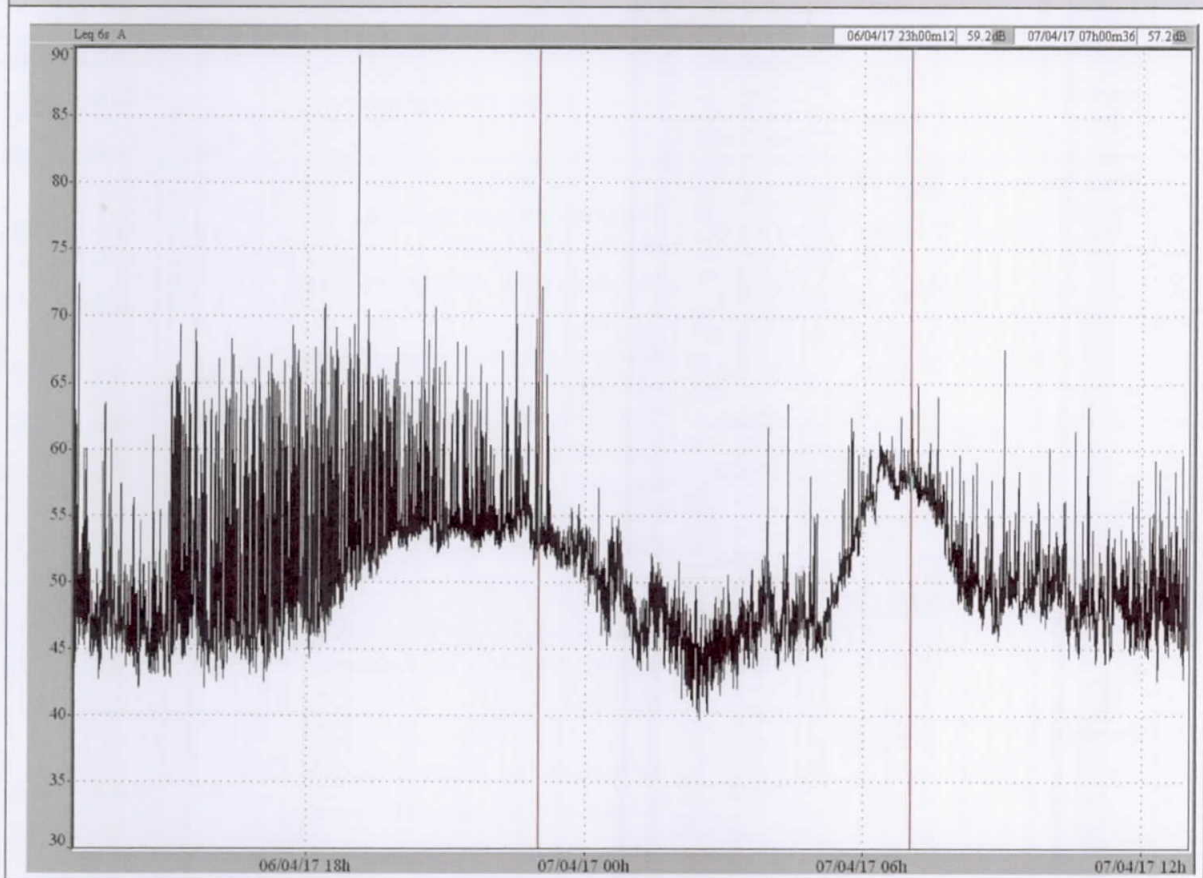


Table 4 – Comparison of Noise Levels at Ground and First Floor (Pos 1)

Time Period, all measured on 7/4/17	Free-Field Noise Levels at 1.5m (Ground Floor) (dB)			Free-Field Noise Levels at 4m (First Floor) (dB)		
	L_{Aeq}	L_{A90}	L_{AFmax}	L_{Aeq}	L_{A90}	L_{AFmax}
13:00 – 14:00	50	46	80	53	50	75
14:00 – 15:00	51	47	74	54	51	78
15:00 – 15:30	59	49	75	60	51	79

Table 5 – Sample Measurement Noise Data

Measurement Location	Date/ Time	Duration, T (min:sec)	Event Description	Free-Field Noise Levels (dB)		
				L_{Aeq}	L_{A90}	L_{AFmax}
Position A	<u>6/4/17</u>					
	13:50	15:00	Dominated by birdsong & distant road traffic	47	44	62
	15:19	00:47	Single aircraft take-off (nearest runway)	57	50	64
	15:20	01:00	Background sources (excluding aircraft)	46	44	60
	15:23	00:38	Single aircraft take-off	58	48	68
	15:23	10:00	General background, including 9 aircraft take-offs	53	45	72
	<u>7/4/17</u>					
	14:05	15:00	General background	47	44	62
Position B	<u>6/4/17</u>					
	14:10	10:00	General background (including 7 aircraft take-offs on furthest runway)	52	47	65
Position C	<u>6/4/17</u>					
	14:22	15:00	Dominated by road traffic, birdsong & aircraft (11 flyovers)	51	48	63
	<u>7/4/17</u>					
	13:15	10:00	Dominated by distant road traffic & birdsong (5 aircraft flyovers)	49	47	68
	14:25	10:00	7 aircraft flyovers	52	47	68
Position D	<u>6/4/17</u>					
	14:40	00:41	1 Aircraft flyover only	49	42	59
	14:43	01:00	Background (excluding aircraft)	45	41	57
	14:46	15:00	General background (including 12 aircraft flyovers)	48	41	65
	<u>7/4/17</u>					
	13:46	15:00	General, includes 11 aircraft	46	41	59
	14:38	06:00	General, includes 4 aircraft	49	43	68
	14:44	00:41	Aircraft take-off only	50	45	58
	14:45	01:00	Background (excluding aircraft)	42	40	53
Position E	<u>6/4/17</u>					
	15:05	10:00	General background, including 8 aircraft flyovers	54	48	69
	<u>7/4/17</u>					
	13:26	15:00	Dominated by road traffic & birdsong. 11 aircraft flyovers.	50	46	69