Our Ref: 19236C/HA

ALLAWAY ACOUSTICS
LIMITED

Client: Lazari Investments

Project: 180-182 Tottenham Court Road, W1

Existing Environmental Noise Levels

Date of Survey: 21st – 22nd August 2006

Prepared By: Chris Williams BSc (Hons) MIOA

ALLAWAY ACOUSTICS
LIMITED

180-182 Tottenham Court Road
Existing Environmental Noise Levels

1. Introduction

1.1 Prior to the relocation of existing plant and installation of new building services plant at this site, we have carried out an environmental noise survey to establish the existing minimum background noise levels.

1.2 This report describes the survey and details the results obtained.

1.3 On the basis of the survey results, a target noise level will be determined for the proposed future plant.

2. Site Description

2.1 The site is located at 180-182 Tottenham Court Road, W1.

2.2 Existing plant comprises 4no. VRV units and 12no. small condensing units.

2.3 A new level is to be built on top of the existing roof and the existing plant will be moved to the new roof. As yet undetermined new plant will also be located on the newly created roof.

2.4 The existing plant noise is the dominant noise source affecting the roof area. Traffic noise determines the general noise levels.

2.5 The area is entirely commercial and there were no residential properties observed within the vicinity, although the Local Authority should confirm this.

2.6 The nearest affected (commercial) window is on the building opposite the site on the other side of Tottenham Court Road, approximately 25m from the location of the existing plant.

2.7 The plant will operate during normal office hours of 8am to 6pm.

3. Survey

3.1 The survey was carried out between the hours of 09:25 on Monday 21st August 2006 and 13:05 on Tuesday 22nd August 2006.

3.2 The weather during the survey period was warm with occasional winds and light showers. This was deemed not to have any significant effect on the measured noise levels.

3.3 To the best of our knowledge there were no roadworks or other unusual influences on traffic flow within the vicinity.

3.4 Noise levels were measured for consecutive 20-minute periods at roof level. Of the parameters measured, the LA90 gives the closest representation of the background level, as it is the level exceeded for 90% of the measurement period. The LAEQ is an energy-averaged value, and the LA10 is indicative of traffic noise.

3.6 In addition to the A-weighted levels referred to above, representative octave-band spectra were also recorded so that the frequency distribution of the noise could be assessed.

4. Instrumentation

4.1 All measurements were obtained using a Norsonic NOR131 Sound Level Meter (s/n 1312779). This instrument conforms to IEC60651 and 60804 Type 1 specifications and to IEC61260 and 61672-1:2002 Class 1 specifications.

4.2 Before commencing the readings, the meter was checked for correct calibration with both the internal reference signal and an acoustic calibrator. The calibration was rechecked after the survey with no change noted.

4.3 To minimise environmental effects, the microphone was fitted with a weathershield at all times.

5. Results

5.1 Full details of the results obtained are attached to this Report.

5.2 The minimum background (L90) noise level was 55dB(A) during the hour after the latest time that the new plant may operate (i.e. 18:00-19:00).

6. Discussion

6.1 The existing plant dominates the background noise level. The data obtained shows a 6dB drop in the background noise after the plant turns off (5pm).

6.2 In order that the new plant noise does not increase existing noise levels it must by at least 10dB(A) lower than the background noise measured during the critical period (18:00-19:00).

6.3 To this end, we would recommend that a limit of 41dB(A) be set as the plant noise limit. This limit should apply to a position outside the nearest affected window.

6.4 Suppression of any tonal components from the plant is also important, as this can increase the potential disturbance.

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Chris Williams BSc (Hons) MIOA
23 August 2006

ALLAWAY ACOUSTICS
LIMITED

SCHEDULE OF RESULTS

Date of Survey: 21st – 22nd August

RE: 180-182 Tottenham Court Road

Table 1 - L_{EQ}

Time	63 Hz	125 Hz	250 Hz	500 Hz	1.0 k	2.0 k	4.0 k	8.0 k	dB(A)
9:25	74	66	66	61	58	54	50	48	64
9:45	74	66	65	61	58	53	49	44	63
10:05	74	66	65	61	62	57	49	44	66
10:25	74	67	66	62	60	55	55	48	65
10:45	75	66	66	62	61	55	50	44	65
11:05	73	65	65	60	58	52	50	45	63
11:25	74	66	65	61	59	54	45	41	64
11:45	73	65	65	60	57	52	45	40	63
12:05	72	65	65	60	59	54	45	45	63
12:25	72	65	65	61	59	57	55	55	65
12:45	73	65	65	60	57	53	49	41	63
13:05	73	66	65	60	58	53	48	42	63
13:25	74	66	66	61	58	53	47	40	63
13:45	73	66	65	62	61	52	45	39	64
14:05	74	66	65	60	57	51	44	39	63
14:25	73	65	65	60	58	52	46	42	63
14:45	74	65	65	61	59	52	46	40	63
15:05	74	66	65	60	58	52	47	41	63
15:25	73	66	65	60	57	51	45	40	63
15:45	73	65	65	61	59	54	45	42	64
16:05	73	66	65	60	61	59	45	40	65
16:25	72	65	65	60	57	51	43	39	62
16:45	72	65	65	60	57	51	44	42	62
17:05	73	64	60	57	55	50	44	40	60
17:25	72	64	60	60	64	57	46	42	66
17:45	73	66	60	57	54	50	44	41	60
18:05	72	65	60	57	54	50	44	42	60
18:25	71	64	60	57	54	50	44	42	59
18:45	72	64	60	56	54	49	44	42	59

19:05	73	64	61	58	56	51	43	42	61
19:25	72	64	60	56	54	49	42	41	59
19:45	74	64	60	57	57	49	44	42	60
20:05	73	64	59	56	53	49	41	41	59
20:25	71	63	59	54	53	48	42	40	58
20:45	71	63	59	55	53	48	41	40	58
21:05	73	63	60	56	53	49	42	40	59
21:25	72	61	56	54	52	48	41	38	57
21:45	71	61	56	53	52	47	40	42	57
22:05	72	61	57	54	52	48	40	37	57
22:25	70	60	56	54	53	48	41	41	57
22:45	72	61	55	56	60	55	42	43	63
23:05	71	60	56	58	60	56	41	40	63
23:25	70	60	55	53	52	47	40	40	56
23:45	71	60	56	53	52	47	40	41	56
0:05	71	60	54	52	52	48	40	42	56
0:25	70	59	55	52	52	47	40	42	56
0:45	69	59	54	52	55	51	41	41	58
1:05	69	58	55	54	56	51	40	41	59
1:25	67	58	55	54	56	47	40	42	58
1:45	68	58	54	52	51	46	39	41	55
2:05	68	58	52	50	50	46	39	42	54
2:25	68	60	56	53	51	46	39	42	56
2:45	68	57	54	52	51	46	39	42	55
3:05	67	57	52	51	50	46	40	42	54
3:25	68	57	53	51	51	46	40	42	55
3:45	68	57	54	52	51	46	39	41	55
4:05	66	57	54	52	51	46	40	41	55
4:25	65	56	54	51	51	46	39	40	55
4:45	68	57	54	51	50	46	39	41	55
5:05	67	58	55	52	50	46	40	40	55
5:25	67	58	54	53	53	50	41	40	57
5:45	68	59	55	52	51	47	41	41	56
6:05	70	59	55	53	52	48	41	41	57
6:25	69	59	55	53	52	48	41	41	56
6:45	71	62	57	55	53	49	42	40	58
7:05	73	64	60	57	54	49	43	41	59

7:25	73	64	61	57	55	51	45	41	60
7:45	73	66	63	59	57	52	45	42	62
8:05	74	66	66	61	58	52	46	42	63
8:25	73	67	66	62	59	54	48	42	64
8:45	75	68	69	66	63	59	52	45	68
9:05	74	66	66	61	58	52	47	42	63
9:25	73	66	66	61	59	53	45	44	63
9:45	74	66	65	61	58	52	45	43	63
10:05	73	66	65	60	58	52	44	43	63
10:25	74	66	65	60	58	51	44	41	63
10:45	74	66	65	60	58	52	44	40	63
11:05	74	66	65	60	58	52	46	42	63
11:25	74	66	65	60	58	51	44	40	63
11:45	74	65	65	60	58	52	44	38	63
12:05	73	66	65	60	58	52	45	38	63
12:25	74	66	65	60	58	51	44	40	63
12:45	73	65	65	60	57	51	44	41	63
13:05	73	65	66	61	65	55	50	51	67

Table 2 – L_{10}

Time	63 Hz	125 Hz	250 Hz	500 Hz	1.0 k	2.0 k	4.0 k	8.0 k	dB(A)
9:25	77	67	66	62	60	55	53	49	65
9:45	77	68	67	62	60	55	53	47	65
10:05	77	68	67	62	60	55	51	44	65
10:25	77	69	68	64	63	59	60	52	68
10:45	78	68	67	64	63	58	54	47	67
11:05	76	67	66	61	59	54	54	49	64
11:25	77	68	66	62	59	55	48	43	64
11:45	76	67	66	61	59	54	47	43	64
12:05	75	67	66	61	59	53	47	47	64
12:25	75	67	66	62	62	62	61	61	69
12:45	76	67	66	61	59	55	51	44	64
13:05	76	68	67	62	59	55	51	45	64
13:25	77	68	67	62	59	55	49	43	65

13:45	76	68	66	62	59	54	48	42	64
14:05	77	67	66	61	59	53	46	41	64
14:25	76	67	66	61	59	54	49	44	64
14:45	77	67	66	61	59	54	48	42	64
15:05	77	67	66	61	59	54	49	43	64
15:25	76	68	66	62	59	54	48	42	64
15:45	76	67	66	61	59	53	47	44	64
16:05	76	67	66	61	59	54	47	42	64
16:25	76	67	66	61	58	53	45	41	63
16:45	75	67	66	61	58	53	46	44	64
17:05	76	66	62	59	57	53	46	44	62
17:25	76	67	62	59	57	53	46	44	62
17:45	76	68	62	59	56	52	46	44	62
18:05	76	68	62	59	56	52	46	44	62
18:25	74	67	61	58	56	52	45	44	61
18:45	75	66	62	58	56	52	45	44	61
19:05	76	66	63	59	57	53	45	44	62
19:25	75	66	62	58	56	52	45	45	61
19:45	77	67	62	58	56	52	45	44	62
20:05	76	66	61	58	56	51	44	45	61
20:25	75	65	60	56	55	51	44	45	60
20:45	75	65	61	57	55	50	43	45	60
21:05	76	66	61	58	56	52	44	44	61
21:25	75	64	59	56	55	51	44	41	60
21:45	74	64	58	56	55	50	43	45	59
22:05	75	64	60	56	55	51	43	39	60
22:25	73	64	59	56	56	51	43	44	60
22:45	76	64	57	56	56	52	44	46	61
23:05	74	63	58	57	56	52	43	45	61
23:25	73	63	57	55	55	50	42	45	59
23:45	74	63	58	55	55	50	42	45	59
0:05	74	62	56	54	55	50	42	45	58
0:25	73	62	57	55	55	50	43	46	59
0:45	73	62	57	55	55	51	43	45	59
1:05	72	61	57	56	56	51	43	44	60
1:25	71	61	57	55	55	50	42	44	58
1:45	71	61	57	55	55	50	42	45	59

2:05	70	59	55	53	54	49	42	44	58
2:25	71	61	58	55	55	50	42	46	59
2:45	71	60	56	54	54	49	42	45	58
3:05	69	60	55	54	54	49	41	45	58
3:25	71	60	56	54	54	50	43	45	58
3:45	70	60	56	55	54	49	42	44	58
4:05	70	60	56	54	54	50	42	44	58
4:25	68	59	56	54	55	50	41	43	58
4:45	70	60	56	54	54	49	42	43	58
5:05	70	60	58	55	54	50	43	42	58
5:25	70	61	57	55	56	51	44	43	59
5:45	71	62	58	56	55	51	44	43	59
6:05	73	62	58	56	56	51	44	42	60
6:25	72	62	58	56	55	51	44	43	59
6:45	75	65	60	57	57	53	45	41	61
7:05	76	66	62	59	57	53	46	43	62
7:25	76	66	63	60	58	54	48	43	63
7:45	76	69	66	62	59	55	48	44	65
8:05	77	68	67	62	59	54	48	44	64
8:25	76	68	67	63	60	55	49	45	66
8:45	77	71	71	69	66	63	56	48	71
9:05	77	67	67	62	59	54	48	44	64
9:25	76	68	67	62	60	55	47	45	65
9:45	76	68	67	62	59	54	47	43	64
10:05	76	67	66	61	59	54	46	45	64
10:25	77	67	66	61	59	53	46	41	64
10:45	77	68	66	61	59	54	47	43	64
11:05	77	67	66	62	59	54	48	43	64
11:25	77	67	66	61	59	54	46	40	64
11:45	77	67	66	61	59	54	47	41	64
12:05	76	67	66	61	59	54	47	40	64
12:25	76	68	66	62	59	53	46	42	64
12:45	76	67	66	62	59	53	46	42	64
13:05	76	67	66	63	66	56	47	40	68

Table 3 – L_{90}

Time	63 Hz	125 Hz	250 Hz	500 Hz	1.0 k	2.0 k	4.0 k	8.0 k	dB(A)
9:25	68	63	64	59	57	49	41	36	62
9:45	68	63	64	59	57	49	41	36	62
10:05	68	63	64	59	57	49	42	37	62
10:25	70	64	64	60	57	50	44	37	62
10:45	68	63	64	59	57	50	43	37	62
11:05	68	63	64	59	56	50	43	35	62
11:25	67	63	64	59	56	49	41	34	61
11:45	67	63	64	59	56	48	41	36	61
12:05	67	63	64	59	56	49	42	39	61
12:25	67	63	64	59	56	49	42	36	61
12:45	68	63	64	59	56	50	44	37	61
13:05	68	63	64	59	56	49	43	37	62
13:25	68	63	64	59	56	49	42	37	62
13:45	67	63	64	59	56	49	41	35	61
14:05	68	63	64	59	56	48	41	35	61
14:25	67	63	64	59	56	49	42	35	61
14:45	67	63	64	59	56	49	42	37	61
15:05	67	63	64	59	56	49	44	37	61
15:25	67	63	64	59	56	48	40	35	61
15:45	67	63	64	59	55	48	40	35	61
16:05	67	63	64	59	55	48	40	35	61
16:25	67	63	64	59	55	48	40	34	61
16:45	67	63	64	59	56	48	40	35	61
17:05	66	60	57	53	51	46	39	33	56
17:25	66	60	57	53	51	46	38	33	56
17:45	67	60	57	53	51	45	38	34	56
18:05	66	60	57	53	51	45	37	35	56
18:25	65	59	56	52	50	44	37	33	55
18:45	65	60	57	53	50	45	37	34	56
19:05	66	60	57	52	50	44	36	33	55
19:25	65	59	56	52	50	44	37	32	55
19:45	66	60	57	52	50	45	37	31	56
20:05	65	59	57	52	50	44	37	34	55
20:25	64	59	57	52	49	43	35	32	55
20:45	64	60	57	52	49	44	36	33	55

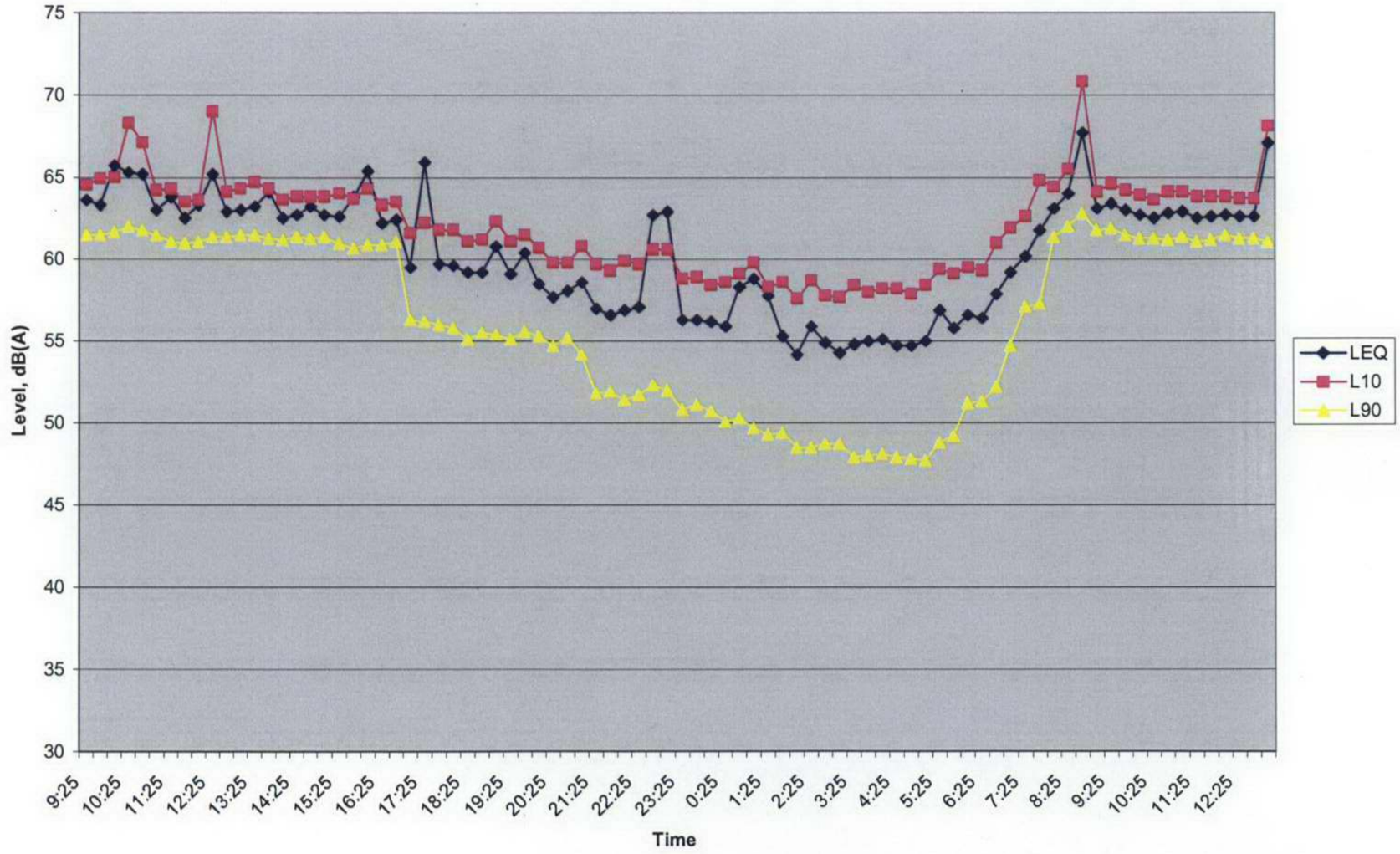
21:05	64	57	53	51	49	44	35	33	54
21:25	62	55	51	49	47	42	33	30	52
21:45	61	54	50	49	47	42	34	32	52
22:05	62	54	50	49	47	41	33	34	51
22:25	61	54	50	49	47	42	34	33	52
22:45	61	54	50	48	47	42	36	31	52
23:05	62	54	51	49	47	42	34	33	52
23:25	61	53	50	48	46	41	33	32	51
23:45	60	54	50	48	47	41	32	31	51
0:05	60	53	50	48	46	41	32	31	51
0:25	60	53	49	47	46	40	32	32	50
0:45	59	53	49	47	46	40	32	24	50
1:05	59	52	49	46	45	40	32	30	50
1:25	58	51	48	46	44	39	32	27	49
1:45	58	51	48	46	44	39	32	28	49
2:05	57	51	47	45	43	38	31	22	49
2:25	57	51	47	45	44	38	30	20	49
2:45	58	51	47	45	43	38	30	22	49
3:05	57	51	47	45	43	38	31	20	49
3:25	57	51	47	45	43	38	29	18	48
3:45	57	51	47	45	43	38	30	19	48
4:05	56	51	47	45	43	38	28	17	48
4:25	57	51	47	45	43	37	29	18	48
4:45	57	51	47	45	43	37	29	18	48
5:05	57	51	47	45	43	37	29	17	48
5:25	58	52	48	46	44	39	32	21	49
5:45	59	52	49	46	44	39	32	22	49
6:05	61	54	50	48	46	42	34	24	51
6:25	61	54	50	48	46	41	34	22	51
6:45	62	56	51	49	48	43	35	26	52
7:05	64	58	56	51	49	43	35	26	55
7:25	67	61	59	54	51	47	40	32	57
7:45	66	61	59	54	52	47	39	30	57
8:05	68	63	64	59	56	49	41	34	61
8:25	68	64	64	60	57	50	43	36	62
8:45	70	65	65	60	58	51	43	39	63
9:05	68	64	64	59	57	49	41	38	62

9:25	68	63	64	59	57	50	42	39	62
9:45	68	63	64	59	56	49	42	37	62
10:05	68	63	64	59	56	49	41	36	61
10:25	68	63	64	59	56	48	41	34	61
10:45	68	63	64	59	56	49	40	36	61
11:05	69	63	64	59	56	49	42	34	61
11:25	68	63	64	59	56	48	40	33	61
11:45	68	63	64	59	56	49	41	34	61
12:05	68	63	64	59	56	50	42	34	62
12:25	68	63	64	59	56	49	40	34	61
12:45	68	63	64	59	56	49	40	32	61
13:05	67	63	64	59	56	48	40	34	61

Notes; All readings sound pressure level dB re: $2x10^{-5}$ Nm^{-2}.

AIRAWAY ACOUSTICS
LIMITED

Environmental Noise Levels



ALLAWAY ACOUSTIC
LIMITED

ACOUSTIC TERMINOLOGY

DECIBEL (dB) - The Decibel is a logarithmic unit used to express ratios of quantities such as sound pressure level or sound power. The logarithmic nature of the unit means that decibel values cannot be added or subtracted in the usual way.

dBA or LA - The A weighted scale is used to take account of the fact that the human ear is more sensitive to sounds at high frequencies than sounds at low frequencies. "A" weighted sound pressure level (sound level) measurements correspond roughly to the subjective impression of loudness of the average listener.

LAEQ - The LAEQ index is used as a method of averaging temporally or spatially varying sound levels. At a given position, it may be defined as the notional sound level which contains the same amount of acoustical energy as the actual (time varying) sound level over the same measurement period. The LAEQ is gaining acceptance for many types of noise assessment, and is now referred to within BS4142 (used to assess the likelihood of justifiable environmental noise complaints), and also within the Noise at Work Regulations 1989.

LAMAX - The LAMAX is the maximum sound pressure level (sound level) recorded during any given measurement period.

LA10 - The LA10 is the sound level that is exceeded for 10% of the measurement period and is commonly used to describe road traffic noise, since it has been found to correlate reasonably well with complaint thresholds.

LA90 - The LA90 is the sound level that is exceeded for 90% of the measurements period, and is generally considered to describe the background noise, since it inherently excludes the sounds of transient events.