SHARPS REDMORE PARTNERSHIP

ACOUSTIC CONSULTANTS

SURVEY OF EXISTING ENVIRONMENTAL NOISE LEVELS AT 18-28 HATTON WALL, LONDON EC1N 8JH

Prepared by:
N. D. Durup
BSc(Hons). AMIOA
and
T. L. Redmore
BEng. Msc. PhD. MIOA

REPORT - 18-28 Hatton Wall, London

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1.0 Introduction

1.1 The buildings comprising 18-28 Hatton Wall, London EC1N 8JH are proposed for development.

1.2 The premises are presently for business use, the proposals are understood to include;

1.3 i) The demolition of the existing building 20-24 Hatton Wall and erection of a new building providing 6 storeys of office accomodation with jewellery workshops in the basement.

1.4 ii) The refurbishment of 26-28 Hatton Wall to provide a ground floor retail unit and 3 x 1 bed units above.

1.5 iii) The change of use of the existing ground floor office reception area at 18 Hatton Wall to retail.

1.6 Sharps Redmore Partnership have been instructed to undertake an environmental noise survey in order to comment on noise impact on to the building and to produce plant noise criteria in accordance with the Local Authority requirements.

1.7 This report details the background noise survey undertaken at the site, comments on noise impact and specifies plant noise criteria based on this survey.

2.0 Local Authority plant noise emissions criteria

2.1 The Local Authority for this project is Camden Council.

2.2 The Camden Replacement Unitary Development Plan (adopted June 2006), contains the following guidance in Appendix 1 – *Noise and Vibration Thresholds*;

Camden Replacement Unitary Development Plan
Appendix 1 – Noise and Vibration Thresholds

Table E: Noise levels from plant and machinery at which planning permission will not be granted

Noise description and location of measurement	Period	Time	Noise level
Noise at 1 metre external to a sensitive façade	Day, evening and night	0000-2400	5dB(A) <LA90
Noise that has a distinguishable discrete continuous note (whine, hiss, screech, hum) at 1 metre external to a sensitive facade	Day, evening and night	0000-2400	10dB(A) <LA90
Noise that has distinct impulses (bangs, clicks, clatters, thumps) at 1 metre external to a sensitive facade	Day, evening and night	0000-2400	10dB(A) <LA90
Noise at 1 metre external to sensitive façade where LA90 >60dB	Day, evening and night	0000-2400	55dB L_{Aeq}

This criteria has been the basis of the plant noise assessment.

3.0 Noise intrusion criteria

3.1 The Local Authority for the site is Camden Council.

3.2 It is understood from previous projects Sharps Redmore Partnership have been involved in within the Camden area that the council does not have specific criteria regarding noise intrusion to residential accommodation. Previous projects have referred to internal levels specified in WHO *Guidelines for community noise*, and BS 8233.

3.3 The WHO Guidelines for community noise contain the following guidance:

Room	L_{Aeq} dB	L_{Amax} dB	Time base
Bedrooms	30	45	8 hour 2300-0700
Other rooms	35	-	16 hour 0700-2300

3.4 WHO suggests no L_{Amax} value for rooms other than bedrooms, a value of L_{Amax} 55 dB has been utilised as a criteria on other residential projects.

3.5 BS 8233 contains the following guidance:

Room	L_{Aeq} dB		L_{Amax} dB	Time base
	Good	Reasonable		
Bedrooms	30	35	45	8 hour 2300-0700
Other rooms	30	40	-	16 hour 0700-2300

3.6 The following criteria are proposed to control noise intrusion from external noise, using the WHO and BS 8233 guidelines:

3.7 **Bedrooms**

$L_{Aeq,8hrs}$ 30 dB

L_{Amax} 45 dB

3.8 **Living room/Kitchen**

$L_{Aeq,16hrs}$ 35 dB

L_{Amax} 55 dB

3.9 These criteria relate to the more onerous guidelines within the standards.

4.0 Noise Survey

4.1 An environmental noise survey was carried out during the 14th and 15th November 2007 to determine the background noise levels on the site.

4.2 Details of the survey are summarised as:

4.3 Survey Equipment

4.4 In order to measure the background noise environment, a 24 hour measurement was made at the rear of the building. This period was subdivided into 15 minute measurements. In addition two short sample measurements were made at different locations.

4.5 Noise levels were measured using a Norsonic 118 sound level meter, which was calibrated before and after use.

4.6 The Norsonic 118 sound level meter allows simultaneous measurements of noise levels both in overall dBA values and frequency selective octave bands over predetermined time periods, using various statistical measurement parameters. The L_{eq}, L_1, L_{10}, L_{90} and L_{MAX} noise levels were recorded in overall dBA values together with octave band levels.

4.7 For information purposes it can be noted:

- dBA is the sound level in decibels (dB) measured by the sound level meter with the A-weighting. The A-weighting is a filter applied to the sound level meter to simulate the frequency response of the human ear, which is more sensitive to high frequency sound than low.
- L_{eq} is the equivalent continuous noise level which is a method of averaging the varying noise level over the time period into a single figure value. The L_{eq} has the same sound energy as the fluctuating level over that period.

- L_{MAX} is the highest level over an individual time constant period within the measurement period.
- L_1 is the noise level exceeded for 1% of the time.
- L_{10} is the noise level exceeded for 10% of the time.
- L_{90} is the noise level exceeded for 90% of the time and is referred to as the background noise level.

4.8 The sound level meter microphone was mounted on a mast during the 24 hour measurement, complete with a wet kit and integrated wind shield.
The meter was hand held for the short sample measurements.

4.9 For the 24 hour measurement the microphone was positioned 2 metres above the third floor level, mounted on a fire escape.

4.10 The measurement locations are shown in Appendix A.

4.11 There was no rain during the survey, the roads were dry, there was little wind and the temperature was low.

5.0 Survey Results

5.1 The full data set is included in Appendix B.

5.2 The 24 hour survey results can be summarised as:

Time	Logarithmic average $L_{Aeq,\ 15minutes}$	Minimum $L_{A90,15minutes}$
0700-1900	57 dB	49 dB
1900-2300	51 dB	48 dB
2300-0700	51 dB	47 dB

5.3 Daytime ground-level measurements can be summarised as :

Location	$L_{Aeq,\ 5minutes}$	$L_{A90,\ 5\ minutes}$
Hatton Wall	61 dB	57 dB
Service yard	49 dB	48 dB

All measurements were free field.

6.0 Comments on measured data

6.1 The noise climate at the rear of the building is fairly consistent throughout the 24 hour period, with the L_{A90}, varying over a 2 dB range during the 24 hour period

6.2 The logarithmic average L_{Aeq} was 6 dB lower in the evening and night than during the day.

6.3 This location is well shielded from direct noise from the surrounding roads by buildings, the main noise source is plant on adjacent roofs, along with general distant noise.

6.4 The L_{A90} level in the rear service yard at ground level was consistent with that at high level.

6.5 During the short duration daytime samples the L_{A90} level on Hatton Wall at street level was around 4 dB higher than in the service yard.

7.0 Proposed Plant noise criteria

7.1 It is our understanding that all the main plant is to be contained within the building envelope, mostly at basement level. Any ductwork or intake/outlet openings in the façade will be attenuated using appropriate acoustic attenuators. Any emissions will be controlled to meet the criteria proposed in section 7.4 Additional measures may be required to control noise emissions to the building itself from these sources.

7.2 In addition to the basement location, a small plant area to the roof is planned to provide space for tenant plant installations if required. Any plant to be located here shall meet the proposed emissions criteria detailed in section 7.4, as well as controlling noise emissions to the building itself.

7.3 The background noise level does not exceed L_{A90} 60 dB, therefore as detailed in the Local Authority criteria (contained in 2.2) the nature of the sound source will define the limiting criteria.

7.4 The operating times of any plant to be included in the development are not known at present, the limiting criteria are therefore proposed for different time periods:

Time	Lowest * $L_{A90,\ 15\ minutes}$	Non-tonal / Non-impulsive source limit	Tonal source limit	Impulsive source limit
0700-1900	52 dB	47 dB	42 dB	42 dB
1900-2300	51 dB	46 dB	41 dB	41 dB
2300-0700	50 dB	45 dB	40 dB	40 dB

* Façade corrected level.

7.5 If plant is to operate during different time periods (as shown above), the noise emissions should be controlled to the most onerous criteria of the different periods.

7.6 Tonal refers to the presence of a distinguishable discrete continuous note or whine, hiss, screech or hum.

7.7 Impulsive refers to the presence of distinct impulses (bangs, clicks, clatters, thumps etc.).

7.8 These limits are the façade level at 1m from the nearest noise sensitive façade, as detailed in the Local Authority criteria.

7.9 There are a number of residential dwellings in the vicinity and proposed within the development itself. From the drawings available it appears that the residential elements of 26-28 Hatton Wall would be the nearest critical receptor, however this should be confirmed during plant specification.

Any external emissions from the basement level plant and from the roof level plant shall be controlled in line with the proposed criteria.

8.0 Façade specification

8.1 The daytime short samples taken measured a L_{Aeq} of 61 dB at street level on Hatton Wall and a L_{Aeq} of 49 dB in the rear service yard.

8.2 The 24 hour measurement at the rear of the existing building showed a reduction in the log. average L_{Aeq} of 6dB between day (0700-1900) and evening/night (1900-0700) periods

8.3 As present there are no detailed drawings relating to the residential layouts therefore the façade specification in sound attenuation terms will detail the minimum required attenuation.

8.4 Assuming typical daytime levels of L_{Aeq} 64 dB (façade level) on Hatton Wall reduced by around 6 dB at night, in line with the 24 hour data, an external night time L_{Aeq} of 58 dB (façade level) could be expected.

8.5 To achieve good internal levels during day and night as proposed, the façade would be required to achieve a minimum SRI (sound reduction index) of 29 dB relative to the external noise spectrum.

8.6 A window of 6-12-6 (glass-air gap- glass mm) would be expected to provide around R_w 33. The acoustic performance required of the glazing will vary depending on the size of the window; larger windows will require higher acoustic performance to achieve the noise intrusion criteria. Detailed window specifications can be commented on when required.

8.7 It should be noted that such specifications relate to the required performance of the window unit i.e. the glass and frame in situ, rather than that of the glass alone.

8.8 The specification in terms of glazing would relate to acoustic requirements only. Thicker glass may be required for structural or thermal reasons, thicker glass or larger air gaps are likely to increase acoustic performance.

8.9 Therefore a façade which along with glazed elements and ventilation services provides a minimum SRI (sound reduction index) of 29 dB relative to the typical external traffic noise spectrum, would provide good internal noise levels in both bedroom and living rooms.

9.0 Conclusions

9.1 A background noise survey has been carried out at the site.

9.2 The Local Authority criteria for plant noise control at the nearest critical receptor has been determined.

9.3 Criteria have been proposed to control plant noise emissions at the nearest critical receptor, likely to be residential within the development itself, to conform with the Local Authority requirements.

9.4 The proposed plant noise control criteria are:

Time	Non-tonal / Non-impulsive source limit	Tonal source limit	Impulsive source limit
0700-1900	47 dB	42 dB	42 dB
1900-2300	46 dB	41 dB	41 dB
2300-0700	45 dB	40 dB	40 dB

9.5 Traffic noise intrusion criteria have been proposed for the residential elements of the developments:

Bedrooms

$L_{Aeq,8hrs}$ 30 dB

L_{Amax} 45 dB

Living room/Kitchen

$L_{Aeq,16hrs}$ 35 dB

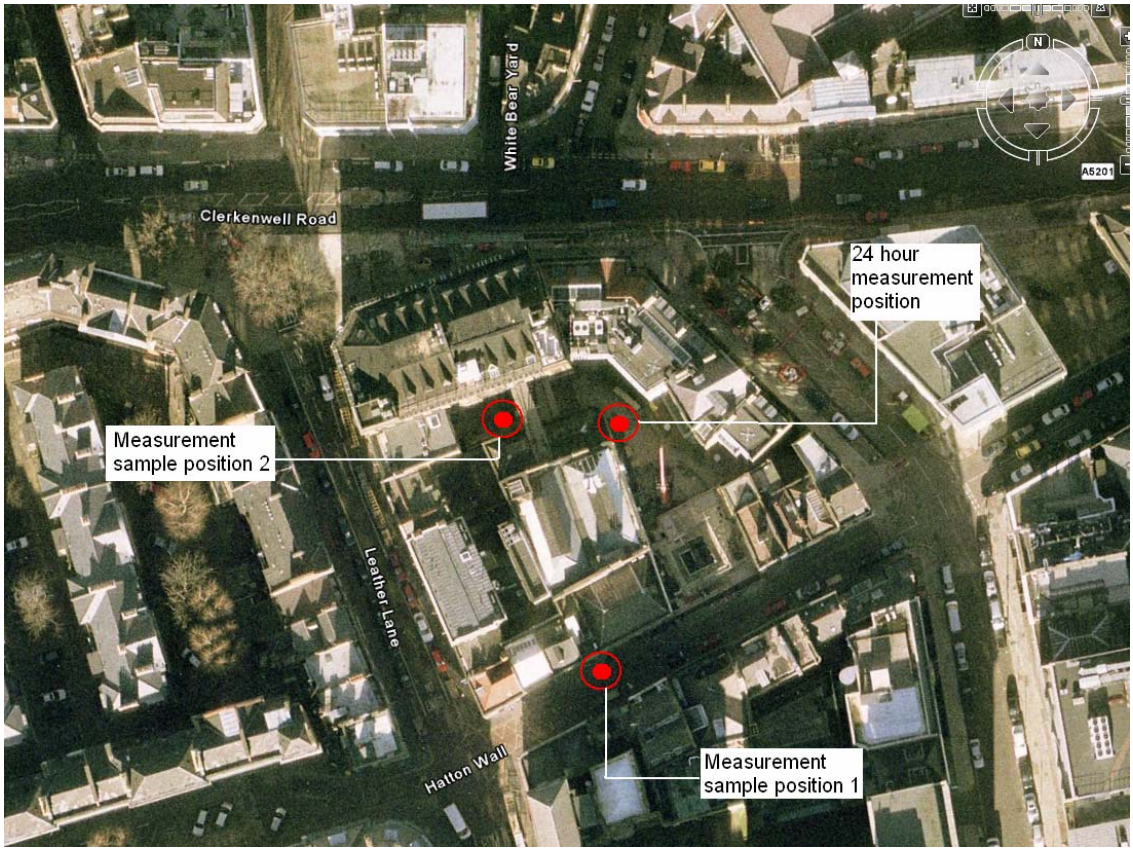
L_{Amax} 55 dB

9.6 Based on the external street level noise levels measured and assuming a similar drop in level during the evening and night time as occurred at the rear of the site, a façade providing a minimum of R_w 29 would control noise intrusion sufficiently.

APPENDIX A

MEASUREMENT LOCATIONS

Location of measurement positions



APPENDIX B

MEASUREMENT RESULTS

24 hour measurement results 14-15 November 2007 18-28 Hatton Wall, London
15 minute duration
Measured in free field conditions and corrected to the nearest decibel.

Time	L_{Aeq}	L_{AFmax}	L_{A1}	L_{A10}	L_{A90}
12:30	55	72	62	56	53
12:45	61	80	73	62	53
13:00	58	71	68	60	52
13:15	57	71	67	59	53
13:30	55	69	62	56	53
13:45	57	70	66	60	53
14:00	56	70	63	58	53
14:15	56	74	65	59	52
14:30	57	76	66	58	52
14:45	55	71	64	57	52
15:00	56	73	65	56	52
15:15	56	75	67	56	51
15:30	54	67	64	56	50
15:45	54	70	63	56	50
16:00	56	75	66	59	50
16:15	55	70	64	57	51
16:30	58	78	70	60	50
16:45	53	76	61	54	50
17:00	55	66	61	58	50
17:15	54	69	64	54	49
17:30	54	80	63	53	49
17:45	51	66	56	52	49
18:00	66	78	74	72	50
18:15	59	77	68	64	50
18:30	52	72	61	53	49
18:45	51	64	58	53	49
19:00	51	71	56	52	49

Time	L_{Aeq}	L_{AFmax}	L_{A1}	L_{A10}	L_{A90}
19:15	51	65	58	53	49
19:30	51	73	55	51	48
19:45	52	65	59	55	49
20:00	50	64	55	52	48
20:15	50	60	54	52	48
20:30	51	64	57	53	49
20:45	51	66	58	52	48
21:00	52	73	63	51	48
21:15	50	65	58	51	48
21:30	50	64	55	51	48
21:45	50	57	54	51	48
22:00	51	75	55	51	48
22:15	50	58	54	51	48
22:30	50	58	54	51	48
22:45	50	58	54	51	48
23:00	49	59	53	51	48
23:15	50	62	54	51	48
23:30	51	64	58	52	48
23:45	49	56	52	51	48
00:00	49	56	51	50	48
00:15	49	65	53	50	48
00:30	49	58	52	50	47
00:45	49	57	52	50	47
01:00	49	56	52	50	47
01:15	49	57	51	50	47
01:30	49	58	53	50	47
01:45	49	56	52	50	47
02:00	49	65	54	50	47
02:15	49	56	52	50	47

Time	L_{Aeq}	L_{AFmax}	L_{A1}	L_{A10}	L_{A90}
02:30	49	56	52	50	47
02:45	49	56	54	50	48
03:00	49	55	52	50	47
03:15	49	55	52	50	47
03:30	48	58	51	49	47
03:45	49	55	51	50	47
04:00	52	57	55	54	49
04:15	53	61	55	54	52
04:30	51	57	54	53	48
04:45	52	58	55	54	48
05:00	53	58	56	54	49
05:15	53	58	56	54	50
05:30	52	60	56	54	48
05:45	52	67	55	54	49
06:00	53	68	58	54	51
06:15	53	63	56	54	50
06:30	53	69	56	55	50
06:45	53	63	59	55	50
07:00	54	62	57	55	51
07:15	54	67	59	56	51
07:30	55	71	62	57	52
07:45	54	63	58	56	51
08:00	55	68	61	56	54
08:15	59	80	69	60	54
08:30	55	70	59	57	53
08:45	56	70	59	57	54
09:00	56	67	61	57	54
09:15	57	74	65	57	54
09:30	59	78	69	61	54

Time	L_{Aeq}	L_{AFmax}	L_{A1}	L_{A10}	L_{A90}
09:45	60	75	72	61	54
10:00	58	69	64	60	55
10:15	56	66	60	57	53
10:30	56	72	62	58	54
10:45	55	75	61	57	53
11:00	54	75	60	55	52
11:15	54	63	57	55	53
11:30	54	69	59	55	53
11:45	57	86	63	57	53
12:00	56	73	65	57	53
12:15	55	75	63	56	53

24 hour spectral results 14-15 November 2007 18-28 Hatton Wall, London
15 minute duration
Measured in free field conditions and corrected to the nearest decibel

L_{eq}	Octave band centre frequency Hz						
Time	**63**	**125**	**250**	**500**	**1 k**	**2 k**	**4 k**
12:30	69	60	55	54	49	45	38
12:45	69	62	59	58	55	52	49
13:00	69	60	56	55	54	48	38
13:15	69	60	56	56	52	47	38
13:30	69	60	56	53	49	44	36
13:45	68	61	57	56	51	45	37
14:00	68	60	55	55	50	45	40
14:15	68	61	57	56	51	44	37
14:30	69	60	57	56	51	45	38
14:45	69	60	55	54	49	44	36
15:00	68	59	54	52	51	48	36
15:15	69	61	56	52	51	47	42
15:30	69	58	53	51	49	45	40
15:45	69	60	55	50	47	45	41
16:00	70	62	56	53	51	48	43
16:15	70	63	55	52	50	47	41
16:30	69	61	57	56	54	49	44
16:45	69	60	53	49	47	44	43
17:00	69	60	56	54	49	43	35
17:15	69	60	55	51	47	44	40
17:30	70	60	53	50	48	45	41
17:45	68	58	52	47	45	41	34
18:00	74	71	67	65	58	54	49
18:15	71	64	60	58	51	49	46
18:30	69	60	53	49	47	42	37
18:45	69	58	51	47	46	41	35

L_{eq}	Octave band centre frequency Hz						
Time	**63**	**125**	**250**	**500**	**1 k**	**2 k**	**4 k**
19:00	69	57	51	47	45	41	34
19:15	69	58	52	48	45	41	34
19:30	69	57	51	48	46	41	34
19:45	69	58	53	50	46	41	34
20:00	69	57	51	47	45	40	33
20:15	69	58	50	47	44	40	35
20:30	68	58	52	48	45	40	33
20:45	69	57	51	48	45	41	33
21:00	69	57	50	46	48	46	33
21:15	69	58	53	47	43	39	32
21:30	69	58	51	46	43	39	32
21:45	69	57	50	46	44	40	33
22:00	69	57	51	47	45	41	34
22:15	69	57	50	46	43	39	32
22:30	69	57	51	46	43	39	33
22:45	69	58	50	46	43	39	32
23:00	69	57	50	46	43	39	32
23:15	69	56	50	46	44	39	32
23:30	69	57	52	48	45	40	32
23:45	69	57	50	46	43	39	32
00:00	69	57	49	46	43	39	31
00:15	69	56	50	46	43	39	32
00:30	69	56	49	45	43	39	32
00:45	69	56	49	45	42	38	31
01:00	69	56	49	45	43	39	32
01:15	69	56	49	45	42	38	31
01:30	69	57	49	45	42	39	32
01:45	69	57	49	45	43	39	32
02:00	69	56	49	45	43	38	31

L_{eq}	Octave band centre frequency Hz						
Time	**63**	**125**	**250**	**500**	**1 k**	**2 k**	**4 k**
02:15	69	56	49	45	43	39	32
02:30	69	57	49	45	42	38	32
02:45	69	57	50	46	43	38	31
03:00	69	57	49	45	42	38	32
03:15	69	57	49	45	42	38	32
03:30	69	56	49	44	42	38	31
03:45	69	56	49	44	42	38	31
04:00	69	58	53	51	47	41	36
04:15	69	59	53	51	47	41	37
04:30	69	58	52	49	45	40	34
04:45	70	58	52	50	46	41	36
05:00	69	58	53	51	47	45	38
05:15	69	57	52	50	46	45	38
05:30	69	58	52	49	46	41	36
05:45	69	58	53	50	46	41	36
06:00	70	58	54	51	48	43	37
06:15	70	58	53	51	48	42	36
06:30	70	59	53	50	47	42	36
06:45	70	59	54	51	48	43	37
07:00	70	59	54	51	48	43	37
07:15	70	59	54	52	49	44	37
07:30	70	60	55	52	50	47	41
07:45	70	59	54	52	49	43	37
08:00	70	60	55	53	50	45	39
08:15	71	63	58	57	54	50	44
08:30	70	62	55	53	50	45	39
08:45	70	62	56	54	50	45	38
09:00	70	63	56	54	50	45	39
09:15	70	62	56	54	51	47	44

L_{eq}	Octave band centre frequency Hz						
Time	**63**	**125**	**250**	**500**	**1 k**	**2 k**	**4 k**
09:30	71	66	58	56	54	49	48
09:45	70	63	61	59	54	49	42
10:00	70	62	58	56	53	47	40
10:15	69	61	56	54	50	46	39
10:30	70	61	56	54	51	47	41
10:45	69	61	56	53	50	46	39
11:00	69	59	54	52	49	45	38
11:15	69	60	54	51	49	44	37
11:30	69	59	53	51	49	45	38
11:45	69	60	56	54	52	47	42
12:00	69	60	55	54	51	46	39
12:15	70	60	54	52	49	46	41

L_{90}	Octave band centre frequency Hz						
Time	**63**	**125**	**250**	**500**	**1 k**	**2 k**	**4 k**
12:30	67	57	52	50	47	42	35
12:45	67	58	53	50	48	43	35
13:00	67	57	52	49	47	42	34
13:15	67	57	53	51	47	43	34
13:30	67	58	53	50	47	42	34
13:45	67	58	53	51	47	42	34
14:00	67	57	52	50	47	42	34
14:15	67	57	52	50	47	42	34
14:30	67	57	52	49	46	42	34
14:45	67	57	51	49	46	41	33
15:00	67	56	52	49	46	42	33
15:15	67	56	51	47	44	40	33
15:30	67	56	50	46	44	40	32
15:45	67	56	51	46	44	40	33
16:00	67	56	51	46	44	40	32
16:15	67	56	51	47	45	41	34
16:30	67	56	51	46	44	40	34
16:45	67	56	51	46	44	40	32
17:00	68	56	51	47	43	40	32
17:15	67	56	50	45	43	39	31
17:30	67	56	50	45	42	39	31
17:45	67	55	49	45	42	38	30
18:00	68	56	51	46	43	40	33
18:15	68	56	51	46	44	40	32
18:30	68	55	49	45	42	38	30
18:45	68	55	49	45	42	38	30
19:00	68	55	49	44	42	38	29
19:15	68	55	49	45	42	38	29

L_{90}	Octave band centre frequency Hz						
Time	**63**	**125**	**250**	**500**	**1 k**	**2 k**	**4 k**
19:30	68	54	49	44	42	37	29
19:45	68	55	49	45	42	38	28
20:00	68	55	49	44	42	37	28
20:15	68	55	49	44	42	37	28
20:30	68	55	49	45	42	37	28
20:45	68	55	49	44	42	37	28
21:00	68	55	48	44	41	36	27
21:15	68	55	49	44	41	36	28
21:30	68	55	49	44	41	37	28
21:45	68	55	48	44	41	36	28
22:00	68	55	48	44	41	37	28
22:15	68	55	48	44	41	36	27
22:30	68	55	49	44	42	37	28
22:45	68	55	48	44	40	35	27
23:00	68	55	48	44	41	36	27
23:15	68	54	48	44	42	37	27
23:30	68	55	49	44	42	37	27
23:45	68	55	48	44	41	36	27
00:00	69	55	48	44	41	36	27
00:15	68	55	48	44	41	36	27
00:30	68	55	48	43	40	35	27
00:45	68	55	48	43	40	35	27
01:00	68	55	48	43	40	35	27
01:15	68	55	48	43	39	35	26
01:30	68	55	48	43	39	35	26
01:45	68	55	48	43	40	35	26
02:00	68	55	48	43	40	35	26
02:15	68	55	48	43	40	35	26
02:30	69	56	48	43	40	35	26

L_{90}	Octave band centre frequency Hz						
Time	**63**	**125**	**250**	**500**	**1 k**	**2 k**	**4 k**
02:45	68	55	48	43	40	35	26
03:00	68	56	48	43	40	35	26
03:15	68	55	48	43	40	35	26
03:30	69	55	48	43	39	35	26
03:45	68	55	48	43	40	35	26
04:00	69	56	49	44	42	39	33
04:15	69	57	52	49	45	39	35
04:30	69	56	48	44	41	37	30
04:45	69	56	48	44	41	37	28
05:00	69	56	49	45	43	39	33
05:15	68	56	48	43	40	41	35
05:30	69	56	48	44	41	36	28
05:45	68	56	49	45	42	37	29
06:00	69	56	51	48	45	40	34
06:15	69	56	49	46	43	39	33
06:30	69	57	50	46	44	39	32
06:45	69	56	50	46	44	39	31
07:00	68	57	52	48	45	40	32
07:15	69	56	51	47	45	41	33
07:30	69	57	52	48	46	41	34
07:45	69	57	51	48	45	40	32
08:00	69	58	53	51	48	42	35
08:15	69	59	54	52	49	44	36
08:30	69	60	53	51	48	43	35
08:45	69	61	53	51	48	43	35
09:00	69	60	54	51	48	43	35
09:15	68	60	54	51	48	43	36
09:30	69	60	54	51	48	43	36
09:45	68	60	54	52	49	44	36

L_{90}	Octave band centre frequency Hz						
Time	**63**	**125**	**250**	**500**	**1 k**	**2 k**	**4 k**
10:00	68	60	55	54	50	44	37
10:15	68	59	53	51	48	43	35
10:30	68	59	54	52	49	44	37
10:45	68	58	53	50	47	42	34
11:00	68	58	52	50	47	42	34
11:15	68	58	52	50	47	43	34
11:30	68	58	52	50	47	43	34
11:45	68	58	52	50	47	43	35
12:00	68	58	52	50	47	42	35
12:15	68	58	52	49	47	42	35

Sample measurement results 14-15 November 2007
18-28 Hatton Wall, London
5 minute duration
Measured in free field conditions and corrected to the nearest decibel.

Location	Date	Time	L_{Aeq}	L_{AFmax}	L_{A1}	L_{A10}	L_{A90}
1	14/11/2007	11:50	61	85	66	61	57
2	15/11/2007	12:37	49	58	55	51	48

L_{eq}			Octave band centre frequency Hz						
Location	Date	Time	63	125	250	500	1.0 k	2.0 k	4.0 k
1	14/11/2007	11:50	70	64	64	59	54	51	46
2	15/11/2007	12:37	63	54	51	47	44	39	34

L_{90}			Octave band centre frequency Hz						
Location	Date	Time	63	125	250	500	1.0 k	2.0 k	4.0 k
1	14/11/2007	11:50	66	62	62	53	50	46	38
2	15/11/2007	12:37	59	52	49	45	42	37	30

L_{fmax}			Octave band centre frequency Hz						
Location	Date	Time	63	125	250	500	1.0 k	2.0 k	4.0 k
1	14/11/2007	11:50	82	79	80	86	80	75	69
2	15/11/2007	12:37	75	65	60	57	55	49	46

Sharps Redmore Partnership
The White House
London Road
Copdock
Ipswich
IP8 3JH

Telephone: (01473) 730073
Fax: (01473) 730030
www.sharpsredmore.co.uk