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24 HOUR NOISE LEVEL SURVEY CARRIED OUT AT THE REAR OF THE PRIVATE PROPERTY AT NO. 36 MILLFIELD LANE, HAMPSTEAD, LONDON NW6 AND A REPORT ON THE NOISE CONTROL MEASURES REQUIRED TO MINIMISE THE NOISE IMPACT OF ANY PROPOSED NEW VENTILATION AND AIR CONDITIONING UNITS

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I J Marchant

Client	:	Peter Deer and Associates
Project	:	36 Millfield Lane, Hampstead, London NW6
Emtec Ref.	:	QF5396/PF3180/RP1
Date	:	25th May 2007

QF5396/PF3180

EMTEC PRODUCTS LTD.

24 HOUR NOISE LEVEL SURVEY CARRIED OUT AT THE REAR OF THE PRIVATE PROPERTY AT NO. 36 MILLFIELD LANE, HAMPSTEAD, LONDON NW6 AND A REPORT ON THE NOISE CONTROL MEASURES REQUIRED TO MINIMISE THE NOISE IMPACT OF ANY PROPOSED NEW VENTILATION AND AIR CONDITIONING UNITS

1.0. INTRODUCTION

This report details the results of a 24 hour noise survey carried out on the roof of the single storey garage at the rear of the private residential property at No. 36 Millfield Lane, Hampstead, London NW6.

The objectives of this survey were as follows:

- To establish the existing background noise level at the rear of the site.
- To assess the proposed new Ventilation and Air Conditioning Plant that is to be mounted on the roof of the proposed new development and to recommend areas that may require particular treatment to ensure that the operation of the new plant does not disturb the occupants of the neighbouring residential properties.

This report has been divided into the following sections for ease of analysis:

2.0. TEST INSTRUMENTATION

All measurement equipment used during the survey complied with the requirements of BS4142:1990 "Method for Rating Industrial Noise Affecting Mixed Residential and Industrial Areas". Details of the equipment are as follows:

Integrating Sound Level Meters	: Bruel & Kjaer type 2231 fitted with a Bruel & Kjaer type 4155 ½ inch condenser microphone.
Statistical Analysis Modules	: Bruel & Kjaer type BZ 7115 capable of computing the percentile levels L1, L10, L50, L90 and L99 and also the Leq level.
Acoustic Calibrator	: Bruel & Kjaer type 4231 electronic calibrator.

Calibration was performed before and after the surveys and found to be, in all cases, +/- 0.1 dB from the reference source.

3.0. TEST PROCEDURE

The survey was conducted during a continuous 24 hour period from 14.02pm on Tuesday the 22nd of May 2007 to 13.42pm on Wednesday the 23rd of May 2007.

Data was continuously acquired throughout the measurement period with the individual averaging time for statistical noise data set to 20 minutes. The following statistical measurements were recorded concurrently:

LA1 - The Sound Pressure Level exceeded for 1% of the measurement period.

LA10 - The Sound Pressure Level exceeded for 10% of the measurement period.

LA50 - The Sound Pressure Level exceeded for 50% of the measurement period.

LA90 - The Sound Pressure Level exceeded for 90% of the measurement period. LA90 is considered to represent the "background noise level" during the measurement period and is used for the assessment of noise to determine the likelihood of complaints (See BS 4142).

LA99 - The Sound Pressure Level exceeded for 99% of the measurement period.

LAeq - The continuous steady state Sound Pressure Level that has the same acoustic energy as the real fluctuating level.

All noise levels recorded were filtered using a standard 'A' Weighting filter.

3.1. Measurement Position

The noise levels were measured at a position in the centre of the roof of the single storey garage on the left hand side of the rear portion of the site.

The microphone was positioned so that it was pointing towards the adjacent residential property.

The microphone was approximately 1.2 metres above the roof level. The rest of the measurement equipment was located in a weatherproof enclosure with a low impedance cable running from the microphone to the instrumentation.

3.2. Weather Conditions

The weather conditions prevailing during the measurement period were in line with those recommended in BS 4142:1990 with no precipitation and no wind. The weather was bright and clear throughout the daytime and nightime period.

The microphone was protected throughout the tests by an acoustically transparent wind balloon.

4.0. RESULTS

The raw test data, gathered during the 24 hour noise survey, is given in Appendix 'A 'of this report.

The 'A' Weighted Leq levels measured over each 20 minute interval throughout the 24 hour periods (denoted by LAeq, (20 mins)) are displayed as bar graphs on the attached Sketch No. QF/5396/T1 at the back of this report.

The 'A' Weighted percentile levels measured over each 20 minute interval denoted by LA10 (20 mins), LA50 (20 mins) and LA90 (20 mins) are displayed as line graphs on the attached Sketch No. QF/5396/T2 at the back of this report.

4.1. Summary of Results

The table QF/5396/D1 below summarises the noise levels taken over the 24 hour period in terms of the maximum and minimum Sound Pressure Levels recorded.

Table QF/5396/D1 – Summary of Maximum and Minimum Noise Levels

	LA1	LA10	LA50	LA90	LA99	Laeq
Min.	32.6 dBA	29.6 dBA	27.6 dBA	26.1 dBA	25.1 dBA	28.4 dBA
Max.	74.1 dBA	72.6 dBA	60.1 dBA	41.1 dBA	35.6 dBA	67.6 dBA

5.0. DISCUSSION OF RESULTS

The lowest recorded LA_{90} noise level was measured at 26.1 dBA during two time periods ending at 3.42am and 4.02am.

The requirement of BS4142 suggests that an increase in noise level of between 0dB and 5dB is unlikely to cause complaints. In non urban locations it is normally allowable to increase the lowest LA_{90} level recorded by 1 or 2dB which means that any new plant must meet a noise level of 5dB lower than the lowest LA_{90} level. This criteria is normally applied at the boundary of the site or at 1 metre from the nearest noise sensitive windows of the neighbouring property, whichever is the nearest.

In this case the nearest location will be the boundary of the site adjacent to the new garage and this is approximately 15 metres and two stories below the rooftop location of the new condenser unit.

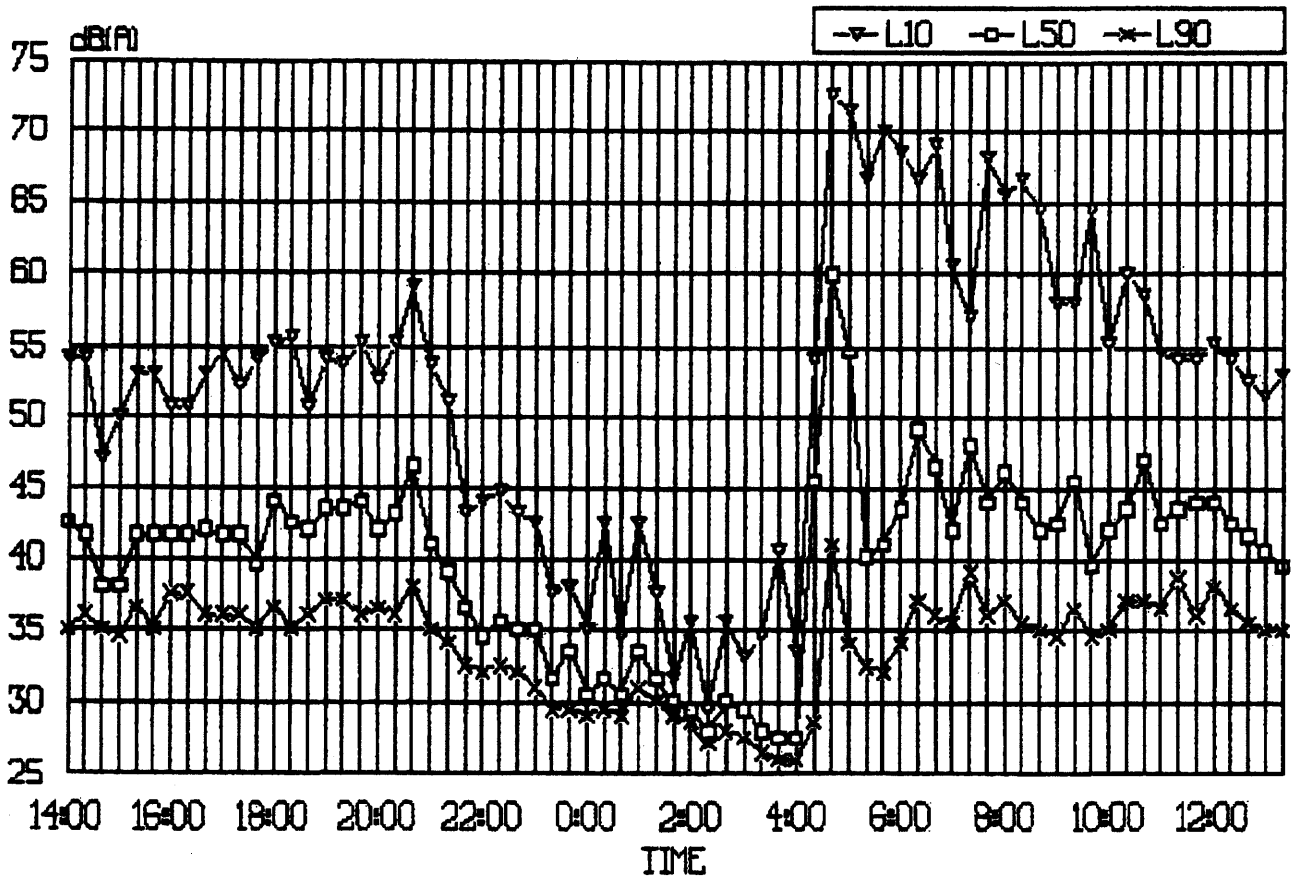
The condenser unit to be used is a Mitsubishi PQRY-P250YGM-A unit which has a free field noise level of 57 dBA at 1 metre. The boundary of the site is some 16 metres and two stories above the location of the condensers. The noise level at the boundary of the site is likely to be just below 23 dBA if the condenser is left untreated and a barrier is erected around the roof plant area which is at least the same height as the condenser. This will give a combined noise level at the boundary of the site of just below 28 dBA which should be acceptable.

If any other plant is to be installed in the house such as ventilation plant or plant associated with the swimming pool it should be noted that this plant will have to be designed to achieve a noise level of below 20 dBA at the boundary of the site so as to ensure it has no material affect on the noise level at this location.

If you could forward details of any other mechanical plant that is to be installed we would be pleased to assess this contribution to the overall noise level and suggest acoustic treatment if necessary.

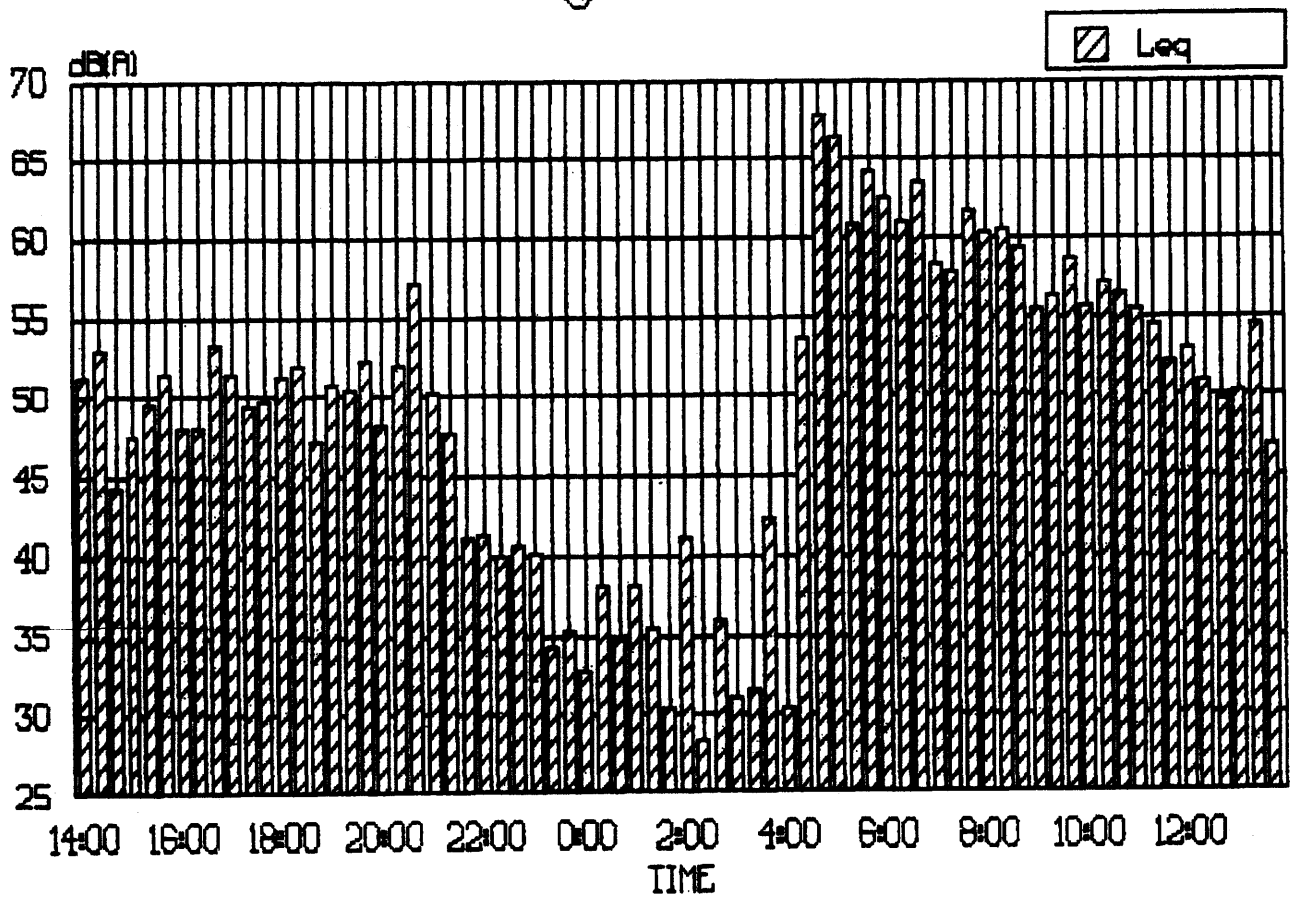
EMTEC PRODUCTS LTD
25th May 2007

36 MILLFIELD LANE, HAMPSTEAD.
22nd to 23rd May 2007



TITLE LA10, LA50 and LA90 Levels	ISSUE DATE: 25/5/07	DRAWN BY: MGR	A B C D E F G H	[redacted]
CLIENT Peter Deer & Associates	PF No. 3180	APPROVED BY: MGR	REVISION	Enterprise House, Blyth Road Hayes, Middlesex UB3 1DD Tel: 020 8848 3031 Fax: 020 8573 3605 Web: www.emtecproducts.co.uk
PROJECT 36 Millfield Lane, Hampstead	STATUS Q A M I	DESIGN AUTH: MGR	SK No. QF/5396/T2	

36 MILLFIELD LANE, HAMPSTEAD.
22nd to 23rd May 2007



TITLE LAeq Levels	ISSUE DATE: 25/5/07	DRAWN BY: MGR	A B C D E F G H	[redacted]
CLIENT Peter Deer & Associates	PF No. 3180	APPROVED BY: MGR	REVISION	Enterprise House, Blyth Road Hayes, Middlesex UB3 1DD Tel: 020 8848 3031 Fax: 020 8573 3605 Web: www.emtecproducts.co.uk
PROJECT 36 Millfield Lane, Hampstead	STATUS Q A M I	DESIGN AUTH: MGR	SK No. QF/5396/T1	

APPENDIX A

Raw Data – Noise Survey

22nd to 23rd of May 2007

NOISE SURVEY DATA FROM BACKGROUND NOISE LEVEL SURVEY ON THE ROOF TO THE REAR GARAGE BEHIND NO.86 MILLFIELD LANE, LONDON N6.

Project :	86 Millfield Lane, London N6.
Client :	Peter Deer & Associates
Ref :	QF5806
Date :	25th May 2007

Measure No.	Start Time	MaxP (dBA)	L1 (dBA)	L10 (dBA)	L50 (dBA)	L90 (dBA)	L99 (dBA)	Leq (dBA)
1	14:02	84.5	66.6	54.1	42.6	35.1	33.6	51.2
2	14:22	92.9	66.6	54.1	41.6	36.1	34.6	52.9
3	14:42	76.7	55.1	47.1	38.1	35.1	33.6	44.3
4	15:02	77.4	60.1	50.1	38.1	34.6	33.1	47.6
5	15:22	79.6	61.1	53.1	41.6	36.6	34.6	49.5
6	15:42	84.1	64.1	58.1	41.6	35.1	34.1	51.5
7	16:02	79.4	59.6	50.6	41.6	37.6	35.6	47.9
8	16:22	76.2	60.1	50.6	41.6	37.6	35.1	48
9	16:42	89	66.6	58.1	42.1	36.1	33.6	53.2
10	17:02	80.4	64.1	54.6	41.6	36.1	33.6	51.5
11	17:22	80.6	61.6	52.1	41.6	36.1	33.6	49.4
12	17:42	77.3	61.1	54.1	39.6	35.1	33.1	49.7
13	18:02	76.4	62.1	55.1	44.1	36.6	34.1	51.2
14	18:22	88.4	63.1	55.6	42.6	35.1	33.1	51.9
15	18:42	75	58.1	50.6	42.1	36.1	33.6	47.2
16	19:02	84.7	62.1	54.1	43.6	37.1	33.6	50.6
17	19:22	76.9	62.1	53.6	43.6	37.1	34.1	50.4
18	19:42	79.7	64.6	55.1	44.1	36.1	33.6	52.9
19	20:02	75.6	59.1	52.6	42.1	36.6	34.1	48.9
20	20:22	80.6	64.6	55.1	43.1	36.1	34.1	51.9
21	20:42	90.3	69.6	59.1	46.6	36.1	35.1	57.1
22	21:02	76.7	62.1	53.6	41.1	35.1	33.1	50.1
23	21:22	75.3	61.1	51.1	39.1	34.1	32.6	47.6
24	21:42	72.7	52.1	48.1	38.6	32.6	31.1	41.1
25	22:02	70	59.1	44.1	34.6	32.1	31.1	41.4
26	22:22	72.9	46.6	44.6	35.6	32.6	31.6	40
27	22:42	67.3	52.6	48.1	35.1	32.1	31.1	40.6
28	23:02	80.3	51.1	42.6	35.1	31.1	29.6	40.2
29	23:22	75.1	42.1	37.6	31.6	29.6	28.6	34.1
30	23:42	59.9	45.1	38.1	33.6	29.6	28.6	35.2
31	00:02	64.5	41.1	35.1	30.6	29.1	28.6	32.6
32	00:22	64.6	49.6	42.6	31.6	29.6	29.1	38.1
33	00:42	65.5	46.6	34.6	30.6	29.1	28.6	34.6
34	01:02	69.1	47.6	42.6	33.6	31.1	30.6	38.2
35	01:22	65.3	46.6	37.6	31.6	30.1	29.1	35.5
36	01:42	60.1	34.6	31.6	30.1	29.1	28.1	30.3
37	02:02	58.2	55.6	35.6	29.6	28.6	27.6	41
38	02:22	71.6	32.6	29.6	28.1	27.1	26.1	28.4
39	02:42	65.7	46.6	35.6	30.1	28.1	27.1	38
40	03:02	68.6	38.1	33.1	29.6	27.6	26.6	31.1
41	03:22	72.2	41.1	34.6	28.1	26.6	25.6	31.4
42	03:42	66.2	57.1	40.6	27.6	26.1	25.6	42.4
43	04:02	65.5	39.6	33.6	27.6	26.1	25.1	30.3
44	04:22	65.1	68.1	54.1	45.6	26.6	25.6	58.7
45	04:42	88	74.1	72.6	60.1	41.1	38.1	67.6
46	05:02	87.4	79.6	71.6	54.6	34.1	31.1	66.5
47	05:22	86.4	72.1	66.6	40.1	32.6	30.6	60.6
48	05:42	87.5	78.1	70.1	41.1	32.1	30.1	64.2
49	06:02	86.9	72.1	66.6	43.6	34.1	31.6	62.4
50	06:22	92.1	71.6	66.6	46.1	37.1	33.6	61.1
51	06:42	87.1	78.1	69.1	46.6	36.1	33.1	63.4
52	07:02	84.6	70.6	60.6	42.1	35.6	34.1	58.4
53	07:22	87	71.1	57.1	45.1	39.1	35.6	57.9
54	07:42	84.6	72.1	66.1	44.1	36.1	34.6	61.7
55	08:02	83.9	70.1	65.6	46.1	37.1	34.1	60.2
56	08:22	84.6	70.6	66.6	44.1	35.6	33.6	60.5
57	08:42	85.4	71.1	64.6	42.1	35.1	32.6	59.4
58	09:02	85	67.6	58.1	42.6	34.6	32.6	55.4
59	09:22	88.3	66.1	58.1	45.6	36.6	36.1	56.3
60	09:42	85.6	70.1	64.6	39.6	34.6	32.6	58.7
61	10:02	88.3	69.6	55.1	42.1	35.1	33.1	55.7
62	10:22	88.7	69.6	60.1	46.6	37.1	34.1	57.2
63	10:42	88.6	69.1	58.6	47.1	37.1	34.1	58.4
64	11:02	84	69.1	54.6	42.6	36.6	33.6	55.5
65	11:22	85.6	66.6	54.1	46.6	36.6	35.1	54.5
66	11:42	84.1	65.1	54.1	44.1	36.1	33.6	52.1
67	12:02	81.4	66.1	55.1	44.1	36.1	35.1	58
68	12:22	84.6	62.1	54.1	42.6	36.6	34.1	51
69	12:42	81.3	62.1	52.6	41.6	35.6	33.6	49.6
70	13:02	81	65.1	51.6	40.6	35.1	33.1	50.1
71	13:22	90.2	66.1	58.1	39.6	35.1	33.1	54.5
72	13:42	80.9	58.6	49.6	40.1	36.1	34.1	49.6