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24 HOUR NOISE LEVEL SURVEY CARRIED OUT AT THE

REAR OF THE BUILDING AT

10 to 12 RUSSELL SQUARE, LONDON WC1

AND A REPORT ON THE NOISE CONTROL MEASURES

REQUIRED TO MINIMISE THE NOISE IMPACT

OF THE PROPOSED NEW AIR CONDITIONING PLANT

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Authorised for Release by

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Client Project Emtec Ref. : QF6323/PF3972/RP1 Date

: TMD Building Consultancy Ltd : 10-12 Russell Square, London WC1 : 19th of April 2010

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1.0. INTRODUCTION

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This report details the results of a 24 hour noise survey carried out at the rear of the building at 10 to12 Russell Square, London WC1.

The objectives of this survey were as follows:

- To establish the existing background noise level in the lightwell at the rear of the building.
- To assess the proposed new Air Conditioning Plant that is to be mounted in the lightwell 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 properties.

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

- 1.0. INTRODUCTION
- 2.0. TEST INSTRUMENTATION
- 3.0. TEST PROCEDURE
- 4.0. RESULTS
- 5.0. DISCUSSION OF RESULTS

2.0. TEST INSTRUMENTATION

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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 9.15am on Wednesday the 7th of April 2010 to 8.35am on Thursday the 8th of April 2010.

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.

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3.1. Measurement Position

The noise levels were measured at a position on the railings at the edge of the flat roof area just above the lightwell at the rear of the building.

Photos A to D show the location of the microphone on the railings at the edge of the flat roof overlooking the lightwell area at the rear of the building.

The microphone was positioned so that it was pointing towards the lightwell and away from the flat roof area.

The microphone was approximately 1.2 metres above the flat 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 generally in line with those recommended in BS 4142:1990 with no precipitation and light wind. The weather was dull and overcast throughout the daytime and nightime period.

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

4.0. <u>RESULTS</u>

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 period (denoted by LAeq, (20 mins)) are displayed as a bar graph on the attached Sketch No. QF/6323/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/6323/T2 at the back of this report.

4.1. Summary of Results

The table QF/6323/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/6323/D1 - Summary of Maximum and Minimum Noise Levels

	LA1	LA10	LA50	LA90	LA99	Laeq	
Min.	61.3 dBA	60.8 dBA	59.8 dBA	58.8 dBA	58.3 dBA	59.8 dBA	
Max.	76.3 dBA	70.8 dBA	66.3 dBA	61.8 dBA	61.3 dBA	67.8 dBA	

5.0. DISCUSSION OF RESULTS

The lowest recorded LA₈₀ background noise level measured during the survey was 58.8 dBA which occurred during one time period ending at 2.55am. Between 10.00pm and 7.00am the LA₈₀ background noise level was between 60.8 dBA and 58.8 dBA. The background noise level within the lightwell is therefore high, even by London standards.

It is proposed to install a single Mitsubishi PUHZ-RP100KVA condenser on the rear wall of the building. The sound pressure level of this condenser is stated by the manufacturer as 49 dBA at 1 metre in free field conditions.

The distance between the proposed location of the condenser and the nearest window of the student residential property next door is approximately 6 metres. Allowing for a +5dB reverberant factor and a -20 log 4 distance correction the resultant sound pressure level, at 1 metre from the nearest residential window, would be approximately 42 dBA. This is more than 10dB below the lowest recorded LA₉₀ background noise level and so the new condenser will have no effect on the existing background noise level.

No additional attenuation will therefore be necessary to the new condenser for it to be acceptable under the current City of Westminster planning guidance.

EMTEC PRODUCTS LTD 20th April 2010







PHOTO A: Flat roof area with railings at edge overlooking lightwell behind



PHOTO B: Microphone location on railings overlooking lightwell



PHOTO C: Lightwell with railings in front



PHOTO D: Student residential property overlooking lightwell

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APPENDIX A

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Raw Data - Noise Survey

7th to 8th of April 2010

NOISE BURVEY DATA FROM BACKGROUND NOISE TEST AT THE REAR OF 10 TO 12 RUSSELL SQUARE, LONDON WC1

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Project : Client :	10 to 12 Russell Square, London WC1 TMD Building Consultancy								
Ref :	QF8929 7th to 8th April 2010								
	/ 01 10 04				1 50		100	100	
No.	Finish Time	MextP (CBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	
1	09:15	95.2 05.2	71.3	64.3	61.8 82.9	61.8 61.9	60.8 8.08	64 66.7	
2	09:55	65.2	64.8	63.3	61.8	61.3	60.8	62.1	
4	10:15	95.2	69.8	62.5	61.8	60.8	60.8 60.9	89.8 82 A	
5 8	10:35	84.0 87.4	62.8	61.8	60.8	59.8	59.8	60.8	
7	11:15	91.5	70.3	63,3	61.9	60.3	59.8	62.5	
8	11:35	89.1 89.9	64.8 66.8	62.3	80.8 80.8	60.3 60.3	59.8	61.5	
10	12:15	95.2	67.8	69.3	61.9	80.3	59,8	62.5	
11	12:36	95.2	73.8 78.9	86.5 70.9	65.8 60.8	80.8 60.8	60.8 59.8	67.0 66.2	
12	18:15	92.8	82.8	61.3	60.8	80.8	59.8	80.6	
14	18:85	90.8	62.8	61.9	60.5 59 B	60.3 59.9	59.5 58.8	60.5 61	
15 16	18:00	89.9	75.3	70.8	61.3	60.3	59.8	66	
17	14:95	95.2	65.8	62.8	61.8	60.8	60.9 60.8	61.7 61 2	
18	14:55 15:15	87.9 84.9	65.8	61.8	60.8	60 .8	69.8	61.8	
20	15:35	87.1	67.3	82.8	61.8	8.08	80.8	61.9	
21	15:55	88.4 87	65.0 64.3	61.8 62.9	80.8 80.8	59.8 60.3	59.8 59.8	61.2 61.2	
22	16:35	83.2	62.8	61.3	60.8	60.8	69.8	80.8	
24	16:55	61.7	62 .8	60.8	60.5	59.8 60.9	59.3 60 6	60,4 61 4	
25 28	17:15	80.5	63.8	61.8	80.8	59.8	59.3	80.7	
27	17:55	88.2	63.6	61.9	80.8	59.8	59. 8	80.8	
28	18:15	90.4 89.1	66.5 64.9	62.8 62.9	61.3 61.9	60.8	59.8	61.4	
30	18:55	86	63.8	62.3	61.3	60.8	59.8	61.3	
91	19:15	95.2 95.2	66.8 84.5	62.3 61.8	61.5 80.8	60,8 60,8	60.8 59.8	61.3	
32 33	19:55	82.9	64.3	61.8	61.3	60.5	59.8	61.2	
34	20:15	84.9	62.8	61.3	80.8 80.8	59.8 59.8	59,8 59,8	60.7 61	
85 96	20:55	89.5	67.8	62.9	61.8	80.8	59.8	61.9	
87	21:15		62.3	61.8	60,8	0 0.8	59.8	80.9 81 1	
36	21:35 21:55	80.5	52.8 63.8	61.8	60.8	60.5	59.8	61.1	
40	22:15	89.9	63.9	61.8	61.9	60.8	59.8	61.2	
41	22:85 22:55	79.4	62.5 67.8	61.5 62.9	61.3	60.6	60.8 60.8	61.9	
43	23:15	78.9	62.3	61.8	61.8	8.08	80.8	61,3	
44	23:35	91.5	66.8	61.6	61.3 61.9	60.8 60.8	60.8 60.8	62.1 61.4	
45	00:15	78.1	62.6	61.8	61.8	60.8	59.8	61.1	
47	00:35	82.2 77 1	62.3	61.5 #1.8	61.5	60.8 60.6	60.8 60.8	61.2 61.2	
40	01:15	82.7	62.8	61.8	60.8	80.3	80.3	61.1	
50	01:35	77	62. 3	61.9	60.5	60.9 50 B	60.9 50 9	61 60.6	
51 52	01:55	82.8	61.8	61,9	60.6	59.8	59.3	80.5	
53	02:35	76.8	61.8	61.3	60.8	59. 3	58,8	60.4	
54 55	02:55	76.1 76.1	62.3	61.8	60.8	59.8	59.3	60.7	
56	09:95	64.8	61.8	61.9	80.8	69.9	59.3	60.4	
57	03:55	76.2 75.7	61.5 61.5	61.S 61.3	60.8 60.3	59,8 59,8	59.3 58.8	60.6 60.4	
58	04:35	76.6	62.8	61.8	60.B	59.8	59.8	60.6	
60	04:55	78.6	62.S	61.8	60.5 60.9	59.8 69.8	55,5 69,9	60.7 60.5	
62	05:35	77.7	62.8	61.3	60.8	59.3	59.8	60.4	
63	06:55	82	62.8	61.3	80.3	59.8	58.8 50 P	60.4	
64 65	08:15 08:95	77,6 82.5	62.3 65.3	61.8 61.8	61.8	59.8	59.3 59.3	61.2	
66	06:55	83.6	66.8	62.3	61.8	60.3	59.6	61.5	
67	07:15	82.4	63.8 87 9	81.8 82.9	61.9 A1 9	80.8 80.8	59.5 60.3	61.8 61.5	
69	07:55	95.1	66.8	63.6	61.8	61.3	80.8	62.8	
70	08:15	88	87.8 87.8	62.8	62.3	61.8 81.8	61.3 61 9	62.6 69	
(1	00:30	01.4	6.10	03.0	06.0	01.0	W110	~~	