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FUME EXTRACT FAN
NOISE ASSESSMENT
Unit 10, Kentish Town Industrial Estate
Regis Road
London NW5 3EW

Client: Railings Gallery

Report by
M. A. Kenyon, MSc, BSc, MIOA

Report Date:	19th April 2012
Ref.:	6393.Camden Fan 19.4.12
Site Visited:	10th April 2012
Site Visited By:	M A Kenyon

Ormskirk Office:
131 New Court Way, Ormskirk, Lancs L39 2YT

Nottingham Office:
23 Bunny Lane. Keyworth. Nottingham. NG12 5JU

CONTENTS

1.0 INTRODUCTION

At the request of Railings Gallery, Martec Environmental Consultants Ltd were instructed to assess the noise impact of a proposed fume extract fan to be located at Unit 10, Kentish Town Industrial Estate, Regis Road, London NW5 3EW.

This report considers measurements made on site. Acoustic terminology is explained at Appendix 1, the authors' qualifications and experience are described in Appendix 2.

2.0 SITE DESCRIPTION

The premises are used to manufacture bespoke picture frames as part of Railings Gallery's operations; as part of the process they wish to install a paint spray booth; this will require a fume extract fan which will in turn require an outlet to be located on the roof of Unit 10.

From Appendix 5 it can be seen that the installers of the paint spray booth state that the fan produces a level of each unit produces a level of 73 dBA at 3m from the outlet under free field conditions. It is understood from Railings Gallery that the hours of operation of the fan would be from 8am to 3pm during the normal working week.

The nearest noise sensitive residential window would be on the opposite

side of the road and further to the east, namely Mary Brancker House; this window is some 55m from the fan outlet on the roof of Unit 10.

In the past the local authority has requested the following information in connection with applications of this nature:

"Please provide an acoustic report relating to the proposed air conditioning/condenser units/ventilation extract duct. The acoustic report should address the cumulative noise levels of all the proposed and existing units and contain the following:-

1. *the background noise levels before installation of plant;*
2. *the manufacturers' details and noise output from proposed plant;*
3. *whether the proposed plant would comply with Camden's noise standards in relation to nearest noise sensitive facades (i.e. 5-10db below background levels). For residential properties please include a spreadsheet calculation of noise prediction that demonstrates that Camden's planning noise conditions will be met; and*
4. *the means of attenuation or isolation necessary to ensure that the proposed plant complies with noise standards (e.g. acoustic screens) and should address the cumulative noise levels of all the proposed and existing units (if applicable)."*

3.0 NOISE MEASUREMENTS

The site was visited on Tuesday 10th April 2012 and instrumentation was installed approximately 1m outside the nearest façade of Mary Brancker House.

The sound level meter was a Svan type 957 [s/n 12308] mounted on pole and fitted with a RION WS-SO2 'all weather' windmuff. The meter calibrated correctly before and after the measurements using a B&K calibrator type 4231 [s/n 2084928]; both the meter and calibrator had been laboratory calibrated within the preceding two years.

The meter was left gathering data during the course of an afternoon; this period was selected as being likely to be the quietest during the proposed hours of operation [weekdays 8am to 3pm]. The main noise sources on installation and removal of the instrumentation were road traffic noise and other ventilation plant.

Weather conditions were dry with temperatures of around 15 degrees Celsius and 30% cloud cover. Wind speed was low. Given the proximity and nature of the main noise sources it is not considered that weather conditions would have significantly influenced the results.

4.0 RESULTS

The detailed results are shown at Appendix 3 and the graph at Figure 1 below.

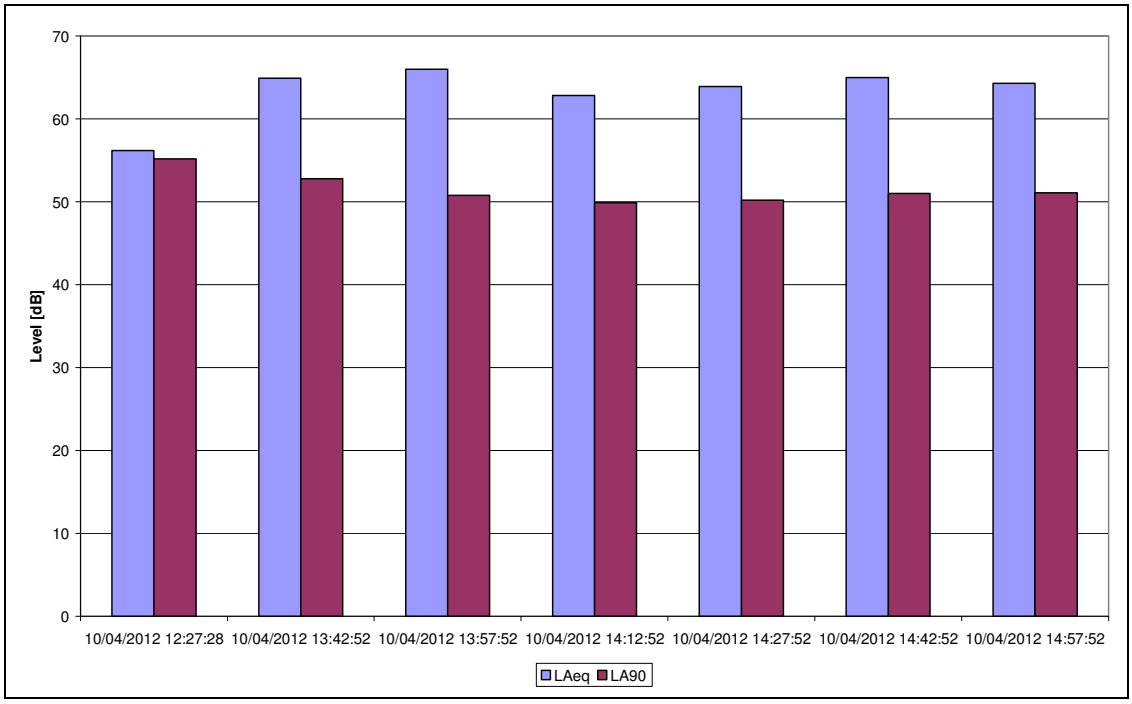

Figure 1: Variation in LA90 and LAeq,15min

5.0 NOISE CRITERIA

5.1 Local Authority

The site lies within Camden Council's area and their advice relating to mechanical installations is detailed within Table E of Appendix 1 to their 2006 UDP:

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}

Figure 2: Camden Noise Criteria

6.0 NOISE CRITERIA

Here the noise should not be tonal or impulsive and the lowest measured background noise was 50 LA90,15min, to the nearest whole number; therefore, the noise from the fan units should not produce a level greater than 45 LAeq,15min at 1m from the building façade of Mary Brancker House.

7.0 PREDICTED NOISE LEVELS

Description	Nr Window
SPL @ 3m	73.0
Number of Units	1.0
Effective SPL @ 3m	73.0
Distance to Window (m)	55.0
Barrier Effect from BS5228	0.0
Façade Effect	2.5
Predicted Level	50.2
Criterion	45
Excess over Criterion	5

Table 1: Noise Level Predictions (LAeq)

From the above it can be seen that the system will need to be specified with an attenuator that reduces noise level by 5 dBA. From "Fans in Air Handling Units" published by Woods Air Movement Ltd in 1993, it is stated *"Invariably the size of the attenuator is dictated by the lower frequencies, i.e. 125 Hz".*

From Atkins Research & Development "The Control of Noise in Ventilation Systems" an appropriately selected attenuator 900mm long will reduce noise in the 125 Hz octave band by 7 dB (see Table 2). The overall reduction in dBA terms will be significantly greater than this; the exact amount will depend on the spectra of the fan which is unknown at this stage, but will be of the order of 15 to 20 dBA.

Length	Octave Band Centre Frequency [Hz]						
[m]	63	125	250	500	1k	2k	4k
0.9	4	7	12	20	25	23	15

Table 2: Attenuator insertion loss (dB)

8.0 CONCLUSIONS

For sources such as these, the local authority seeks to limit noise to a level 5 dBA below the existing background noise levels.

It is understood that the proposed external fan units (mounted on the roof of Unit 10) would operate only between 8.00am and 3.00pm.

At the nearest residential facade, the noise survey indicated that daytime background levels 1m from the facade would be no lower than 50 LA90; therefore, the local authority's noise limit equates to a level of 45 LAeq 1m outside the nearest residential window [50 – 5 = 45].

The predicted noise level for the fume extract fan unit is 50 LAeq to the nearest whole number, at the nearest residential window. Consequently the local authority's criterion would be exceeded by 5 dB. The installation of a 900mm long in-duct silencer should reduce the overall noise level by at least 15 dBA; thus ensuring compliance with the local authority's requirements.

APPENDIX 1

EXPLANATION OF ACOUSTIC TERMS

The dB or the decibel, is the unit of noise. The number of decibels or the level, is measured using a sound level meter. It is common for the sound level meter to filter or 'weight' the incoming sound so as to mimic the frequency response of the human ear. Such measurements are designated **dB(A)**.

A doubling of the sound is perceived, by most people, when the level has increased by 10 dB(A). The least discernible difference is 2 dB(A). Thus most people cannot distinguish between, say 30 and 31 dB(A).

The Background level of noise is most commonly represented by the level which is exceeded for 90% of the time i.e. the LA90.

If a noise varies over time then the **equivalent continuous level, or LAeq**, is the notional constant level of noise which would contain the same amount of acoustic energy as the time varying noise.

The following table gives an indication of the comparative loudness of various noises expressed in terms of the A weighted scale:

Source of noise	dB(A)	Nature of Noise
Inside Quiet bedroom at night	30	Very Quiet
Quiet office	40	
Rural background noise	45	
Normal conversational level	60	
Busy restaurant	65	
Typewriter @ 1m	73	
Inside suburban electric train	76	
Alarm clock ringing @ .5m	80	
Hand clap @ 1m	80	
HGV accelerating @ 6m	92	Very Loud

APPENDIX 2
QUALIFICATIONS AND EXPERIENCE OF M. A. KENYON

My full name is Melville Alexander Kenyon. I hold a Bachelor's degree in Engineering and a Master's degree in Environmental Acoustics. I am a member of the professional body for noise and vibration specialists, the Institute of Acoustics and have sat on the British Standards Committee dealing with noise in buildings [BS.8233].

My company is on the panel of noise advisers to both the Noise Abatement Society and the Clay Pigeon Shooting Association and I have lectured at Liverpool John Moores University on the Diploma of Acoustics course and at Manchester Metropolitan University on their Environmental Health degree course.

I have some 29 years experience of dealing with problems caused by noise and vibration, both regarding noise and vibration in the environment, the workplace and the home. During that time I have advised many groups of both residents and developers about the problems of noise and vibration in the environment.

APPENDIX 3
Detailed Results [dBF @ façade]

End Date & time	Duration	Lmax	Lmin	LEQ	L01	L10	L50	L90
10/04/2012 12:27:28	00:00:04	58.2	53	56.2	59.6	56.9	56	55.2
10/04/2012 13:42:52	00:15:00	88.5	50.2	64.9	76.7	66.8	58.2	52.8
10/04/2012 13:57:52	00:15:00	88.3	46.7	66	78.7	67.3	58.4	50.8
10/04/2012 14:12:52	00:15:00	87.3	47.9	62.8	73.5	65	55.9	49.9
10/04/2012 14:27:52	00:15:00	86.3	47.6	63.9	74.8	67	56.9	50.2
10/04/2012 14:42:52	00:15:00	86.9	49	65	76.2	66.8	56.8	51
10/04/2012 14:57:52	00:15:00	88.2	47.9	64.3	76.7	66.3	57.2	51.1
10/04/2012 14:58:46	00:00:54	72.2	47.5	60.9	71.2	64.7	57.1	48.5
10/04/2012 15:00:49	00:00:47	97.5	42.2	93.8	94.9	94.8	94.4	94

APPENDIX 4

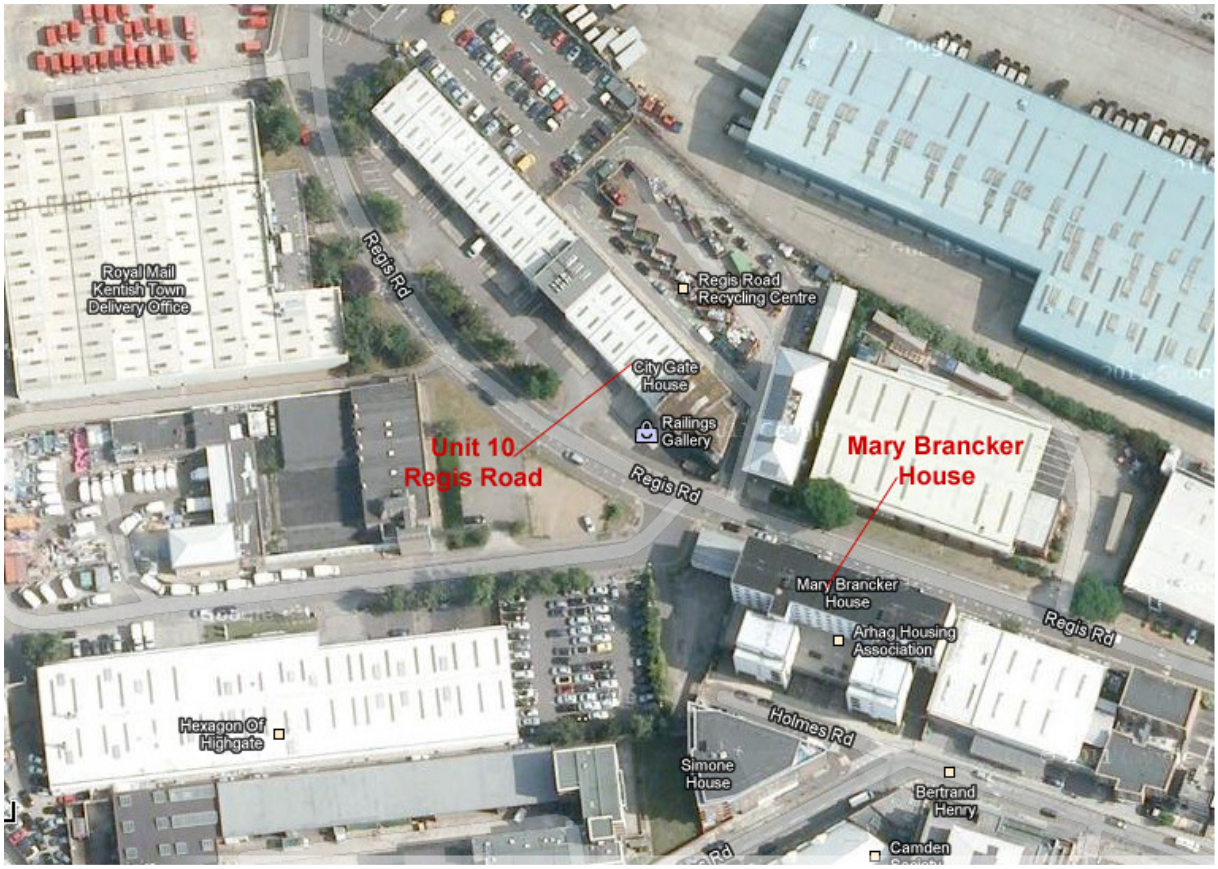

Figure 3: Photograph showing location of Noise Source and Nearest Residential Property

APPENDIX 5
DATA SHEET FOR PROPOSED UNITS

Hi Mel,

Spot on, just remember this is under free field conditions.

Kind Regards

Lloyd Fox

Richmond Spray Booths Ltd.

2A Orgreave Drive Dore House Industrial Estate Sheffield S13 9NR

Office: 0114 253 1374 **Works Office:** 0114 288 0259 **Fax:** 0114 288 9421

Email: lloyd@spraybooothltd.co.uk

Web: www.spray-booths.co.uk

From: Mel Kenyon [mailto:mak@martecenviro.co.uk]
Sent: 13 April 2012 15:48
To: Richmond Spray Booths
Subject: Re: Railings Gallery - Extract Booth [6393] 12.42012

Lloyd
Just to confirm that the 73 dBA was at 3m from the outlet under free field conditions.

Mel Kenyon MSc BSc MIOA
Martec Environmental Consultants
www.martecenviro.co.uk
01524 222000

On 13/04/2012 13:18, Richmond Spray Booths wrote:

Hi Mel,

Great to speak with you.

I and my colleagues look forward to Helping and supporting all parties with

This project.

Our direct drive exhaust fans are likelyTo have a dba reading of 73dBa in free

Field conditions.

If I can help further please let me know.

Kind Regards

Lloyd Fox

Richmond Spray Booths Ltd.

2A Orgreave Drive Dore House Industrial Estate Sheffield S13 9NR

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