

Suite 5 Riverside House Woolwich High-street
London – SE18 6DN
07598854992
soundspace.me.uk
soundspaceac@gmail.com



7 Queen Street Gravesend
DA12 2EQ

Acoustic report in support for planning
application for kitchen extraction
system

Report
RF 811292

1.0	INTRODUCTION.....	2
2.0	SITE DESCRIPTION.....	2
3.0	ENVIROMENTAL NOISE SURVEY	2
3.1	Procedures.....	2
3.2	Equipment	2
4.0	RESULTS	3
5.0	NOISE CRITERIA	3
6.0	DISCUSSION.....	4
6.1	Plant installments.....	4
7.0	NOISE IMPACT ASSESSMENT	5
7.1	External receiver	5
7.2	British standards	6
8.0	CONCLUSION	6
APENDIX A		
	Acoustics calculation AC1	7
	Noise Time History NT1.....	8
	Site plan SP1	9

1.0 INTRODUCTION

Sound space acoustics suite 5 Riverside house Woolwich high street London SE18 6DN was commissioned for 7 Queen street Gravesend DA12 2EQ to undertake a noise survey and assessment report, which is required to accompany a Planning Application. The Measured noise levels will be used to determine noise emission criteria for an externally mounted kitchen extract unit with a flue outlet terminus in agreement with the planning requirements. As the plant that will be replaced is currently in use, this report will look at noise measurements taken outside of the unit's operational hours. This report presents the results of the environmental survey followed by noise impact calculations and outlines any necessary mitigation measures.

2.0 SITE DESCRIPTION

There is currently an internal fan and external flue terminus that is installed to the rear of 7 Queen street. The flue starts on the ground floor and terminates above the eaves level.

The plant location is a mixed commercial and residential area with a busy shopping street to the front of the property. An assessment has been undertaken for the nearest residential window, as shown in indicative rear elevation SP1

3.0 ENVIRONMENTAL NOISE SURVEY

3.1 procedure

Measurements were undertaken at the position shown in Site Plan. The choice of this position was based both on accessibility and on collecting representative noise data in relation to the nearest noise sensitive receivers.

Continuous automated monitoring was undertaken for the duration of the survey

Background noise levels at the monitoring position were dominated by existing plant units servicing nearby commercial premises.

In order to discount the influence of any existing plant units, this assessment will focus on the minimum measured background noise levels during the daytime period.

Weather conditions were generally dry with light winds, therefore suitable for the measurement of environmental noise.

The measurement procedure generally complied with BS7445:1991. Description and measurement of environmental noise, Part 2- Acquisition of data.

3.2 Equipment

The equipment calibration was verified before and after use and no abnormalities were observed. The equipment used was as follows:

- Svantek Type 957 Class 1 Sound Level Meter
- Cirrus Type 511E Class 1 Calibrator

4.0 RESULTS

The L_{Aeq} : 5min, L_{Amax} : 5min, L_{A10} : 5min and L_{A90} : 5min acoustic parameters were measured at the location shown in Site Plan. The measured levels are shown as a time history in Figure NT1.

Minimum background noise levels are shown in Table 4.1 below.

Minimum background noise level L_{A90} : 5min dB(A)	
Daytime (07:00 - 23:00)	47 dB(A)
Night-time (23:00 - 07:00)	42 dB(A)

Table 4.1: Minimum background noise levels

5.0 NOISE CRITERIA

In order to provide a suitably robust assessment and protect the amenity of residential premises in the area, we propose to set noise emissions criteria as follows:

“The ‘A’ weighted sound pressure level from the plant, when operating at its noisiest, shall not at any time exceed a value of 10 dB below the minimum external background noise, at a point 1 metre outside any window of any residential property.”

As the proposed plant units will only be operating during the opening hours of the kitchen, which is understood to be 011:00 to 23:00, we propose to set the noise criteria at 37 dB(A), the value 10 dB below the minimum calculated background noise during the daytime.

6.0 DISCUSSION

6.1 Plant installation

The proposed plant installation is comprised of an externally mounted kitchen extract with an outlet flu terminus. A plant units is being considered, as follows:

- FläktWoods 35JM 16/2/5/18

Noise emissions for the selected fan units as provided by the manufacturer are as shown in Table 6.1.

	<i>Sound Power Level (dB) in each Frequency Band</i>							
Unit	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
35JM								
FläktWoods 35JM 16/2/5/18 Casing Breakout	68	64	64	62	56	47	47	44
FläktWoods 35JM 16/2/5/18 Outlet	78	79	84	83	82	76	72	67

Table 6.1 Manufacturer's Sound Power Levels

We would recommend an in-line silencer is installed within the duct run. The attenuation levels in table 6.2 would sufficiently reduce noise emissions to an acceptable level.

	<i>Insertion Loss (db) in each Frequency Band</i>							
Mitigation	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
In-line Silencer	5	11	21	33	37	36	27	18

Table 6.2 Proposed Mitigation Measures

The fan unit would require additional casing or acoustic cladding to the fan itself in order to achieve additional attenuation to the casing breakout levels, as shown in Table 6.3.

	<i>Required Attenuation (dB) in each Frequency Band</i>							
Mitigation Type	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
Additional Fan Casing	10	12	16	20	24	30	31	31

Table 6.3: Spectral attenuation required by proposed fan casing

With the in-line silencer and additional fan casing installed, noise emissions from the

flue terminus and casing breakout caused from the extract fan would bring the overall noise emissions to within the required criterion. Calculations regarding the spectral levels for this unit can be found in AC1- Appendix A1.

7.0 NOISE IMPACT ASSESSMENT

The option of 35JM would be suitable with regard to meeting the set noise emissions criterion in the proposed location. We therefore recommend the 35JM unit with the proposed mitigation measures. The noise impact assessment for this option follows.

7.1 External receiver assessment

The nearest noise sensitive receiver to the proposed plant installation has been identified as the residential property roof light on the second floor, approximately 2 metres from the plant as shown on site plan SP1.

Taking into account all necessary acoustic corrections, including proposed mitigation measures described above, the resulting noise level at the closest noise sensitive windows would be as shown in Table 7.1. Detailed calculations are shown in Appendix A.

As shown in Table 7.1 and Appendix A, transmission of noise to the receiver windows due to the effects of the plant installation would be expected to be 1dB over the emissions criteria, this is considered to have a non-significant effect on the background noise

Further calculations have been undertaken to assess whether the noise emissions from the proposed plant unit would be expected to meet recognised British Standard recommendations, in order to further ensure the amenity of nearby noise sensitive receivers.

Receiver	Criterion	Noise Level at Receiver (due to proposed plant with mitigation)
Receiver 1	37 dB(A)	37 dB(A)

Table 7.1: Noise levels and criteria at Receiver

7.2 British standard

British Standard 8233:2014 '*Sound insulation and noise reduction for buildings – Code of Practice*' gives recommendations for acceptable internal noise levels in residential properties. Assuming worst case conditions, of the closest windows being for a bedroom, BS8233:2014 recommends 35dB(A) as being acceptable daytime conditions, suitable for the plant operating hours.

With an external level of 37 dB(A), the window itself would only need to provide 2dB attenuation in order for acceptable conditions to be met. However, according to BS8233:2014, a partially open window offers a minimum of 10dB attenuation.

It can therefore be predicted that noise emissions from the proposed plant unit would be expected to meet the recommendations of the relevant British Standard, even with windows partially open. Predicted levels are shown in Table 7.2.

Receiver	Design Criterion - <i>For daytime conditions in a bedroom, in BS8233:2014</i>	Noise Level at Receiver (due to plant installation)
Inside Residential Window	35 dB(A)	6 dB(A)

Table 7.2 Noise levels and criteria inside nearest residential space

8.0 CONCLUSION

An environmental noise survey has been undertaken at 7 queen street. The results of the survey have enabled criteria to be set for noise emissions from the installed plant unit in order to meet the requirements.

A noise impact assessment has then been undertaken using manufacturer noise data to predict the noise levels due to the current proposals at the nearby noise sensitive receive

Calculations show that noise emissions from the proposed plant unit would meet the set requirements and recommendations of the relevant British Standard, provided that the proposed mitigation measures in this report are adopted.

APPENDIX A

External plant Noise Emissions (Receiver: Inside Nearest Residential Receiver Source: Proposed extract fan)

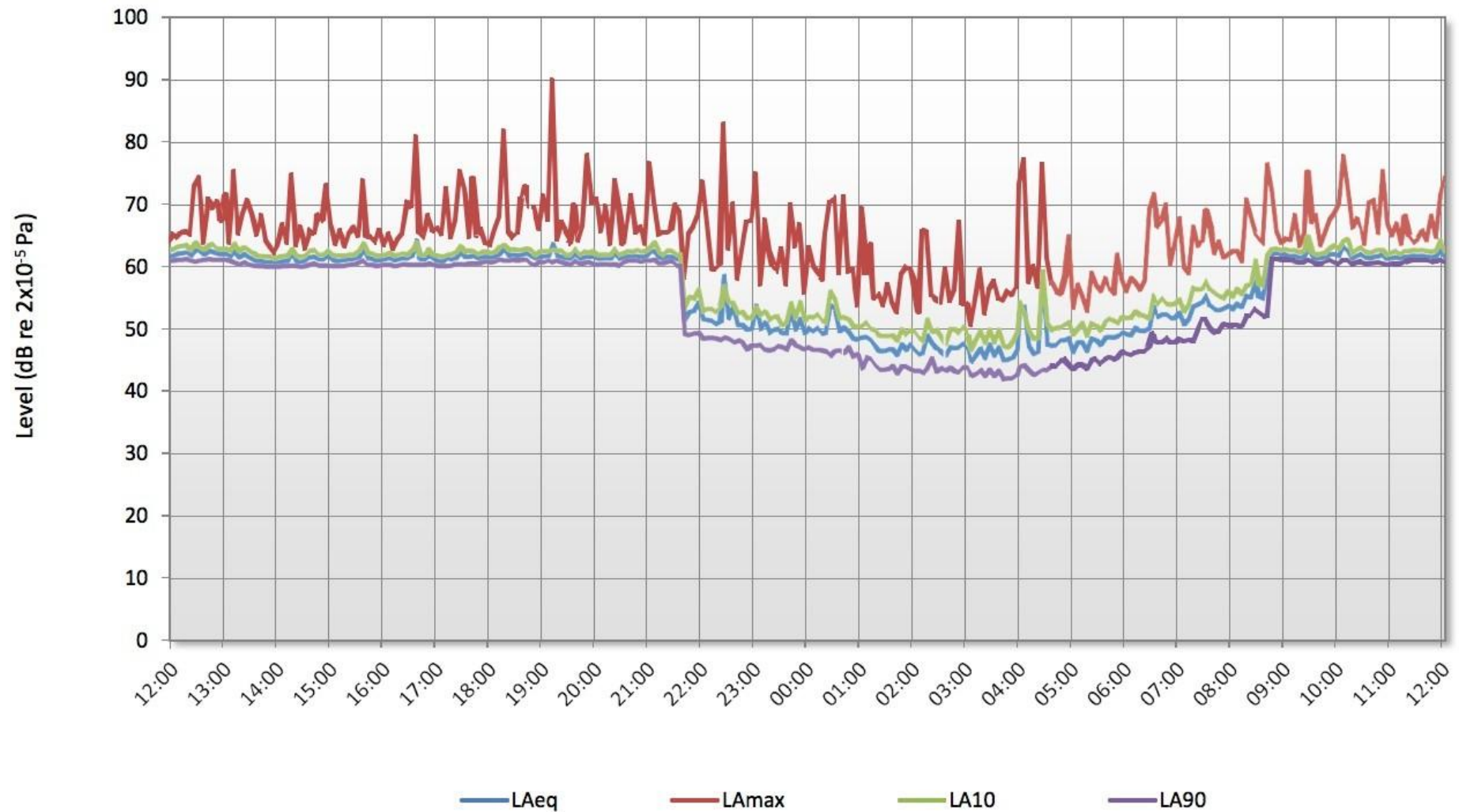
Manufacturer provided sound power level									
FläktWoods 35JM/16/2/5/18 (Casing Breakout)	68	64	64	62	56	47	47	44	71
Conversion to sound pressure level, allowing for reflections	-5	-5	-5	-5	-5	-5	-5	-5	
Attenuation required from proposed casing breakout, dB	-10	-12	-16	-20	-24	-30	-31	-31	
Distance correction to receiver, dB (2m)	-6	-6	-6	-6	-6	-6	-6	-6	
Sound pressure level at receiver from casing breakout	47	41	37	31	21	6	5	2	33
Manufacturer provided sound power level									
FläktWoods 35JM/16/2/5/18 (Flue Terminus)	77	79	84	83	82	76	72	67	89
Conversion to sound pressure level, allowing for reflections	-11	-11	-11	-11	-11	-11	-11	-11	
Attenuation required from proposed silencer, dB	-5	-11	-21	-33	-37	-36	-27	-18	
Distance correction to receiver, dB (4m)	-12	-12	-12	-12	-12	-12	-12	-12	
Resultant Sound Pressure Level at Nearest Noise Sensitive Receiver	49	45	40	27	22	17	22	26	35
Cumulative Sound Pressure Level at Nearest Noise Sensitive Receiver	51	47	42	33	25	17	22	26	37
Design Criterion									37

BS 8233 Assessment calculation (Receiver: Inside Nearest Residential Window Source: Cumulative level of plant units)

Sound pressure level outside window	51	47	42	33	25	17	22	26	37
Minimum attenuation from partially open window, dB	-10	-10	-10	-10	-10	-10	-10	-10	
Sound pressure level inside nearest noise sensitive premises	41	37	32	23	15	7	12	16	27
Design Criterion									35

Acoustic calculations - AC1





Noise time History - NT1



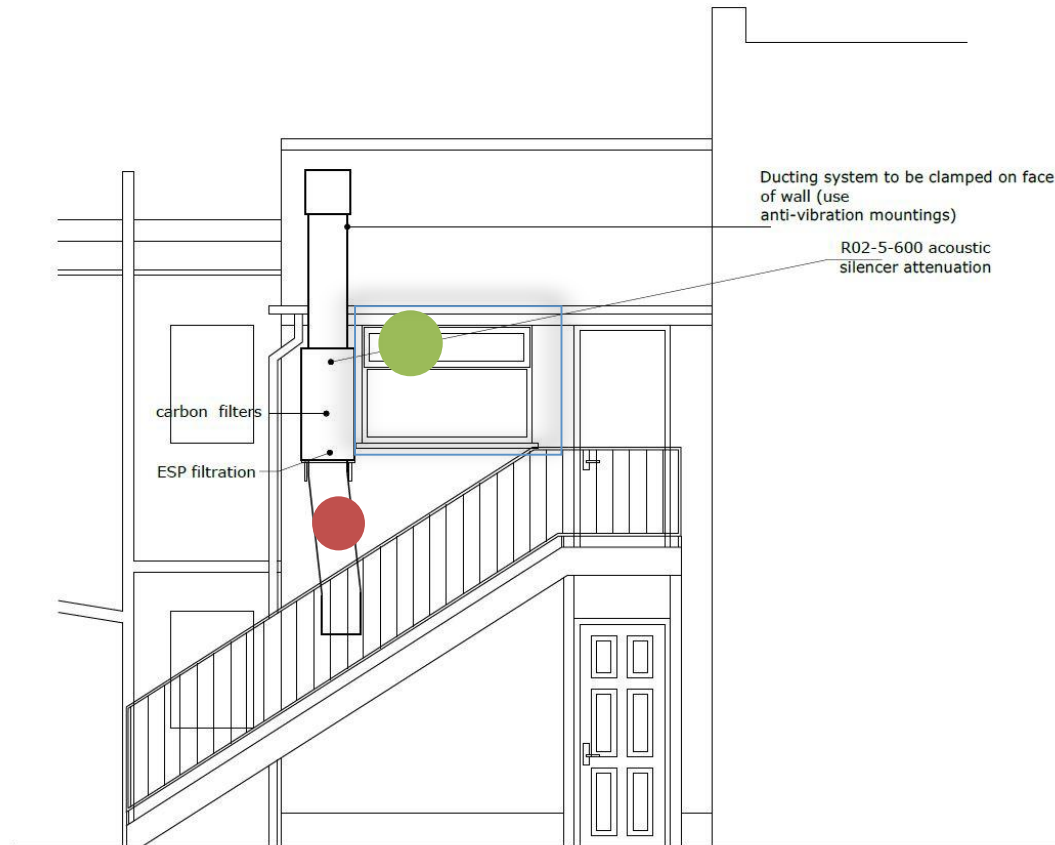
Nearest Window



Nearest noise sensitive receiver



Nearest noise survey



Rear elevation - SP1