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Environmental noise impact assessment.

Address:

3 Lamp Office Court, Lambs Conduit Street, London WC1N 3NF

Client:

Manan Upadhyay
Architect
Ben Pentreath & Associates

24 March 2015

Engineer: Simone Longo AMIOA

Acoustic Report – Environmental Noise EA. 3 Lamp Office Court, Lambs Conduit Street London WC1N 3NF Engineer: Simone Longo AMIOA	N. M. & S. www.noisemeasurements.co.uk - www.nmsacoustics.com e: info@nmsacoustics.com t: 0800 014 8482 - m: 07887561945 (24 hours)

Summary.

1.0 Survey address.

1.1 At the rear of 55-56 Lambs Conduit Street London WC1N 3NF, the measuring microphone was positioned in correspondence of the nearest noise sensitive window at 1 m from the building façade.

1.2 Fig below shows the relevant details at the installation site.

1.2.1 In "A" is the microphone position used for the noise survey.

1.2.2 In "B" is the proposed installation site of the unit.

1.2.3 "A", "C" and "D" indicates the nearest façade affected by the noise emission.

1.2.3.1 Façade in "D" is in the acoustic shadow (yellow area) caused by the rear wall at the back of the unit (see picture below showing the installation site).

1.2.3.2 The shortest path for the noise to travel to the sensitive location is in front of the unit affecting façade "A", noise emission in this direction should be estimate taking into account a correction for the rear wall reflection from the back of the unit projecting in direction of "A".

1.3 Rear wall at the proposed installation site for the unit, the wall cause an acoustic shadow towards the rear properties but a correction should be added for the forward facing façade in "A"

2.0 Environmental noise survey details.

2.1 Operating hours:

2.2 The proposed operating hours for the unit is from 8 am to 18.00 Monday to Saturday.

2.3 In order to estimate the lowest representative background noise LA90,15 min at the sensitive location a precision sound level meter (SLM) was used to monitor the ambient noise during operating hours of the proposed unit, the survey took place on the 13/03 2015.

3.0 Environmental noise survey results.

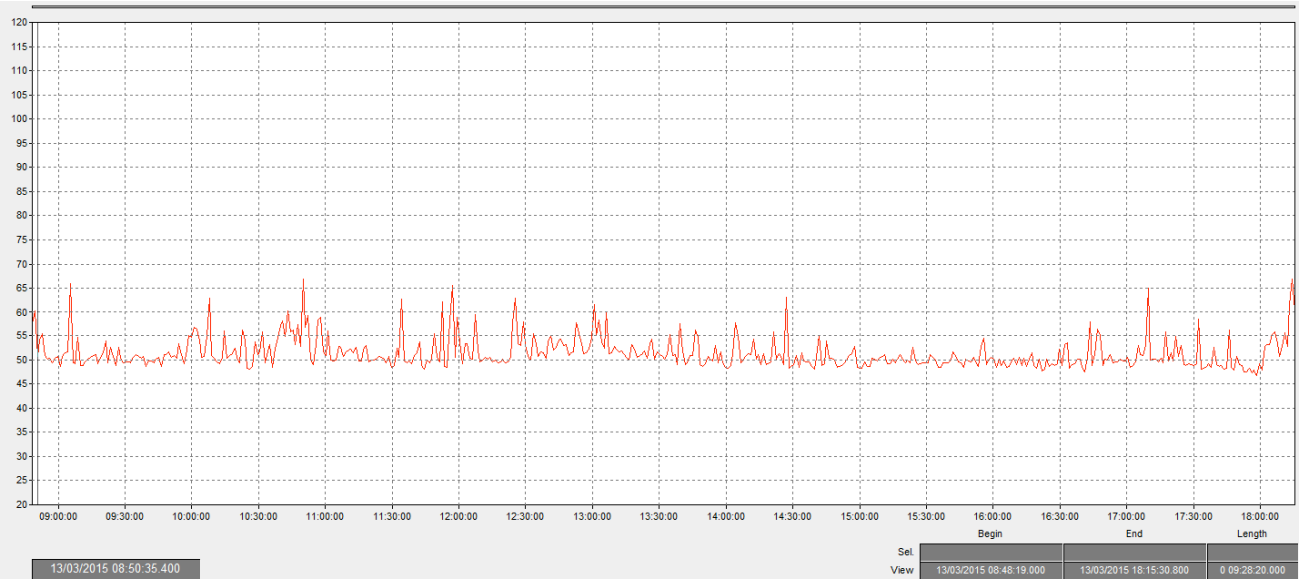
3.1 Lowest representative environmental background noise recorded within the period of interest is given in table below.

Lowest LA90,*15min.*		
13/03/2015	Time @ 17.48	46.4 dB LA90,15min

4.0 Subjective analysis of the environmental noise or soundscape at the site.

4.1 The specific location at the rear of the building was relatively quiet for a city centre, primarily dominated by slow traffic noise.

5.0 Graph Time VS Level relative to the survey.



6.0 Weather condition:

6.1 No particular remarks, wind or atmospheric precipitations.

7.0 Survey numerical data.

Calculation interval (absolute time)	Effective duration	L 90.0%: LAF(spl) (dB)
13/03/2015 08:48:19.000 - 13/03/2015 18:16:34.550		
13/03/2015 08:48:19.000 - 13/03/2015 09:03:18.999	0 00:15:00.000	48.2 dB
13/03/2015 09:03:19.000 - 13/03/2015 09:18:18.999	0 00:15:00.000	48.4 dB
13/03/2015 09:18:19.000 - 13/03/2015 09:33:18.999	0 00:15:00.000	48.3 dB
13/03/2015 09:33:19.000 - 13/03/2015 09:48:18.999	0 00:15:00.000	48.3 dB
13/03/2015 09:48:19.000 - 13/03/2015 10:03:18.999	0 00:15:00.000	48.7 dB
13/03/2015 10:03:19.000 - 13/03/2015 10:18:18.999	0 00:15:00.000	48.5 dB
13/03/2015 10:18:19.000 - 13/03/2015 10:33:18.999	0 00:15:00.000	47.9 dB
13/03/2015 10:33:19.000 - 13/03/2015 10:48:18.999	0 00:15:00.000	48.7 dB
13/03/2015 10:48:19.000 - 13/03/2015 11:03:18.999	0 00:15:00.000	48.9 dB
13/03/2015 11:03:19.000 - 13/03/2015 11:18:18.999	0 00:15:00.000	48.6 dB
13/03/2015 11:18:19.000 - 13/03/2015 11:33:18.999	0 00:15:00.000	48.0 dB
13/03/2015 11:33:19.000 - 13/03/2015 11:48:18.999	0 00:15:00.000	48.0 dB
13/03/2015 11:48:19.000 - 13/03/2015 12:03:18.999	0 00:15:00.000	48.1 dB
13/03/2015 12:03:19.000 - 13/03/2015 12:18:18.999	0 00:15:00.000	48.8 dB
13/03/2015 12:18:19.000 - 13/03/2015 12:33:18.999	0 00:15:00.000	48.8 dB
13/03/2015 12:33:19.000 - 13/03/2015 12:48:18.999	0 00:15:00.000	49.5 dB
13/03/2015 12:48:19.000 - 13/03/2015 13:03:18.999	0 00:15:00.000	50.2 dB
13/03/2015 13:03:19.000 - 13/03/2015 13:18:18.999	0 00:15:00.000	49.3 dB
13/03/2015 13:18:19.000 - 13/03/2015 13:33:18.999	0 00:15:00.000	49.1 dB
13/03/2015 13:33:19.000 - 13/03/2015 13:48:18.999	0 00:15:00.000	48.5 dB
13/03/2015 13:48:19.000 - 13/03/2015 14:03:18.999	0 00:15:00.000	47.9 dB
13/03/2015 14:03:19.000 - 13/03/2015 14:18:18.999	0 00:15:00.000	48.3 dB
13/03/2015 14:18:19.000 - 13/03/2015 14:33:18.999	0 00:15:00.000	47.6 dB
13/03/2015 14:33:19.000 - 13/03/2015 14:48:18.999	0 00:15:00.000	47.6 dB
13/03/2015 14:48:19.000 - 13/03/2015 15:03:18.999	0 00:15:00.000	47.5 dB
13/03/2015 15:03:19.000 - 13/03/2015 15:18:18.999	0 00:15:00.000	48.2 dB
13/03/2015 15:18:19.000 - 13/03/2015 15:33:18.999	0 00:15:00.000	48.2 dB
13/03/2015 15:33:19.000 - 13/03/2015 15:48:18.999	0 00:15:00.000	47.9 dB
13/03/2015 15:48:19.000 - 13/03/2015 16:03:18.999	0 00:15:00.000	48.0 dB

13/03/2015 16:03:19.000 - 13/03/2015 16:18:18.999	0 00:15:00.000	47.7 dB
13/03/2015 16:18:19.000 - 13/03/2015 16:33:18.999	0 00:15:00.000	47.4 dB
13/03/2015 16:33:19.000 - 13/03/2015 16:48:18.999	0 00:15:00.000	47.2 dB
13/03/2015 16:48:19.000 - 13/03/2015 17:03:18.999	0 00:15:00.000	47.5 dB
13/03/2015 17:03:19.000 - 13/03/2015 17:18:18.999	0 00:15:00.000	48.1 dB
13/03/2015 17:18:19.000 - 13/03/2015 17:33:18.999	0 00:15:00.000	47.6 dB
13/03/2015 17:33:19.000 - 13/03/2015 17:48:18.999	0 00:15:00.000	47.3 dB
13/03/2015 17:48:19.000 - 13/03/2015 18:03:18.999	0 00:15:00.000	46.4 dB
13/03/2015 18:03:19.000 - 13/03/2015 18:16:34.550	0 00:13:15.600	46.7 dB

8.0 Instrumentation

8.1 Table showing instrumentation data.

Instrument type:	Norsonic Sound Analyser Nor-140			Serial no:	1402725
Preamflifier type:	Norsonic Type Nor-1209			Serial no:	12247
Microphone type:	Norsonic Type Nor-1225			Serial no:	24301
UKAS ILAC periodic laboratory verification by:	UKAS ILAC LABORATORY 0789 CERTIFICATE U17345				
Date of last verification:	04/11/2014				
Calibrator type:	Norsonic Type 1251			Serial no:	31943
UKAS ILAC periodic laboratory verification by:	UKAS ILAC LABORATORY 0789 CERTIFICATE U17243				
Date of last verification:	04/11/2014				
Measurement title:	EA.			Date:	13/03/2015
Measurement duration:	Sample based.	Period length:	15 min.	Filter bandwidth:	(A) 1/1 Oct
Initial calibration level:	113.9 dB	Sampling frequency:	50 ms	End calibration level:	113.8 dB

Personell:

Simone Longo
NMS principal consultant AMIOA MA
Third party accreditation:
ALP10/991-INAC260 Certificate of Competence in Acoustics (EU)
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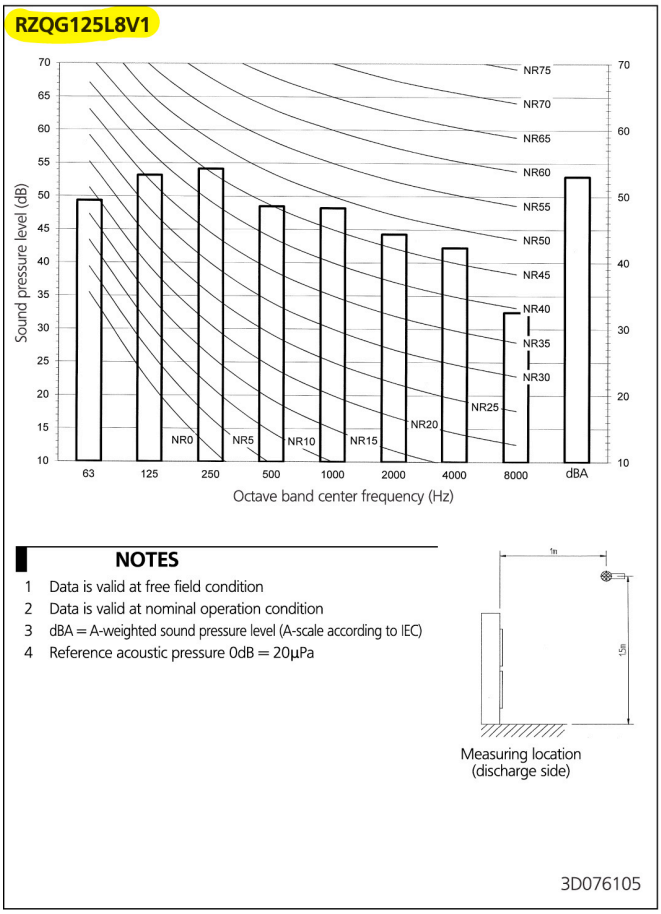
9.0 Specific noise emission.

9.1.1 Mark and model of the proposed unit object of this report (Heat pump) :

9.1.1.1 DAIKIN Model: RZQG125L8V1

9.1.1.2 Manufacture noise emission data is given at 53dBA free field, measured a 1 m from the unit at the worst case (Heating).

9.1.2 Manufacture published Sound Pressure spectrum noise graph.



10.0 Noise emission predictive estimate.

10.1 As follow is a simplified predictive calculation to estimate the specific noise emission from the proposed plant to the nearest noise sensitive window.

10.1.1 The specific noise emission is given by the manufacture at 53dBA at 1 m free field, but the floor is taken into account as per the above graph given by the manufacture.

10.1.2 To account for the specific installation site a correction of 4.5 dBA is suggested as effect of the rear wall reflection in direction of façade “A”, this cause the emission to rise at 57.5dBA at 1m from the unit.

10.1.3 The distance from the installation position and facads “A” is 15 m therefore the noise emission measured at 1 m needs to travel 13 m to arrive at 1 m from the nearest sensitive window.

10.1.3.1 57.5 dBA at 1 m equal to 35.2 dBA at 13 m.

10.1.4 A further correction needs to be added to the noise emission due to the façade reflection, a 3 dBA is suggested causing the specific emission to raise at 38.2 dBA

10.1.5 To estimate the environmental noise impact of the unit, the calculated emission is subtracted from the lowest representative background noise 46.4 dBA LA90,15 min

10.1.5.1 The subtraction indicates the unit is noise emission is 8.2 dBA below background noise therefore a noise mitigation will be described.

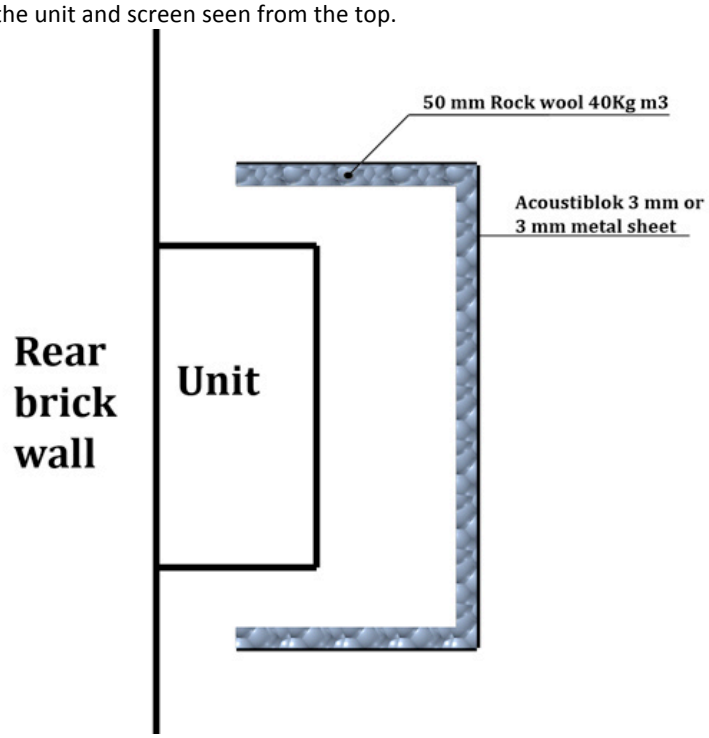
11.0 Proposed mitigation measure.

11.1 In order to comply with regulations a further reduction of the noise emission should be achieve, the reduction should be in the range of 2 dBA approximately.

11.2 To achieve the specific noise reduction we suggest an acoustic screen made of either acoustiblok 3 mm membrane or alternatively 3 mm metal sheet. The inner side of the screen should be lined with 50 mm 40 Kg m3 density Rockwool.

11.2.1 The acoustiblok membrane is available from http://www.acoustiblok.co.uk/

11.3 Fig below shows schematically the screen, the screen should be 1.5 m tall and should be placed at 500 mm from the unit, leaving the top-side open, the figure below show a view of the unit and screen seen from the top.



11.4 It is estimated this configuration will produce no less than 10 dBA noise reduction in direction of the nearest noise sensitive façade in “A”.

12.0 Conclusion.

12.1 The outcome of the survey finds an excess of noise equal to 1.8 dBA, therefore a mitigation measure is specified, provided the suggested mitigation measure is implemented there should be no objection to this application concerning noise, and planning permission should be granted.

Approved for Issue on behalf of
Noise Measurements & Solutions

Simone Longo
Acoustic Engineer MA - AMIOA – AIA

Appendix A

SOURCE OF INFORMATION

Information used in this assessment has been obtained from the following sources:

- Planning Policy Guidance PPG24.
- BS8233: 1999 Sound Insulation and noise reduction for buildings – Code of Practice.
- BS4142: 1997 Method for rating industrial noise affecting mixed residential and industrial areas.
- BS7445: 1991: Description and measurement of environmental noise.
- Engineering and noise control Third edition.
- Acoustic calculations: NOR-Review software
- Inverse square law calculator web based at http://www.sengpielaudio.com/calculator-squarelaw.htm

Appendix B

GLOSSARY

dB Decibel. The decibel scale measures levels relative to a reference, either a fixed reference when measuring absolute levels, or another level when expressing changes. If the quantity is power- like (i.e. could be expressed in watts) the level in decibels is 10 times the common logarithm of the ratio of the measured quantity to the reference quantity. If the quantity is a physical amplitude such as pressure or voltage, and the power of the quantity is related to the its square, then the decibel level is 20 times the common logarithm of the ratio of the measured quantity to the reference quantity. Thus doubling of power gives a 3 dB increase, while a doubling of pressure gives a 6 dB increase.

L*A* A-weighted sound pressure level. The units are decibels, abbreviated dB (or dB(A) if the subscript A is omitted). A- weighting is a frequency weighting which discriminates against low frequency and very

high frequency sound in order to approximate the frequency response of the human ear. The subscript *s* or *f* signifies that the time constant of the measurement is either 'slow' (1 second) or 'fast' (125 milliseconds)

L*Amax* The maximum value of L*A* reached during one or more noise events. (See reference to '*s*' and '*f*' subscripts above).

L*Aeq,T* Equivalent continuous sound level. The root mean square sound pressure level determined over time interval T expressed in decibels. May be regarded as the level of a notional steady sound which has the same energy in period T as an actual time-varying sound which occurs in the same period. Sound level, duration and number of events are treated such that doubling the number of events, or doubling the duration of an event, has the same effect as doubling the number of sources (i.e. doubling the energy), which in the decibel scale is an increase of 3 dB (see above).

L*A10* The A-weighted sound level in dB which is exceeded for 10% of the time period stated.

ppv Peak particle velocity, the highest instantaneous velocity reached by a vibrating surface.

VDV Vibration Dose Value, the fourth root of the time integral of the fourth power of the frequency-weighted vibration velocity. The frequency weightings are specified in BS 6841:1987 and BS 6472:1992. The units are ms-1.75.

SELv Sound Exposure Level (or Single Event Level), the time integral of the squared sound pressure expressed in decibels. May be regarded as L*Aeq,T* normalised so that T is one second regardless of the actual duration of the event. Is used to construct L*Aeq,T* for a period containing many noise events, from knowledge of the SELv for each individual event.