Noise Measurements & Solutions
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NMS Acoustics

EA:
Environmental Noise Assessment.

Address:

2b England's Lane, London NW3 4TG

Client:

Crestworks LTD

Fabiola Rroshi

08 February 2016

Engineer: Simone Longo AMIOA

Acoustic Report - Environmental Noise EA. 2 b England's Lane, London NW3 4TG 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:

Acoustic Report - Environmental Noise EA. 2 b England's Lane, London NW3 4TG 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)

1.0 Survey address.

1.1 At the rear façade at 2 b England Lane NW3 4TG.

1.2 Figure below shows the installation of the environmental monitoring system used for this survey.

2.0 Environmental noise survey details.

2.1 Operating hours:

2.1.1 The proposed plant is expected to operate from 11.00 to 22.00 daily.

2.1.2 In order to estimate the lowest representative background noise LA90 at the sensitive location a precision sound level meter (SLM) was positioned at the first floor window at the rear façade of the building.

2.1.3 The specific position was deemed equivalent to the nearest noise sensitive façade located at the opposite building, but inaccessible for the purpose of this survey.

2.1.4 The figure below shows the nearest noise sensitive façade and windows at the estimated distance of 11m from the installation site of the proposed plant.

3.0 Environmental noise survey results.

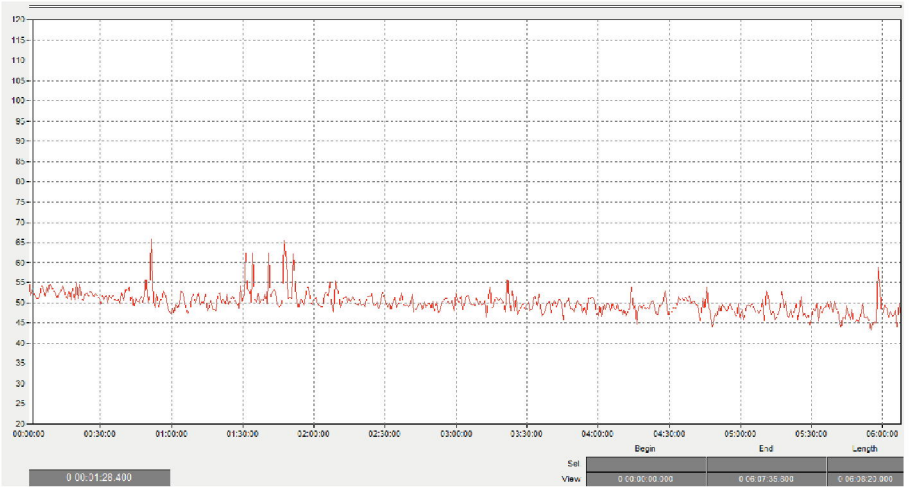
3.1 Lowest representative environmental background noise recorded within the period of interest is given in table below.

Lowest LA90,*15min.*		
04/02/2016	@ 21:50 – 22:05	41.0 dB LA90,15min (conservative)

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

4.1 The soundscape at the specific location is predominantly made of slow moving traffic noise, another restaurant is operating next door and at the rear in near proximity their ventilation system and kitchen noise is sporadically audible at the assessment position.

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 Instrumentation

7.1 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 assessment.	Date:	04/02/2016
Measurement duration:	Continuous integration 15 min interval	Period length: 15 min.	Filter bandwidth: (A) 1/1 Oct
Initial calibration level:	113.9 dB	Sampling frequency: 50 ms	End calibration level: 113.6 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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8.0 Specific noise emission.

8.1 There are tree (3) specific noise emissions object of this survey.

8.1.1 Kitchen extractor fan noise.

8.1.1.1 Maker and model of the fan units: S&P KABB/4-4000/355

8.1.1.2 Manufacture declared noise emission: outlet 55 dBA @ 1.5 m free field, case breakout 45 dBA

8.1.2 Heat pump condenser units (2 units).

8.1.2.1 (A) PANASONIC - U-140PEY1E8 - 55 dBA

8.1.2.2 (B) PANASONIC - U-71PEY1E5 - 52 dBA

9.0 Noise emission predictive estimate.

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

9.2 **The extractor flue.**

9.2.1 The flue outlet estimated distance from the nearest sensitive window is approximately 10 m.

9.2.2 A predictive calculation to estimate the noise impact of the unit at the nearest window should take into account the attenuation due to distance, in this particular location the extractor unit noise emission is given at 1.5 m and is approximately 11 m away from the nearest centre window, attenuation should estimate 10 m attenuation due to distance, that equals to 38.5 dBA.

9.2.3 A further correction of +3dBA is necessary to account for the façade reflection, to account for this, the total emission at the receptor equal to 41.5 dBA.

9.2.4 The manufacture declared noise emission level is given as free field, therefore at this location we should account for 2 reflecting surfaces, a suggested correction is +6 dBA, now the total noise emission is estimated to be 47.5 dBA

9.2.5 Subtracting the lowest background noise recorded at the site from the predicted output at the nearest centre window will give an idea of the noise impact of the unit at this location, as follow, the lowest background noise measured on site is 41.0 dBA LA90, 15min.

9.2.5.1 The predicted noise emission at 1 m from the window results in the specific noise emission 7.5 dBA above background noise.

9.2.6 The result of this predictive calculation shows that attenuation of 17.5 dBA is necessary to reduce the specific noise at 10 dBA below background noise, as required to achieve planning permission.

9.2.7 For this purpose a noise attenuation giving at least 17.5 *TL* will be recommended for this specific installation.

9.3 **Case Breakout noise.**

9.3.1 Case breakout noise is given at 45 dBA at 1.5 m, and will proportionally require a noise reduction of 7.5 dBA to achieve the required emission level of 10 dBA below background noise at the receptor window.

9.4 **Heat Pumps.**

9.4.1 Unit (A) PANASONIC - U-140PEY1E8 - 55 dBA

9.4.2 The unit noise emission is assumed to be at 1 m hemispherical therefore a correction of + 3 dBA should be added, this equals now to 58 dBA.

9.4.3 Considering the attenuation due to distance the specific noise emission at the receiving façade is estimated at 38 dBA.

9.4.4 An additional correction of + 3 dBA is necessary to account for the façade reflection now the total noise emission is estimated at 41 dBA

9.4.5 Subtracting the lowest background noise recorded at the site from the predicted output at the nearest centre window will give an idea of the noise impact of the unit at this location, as follow, the lowest background noise measured on site is 41.0 dBA LA90, 15min.

9.4.5.1 The predicted noise emission at 1 m from the window results in the specific noise emission requiring 10 dBA attenuation.

9.4.6 Unit (B) PANASONIC - U-71PEY1E5 - 52 dBA

9.4.6.1 Unit (B) proportionally will require 8 dBA attenuation.

10.0 Noise mitigation measure.

10.1 In order to achieve for planning purpose the required 10 dBA below background noise for the extractor and heat pumps emission at the receptor, the following noise mitigation measures are suggested.

10.1.1 **Extractor fan outlet suggested attenuator:** Envirosound EVS-1-900-ME manufacture declared transmission loss 41.7 dBA (Calculated).

10.1.1.1 Extractor fan emission 47.5 dBA – *TL 41.7 dBA = 5.8 dBA. The plant emission result well below the required threshold limit.*

10.2 **Case breakout** requires attenuation of 7.5 dBA, this can be achieve by enclosing the fan engine case with acoustiblock 6 mm membrane, edged and joint sealed with acoustic sealant and tape should provide 10 dBA or more attenuation resulting in the case breakout noise at the receptor no less than 13 dBA below background noise.

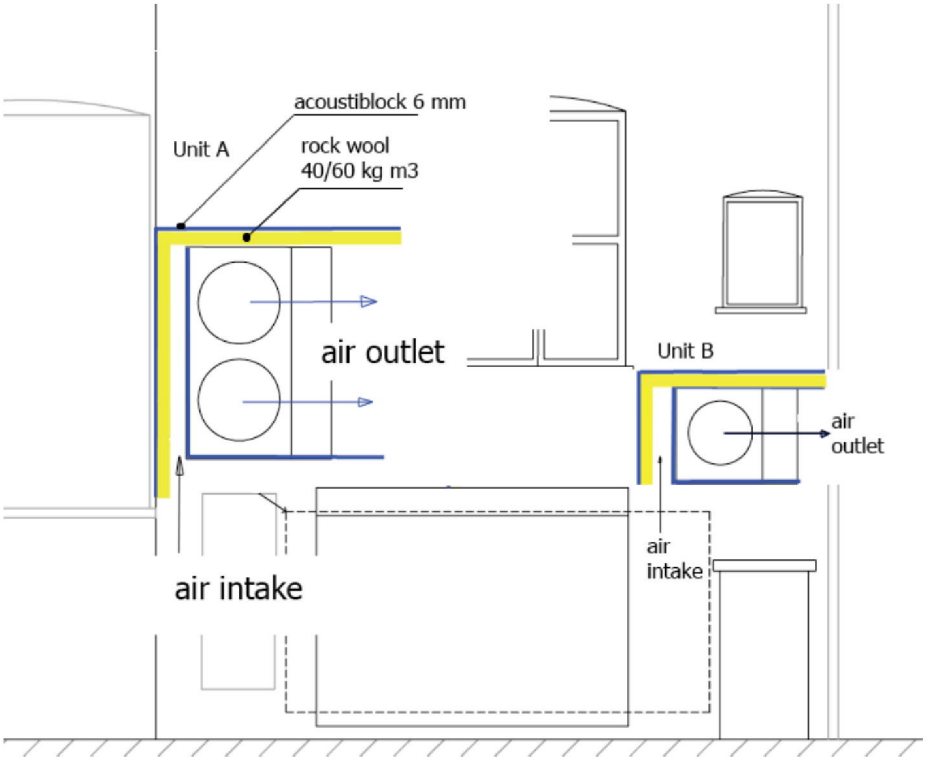
10.2.1 **Acoustblock membrane is available from** http://www.acoustiblok.co.uk/

10.3 **Heat pumps.**

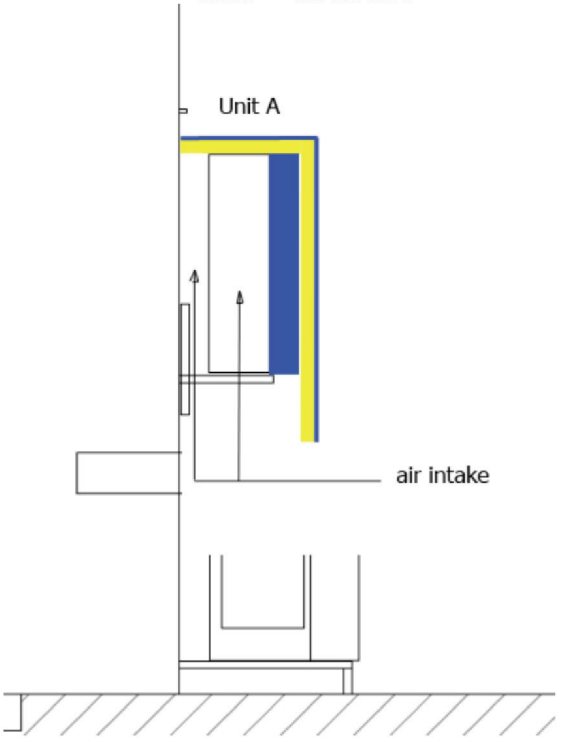
10.3.1 Heat pumps will requires at this site noise mitigation by no less than 10 dBA in the direction of the noise sensitive façade, this can be achieved by partially enclosing the units with acoustic panels made of 6 mm acoustiblock membrane over a wire frame and internally lined with 50mm high density rock wool panels 40-60Kg cubic m.
ALTERNATIVES; SUCH AS A 3MM THICK STEEL (ONLY) CASING CAN BE ALSO USED.

10.3.2 As follow some schematic guidelines for the construction of the acoustic screens made on the basis of the proposed drawings, please note the scale of the drawings is approximated.

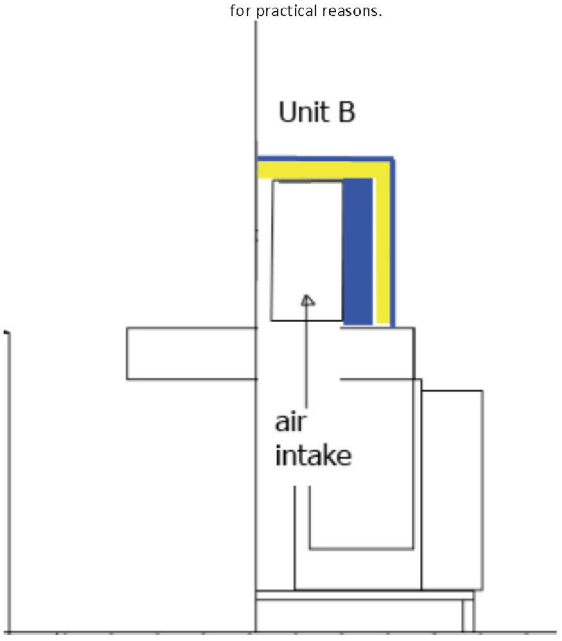
10.3.2.1 It will be necessary to ensure air gaps for air passage is at least 50mm wide



10.3.2.3 Side view Unit A



10.3.2.4 Side view Unit B. note the unit needs to be installed at a different position for practical reasons.



11.0 Conclusion.

11.1 The outcome of the survey finds noise emission from the plant exceeding the threshold required for planning permission, therefore noise mitigation measures have been developed and proposed in this report for the fan extractor flue, breakout noise and condenser units A and B.

11.2 It is estimated that, with the implementation of the proposed noise mitigation measures the plant noise emission at the nearest receptors will be less than 10 dBA below the lowest background noise LA90 15 min recorded on site, therefore planning permission should be granted on the basis of noise.

Approved for Issue on behalf of
Noise Measurements & Solutions

[redacted]

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: 2014 Sound Insulation and noise reduction for buildings – Code of Practice.
- BS4142: 2014 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

Survey Numerical data.

Calculation interval (absolute time)	Effective duration	L 90.0%: LAF(spl) (dB)
04/02/2016 16:05:55.000 - 04/02/2016 22:14:04.250		
04/02/2016 16:05:55.000 - 04/02/2016 16:20:54.999	0 00:15:00.000	49.3 dB
04/02/2016 16:20:55.000 - 04/02/2016 16:35:54.999	0 00:15:00.000	49.5 dB
04/02/2016 16:35:55.000 - 04/02/2016 16:50:54.999	0 00:15:00.000	48.5 dB
04/02/2016 16:50:55.000 - 04/02/2016 17:05:54.999	0 00:15:00.000	44.6 dB
04/02/2016 17:05:55.000 - 04/02/2016 17:20:54.999	0 00:15:00.000	44.7 dB
04/02/2016 17:20:55.000 - 04/02/2016 17:35:54.999	0 00:15:00.000	46.2 dB
04/02/2016 17:35:55.000 - 04/02/2016 17:50:54.999	0 00:15:00.000	47.7 dB
04/02/2016 17:50:55.000 - 04/02/2016 18:05:54.999	0 00:15:00.000	46.7 dB
04/02/2016 18:05:55.000 - 04/02/2016 18:20:54.999	0 00:15:00.000	46.4 dB
04/02/2016 18:20:55.000 - 04/02/2016 18:35:54.999	0 00:15:00.000	46.8 dB
04/02/2016 18:35:55.000 - 04/02/2016 18:50:54.999	0 00:15:00.000	46.4 dB
04/02/2016 18:50:55.000 - 04/02/2016 19:05:54.999	0 00:15:00.000	46.4 dB
04/02/2016 19:05:55.000 - 04/02/2016 19:20:54.999	0 00:15:00.000	46.5 dB
04/02/2016 19:20:55.000 - 04/02/2016 19:35:54.999	0 00:15:00.000	45.5 dB
04/02/2016 19:35:55.000 - 04/02/2016 19:50:54.999	0 00:15:00.000	45.3 dB
04/02/2016 19:50:55.000 - 04/02/2016 20:05:54.999	0 00:15:00.000	45.3 dB
04/02/2016 20:05:55.000 - 04/02/2016 20:20:54.999	0 00:15:00.000	45.1 dB
04/02/2016 20:20:55.000 - 04/02/2016 20:35:54.999	0 00:15:00.000	44.3 dB
04/02/2016 20:35:55.000 - 04/02/2016 20:50:54.999	0 00:15:00.000	44.4 dB
04/02/2016 20:50:55.000 - 04/02/2016 21:05:54.999	0 00:15:00.000	44.3 dB
04/02/2016 21:05:55.000 - 04/02/2016 21:20:54.999	0 00:15:00.000	44.9 dB
04/02/2016 21:20:55.000 - 04/02/2016 21:35:54.999	0 00:15:00.000	43.2 dB
04/02/2016 21:35:55.000 - 04/02/2016 21:50:54.999	0 00:15:00.000	43.3 dB
04/02/2016 21:50:55.000 - 04/02/2016 22:05:54.999	0 00:15:00.000	41.0 dB
04/02/2016 22:05:55.000 - 04/02/2016 22:14:04.250	0 00:08:09.300	41.7 dB

Appendix C

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.

LA 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)

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

LAeq,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).

LA10 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.