NMS Acoustics 38 Aspen House Maitland Park Villas NW3 2EH London www.nmsacoustics.com e: info@nmsacoustics.com t: 0800 014 8482 - m: 07887561945 (24 hours) VAT. 745299007	NMS Acoustics

Environmental noise assessment.

Address:

208 Kilburn High Road, London.

Client:

Mr. Natvar Natha

13 June 2016

Engineer: Simone Longo AMIOA

SUMMARY.

1.0 Survey address.

1.1 At the rear of 208 Kilburn High Road, London.

1.2 The measuring microphone was positioned at 1 m from the rear façade of the building.

1.3 Fig below shows the details of the installation site.

2.0 Environmental noise survey details.

2.1 Operating hours:

2.2 The proposed operating hours for the unit is from 10 am to 23.00 seven days per week.

2.3 In order to estimate the lowest representative background noise LA90,15 min at the site, a precision sound level meter (SLM) was used to monitor the ambient noise during the proposed operating hours.

2.4 The noise survey took place on Sunday 29 May 2016.

3.0 Environmental noise survey results.

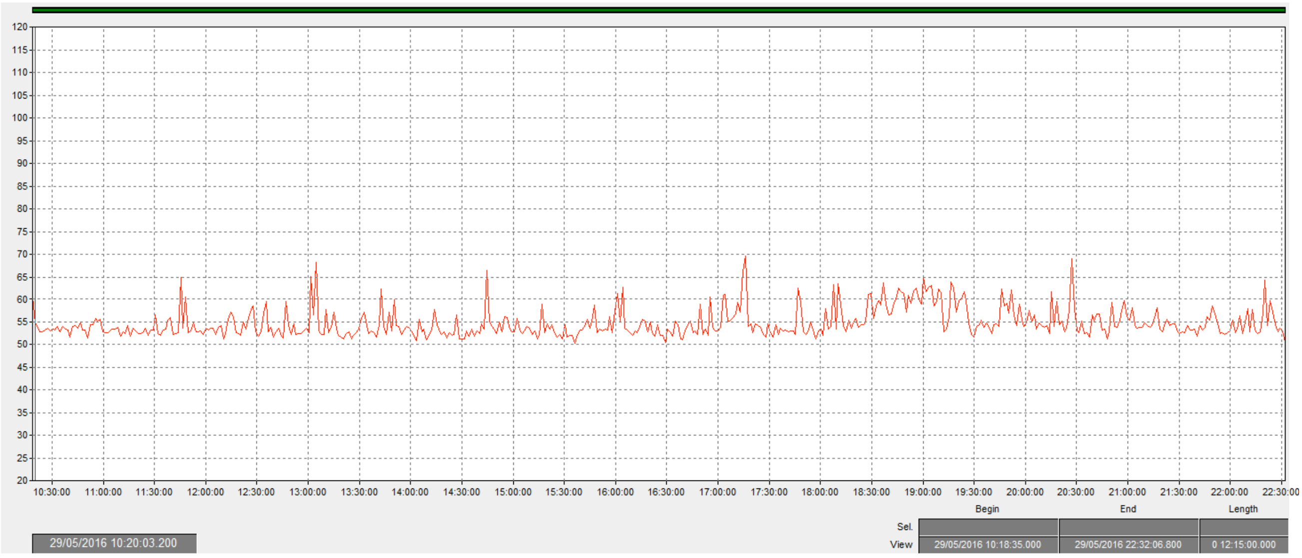
3.1 Lowest representative environmental background noise recorded within the period of interest is given in table below.

Lowest LA90,*15min.*		
29/05/2016	Time @ 10.17	48.1 dB LA90,15min

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

4.1 At the survey location ambient noise is primarily interested by the constant traffic noise of Kilburn High road, no other major noise activity can be heard a part from traffic noise and some heat pumps in the vicinity coming on and off sporadically.

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.	Effective duration	L 90.0%: LAF(spl) (dB)
29/05/2016 10:17:41.000 - 29/05/2016 10:32:40.999	0 00:14:06.000 (1)	48.1 dB
29/05/2016 10:32:41.000 - 29/05/2016 10:47:40.999	0 00:15:00.000 (1)	49.1 dB
29/05/2016 10:47:41.000 - 29/05/2016 11:02:40.999	0 00:15:00.000 (1)	49.0 dB
29/05/2016 11:02:41.000 - 29/05/2016 11:17:40.999	0 00:15:00.000 (1)	49.4 dB
29/05/2016 11:17:41.000 - 29/05/2016 11:32:40.999	0 00:15:00.000 (1)	49.6 dB
29/05/2016 11:32:41.000 - 29/05/2016 11:47:40.999	0 00:15:00.000 (1)	49.5 dB
29/05/2016 11:47:41.000 - 29/05/2016 12:02:40.999	0 00:15:00.000 (1)	50.2 dB
29/05/2016 12:02:41.000 - 29/05/2016 12:17:40.999	0 00:15:00.000 (1)	49.3 dB
29/05/2016 12:17:41.000 - 29/05/2016 12:32:40.999	0 00:15:00.000 (1)	49.7 dB
29/05/2016 12:32:41.000 - 29/05/2016 12:47:40.999	0 00:15:00.000 (1)	49.5 dB
29/05/2016 12:47:41.000 - 29/05/2016 13:02:40.999	0 00:15:00.000 (1)	50.3 dB
29/05/2016 13:02:41.000 - 29/05/2016 13:17:40.999	0 00:15:00.000 (1)	50.3 dB
29/05/2016 13:17:41.000 - 29/05/2016 13:32:40.999	0 00:15:00.000 (1)	49.7 dB
29/05/2016 13:32:41.000 - 29/05/2016 13:47:40.999	0 00:15:00.000 (1)	50.1 dB
29/05/2016 13:47:41.000 - 29/05/2016 14:02:40.999	0 00:15:00.000 (1)	50.3 dB
29/05/2016 14:02:41.000 - 29/05/2016 14:17:40.999	0 00:15:00.000 (1)	50.0 dB
29/05/2016 14:17:41.000 - 29/05/2016 14:32:40.999	0 00:15:00.000 (1)	49.6 dB
29/05/2016 14:32:41.000 - 29/05/2016 14:47:40.999	0 00:15:00.000 (1)	50.0 dB
29/05/2016 14:47:41.000 - 29/05/2016 15:02:40.999	0 00:15:00.000 (1)	50.8 dB
29/05/2016 15:02:41.000 - 29/05/2016 15:17:40.999	0 00:15:00.000 (1)	49.6 dB

29/05/2016 15:17:41.000 - 29/05/2016 15:32:40.999	0 00:15:00.000 (1)	49.9 dB
29/05/2016 15:32:41.000 - 29/05/2016 15:47:40.999	0 00:15:00.000 (1)	49.7 dB
29/05/2016 15:47:41.000 - 29/05/2016 16:02:40.999	0 00:15:00.000 (1)	50.6 dB
29/05/2016 16:02:41.000 - 29/05/2016 16:17:40.999	0 00:15:00.000 (1)	49.9 dB
29/05/2016 16:17:41.000 - 29/05/2016 16:32:40.999	0 00:15:00.000 (1)	49.4 dB
29/05/2016 16:32:41.000 - 29/05/2016 16:47:40.999	0 00:15:00.000 (1)	49.9 dB
29/05/2016 16:47:41.000 - 29/05/2016 17:02:40.999	0 00:15:00.000 (1)	50.0 dB
29/05/2016 17:02:41.000 - 29/05/2016 17:17:40.999	0 00:15:00.000 (1)	51.5 dB
29/05/2016 17:17:41.000 - 29/05/2016 17:32:40.999	0 00:15:00.000 (1)	50.4 dB
29/05/2016 17:32:41.000 - 29/05/2016 17:47:40.999	0 00:15:00.000 (1)	49.9 dB
29/05/2016 17:47:41.000 - 29/05/2016 18:02:40.999	0 00:15:00.000 (1)	50.1 dB
29/05/2016 18:02:41.000 - 29/05/2016 18:17:40.999	0 00:15:00.000 (1)	50.4 dB
29/05/2016 18:17:41.000 - 29/05/2016 18:32:40.999	0 00:15:00.000 (1)	50.8 dB
29/05/2016 18:32:41.000 - 29/05/2016 18:47:40.999	0 00:15:00.000 (1)	51.1 dB
29/05/2016 18:47:41.000 - 29/05/2016 19:02:40.999	0 00:15:00.000 (1)	52.5 dB
29/05/2016 19:02:41.000 - 29/05/2016 19:17:40.999	0 00:15:00.000 (1)	51.0 dB
29/05/2016 19:17:41.000 - 29/05/2016 19:32:40.999	0 00:15:00.000 (1)	50.7 dB
29/05/2016 19:32:41.000 - 29/05/2016 19:47:40.999	0 00:15:00.000 (1)	51.2 dB
29/05/2016 19:47:41.000 - 29/05/2016 20:02:40.999	0 00:15:00.000 (1)	51.2 dB
29/05/2016 20:02:41.000 - 29/05/2016 20:17:40.999	0 00:15:00.000 (1)	51.1 dB
29/05/2016 20:17:41.000 - 29/05/2016 20:32:40.999	0 00:15:00.000 (1)	50.5 dB
29/05/2016 20:32:41.000 - 29/05/2016 20:47:40.999	0 00:15:00.000 (1)	50.1 dB
29/05/2016 20:47:41.000 - 29/05/2016 21:02:40.999	0 00:15:00.000 (1)	51.4 dB
29/05/2016 21:02:41.000 - 29/05/2016 21:17:40.999	0 00:15:00.000 (1)	51.0 dB
29/05/2016 21:17:41.000 - 29/05/2016 21:32:40.999	0 00:15:00.000 (1)	50.9 dB
29/05/2016 21:32:41.000 - 29/05/2016 21:47:40.999	0 00:15:00.000 (1)	50.7 dB
29/05/2016 21:47:41.000 - 29/05/2016 22:02:40.999	0 00:15:00.000 (1)	50.4 dB
29/05/2016 22:02:41.000 - 29/05/2016 22:17:40.999	0 00:15:00.000 (1)	50.6 dB
29/05/2016 22:17:41.000 - 29/05/2016 22:32:40.999	0 00:14:25.850 (1)	49.9 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. Background noise continuous integration.	Date:	29/05/2016
Measurement duration:	Logging continuous integrating.	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)
Contact:
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9.0 Specific noise emission.

9.1.1 Maker and model of the proposed unit object of this report (Kitchen extractor):

9.1.1.1 Flakt Woods: JM Aerofoil -Model 63JM/20/4/6/14

9.1.1.2 Manufacture noise emission data is given by Northern Fan Supply at 71dBA LpA at 3 m from Intake Outlet and case breakout, it is assumed this date is given as hemispherical radiation.

	Sound Spectrum (Hz)								Overall	
	63	125	250	500	1k	2k	4k	8k	Lw*	LpA @ 3 m**
Inlet*	82	88	90	91	87	84	76	70	96	71
Outlet*	84	88	90	91	87	84	78	72	96	71
Breakout*	84	88	90	91	87	84	78	72	96	71

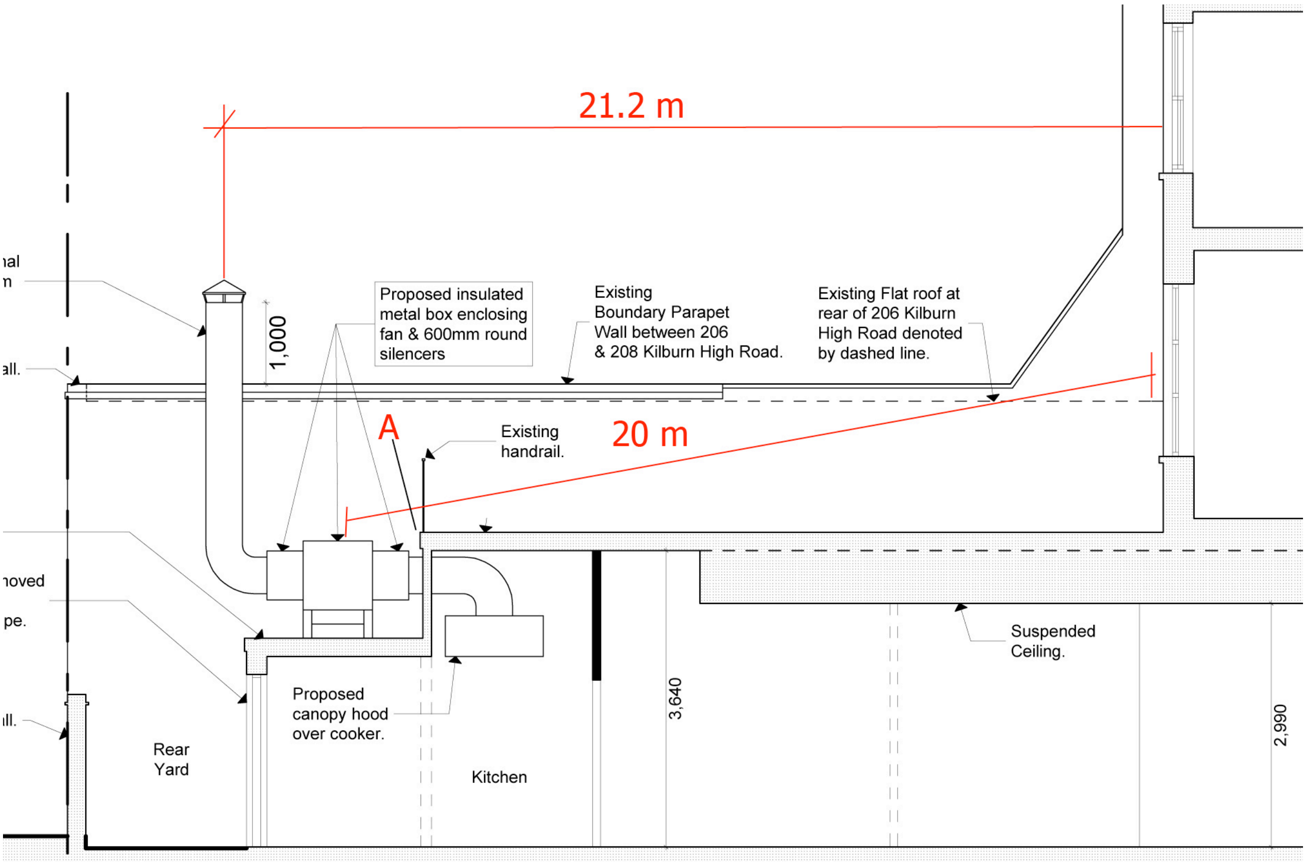
* Lw dB re 10^{-12} W ** dBA re $2x10^{-5}$ Pa
Sound data at requested duty.

10.0 Proposed installation.

10.1 The engine fan rotor proposed installation is at the rear flat roof-top extension of the restaurant kitchen, and the flue outlet is installed at the same location extending vertically from the fan engine rotor location.

10.2 Below is a portion of the drawing provided by the architect showing the detail of the installation and relative distance form the nearest noise sensitive façade.

10.3 The distance is estimated at 21.2 m from the centre of the flue outlet. The lower rear side window opposite and below the flue is not considered as is understood there are no window to living spaces at that location.



11.0 Noise emission predictive estimate.

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

12.0 Fan engine case Breakout noise.

12.1 The specific noise emission at the extractor case breakout is given by the manufacture at 71dBA Lp, at 3 m assuming hemispherical propagation.

12.2 To account for the specific installation site configuration a correction of -4 dBA is suggested as effect of the acoustic shadow projected by the wall marked in “A” in the drawing above, making the noise emission at (71-4)=68dBA.

12.2.1 Further, the noise emission to the nearest window need to be estimated as the effect of distance, in our case the noise emission given at 3 m needs to travel 16 m to reach 1 m distance from the nearest window, in this case using the distance law for sound propagation it can be estimated noise level will be 53.4 dBA

12.2.2 One more correction, the façade reflection requires +3dBA noise emission at the window is now 56.4 dBA.

12.2.3 To finally estimate the environmental noise impact of the case breakout of the extractor unit, the calculated emission is subtracted from the lowest representative background noise, in this case (56.4-48.1)= 8.3 dBA.

12.2.3.1 The subtraction indicates the unit noise emission is 8.3 dBA above background noise, therefore noise mitigation will necessary for reducing the noise by at least 18.3 in order to achieve planning permission.

13.0 Proposed mitigation measure (Unit case breakout).

13.1.1 In order to attenuate noise emission by 18.3 dBA an acoustic enclosure is suggested.

13.1.2 The case engine should be enclosed with a 3 mm metal sheet enclosure having specific weight of 23 Kg per square m the enclosure should be built hermetically airtight, the enclosure so built should provide 20 dBA noise reduction, the enclosure should be internally lined with 50 mm rock wool.

13.1.3 The enclosure should be bolted onto the flat roof using specific anti vibration mounting, please refer to the manufacture of the of the engine rotor for the specific requirements.

14.0 Extractor flue outlet.

14.1 The extractor flue outlet emission is also given at 71 dBA at 3 m, the distance from the extractor outlet and the nearest window is 21.2 m this means noise emission will travel 17.2 m to arrive at 1 m from the nearest sensitive window.

14.2 The rain cap on top of the flue outlet will increase the directionality of the noise emission in direction of the window, for this is suggested a +4 dBA correction making the total emission at 75 dBA

14.3 Using the distance law formula for sound propagation the emission lever at 1 m from the window is estimated at 59.8 dBA.

14.4 A further correction of +3 dBA is necessary to account for the façade reflection, making the total estimated noise emission at the sensitive location to 62.9 dBA

14.4.1 To finally estimate the environmental noise impact of the flue outlet, the calculated emission is subtracted from the lowest representative background noise, in this case (62.9-48.1)= 14.8 dBA.

14.4.2 The estimated emission level results at 14.8 dBA above background noise, therefore it should be reduced by 24.8 dBA in order to be 10 dBA below background noise as required by the local council.

15.0 Proposed mitigation measure (Flue Outlet).

15.1 To mitigate the noise emission level to 10 dBA below background noise is suggested the implementation an in line attenuator.

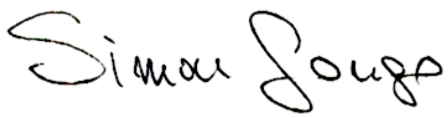
15.1.1 Make and model n: Flaktwood BDER61 diameter 630 Length 120 -

15.1.1.1 The manufacture declared attenuation is calculated at – TL 29.62 dBA

16.0 Conclusion.

16.1 The outcome of the survey finds an excess of noise from both the case breakout of the unit and the flue outlet, and a suitable mitigation measure is specified for both sources. According with the predictive estimate and the suggested noise mitigation measure attenuation performance, the emission noise from the unit and the flue outlet will be reduced to 10 dBA below background noise, therefore 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
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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

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)

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.