



Noise Impact Assessment

Project Reference Number: PA176

Report Reference Number: IB1512161NR

Client: Mohammed Tarhini

Site: 178 Kilburn High Road, London, NW6 4JD

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Project Information

Peak Acoustics have been commissioned to undertake the assessment detailed within this report. Below is a summary of pre-commencement requirements and comments as communicated to Peak Acoustics by involved parties, this information forms the basis of the assessment and report.

Client Contact	Francois Ziade on 15/12/2016.
Client Requirement	The client has requested a noise assessment of the proposed kitchen extraction equipment at 178 Kilburn High Road, London, NW6 4JD.
Site details as communicated by client.	It is proposed to convert the current A1 shop into A3 food and drink establishment. Peak Acoustics have been informed by the client that a kitchen extraction system will be installed with associated ductwork and rooftop exhaust.
Selected Methodology	To assess the noise impact of the proposed kitchen extraction equipment on the nearest sensitive receptor, Peak Acoustics will undertake measurement and assessment using BS4142:2014.
Methodology Justification	'BS4142:2014 – Methods for rating and assessing industrial and commercial sound' is a recognised standard for determining the noise impact of fixed plant machinery via relation of noise emissions to the measured background noise level on site.
Local Authority Contact	N/A
Local Authority Consultation	N/A
Local Authority Guidance/Unitary Development Plans/Unique or bespoke standards	N/A

Assessment Summary

A noise assessment has been undertaken at 178 Kilburn High Road, London, NW6 4JD. This is to assess the impact of proposed kitchen extraction equipment on the nearest sensitive receptor.

The nearest sensitive receptor (NSR) has been identified as the 2nd floor side window of 178 Kilburn High Road, being closest to the extraction flue located at 3rd floor roof level.

Background noise levels have been recorded on site and measured at their lowest as **49.3dB L_{A90, 1hr}** (between 22:00 – 23:00), during the opening hours of the site.

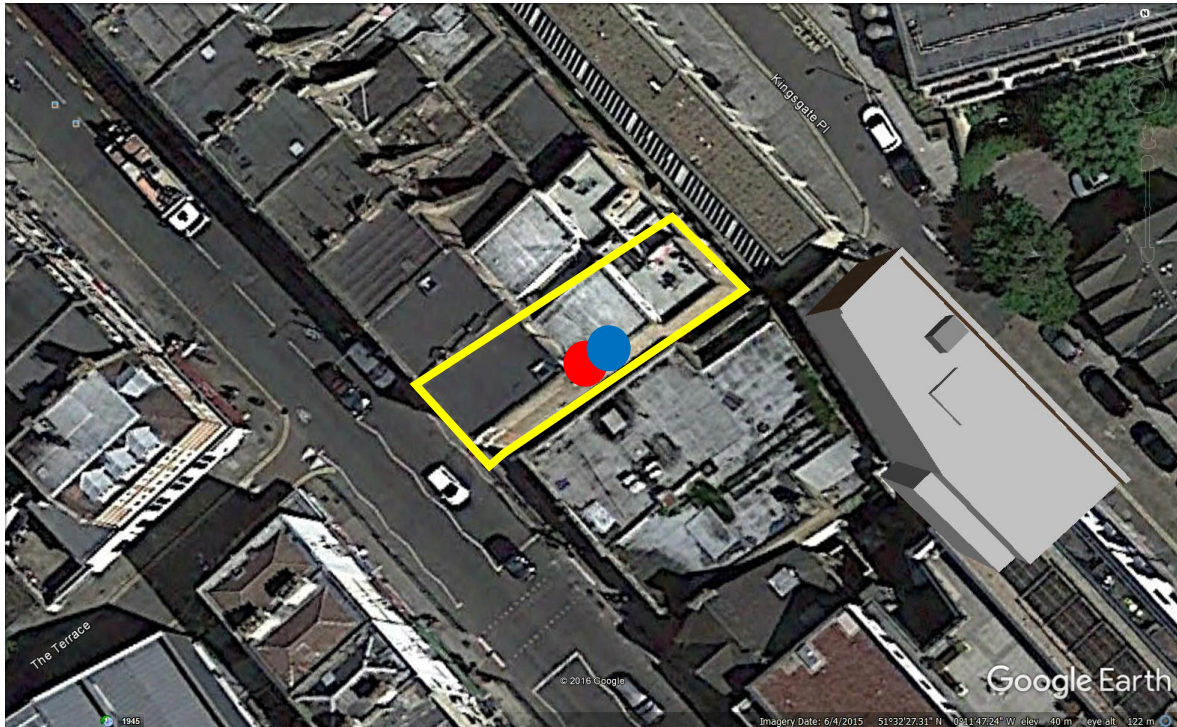
The sound rating level at the NSR from the extraction system is determined be **25.0dB L_{Ar}**. This is 24.3dB below the background level and is therefore classed as **Low Impact** in line with BS4142:2014.




1. Subjective Impressions

- 1.1 Background noise levels were measured at a representative location to the NSR, taken to be the side window of the 2nd floor dwelling of 178 Kilburn High Road located approximately 6m from the kitchen extraction exhaust (see **Appendix G** for detailed location drawings).
- 1.2 The primary noise sources on site were identified as vehicle traffic on Kilburn Main Road. Secondary noise sources were noted as pedestrians and distant traffic.

2. Measurement Location

- 2.1 Background noise measurements were taken outside at 2nd floor roof level to the rear of the building at a representative location to the NSR.
- 2.2 The measurement location is shown below.



-  Site location
-  Background measurement location
-  NSR location

3. Measurement Equipment

3.1 Measurements were undertaken using a Svantek 971 Class 1 Sound Level Meter. SN: 40305. Full equipment details can be found in **Appendix B**.

3.2 The calibrator reference level was 113.0dB and calibration levels were measured at 112.25 before and after 112.28 after measurement (0.03dB drift). Full calibration details can be found in **Appendix D**.

4. Weather Conditions

4.1 Weather conditions were deemed acceptable for environmental noise measurement; detailed weather conditions are given in **Appendix C**.

5. Measurement Procedure

5.1 Background measurements were conducted over a weekday period from 19th – 20th December. Full measurement times and durations can be found in **Appendix A**.

5.2 Measurements were taken outside at 2nd floor roof level at a distance of at least 1m from any reflective surface.

5.3 Background noise measurements were obtained in 5min time intervals.

5.4 Measured noise levels are shown graphically in **Appendix E** and are typical of an environmental noise climate dominated by road traffic due to the noticeable decrease in noise levels across the night and early morning.

6. Specific Sound Level

6.1 The kitchen extraction fan is located internally at ground floor level with associated ductwork and exhaust located at 3rd floor roof level.

6.2 A silencer is proposed to reduce the noise output at the exhaust.

6.3 The extraction system exhaust is located approximately 6m away from the nearest residential window.

6.4 The proposed extraction fan, Helios GBW 560/4 has a stated extract noise level of 73.0dB L_{Aeq} at 1m. The proposed silencer is Quiet-Duct 3LFS(900). Full specifications can be found in **Appendix F**.

6.5 The proposed silencer reduces the extract noise level to 50.9dB L_{Aeq} as calculated below:

Frequency, Hz	125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	8000Hz	Sum, dB L_{Aeq}
Fan Exact, dB L_{eq}	54.0	66.0	67.0	67.0	66.0	62.0	53.0	70.0
Silencer Reductions, dB	13.0	23.0	28.0	27.0	21.0	17.0	14.0	-
Silenced Fan, dB L_{eq}	41.0	43.0	39.0	40.0	45.0	45.0	39.0	50.9

6.6 Attenuation through the ductwork will also occur. A table of likely resultant noise attenuation is shown below:

Description	Sound level reduction (500Hz)
Ductwork 90° bend	3dBA
Extraction unit grill	4dBA
Main ductwork (per meter)	0.3dBA
Branch ductwork (per meter)	0.5dBA

6.7 Taking the figures in the table above as an estimation for the likely broadband attenuation, with two 90° bends, approximately 11m of ductwork and an end grille, the total attenuation from ductwork would be 13.3dB resulting in a noise level at the extraction flue of 37.6dB L_{Aeq} .

6.8 This is then distance corrected to the NSR approximately 6m away:

$$L_2 = L_1 - 20 \cdot \log(r_1/r_2)$$

$$L_2 = 37.6 - 20 \cdot \log(6/1)$$

$$L_2 = 22.0\text{dB } L_{Assl}$$

(Point source distance attenuation is applied, $20 \cdot \log(r_1/r_2)$, where r_1 is the distance between the noise source and NSR and r_2 is the distance between microphone and noise source)

6.9 The resulting specific sound level at the NSR is **22.0dB L_{Assl}** .

7. Rating Level

7.1 The specific sound level is to be corrected for intermittency due to the units not being in continuous operation.

7.2 From an informed subjective analysis of the 1/1 octave band frequency data of the proposed fan (see **Appendix F** for details) it has been determined that the specific sound level will not be tonal. No Penalty is applied for tonality.

7.3 The kitchen extraction system will not emit impulsive noise, therefore no penalty is applied for impulsivity.

7.4 A +3dB intermittency penalty is applied to the overall specific sound.

7.5 This gives a sound rating level at the NSR of **25.0dB L_{Ar}** .

8. Background Sound Level

- 8.1 Background noise levels were measured over a weekday period from 19th – 20th December.
- 8.2 The proposed opening times of the premises are 09:00 – 23:00.
- 8.3 Background noise levels were measured at their lowest during the proposed opening times as **49.3dB L_{A90, 1hr}** between 22:00 – 23:00.

9. BS4142:2014 Assessment Outcome

- 9.1 The sound rating level is **24.3dB** below the background level at the NSR.
- 9.2 This is classed as **Low Impact** under BS4142:2014.

10. Further Considerations

- 10.1 **Noise Management Plan** - To protect nearby residents from unnecessary noise nuisance due to associated activities, a noise management plan should be established. This may include but not be limited to the following:
- The staff should monitor the doors and ensure they are kept closed during all hours of the operation.
 - Any music played within the premises should not be above comfortable conversation volume and should have the low frequencies attenuated, as lower frequencies have higher flanking properties.
- 10.2 **Deliveries** - Due to multiple commercial businesses, including shops and cafes being located along High Street, the influence of deliveries to the proposed development will be imperceptible within the current noise climate. It is recommended to approach delivery companies who work in accordance with the 'Quiet Deliveries Scheme' outlined by the Department of Transport, as the methodologies within the document and relevant training aim to minimise both disturbance on the roads as well as noise disturbances to nearby residents.

11. Uncertainty

- 11.1 Uncertainty can arise when a calculated method, such as distance correction and noise level summation, is used to determine an overall noise level at a NSR location, however it is an accepted method when there are no specific noise sources on site that can be measured.
- 11.2 The monitoring equipment is subject to a 1dB error margin, however calibration checks before and after measurements demonstrate that the error margin remained consistent throughout the measurement procedure.

Appendices

APPENDIX A - Measurement Details					
Measurement	Kit	Start Date	Start Time	End Date	End Time
M1	A2	19/12/2016	13:23	20/12/2016	12:03

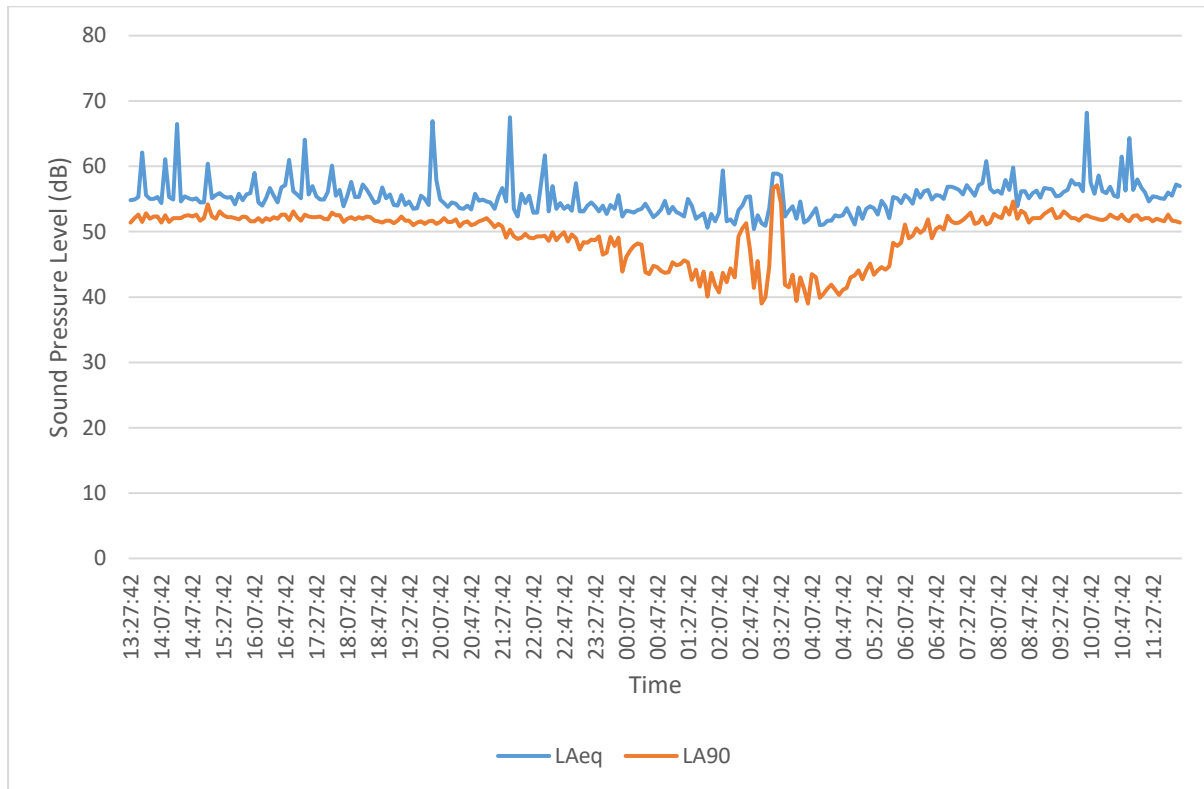
APPENDIX B - Equipment Details					
Kit	Equipment	Make	Model	Class	Serial Number
A2	Sound Meter	Svantek	971	1	40305
A2	Pre-Amp	Svantek	SV12L	1	32484
A2	Calibrator	Svantek	SV31	1	43806

APPENDIX C - Meteorology Details							
Measurement	Date	Temp C	Wind Speed m/s	Wind Direction	Humidity %	Precipitation mm	Cloud Cover (Oktas)
M1	19/12/2016	5	1.7	NE	95	0.8	6/8
M1	20/12/2016	6	2.5	E	86	0.0	7/8

APPENDIX D - Calibration Details					
Measurement	Calibrator Ref Level (dB)	Level Before (dB)	Deviation Before (dB)	Level After (dB)	Deviation After (dB)
M1	113.0	112.25	0.75	112.22	0.78

APPENDIX E – Noise Measurement Details

Measured Background Noise Levels, Graph: 19th – 20th December 2016



APPENDIX G – Duct Plans

Proposed Side Duct Elevation & Roof Duct Layout

