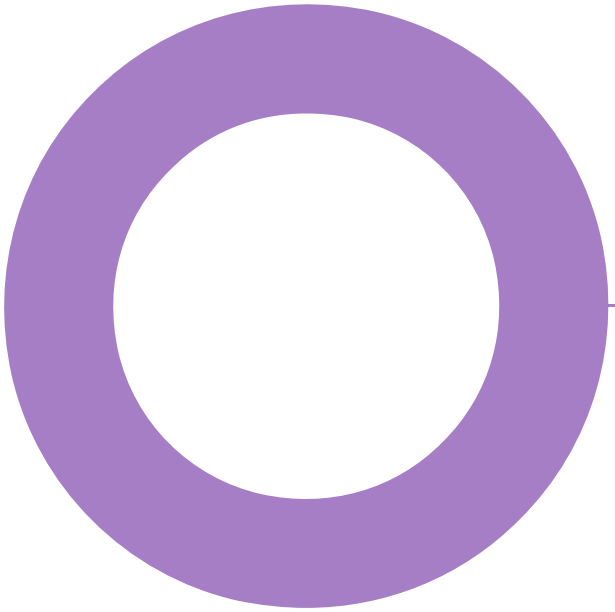
HOARE LEA

155-161 Grafton Road. London.
West Hampstead Motors.

ACOUSTICS
NOISE ASSESSMENT FOR PLANNING

REVISION 01 – 09 FEBRUARY 2018



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Contents.

Executive summary

There are proposals to install chimney flue equipment at the rear of West Hampstead Motors, a commercial property located at 155-161 Grafton Road. This report has been prepared by Hoare Lea to support the planning application for the building services equipment to the London borough of Camden. The details of the survey are summarised below:

- A noise survey was undertaken to establish baseline noise levels in the area. The results of the survey have been used to derive plant emission limits in line with the local authority criteria.
- Calculations have been undertaken to assess the likely impact of the plant equipment on the nearby residential properties.
- The assessment indicates that the plant emission limits can be met with the use of a sound attenuator as part of the extract system. The attenuator would need to provide a minimum acoustic Insertion Loss of 14 dB. Guideline insertion loss requirements have been provided.

On the basis of the assessment and discussions, noise emissions from the proposals can be suitably controlled and therefore should not preclude the granting of planning permission.

1. Introduction

Hoare Lea has been appointed by West Hampstead Motors to undertake an acoustic assessment for the installation of an extract system terminating in a chimney flue. . The business is located at 155-161 Grafton Road, situated within the London Borough of Camden.

The flue equipment is currently located on the second floor roof of the building and is occasionally operational over weekday periods during working hours. The proposals are to move the plant equipment to a more suitable location at the rear of the property for compliance with local authority requirements.

This report summarises the acoustic survey and assessment undertaken as part of the project. Guidance of mitigation measures are set out with a view of complying with local authority policy regarding noise.

A glossary of the acoustic terms used within this report is provided in Appendix A.

2. Description of site and surroundings

The site is situated within the London Borough of Camden within a mixed-use area. The building overlooks Grafton Road and is located adjacent to Queen's Crescent Market. Grafton Road is a primarily residential road whilst Queen's Crescent is commercial area. A school, Carlton Primary School, is located opposite the site. The nearest noise sensitive property are the residential properties located at 149 and 163 Grafton Road.

Figure 1 illustrates the site location as well as the nearby noise sensitive properties.

The local noise environment is dominated by road traffic activity on Grafton Road. Noise from aeroplanes, the school and commercial activities was also observed to contribute to the overall noise environment.

It is also understood that 'The Dome', a multipurpose venue, located to the rear of the site, is also a source of noise when it is host to sports activities or other large events.

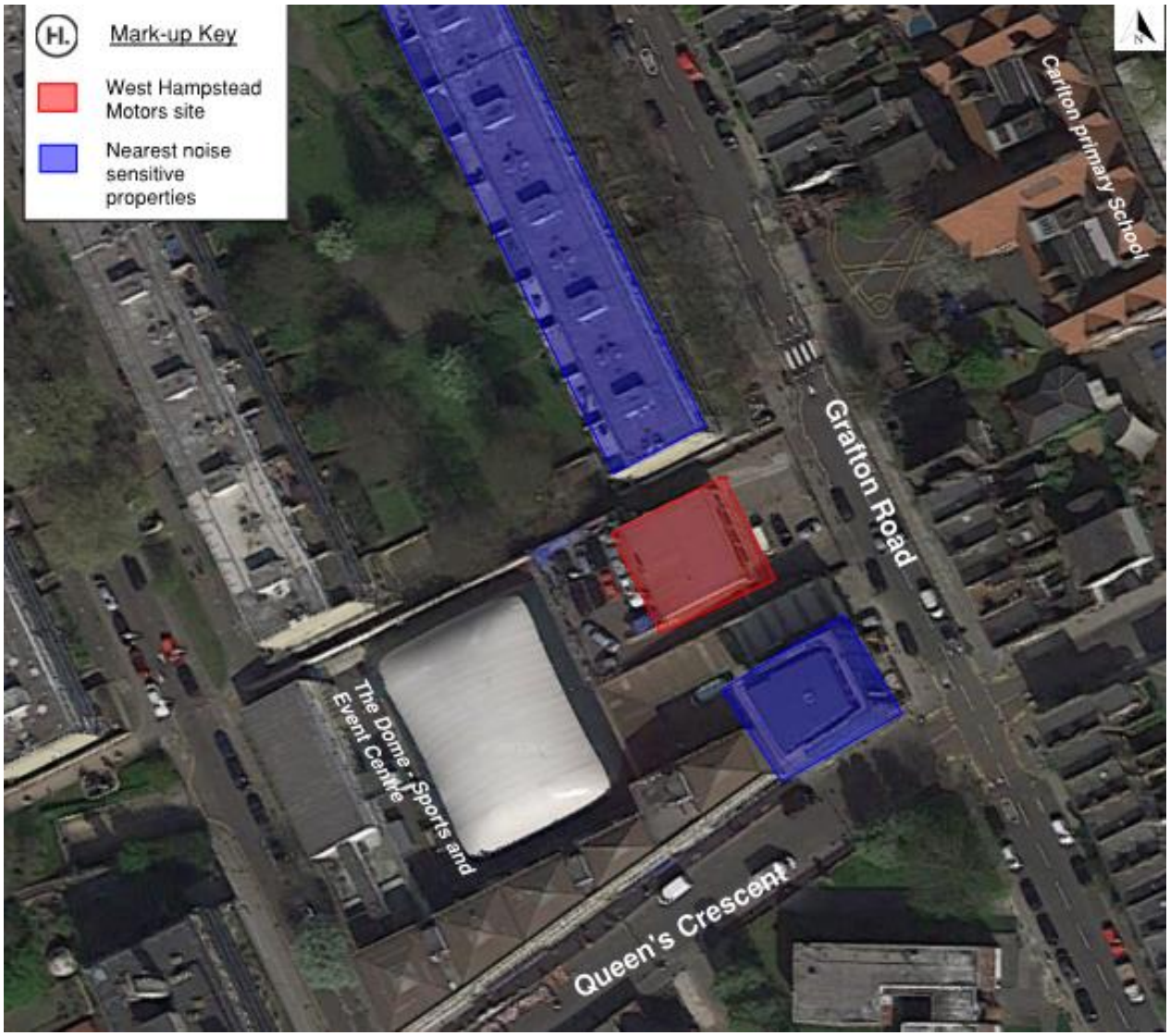

Figure 1: Site location, Image source Google Maps

3. Acoustic design standards

The following policy and guidance has been used for the survey and assessment:

- Camden Local Plan, adopted 2017
- National Planning Policy Framework
- British Standard 7445, ' Description and measurement of environmental noise' 2003
- British Standard 4142, ' Methods for rating and assessing industrial and commercial sound' , 2014

3.1 National Panning Policy Framework

The National Planning Policy Framework (National Planning Policy Framework, Department for Communities and Local Government, March 2012) sets out the Government's current planning policies for England and how these are expected to be applied.

With regards to local noise planning policies, Section 11 paragraph 123 of the NPPF states:

'Planning policies and decisions should aim to:

- Avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;
- Mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions;
- Recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put upon them because of changes in nearby land uses since they were established;
- Identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.'

Reference is made to the DEFRA Noise Policy Statement for England 2010 (NPSfE). This latter document is intended to apply to all forms of noise other than that which occurs in the workplace and includes environmental noise and neighbourhood noise in all forms.

The NPSfE advises that the impact of noise should be assessed on the basis of adverse and significant effect but does not provide any specific guidance on assessment methods or limit sound levels. Moreover, the document advises that it is not possible to have 'a single objective noise-based measure…that is applicable to all sources of noise in all situations'. It further advises that the sound level at which an adverse effect occurs is 'likely to be different for different noise sources, for different receptors and at different times'.

In the absence of specific guidance for assessment of environmental noise within the NPPF and the NPSfE, it is considered appropriate to base assessment on current British Standards and national guidance. These are considered to be Local Authority guidance, BS 4142 (BS 4142: 2014: 'Method for rating industrial and commercial sound'), BS 8233 (BS 8233: 2014, "Guidance on Sound Insulation and Noise Reduction for Buildings", BSI.) and the World Health Organisations (World Health Organisation (WHO) - Guidelines for Community Noise, 1999) (WHO) guidelines.

3.2 Camden Local Plan, adopted 2017

The London Borough of Camden's Development Policies document outlines all relevant planning policies and contains policies relating to noise and vibration effects.

3.3 Policy A4 Noise and vibration

Policy A4 within the document specifies quantitative criteria in respect of a number of noise and vibration related issues. The policy states:

> 'The Council will seek to ensure that noise and vibration is controlled and managed and will not grant planning permission for:
>
> – Development likely to generate noise pollution; or
>
> – Development sensitive to noise in locations with noise pollution, unless appropriate attenuation measures are provided and will not harm the continued operation of existing uses.
>
> Developments that exceed Camden's Noise and Vibration thresholds will not be permitted. The Council will only grant permission for plant or machinery if it can be operated without causing harm to amenity and does not exceed our noise thresholds.
>
> The Council will seek to minimise the impact on local amenity from the demolition and construction phases of development. Where these phases are likely to cause harm, conditions and planning obligations may be used to minimise the impact.'

The sub sections below set out the available guidance that assessment criteria can be drawn from, in conjunction with the Local Planning Authority guidance.

3.3.1 Camden's Noise thresholds

The significance of noise impact varies depending on the different noise sources, receptors and times of operation under consideration. Camden's thresholds for noise and vibration evaluate noise impact in terms of various 'effect levels' derived from the National Planning Policy Framework and Planning Practice Guidance.:

- NOEL – No Observed Effect Level
- LOAEL – Lowest Observed Adverse Effect Level
- SOAEL – Significant Observed Adverse Effect Level

The design criteria proposed by the Council will vary depending on the context, type of noise and sensitivity of the receptor.

- Green – where noise is considered to be an acceptable level
- Amber – where noise is observed to have an adverse effect level, but which may be considered acceptable when assessed in the context of other merits of the development
- Red - where noise is observed to have a significant adverse effect.

This is further elaborated in Table 1.

Table 1: Local Authority plant noise emission limits

Dominant Noise Source	Assessment Location	Design Period	LOAEL (Green)	LOAEL to SOAEL (Amber)	SOAEL (Red)
Anonymous noise such as general environmental noise, road traffic and rail traffic	Noise at 1 metre from noise sensitive façade/free field	Day	<50dB$L_{Aeq,16hr}$	50dB to 72dB$L_{Aeq,6hr}$* *	>72dB$L_{Aeq,16hr}$*
		Night	<45dB$L_{Aeq,8hr3}$ <40dB$L_{Aeq,3hr}$**	45dB to 62dB$L_{Aeq,8hr}$* >40dBL_{night}**	>62dB$L_{Aeq,8hrs}$*
	Inside a bedroom	Day	<35dB$L_{Aeq,16hr}$	35dB to 45dB$L_{Aeq,16hr}$	>45dB$L_{Aeq,16hr}$
		Night	<30dB$L_{Aeq,8hr}$ 42dB$L_{Amax,fast}$	30dB to 40dB$L_{Aeq,16hr}$ 40dB to 73dB$L_{Amax,fast}$	>40dB$L_{Aeq,\ 8hr}$ >73dB$L_{Amax,fast}$

*$L_{Aeq,T}$ values specified for outside a bedroom window are façade levels

**L_{night} values specified outside a bedroom window are free field levels.

Industrial and Commercial Noise Sources

When considering industrial and commercial noise sources British Stand 4142:2014, 'Method for rating and assessing industrial commercial sound' (BS 4142) will be used. Table 2 provides noise levels limits applicable to proposed industrial and commercial developments (including plant and machinery)

Table 2 : Noise levels applicable to proposed industrial and commercial developments (including plant and machinery) as per Camden's Local Plan

Existing Noise sensitive receptor	Assessment Location	Design Period	LOAEL (Green)	LOAEL to SOAEL (Amber)	SOAEL (Red)
Dwellings**	Garden used for main amenity (free field) and Outside living or dining or bedroom window (façade)	Day (07:00-23:00)	'Rating level' 10dB* below background	'Rating level' between 9dB below and 5dB above background	'Rating level' greater than 5dB above background
Dwellings**	Outside bedroom window(façade)	Night (23:00-07:00)	Rating level' 10dB* below background	'Rating level' between 9dB below and 5dB above background or	'Rating level' greater than 5dB above

Existing Noise sensitive receptor	Assessment Location	Design Period	LOAEL (Green)	LOAEL to SOAEL (Amber)	SOAEL (Red)
			and no events exceeding 57dBL_{Amax}	noise events between 57dB and 88dB L_{Amax}	background and/or events exceeding 88dBL_{Amax}

*10dB should be increased to 15dB if the noise contains audible tonal elements. (day and night). However, if it can be demonstrated that there is no significant difference in the character of the residual background noise and the specific noise from the proposed development then this reduction may not be required. In addition, a frequency analysis (to include, the use of Noise Rating (NR) curves or other criteria curves) for the assessment of tonal or low frequency noise may be required.

**levels given are for dwellings; however, levels are use specific and different levels will apply dependent on the use of the premises.

3.4 British Standard 4142: 'Methods for rating and assessing industrial and commercial sound', 2014

Camden's Local Plan refers to BS 4142 as being the appropriate guidance for assessing commercial operations and fixed building services plant noise. This British Standard provides an objective method for rating the likelihood of complaint from industrial and commercial operations. It also describes means of determining noise levels from fixed plant installations and determining the background noise levels that prevail on a site.

The assessment of impacts is based on the subtraction of the measured background noise level from the rating level determined. The rating level is the source noise level (either measured or predicted) corrected for tone or character (if necessary). The difference is compared to the following criteria to evaluate the impact.

- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact.
- A difference of around +5 dB indicates is likely to be an indication of an adverse impact.
- Where the rating level does not exceed the background noise level, this is an indication of the specific sound source having a low impact.

4. Baseline noise survey

An environmental acoustic survey was undertaken between the 17th of January and the 26th of January 2018. The survey comprised a long term unattended survey and some additional short-term measurements of the existing installation.

Measurement locations for the survey are shown in Figure 2.

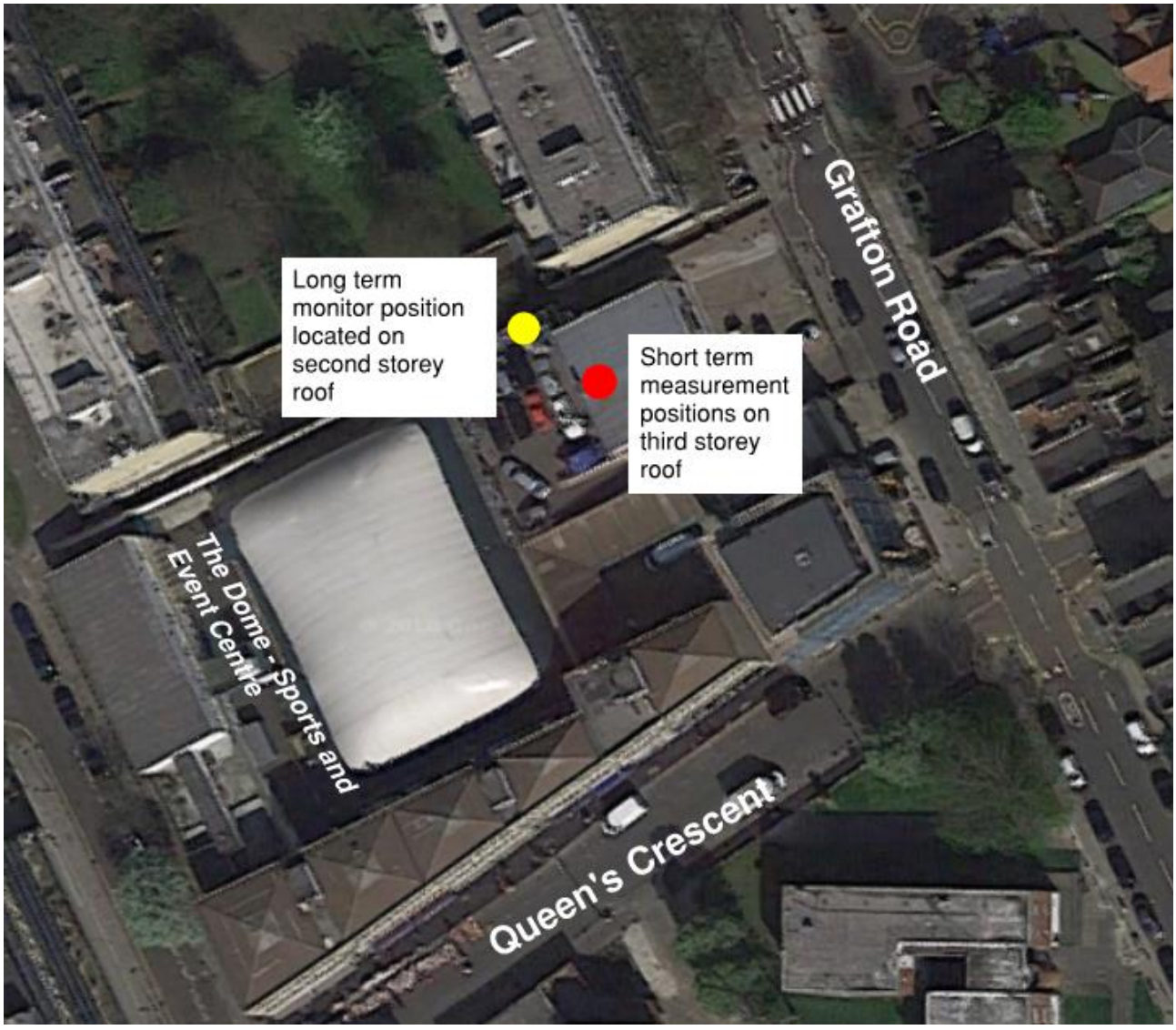

Figure 2: Measurement locations for noise survey, Image source: Google Maps

4.1 Short term measurements

The existing chimney flue installation is located on the second floor roof of the building and operational for a few hours a day, over weekday periods. The plant operates in two different modes – Spray mode and bake mode. The levels from the spray mode were observed to be moderately high but the noise during spray mode was only just noticeable when standing adjacent to the flue system.

A series of short-term measurements were taken of the existing installation to quantify its noise emission levels. The measurements were undertaken at two separate visits on the 17th of January and the 26th of January 2018 and are summarised in Table 3. Due to the height of the existing flue, suitable on axis measurements were not possible.

Table 3: Summary of short-term measurements

Installation mode	Measurement description	Measurement date	Measurement period,T	Measured level, $L_{Aeq,T}$ dB
In spray mode	1 m from the kit at 90 degree angle from exhaust	17/01/2018	00:00:33	68
	1 m from the kit at 90 degree angle from exhaust	26/01/2018	00:00:30	69
In bake mode	1 m from the kit at 90 degree angle from exhaust	17/01/2018	00:00:31	48
	1 m from the kit at 90 degree angle from exhaust	26/01/2018	00:00:20	51
Turned off	1 m from the kit	17/01/2018	00:00:31	46
	1 m from the kit	26/01/2018	00:00:25	49

Full details of the survey work, including weather conditions and instrument information is provided in Appendix B. Further details of the short-term measurements, including spectral data, has been included in Table B1 in Appendix B.

4.2 Long term noise monitoring

The long-term monitoring was undertaken at one location, on the first floor roof of the property, overlooking the nearby residential property. This location is considered representative of free field noise levels incident at the façade of the nearby noise sensitive receptor. As the chimney flue was operational during the noise survey; the meter was located at a suitable location away from the kit and screened from its line of sight

The results of the noise survey are summarised and presented in Table 4 and Table 5. Table 4 summarises the measurements from the entire survey period and Table 5 summarises the data for weekday periods only.

Table 4: Summary of noise levels measured by a noise monitor at roof level

Day and Date	Period	Average ambient noise levels, L_{Aeq} dB	Typical lowest background noise levels, L_{A90} dB
17/01/2018 Wednesday	Day (16:00-23:00)	52	46
	Night (23:00-07:00)	57	46
18/01/2018 Thursday	Day (07:00-23:00)	54	45
	Night (23:00-07:00)	47	43
19/01/2018 Friday	Day (07:00-23:00)	54	46
	Night (23:00-07:00)	46	43
20/01/2018 Saturday	Day (07:00-23:00)	52	45
	Night (23:00-07:00)	46	42
21/01/2018 Sunday	Day (07:00-23:00)	53	43
	Night (23:00-07:00)	46	43
22/01/2018 Monday	Day (07:00-23:00)	54	45
	Night (23:00-07:00)	46	43
23/01/2018 Tuesday	Day (07:00-23:00)	56	46
	Night (23:00-07:00)	50	45
24/01/2018 Wednesday	Day (07:00-23:00)	58	46
	Night (23:00-07:00)	47	43
25/01/2018 Thursday	Day (07:00-23:00)	54	46
	Night (23:00-07:00)	48	43

Table 5: Summary of noise levels occurring over weekday periods

Period,T	Average ambient noise levels, $L_{Aeq,T}$ dB	Typical lowest background noise levels, L_{A90} dB
Day (07:00-23:00)	55	45
Night (23:00-07:00)	51	43

A discussion on the survey results as well as a graphical representation of all the measured data is presented in Appendix B.

5. Plant emission limits

The levels indicate that the noise sensitive receptors in the area are exposed to levels > 50 dB $L_{Aeq,16hr}$ and would therefore fall under the LOAEL to SOAEL category under NPPF or the Amber noise category under Camden's local plan.

Recommended noise emission limits are provided in Table 6. These have been derived based on the guidance provided by Camden's Local Plan as well as British Standard 4142:2014, referenced in sections 3.3.1 and 3.4 respectively. The limit has been derived with the intention of ensuring the noise source does not exceed the background level thereby having a low impact on the area.

It is understood that the plant is to be operational occasionally between the hours of 09:00-18:00 over weekday periods. Hence, only day time limits have been presented. The limits have been derived relative to the background noise levels measured on weekdays during the survey.

Table 6: Plant emission limits

Period	Measured background levels, L_{A90} dB	Plant noise rating level, $L_{Ar,Tr}$
Day (07:00 – 23:00)	45	40

The limits are applicable 1 m from the nearest noise sensitive building. As per Camden's requirement, if the plant noise is expected to create a distinguishable hum or create a perceptible hum hiss or tone, the above noise limits will be reduced to include tonal penalty.

6. Noise assessment

6.1 Overview of proposals

The proposals are to move the existing chimney flue to the rear of the building, overlooking the second floor roof. The location of the equipment can be understood through Figure 3 and Figure 4 that show the proposals in plan and in section, respectively.

It is understood as part of the commercial property, the equipment will only be operational during the daytime, between 09:00-18:00.

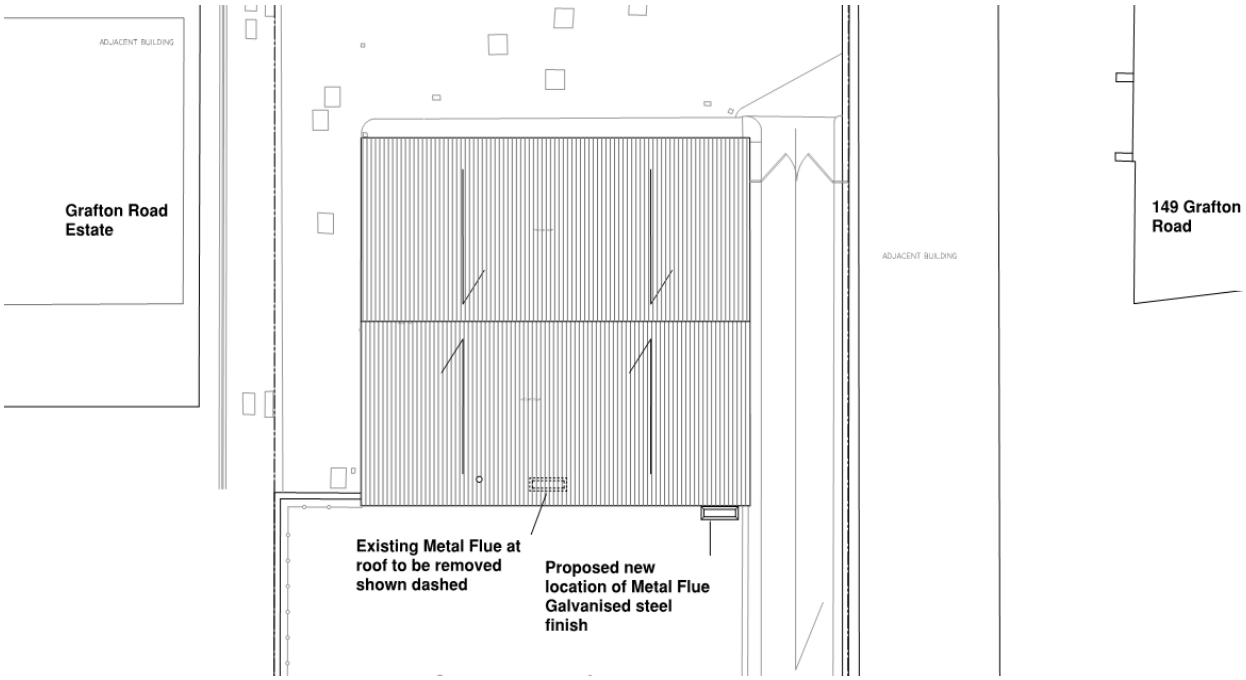

Figure 3: Plan view of proposals

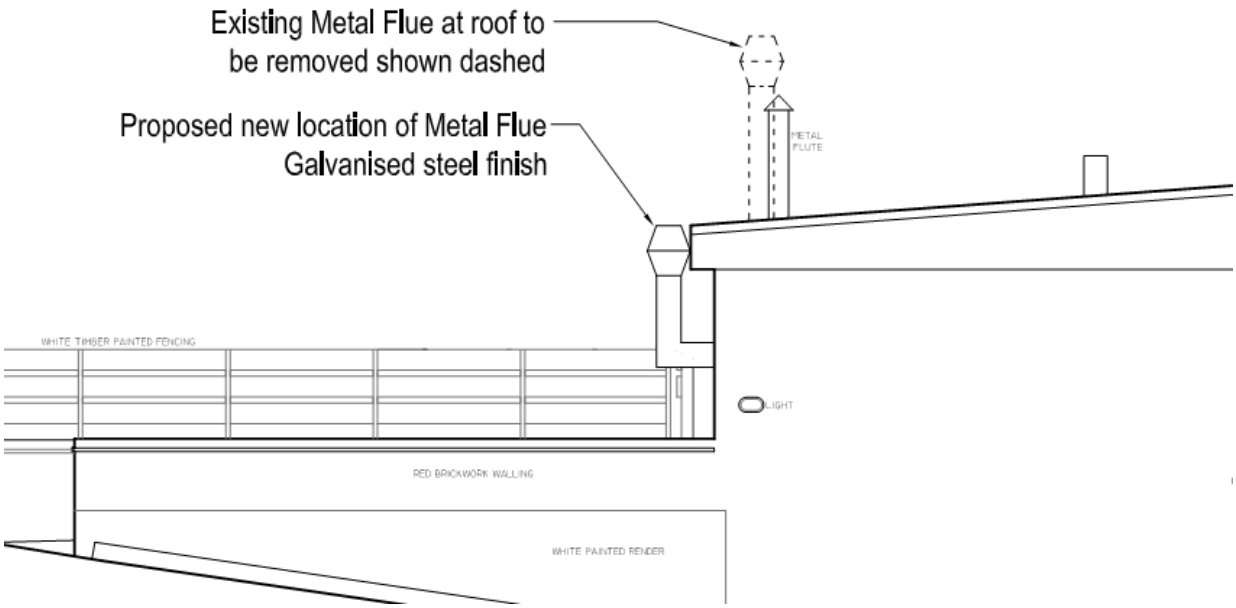

Figure 4: Section view of proposals

6.2 Assessment

Calculations been undertaken to determine the resulting noise levels at the nearby residential buildings 149 Grafton Street and Grafton Road Estate. The assessment has been undertaken with the aim of identifying mitigation measures, if any, required to ensure compliance with the Local Authority's criteria.

The calculations take into account distance attenuation, source reflections and screening effects provided by the building. The source levels used in the calculations are from the worst-case levels measured during the survey.

Table 7 summarises the noise assessment to 149 Grafton Road

Table 7: Summary of noise assessment to 149 Grafton Road

	A-weighted sound pressure level, dB(A) per frequency octave band (Hz)								Average sound pressure level, dB(A)
	63	125	250	500	1000	2000	4000	8000	
Source sound pressure level, dB(A)	39	55	60	62	66	63	55	43	69
Uncertainty	3	3	3	3	3	3	3	3	
Number of units	1	1	1	1	1	1	1	1	
Contribution from multiple units, if any	0	0	0	0	0	0	0	0	
Directivity correction from 90-degree to 60 degree at receiver	0.5	0.5	1	1.5	3.5	15	15	15	
Distance attenuation	-25	-25	-25	-25	-25	-25	-25	-25	
Source reflections	3	3	3	3	3	3	3	3	
Effect of screening	-5.3	-5.7	-6.5	-7.7	-9.5	-11.7	-14.2	-17.0	
Total noise level at receiver	16	31	36	37	41	48	37	22	50
Tonal penalty*	4	4	4	4	4	4	4	4	
Noise level at receiver with penalty	20	35	40	41	45	52	41	26	54
Plant noise rating to be met 1 m from the receiver, dB(A)	40								
Attenuation required	-14								

*A tonality correct has been included as the noise source is not continuous and will run occasionally over weekday periods.

Table 8 summarises the noise assessment to Grafton Estate

Table 8: Summary of noise assessment to Grafton Estate

	A-weighted sound pressure level, dB(A) per frequency octave band (Hz)								Average sound pressure level, dB(A)
	63	125	250	500	1000	2000	4000	8000	
Source sound pressure level, dB(A)	39	55	60	62	66	63	55	43	69
Uncertainty	3	3	3	3	3	3	3	3	
Number of units	1	1	1	1	1	1	1	1	
Contribution from multiple units, if any	0	0	0	0	0	0	0	0	
Directivity correction from 90 degree to 60 degree at receiver	0.5	0.5	1	1.5	3.5	15	15	15	
Distance attenuation	-27	-27	-27	-27	-27	-27	-27	-27	
Source reflections	3	3	3	3	3	3	3	3	
Effect of screening	-11.7	-14.2	-17.0	-19.8	-22.8	-25.8	-28.7	-31.7	
Noise level at receiver	10	24	28	27	31	36	25	10	38
Tonal penalty*	4	4	4	4	4	4	4	4	
Noise level at receiver with penalty	14	28	32	31	35	40	29	14	42
Plant noise rating to be met 1 m from the receiver, dB(A)	40								
Attenuation required	-2								

*A tonality correct has been included as the noise source is not continuous and will run occasionally over weekday periods.

6.3 Mitigation

The assessment indicates that without noise mitigation measures, noise from the plant will be in excess of the plant emissions limit.

The higher noise levels from the flue system can be mitigated via the use of a sound attenuator within the ductwork system. The attenuator would need to provide a minimum Insertion Loss of 14 dB. Guideline insertion losses have been presented in Table 9. Typically, this would be a cylindrical pod attenuator of 900 mm (2D) in length. Selections of attenuators will be made post planning with product specific information from suppliers.

Table 9: Guideline insertion losses for attenuator to meet plant emission limits

	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
Guideline insertion loss performances, dB	-5	-7	-9	-11	-14	-19	-20	-25

7. Summary

There are proposals to move the existing chimney flue, associated with West Hampstead Motors, to the rear of the property. The business is located at 155-161 Grafton Road within the London Borough of Camden. This report has been prepared to support the planning application for the building services equipment.

An environmental noise survey has been undertaken as part of the project to establish baseline noise levels, The results of the survey have been used to derive plant emission limits in line with Camden's local policy.

An acoustic assessment has been undertaken based on the new proposals to understand the noise levels at the nearby residences. The assessment identifies the need for sound attenuators to mitigate noise levels from the flue. The attenuator would need to provide a minimum Insertion Loss of 14 dB. Guideline insertion loss requirements have been provided.

On the basis of the assessment and discussions, noise emission from the proposals can be suitably controlled and therefore should not pose an obstacle in the granting of planning permission.

Appendix A: Glossary

Decibel (dB)

The decibel is the unit used to quantify sound pressure levels. The human ear has an approximately logarithmic response to acoustic pressure over a very large dynamic range (typically 20 micro-Pascals to 100 Pascals). Therefore, a logarithmic scale is used to describe sound pressure levels, also sound intensity, and power levels. The logarithms are taken to base 10. Hence an increase of 10 dB in sound pressure level is equivalent to an increase by a factor of 10 in the sound pressure level (measured in Pascals). Subjectively, this increase would correspond to a doubling of the perceived loudness of sound.

Octave and Third Octave Bands

The human ear is sensitive to sound over a range of frequencies between approximately 20 Hz to 20 kHz and is generally more sensitive to medium and high frequencies than to low frequencies within the range. There are many methods of describing the frequency content of a noise. The most common methods split the frequency range into defined bands, in which the mid-frequency is used as the band descriptor and in the case of octave bands is double that of the band lower. For example, two adjacent octave bands are 250 Hz and 500 Hz. Third octave bands provide a fine resolution by dividing each octave band into three bands. For example, third octave bands would be 160 Hz, 250 Hz, 315 Hz for the same 250 Hz octave band.

A-Weighting

The 'A' weighting is a correction term applied to the frequency range in order to mimic the sensitivity of the human ear to noise. It is generally used to obtain an overall noise level from octave or third octave band frequencies. An 'A' weighted value would be written as dB (A).

Equivalent Continuous Sound Level $L_{eq,}$

The L_{eq}, is a parameter defined as the equivalent continuous sound pressure level. Over a defined time period 'T', it is the sound pressure level equivalent to the acoustic energy of the fluctuating sound signal. The $L_{eq,T}$ can be seen to be an "average" sound pressure level over a given time period (although it is not an arithmetic average). Typically the $L_{eq,T}$ will be an 'A' weighted noise level in dB(A). It is commonly used to describe all types of environmental noise sources.

Background Noise Level L_{90}

The $L_{90,T}$ is a parameter defined as the sound pressure level exceeded for 90% of the measurement period 'T'. It is a statistical parameter and cannot be directly combined to other acoustic parameters. It is generally used to describe the prevailing background noise level or underlying noise level.

$L_{max,T}$

The Lmax,T is a parameter defined as the maximum sound pressure level that occurred during the time period 'T'. It is commonly used to describe the highest noise level that occurred during an event such as a vehicle pass-by.

Rating level, $L_{Ar,Tr}$

Specific sound level plus any adjustment for the characteristic features of the sound.

Appendix B: Environmental noise survey

An environmental noise survey was undertaken on behalf of West Hampstead Motors between 17th of January 2018 and 26th of January 2018. The survey comprised long term monitoring on site, with some additional short-term attended measurements.

For the long term monitoring - a Rion NL-52 sound monitor was located at the first floor roof of the property overlooking the nearby residential buildings to establish baseline noise levels in the area. The measurement results were logged as contiguous 15-minute samples.

The chimney flue associated with the property was occasionally operational during the survey. However, the meter itself was placed away from the existing plant equipment and screened by the line of sight and hence there should be minimal influence by the equipment on existing background levels.

The measurement results are graphically presented in Figure B1 and Figure B2. The measurement results indicate that the noise levels on site are moderate, with frequent higher noise activity levels measured. The higher noise activities are expected to be from road traffic noise or other commercial activities in the area. The average ambient noise levels and background levels during the daytime appear to vary frequently; the levels appear to be influenced by the higher noise levels in the area.

A noticeable change in average noise levels is observed from day to night periods. The levels from evening to night periods undergo a gradual decrease.

An anomalous increase in noise levels is observed on 18/01/2018 on from 02:45 – 06:30. The cause of the increase is not known.

Additional short-term measurements were undertaken to understand the noise levels emitted from the existing flue. The levels were measured at different at 1 m from the flue extract grille at a 90-degree angle. Due to the height of the existing flue, suitable on axis measurements were not possible. The measurements were undertaken for both the operational modes – spray mode and bake mode.

The short-term measurements are presented with their octave band data in Table B1.

The weather conditions during the survey were dry with cloud cover. The equipment used was calibrated before and after the survey, with no observable drift. The equipment details have been summarised in Table B2.

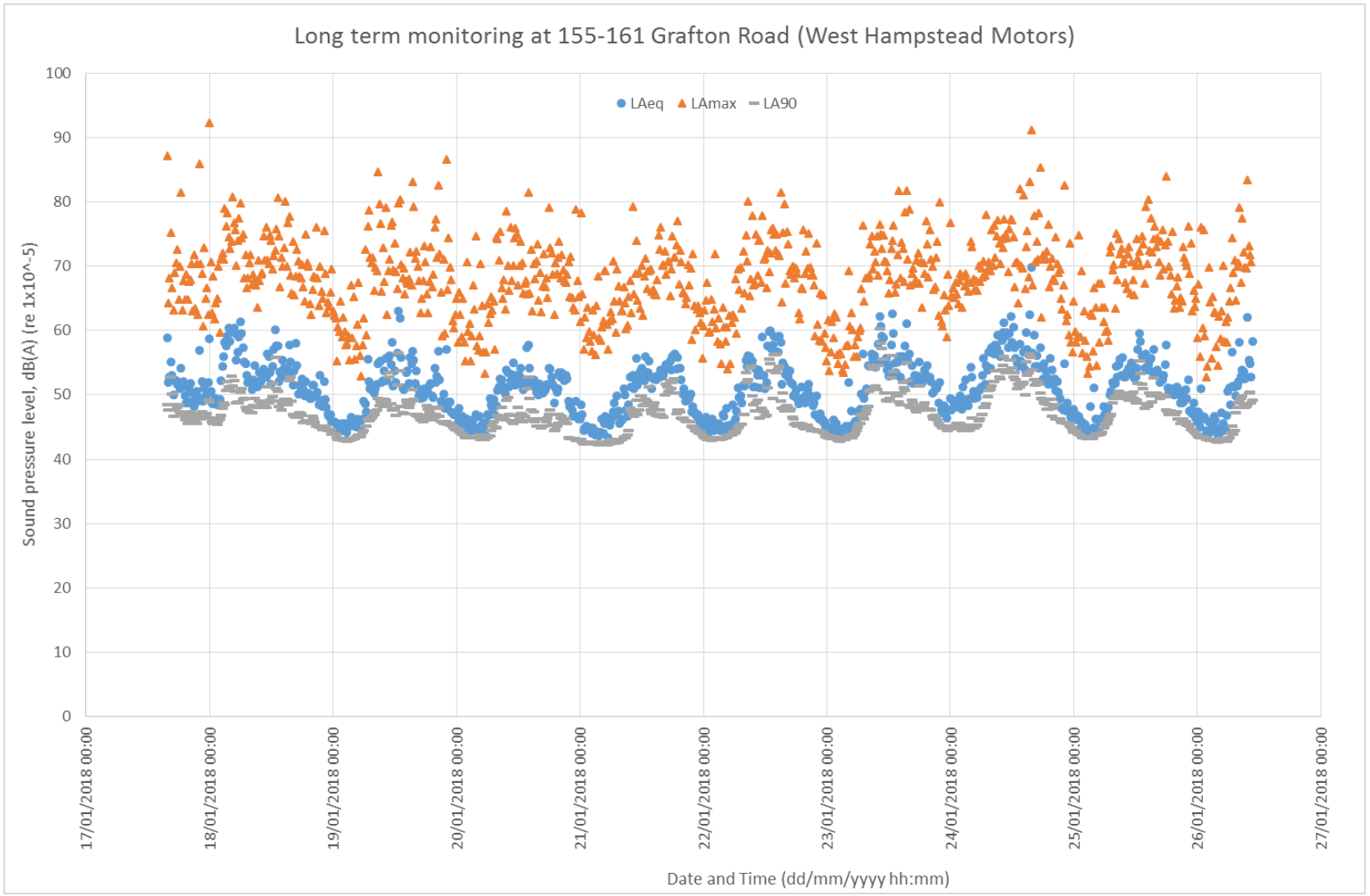

Figure B1: Graphical representation of all measurement results

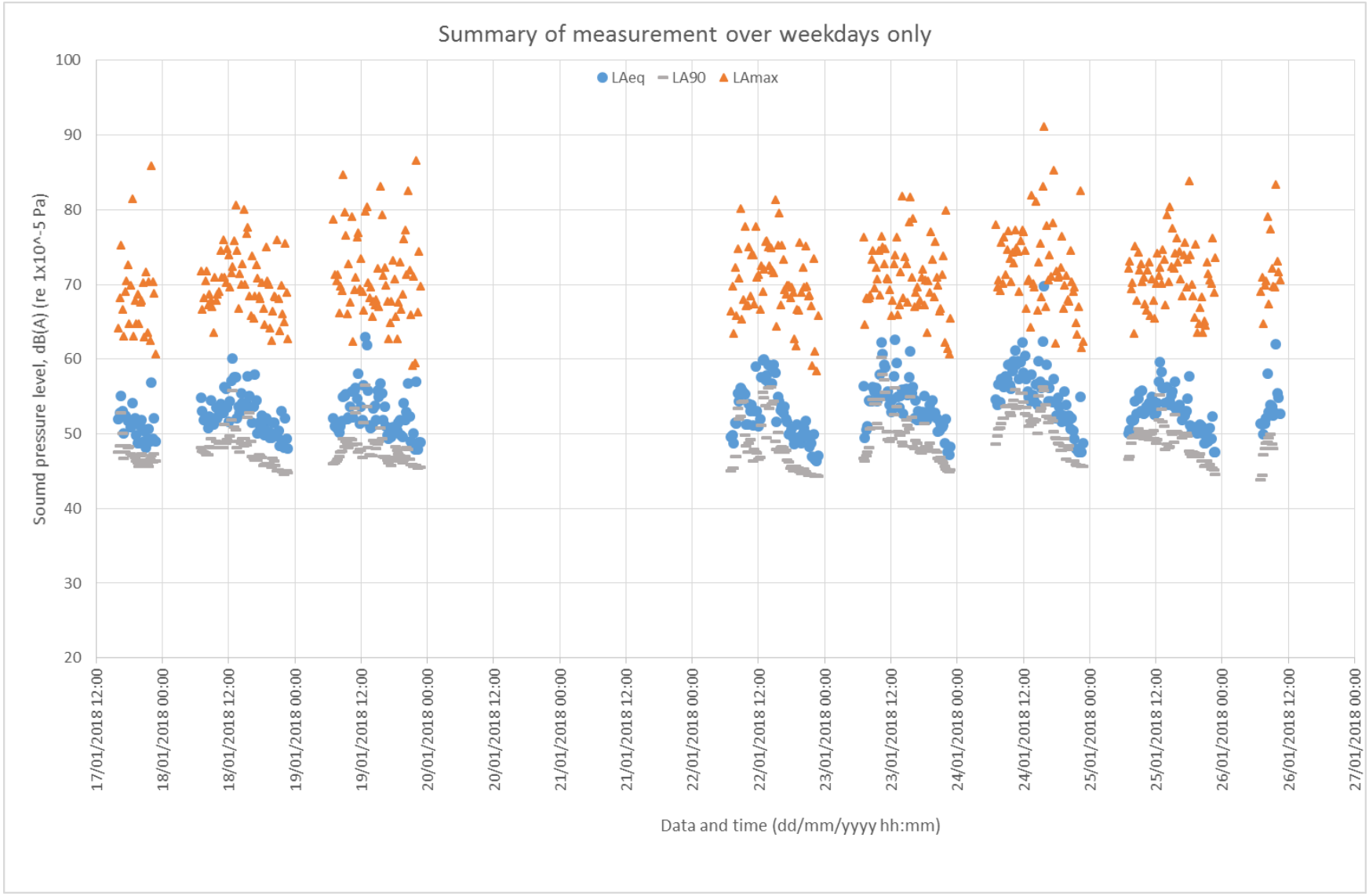

Figure B2: Graphical representation of weekday data only

Table B1: Short-term measurements

Serial No	Installation Mode	Measurement description	Measurement date and time	Measurement period,T	A-weighted spectral noise levels, dB(A) per octave band, Hz								Measured level, $L_{Aeq,T}$
					63	125	250	500	1000	2000	4000	8000	
1	Spray mode	1 m from the kit at 90 degree angle from exhaust	17/01/2018 15:02	00:00:33	37	54	58	60	64	62	55	46	68
2	Bake mode	1 m from the kit at 90 degree angle from exhaust	17/01/2018 15:14	00:00:31	33	35	41	42	43	40	37	22	48
3	Turned off	1 m from the kit at 90 degree angle from exhaust	17/01/2018 15:17	00:00:31	29	33	39	40	40	36	28	18	45
4	Spray mode	1 m from the kit at 90 degree angle from exhaust	26/01/2018 11:21	00:00:30	39	55	60	62	66	63	55	43	70
5	Bake mode	1 m from the kit at 90 degree angle from exhaust	26/01/2018 11:27	00:00:20	32	37	42	44	47	44	36	25	51
6	Turned off	1 m from the kit at 90 degree angle from exhaust	26/01/2018 11:34	00:00:25	32	35	41	42	44	41	34	21	49

Table B2: Instrument details for the survey

Survey details	Instrumentation description	Manufacturer	Model	Serial Number	Date of Calibration Certificate
Long term measurements	Sound Level Meter	Rion	NL-52	00832187	10/11/2017
	Microphone	Rion	UC-59	10815	10/11/2017
	Pre-amp	Rion	NH-25	32215	10/11/2017
	Acoustic Calibrator	Rion	NC - 74	34557134	12/10/2017
Short term measurements	Sound Level Meter	Brüel & Kjær	2250	3004050	28/09/2017
	Microphone	Brüel & Kjær	4189	3099822	28/09/2017
	Pre-amp	Brüel & Kjær	ZC0032	19776	28/09/2017
	Acoustic Calibrator	Brüel & Kjær	4231	2445715	28/09/2017

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