Roosters Piri Piri

61 Camden High Street
Camden
London
NW1 7JL

Plant Noise
Impact Assessment

On behalf of

Roosters Piri Piri

Project Reference: 89549 | Revision: - | Date: 2nd November 2020

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Document Information

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	Name	Qualifications	Initials	Date
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For and on behalf of Noise Solutions Ltd				

Revision	Date	Description	Prepared	Reviewed/ Approved

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Appendices

Executive Summary

Noise Solutions Limited has undertaken a noise impact assessment of plant to be installed at a new Roosters Piri Piri restaurant located on Camden High Street.

It is understood that kitchen ventilation and air conditioning (AC) plant will be installed to the rear of the property.

The assessment shows that noise from the proposed plant will comply with the local authority's requirements and should therefore be acceptable to them.

1.0 Introduction

1.1. Noise Solutions Ltd (NSL) has been commissioned by Roosters Piri Piri to provide a noise impact assessment for plant serving a proposed restaurant located on Camden High Street.

1.2. An environmental sound survey has been undertaken to establish the prevailing background sound pressure levels at a location representative of the sound levels outside the nearest noise sensitive receptors to the site.

1.3. The cumulative plant noise levels have been predicted at the nearest noise-sensitive windows and assessed against recognised Standards and guidance.

1.4. To assist with the understanding of this report a glossary of acoustic terms can be found in **Appendix A**. An in-depth glossary of acoustic terms can be viewed online at www.acoustic-glossary.co.uk.

2.0 Details of development proposals

2.1. It is proposed to install kitchen ventilation (supply and extract) and an air conditioning (AC) unit at 61 Camden High Street to the rear of the property to the west.

2.2. Plant is to comprise ventilation plant and an air conditioning unit. All plant will only operate during the opening hours of the restaurant.

2.3. A site plan showing the site and surrounding area, the nearest noise sensitive properties and noise monitoring location used in this assessment is presented in **Appendix B**.

3.0 Nearest noise sensitive receptors

3.1. The area surrounding the site is a mixture of commercial and residential in nature. The nearest noise sensitive properties are the flat above the restaurant (Receptor R1) with a west-facing window and flats to the west (Receptor R2) on Mary Terrace at approximate distances of 8 and 24 m respectively.

4.0 Existing noise climate

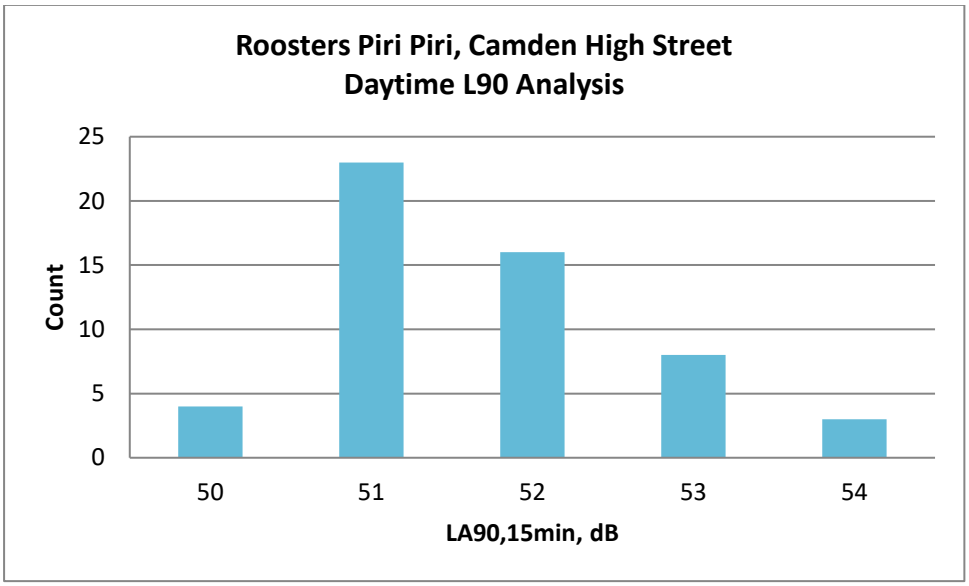
4.1. An environmental noise survey has been undertaken to establish the typical background sound levels at a location representative of the noise climate outside the façades of the nearest noise sensitive receptors to the proposed plant area during the quietest times at which the plant will operate.

4.2. The results of the environmental sound survey are summarised in Table 1 below. The full set of measurement results and details of the survey methodology are presented in **Appendix C**.

Table 1 Summary of survey results

Measurement period	Range of recorded sound pressure levels (dB)			
	$L_{Aeq(15mins)}$	$L_{AFmax(15mins)}$	$L_{A10(15mins)}$	$L_{A90(15mins)}$
Daytime (07.00 – 23.00 hours)	54-60	66-85	56-62	50-54
Night-time (23.00 – 07.00 hours)	51-59	63-87	54-59	48-51

Figure 1 Histogram of daytime LA90 background sound pressure levels



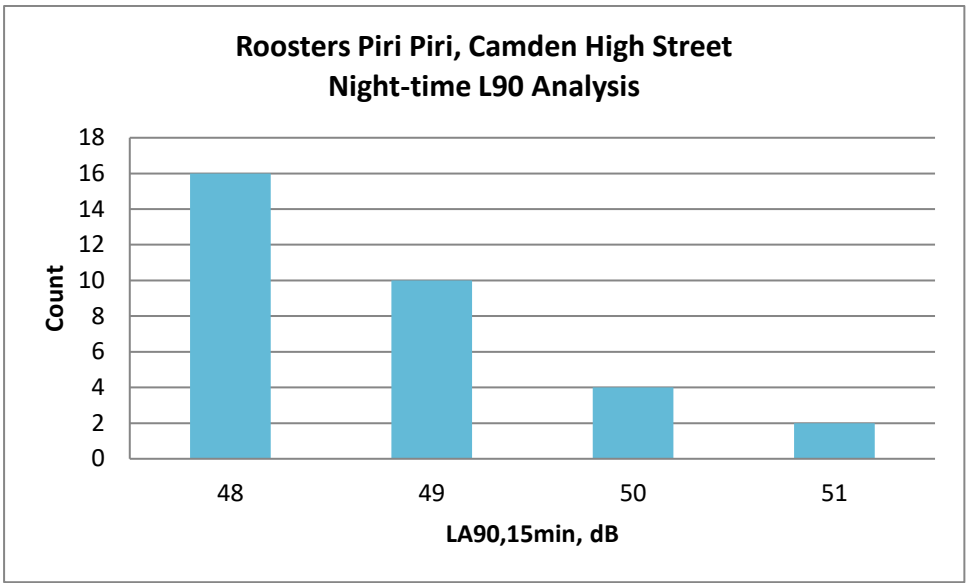
4.3. Further statistical analysis has been carried out on the data, and the mean and median values are shown in Table 2 below.

Table 2 Statistical analysis of $L_{A90,15min}$ levels during the daytime period

dB, L_{A90} daytime period	
Mean	52
Modal	51
Median	51

4.4. From the histogram analysis, 50 dB(A) has been selected to be a robust representation of the background noise level during the daytime period.

Figure 2 Histogram of night-time L_{A90} background sound pressure levels



4.5. Further statistical analysis has been carried out on the data and the mean and median values are shown in Table 3 below.

Table 3 Statistical analysis of $L_{A90,15min}$ levels during the night-time period

dB, L_{A90} night-time period	
Mean	49
Modal	48
Median	48

4.6. From the histogram analysis, 48 dB(A) has been chosen to be representative of the background sound level during the night-time period.

4.7. Therefore, the following values are considered representative of the existing background sound pressure levels at nearby noise sensitive premises:

- 50 dB L_{A90} during the daytime period; and
- 48 dB L_{A90} during the night-time period.

5.0 Plant noise design criteria

National Planning Policy Framework

5.1. A new edition of NPPF was published in February 2019 and came into effect immediately. The original National Planning Policy Framework (NPPF[1]) was published in March 2012, with a revision in July 2018 - this document replaced the existing Planning Policy Guidance Note 24 (PPG 24) "Planning and Noise." The 2019 revised edition contains no new directions or guidance with respect to noise, and hence, all previous references remain extant. The paragraph references quoted below relate to the February 2019 edition.

5.2. Paragraph 170 of the NPPF states that the planning system should contribute to and enhance the natural and local environment by, (amongst others) *"preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, water or noise pollution or land stability."*

5.3. The NPPF goes on to state in Paragraph 180:

"planning policies and decisions should ...

a) Mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development, - and avoid noise giving rise to significant adverse impacts on health and quality of life;
b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason ..."

5.4. The NPPF document does not refer to any other documents or British Standards regarding noise other than the Noise Policy Statement for England (NPSE[2]).

5.5. Paragraph 2 of the NPPF states that "planning law requires that applications for planning permission must be determined in accordance with the development plan unless material considerations indicate otherwise."

5.6. Paragraph 12 of the NPPF states that "The presumption in favour of sustainable development does not change the statutory status of the development plan as the starting point for decision making. Where a planning application conflicts with an up-to-date development plan (including any neighbourhood plans that form part of the development plan), permission should not usually be granted. Local planning authorities may take decisions that depart from an up-to-date

[1] National Planning Policy Framework, DCLG, March 2012
[2] Noise Policy Statement for England, DEFRA, March 2010

development plan, but only if material considerations in a particular case indicate that the plan should not be followed".

5.7. Paragraph 117 states that "Planning policies and decisions should promote an effective use of land in meeting the need for homes and other uses, while safeguarding and improving the environment and ensuring safe and healthy living conditions. Strategic policies should set out a clear strategy for accommodating objectively assessed needs, in a way that makes as much use as possible of previously-developed or 'brownfield' land".

London Borough of Camden

5.8. Section 6 of the Camden Planning Guidance Amenity, published March 2018, gives guidance on noise and vibration.

5.9. Clause 6.8 refers noise thresholds within Appendix 3 of the Local Plan and to refers to the principles of No observed effect level (NOEL), Lowest observable adverse effect level (LOAEL) and Significant observed adverse effect level (SOAEL) and defines their meanings. Specifically, in the context of this report, LOAEL is defined as:

> *The level above which changes in behaviour (e.g. closing windows for periods of the day) and adverse effects on health (e.g. sleep disturbance) and quality of life can be detected.*

5.10. SOEAL is defined as:

> *The level above which adverse effects on health and quality of life occur. This could include psychological stress, regular sleep deprivation and loss of appetite.*

5.11. Clause 6.27 states that:

> *Developments proposing plant, ventilation, air extraction or conditioning equipment and flues will need to provide the system's technical specifications to the council accompanying any acoustic report. "BS4142 Method for rating Industrial and Commercial Sound' contains guidance and standards which should also be considered within the acoustic report.*

5.12. Appendix 3 within the Camden Local Plan published 2017 states:

> *"A relevant standard or guidance document should be referenced when determining values for LOAEL and SOAEL for non-anonymous noise. Where appropriate and within the scope of the document it is expected that British Standard 4142:2014 'Methods for rating and assessing industrial and commercial sound' (BS 4142) will be used. For such cases a 'Rating Level' of 10 dB below background (15dB if tonal components are present) should be considered as the design criterion)."*

5.13. Table C of the appendix states the criteria at which development related noise levels will be acceptable:

Table C: Noise levels applicable to proposed industrial and commercial development (including plant and machinery)

Existing Noise sensitive receptor	Assessment Location	Design Period	LOAEL (green)	LOAEL to SOAEL (Amber)	SOAL (Red)
Dwellings**	Garden used for main amenity (free field) and Outside living or dining or bedroom window (façade)	Day	'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	'Rating level' 10dB* below background and no events exceeding 57dBL_{Amax}	'Rating level' between 9dB below and 5dB above background or noise events between 57dB and 88dBL_{Amax}	'Rating level' greater than 5dB above 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.*

5.14. The plant noise data available indicates that the noise from the units is not tonal. It is therefore considered appropriate to exclude the 5 dB additional penalty described in the notes to Table C.

BS 4142:2014 Methods for rating and assessing industrial and commercial sound

5.15. BS 4142:2014 is intended to be used to assess the likely effects of sound on people residing in nearby dwellings. The scope of BS 4142:2014 includes *"sound from fixed plant installations which comprise mechanical and electrical plant and equipment"*.

5.16. The procedure contained in BS 4142:2014 is to quantify the *"specific sound level"*, which is the measured or predicted level of sound from the source in question over a one hour period for the daytime and a 15 minute period for the night-time. Daytime is defined in the standard as 07:00 to 23:00 hours, and night-time as 23:00 to 07:00 hours.

5.17. The specific sound level is converted to a rating level by adding penalties on a sliding scale to account for either potentially tonal or impulsive elements. The standard sets out objective methods for determining the presence of tones or impulsive elements but notes that it is acceptable to subjectively determine these effects.

5.18. The penalty for tonal elements is between 0 dB and 6 dB, and the standard notes: *"Subjectively, this can be converted to a penalty of 2 dB for a tone which is just perceptible at the noise receptor, 4 dB where it is clearly perceptible, and 6 dB where it is highly perceptible."*

5.19. The penalty for impulsive elements is between 0 dB and 9 dB, and the standard notes: *"Subjectively, this can be converted to a penalty of 3 dB for impulsivity which is just perceptible at the noise receptor, 6 dB where it is clearly perceptible, and 9 dB where it is highly perceptible."*

5.20. The assessment outcome results from a comparison of the rating level with the background sound level. The standard states:

- *Typically, the greater this difference, the greater the magnitude of the impact.*
- *A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context;*
- *A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context;*
- *The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.*

5.21. The standard does state that *"adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact."*

5.22. The standard goes on to note that: *"Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night."*

5.23. In addition to the margin by which the Rating Level of the specific sound source exceeds the Background Sound Level, the 2014 edition places emphasis upon an appreciation of the context, as follows:

> *"An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context."*

5.24. BS 4142:2014 requires uncertainties in the assessment to be considered, and where the uncertainty is likely to affect the outcome of the assessment, steps should be taken to reduce the uncertainty.

Proposed criteria

5.25. To comply with the London Borough of Camden's requirements, the rating noise level as per the methodology of BS4142:2014 of the new plant, at the nearest noise-sensitive receptor, must not exceed the limits in Table 4 below.

Table 4 Plant noise emissions limits at sensitive receptors

Period	Cumulative plant noise rating level, dB(A)
Daytime (07.00 – 23.00 hours)	40
Night-time (23.00 – 07.00 hours)	38

5.26. The above limits have not been approved by the local authority at this stage.

6.0 Plant noise impact assessment

6.1. The cumulative plant noise levels at the nearest noise sensitive receptors have been predicted. The predictions have been based on all plant operating at their full duty against both the day- and night-time criteria to ensure a robust assessment.

6.2. Noise levels at the nearest receptors have been predicted taking into account ductwork system losses, aperture size, directivity of sound propagation and distance and screening attenuation from the source to the receptors. Predictions are inclusive of the following atmospheric-side attenuation fitted to the kitchen ventilation:

Table 5 Proposed atmospheric-side attenuator selections

Attenuator	Insertion loss (dB) at Octave Band Centre Frequencies (Hz)							
	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
Intake	5	6	10	19	26	25	23	18
Extract	4	5	9	15	21	16	14	9

6.3. The proposed fans are high-quality systems which will run continuously. The fans will not emit any impulsive characteristics provided they are well maintained. Although the manufacturers do not provide 1/3 octave band frequency data to enable a full tonal analysis in accordance with the methodology detailed in BS 4142:2014, a review of the 1/1 octave band data in **Appendix D** does not suggest the presence of any tonal peaks. In order to be robust, however a +3 dB feature correction has been applied to the predicted noise levels when assessing the impact at the residential premises.

6.4. Table 5 below, summarises the results of the assessment at the identified receptors. All other nearby receptors benefit from increased distance/screening to the plant. The full set of calculations is given in **Appendix E**.

6.5. Cumulative noise levels from the proposed AC and refrigeration plant should not exceed the following limits in order to demonstrate compliance with the criteria detailed in Section 5.25:

Table 6 Assessment of predicted noise levels at the nearest noise sensitive receptors

Receptor	Period	Predicted rating noise level at receptor, L_{Aeq} (dB)	Design criterion (dB)	Difference (dB)
R1	Daytime (07.00 - 23.00 hours)	38	40	-2
	Night-time (23.00 – 07.00 hours)	38	38	0
R2	Daytime (07.00 - 23.00 hours)	38	40	-2
	Night-time (23.00 – 07.00 hours)	38	38	0

6.6. The assessment shows that, when attenuated, plant noise levels comply with the proposed design criteria and would therefore meet the London Borough of Camden's usual requirements.

Context and uncertainties

6.7. Where possible uncertainty in the above assessments has been minimised by taking the following steps:

- The meter and calibrator used have a traceable laboratory calibration and the meter was field calibrated before and after the measurements;
- Uncertainty in the calculated impacts has been reduced by the use of a well-established calculation method;
- Care was taken to ensure that the measurement positions were representative of the noise climate outside the nearby residential dwellings and not in positions where higher noise levels were present.

6.8. As BS4142: 2014 advises, the impact must be considered within the context of the site and the surrounding acoustic environment. The following must, therefore, also be taken into consideration when determining the potential impact that may be experienced:

- The assessment is undertaken at the nearest residential windows. The impact on all other nearby residential windows will be lower due to screening and distance attenuation.

Plant vibration

6.9. It is recommended that all plant, and connected ducts and pipes, is resiliently isolated to reduce the risk of vibration entering the building structure.

7.0 Summary

7.1. Noise Solutions Ltd has been commissioned by Roosters Piri Piri to provide a noise impact assessment for plant serving a proposed Roosters Piri Piri restaurant located on Camden High Street.

7.2. An environmental noise survey has been undertaken to establish the existing prevailing noise levels at locations representative of the noise climate outside the nearest noise sensitive receptors to the proposed plant area.

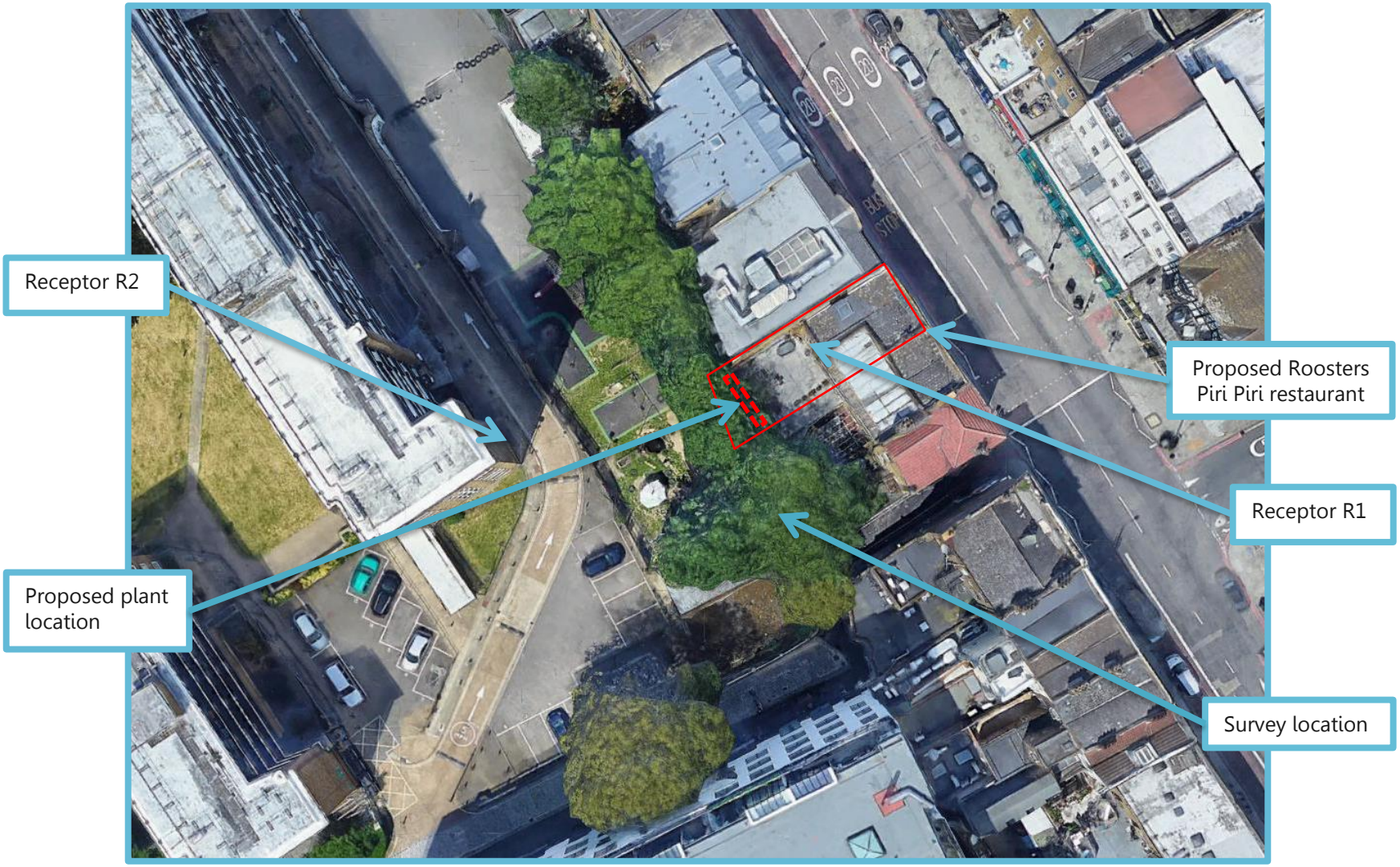
7.3. The assessment shows that the proposed plant will comply with the London Borough of Camden's usual requirements and should therefore be acceptable to them.

7.4. Additional recommendations have been made to control plant vibration to the residential properties within the building.

Appendix A Acoustic terminology

Parameter	Description
Ambient Noise Level	The totally encompassing sound in a given situation at a given time, usually composed of a sound from many sources both distant and near ($L_{Aeq,T}$).
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s1 and s2 is given by 20 $\log_{10}$ (s1/s2). The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is 20μPa. The threshold of normal hearing is in the region of 0 dB and 140 dB is the threshold of pain. A change of 1 dB is only perceptible under controlled conditions.
dB(A), L_{Ax}	Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB(A) broadly agree with people's assessment of loudness. A change of 3 dB(A) is the minimum perceptible under normal conditions, and a change of 10 dB(A) corresponds roughly to halving or doubling the loudness of a sound. The background noise in a living room may be about 30 dB(A); normal conversation about 60 dB(A) at 1 metre; heavy road traffic about 80 dB(A) at 10 metres; the level near a pneumatic drill about 100 dB(A).
Fast Time Weighting	Setting on sound level meter, denoted by a subscript F, that determines the speed at which the instrument responds to changes in the amplitude of any measured signal. The fast time weighting can lead to higher values than the slow time weighting when rapidly changing signals are measured. The average time constant for the fast response setting is 0.125 (1/8) seconds.
Free-field	Sound pressure level measured outside, far away from reflecting surfaces (except the ground), usually taken to mean at least 3.5 metres
Façade	Sound pressure level measured at a distance of 1 metre in front of a large sound reflecting object such as a building façade.
$L_{Aeq,T}$	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
$L_{max,T}$	A noise level index defined as the maximum noise level recorded during a noise event with a period T. L_{max} is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
$L_{10,T}$	A noise level index. The noise level exceeded for 10% of the time over the period T. L_{10} can be considered to be the "average maximum" noise level. Generally used to describe road traffic noise. $L_{A10,18h}$ is the A –weighted arithmetic average of the 18 hourly $L_{A10,1h}$ values from 06:00-24:00.
$L_{90,T}$	A noise level index. The noise level that is exceeded for 90% of the measurement time interval, T. It gives an indication of the lower levels of fluctuating noise. It is often used to describe the background noise level and can be considered to be the "average minimum" noise level and is a term used to describe the level to which non-specific noise falls during quiet spells, when there is lull in passing traffic for example

Appendix B Aerial photograph of site showing areas of interest



Appendix C Environmental sound survey

Details of sound survey

C.1 Measurements of the existing background sound levels were undertaken between 13:00 hours on Thursday 22nd and 10:30 hours on Friday 23rd October 2020.

C.2 The sound level meter was programmed to record the A-weighted L_{eq}, L_{90}, L_{10} and L_{max} noise indices for consecutive 15-minute sample periods for the duration of the noise survey.

Measurement position

C.3 The representative measurement position was located on the lamppost most representative of the background noise level at Receptor R1 (indicated on the site plan in **Appendix B**).

C.4 In accordance with BS 7445-2:1991 *'Description and measurement of environmental noise – Part 2: Guide to the acquisition of data pertinent to land use'*, the measurements were undertaken under free-field conditions.

Equipment

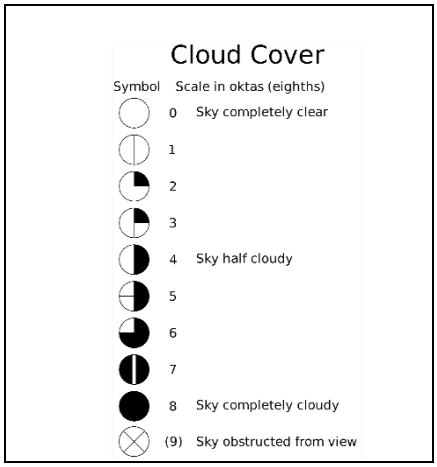
C.5 Details of the equipment used during the survey are provided in the table below. The sound level meter was calibrated before and after the survey; no significant change in the calibration level was noted.

Environmental noise survey

Description	Model / serial no.	Calibration date	Calibration certificate no.
Class 1 Sound level meter	Svantek 977/ 69747	20/08/2020	14015672
Condenser microphone	ACO Pacific 7052E / 70829		
Preamplifier	Svantek SV12L / 73687		
Calibrator	Svantek SV 40A / 10843	20/08/2020	14015672-3

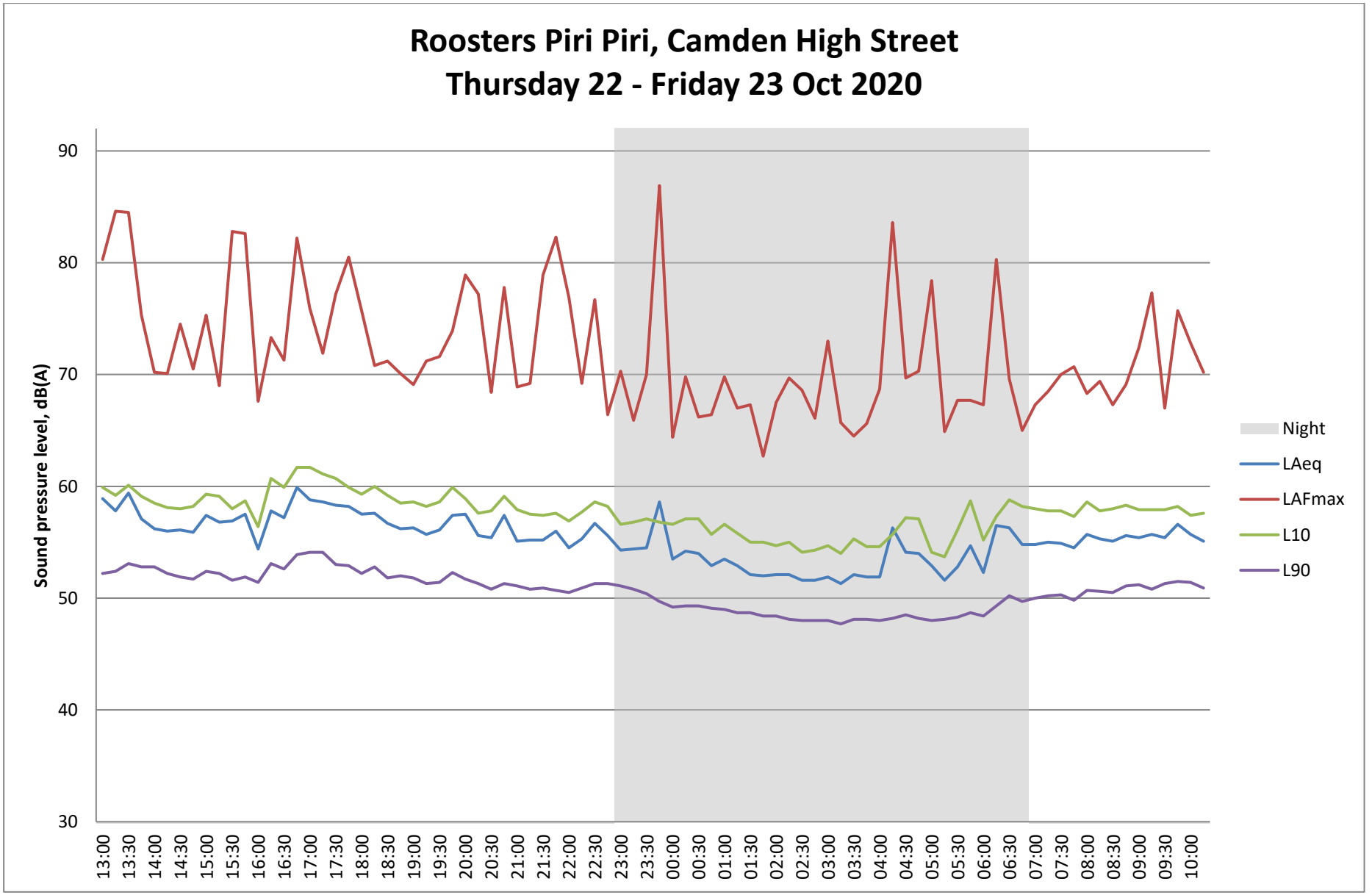
Weather conditions

C.6 Weather conditions were determined both at the start and on completion of the survey. It is considered that the meteorological conditions were appropriate for environmental noise measurements. The table below presents the weather conditions recorded on site at the beginning and end of the survey.

Weather Conditions				
Measurement Location	**Date/Time**	**Description**	**Beginning of Survey**	**End of Survey**
As indicated on Appendix B	13:00 22/09/2020-10:30 23/09/2020	Temperature (°C)	16.5	15
		Precipitation:	No	No
		Cloud cover (oktas - see guide)	3	7
		Presence of fog/snow/ice	No	No
		Presence of damp roads/wet ground	Damp	No
		Wind Speed (m/s)	2	1
		Wind Direction	NE	NE
		Conditions that may cause temperature inversion (i.e. calm nights with no cloud)	No	No

Results

C.7 The results of the environmental survey are considered to be representative of the background sound pressure levels at the façades of the nearest noise sensitive receptors during the quietest times at which the plant will operate. The results of the survey are presented in a time history graph overleaf.


Roosters Piri Piri, Camden High Street
Thursday 22 - Friday 23 Oct 2020
Sound pressure level, dB(A)
90
80
70
60
50
40
30
13:00
13:30
14:00
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15:00
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10:00
Night
LAeq
LAFmax
L10
L90

Appendix D Plant noise data and attenuator schedule

Plant Item	Manufacturer	Model	Sound Pressure Level	Measurement Distance
Restaurant AC	Mitsubishi	AZAS125MV1	57 dB(A)	1 m

Plant Item	Unit / Model	Notes	Sound power level (dB) at octave band centre frequencies (Hz)								$L_{w,A}$ (dB)
			63	125	250	500	1000	2000	4000	8000	
Kitchen supply	Helios GBD 500/4/4	Intake L_w	73	73	75	72	74	69	63	56	77
Kitchen extract	Helios GBD 560/4/4	Exhaust L_w	76	76	71	72	67	65	60	51	73

Proposed atmospheric-side attenuator selections

Fan Ref	Width (mm)	Height (mm)	Length (mm)	Air Vol (m^3/s)	Pressure Loss (Pa)	Insertion Loss (dB) at octave band centre frequency (Hz)							
						63	125	250	500	1k	2k	4k	8k
Kitchen supply	1200	600	600	2.56	34	5	6	10	19	26	25	23	18
Kitchen extract	1200	600	600	3.61	44	4	5	9	15	21	16	14	9

Appendix E Plant noise calculations

Summary

Plant	Resultant at Receptor, dB(A)	
	R1	R2
Kitchen supply	22	30
Kitchen extract	31	23
AC condenser	32	33
Cumulative	**35**	**35**
BS 4142 correction	3	3
Rating level	**38**	**38**

Kitchen supply

Description	Notes.	Sound level (dB) at octave band centre frequencies (Hz)								dB(A)
		63	125	250	500	1k	2k	4k	8k	
Source noise level (unattenuated)	In-duct L_w	73	73	75	72	74	69	63	56	**77**
System losses		-7	-2	0	0	0	0	0	0	
Atmospheric side attenuator	I.L.	-5	-6	-10	-19	-26	-25	-23	-18	
Sound power level leaving terminal		**61**	**65**	**65**	**53**	**48**	**44**	**40**	**38**	**58**

Receptor R1										
Directivity correction	800 x 800 (120,45)	-1	-1	-3	-5	-10	-10	-10	-10	
Distance correction	8 m	-26	-26	-26	-26	-26	-26	-26	-26	
Screening correction		-10	-10	-10	-10	-10	-10	-10	-10	
Surface corrections etc		3	3	3	3	3	3	3	3	
Resultant at Receptor R1	**L_p**	**27**	**31**	**29**	**15**	**5**	**1**	**-3**	**-5**	**22**

Receptor R2										
Directivity correction	800 x 800 (0,0)	1	2	3	4	5	6	6	6	
Distance correction	23.5 m	-35	-35	-35	-35	-35	-35	-35	-35	
Screening correction										
Surface corrections etc		3	3	3	3	3	3	3	3	
Resultant at Receptor R2	**L_p**	**30**	**35**	**36**	**25**	**21**	**18**	**14**	**12**	**30**

Kitchen extract

Description	Notes.	Sound level (dB) at octave band centre frequencies (Hz)								dB(A)
		63	125	250	500	1k	2k	4k	8k	
Source noise level (unattenuated)	In-duct L_w	76	76	71	72	67	65	60	51	**73**
System losses		-16	-11	-5	-2	-5	-8	-11	-11	
Atmospheric side attenuator	I.L.	-4	-5	-9	-15	-21	-16	-14	-9	
Sound power level leaving terminal		**56**	**60**	**57**	**55**	**41**	**41**	**35**	**31**	**54**

Receptor R1										
Directivity correction	550 x 550 (90,0)	0	0	0	0	-4	-7	-7	-7	
Distance correction	5.5 m	-23	-23	-23	-23	-23	-23	-23	-23	
Screening correction										
Surface corrections etc										
Resultant at Receptor R1	**L_p**	**33**	**37**	**34**	**32**	**14**	**11**	**5**	**1**	**31**

Receptor R2										
Directivity correction	550 x 550 (0,0)	1	2	3	4	5	6	6	6	
Distance correction	21.4 m	-35	-35	-35	-35	-35	-35	-35	-35	
Screening correction										
Surface corrections etc										
Resultant at Receptor R2	**L_p**	**22**	**27**	**25**	**24**	**11**	**12**	**6**	**2**	**23**

Restaurant AC plant

Receptor	Source Sound level (dBA)	Distance		Directivity Correction (dB)	Screening (dB)	Cumulative plant rating level at façade L_{Aeq} (dB)
		Distance to Receptor (m)	Correction (dB)			
Receptor R1	47 @ 1 m	8	-18	3	-10	32
Receptor R2	47 @ 1 m	23	-27	3	0	33