

All'Onda Restaurant

**Noise Impact
Assessment**

Issue 04

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1.0 EXECUTIVE SUMMARY

A restaurant is proposed at 67 Charlotte Street located on the site of a former restaurant whose external plant has already been removed. The new restaurant will have the same permitted opening hours, and fewer covers than the former Spanish tapas restaurant. This report assesses the impact of the proposed plant associated with the new restaurant which is to be located in the same location as the former plant.

An unattended noise survey was undertaken between 10:00 on Tuesday 26th July and 09:00 on Thursday 28th July 2022 to determine the background noise levels in the vicinity of four proposed heat pump/air conditioning units, and one proposed kitchen extract fan (using the existing duct), to be installed on the roof of 67 Charlotte Street. These units will be used by a restaurant on the ground floor of the building whose operating hours are understood to be 10:00-22:00. For this reason, the units are not expected to be in use outside of daytime hours (07:00 – 23:00).

The noise monitoring equipment was located on the terrace of the first floor flat in 67 Charlotte Street. The predominant noise sources identified at the site were two sources of plant noise from chimneys attached to existing restaurants in neighbouring buildings. Measurements at this location were considered representative of the current background noise levels at the nearest noise-sensitive receptors, identified to be the terrace itself, as well as one other terrace and four windows surrounding the space. It is noted that the plant associated with the former restaurant is no longer in operation and therefore noise levels may be lower than what was experienced during prior occupation of the restaurant. As a conservative approach, this assessment is based on the current background noise levels.

The representative background noise levels during the evening (19:00 – 23:00) are considered to be 50dB whilst representative background noise levels between (07:00 - 19:00) are 56dB i.e. significantly less onerous than the period encompassing evening meals service. As a result, the evening period has been used to set plant noise emission limits in accordance with the Borough of Camden's Local Plan, which specifies that noise without audible tonal elements should be "10dB below background" levels. Thus, the upper limit for the plant noise emission is 40dB. The sound pressure level from the proposed plant was calculated at each of the six nearest noise-sensitive receptors considered, and the predicted plant noise rating levels are up to 40dB, when induct attenuation is provided to the kitchen extract fan.

The proposed units are therefore considered to have a 'Low Observable Adverse Effect Level' at the nearest noise-sensitive receptors and meet the requirements of the Camden Local Plan.

2.0 INTRODUCTION

Max Fordham LLP have been appointed to provide a noise impact assessment in relation to the installation of new plant equipment at 67 Charlotte Street, London, W1T 4PH. Max Fordham LLP are full members of the Association of Noise Consultants (ANC).

The ground floor of 67 Charlotte Street is to be refurbished to include a restaurant, which will require the installation of three heat pump/air conditioners on the roof of the building, as well as a kitchen extract fan connected to the base of an existing exhaust chimney. These plant items are situated in the same locality as the plant from the former restaurant, which has been removed. This noise impact assessment aims to evaluate the impact of this plant equipment on the noise environment at the nearest identified noise-sensitive receptors (NSRs).

A glossary of the common acoustic terms used in this report is given in Appendix B, for reference.

2.1 Site Overview

The site is 67 Charlotte Street, located in the London borough of Camden. Figure 1 shows the location of the proposed plant as well as the nearest noise-sensitive receptors.

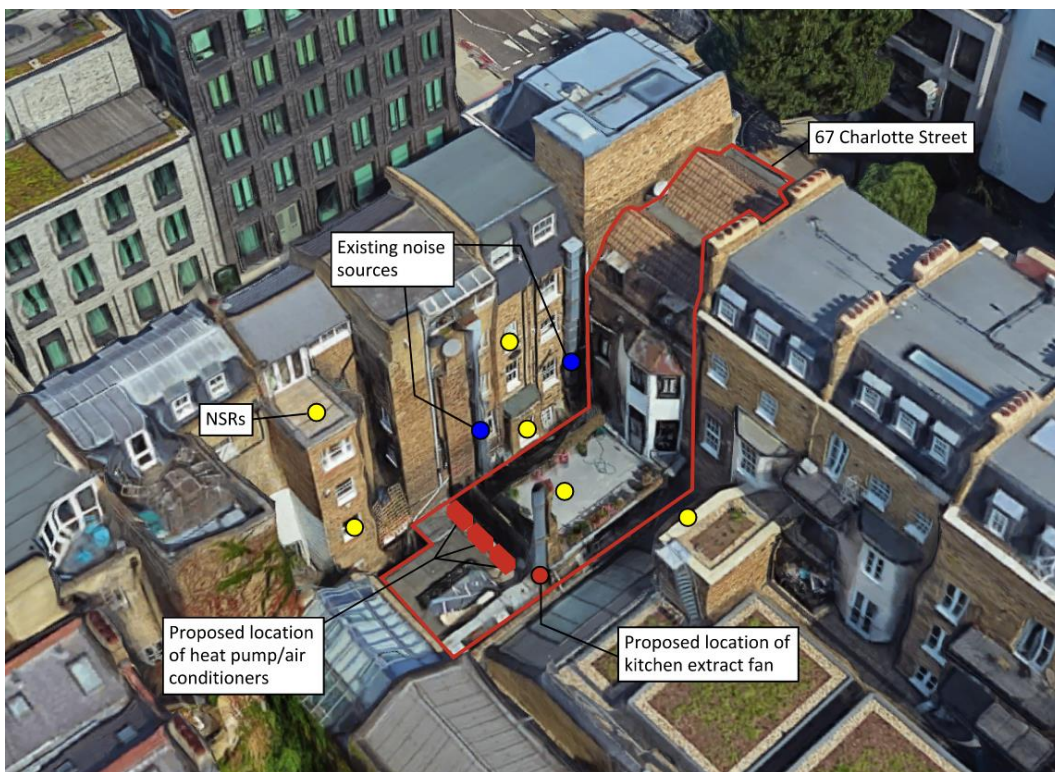


Figure 1: Overview of site showing the proposed location of the plant equipment, the existing sources of plant noise, and the six nearest noise-sensitive receptors (NSRs), marked with yellow dots.

The dominant sources of existing noise at this site are two pieces of plant: chimneys attached to two existing restaurants (marked on Figure 1 with blue dots). The nearest identified noise-sensitive receptors are four windows facing the roof where the plant will be installed, the terrace belonging to the first floor flat in 67 Charlotte Street, and the terrace belonging to the top floor flat in 31 Tottenham Street (marked on Figure 1 with yellow dots).

3.0 ASSESSMENT CRITERIA

The following is a summary of the planning policy which applies to the proposed development, and which the results of the noise survey have been assessed against.

3.1 National Planning Policy

2.1.1 National Planning Policy Framework

Planning Policy Guidance Note 24 (PPG24), which was generally used for overall guidance to planners regarding environmental noise, particularly for residential sites, was replaced in March 2012 by the more general advice given in the National Planning Policy Framework (NPPF).

The NPPF (last updated July 2021) states in paragraph 174e, that planning policies and decisions should contribute to and enhance the natural and local environment by “preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability.” Furthermore, it states in paragraphs 185 and 187 that planning policies and decisions should:

- 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 the quality of life [paragraph 185 a)],
- identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason [paragraph 185 b)], and
- be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established [paragraph 187].

2.1.2 Noise Policy Statement for England

The NPPF document also refers to the Noise Policy Statement for England (March 2010). The Noise Policy Statement for England (NPSE) sets out (paragraph 1.6) the long term vision of Government noise policy: “Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.”

The NPSE also states: “Excessive noise can have wide-ranging impacts on the quality of human life, health (for example owing to annoyance or sleep disturbance) and use and enjoyment of areas of value such as quiet places and areas with high landscape quality.”

The NPSE also cites (in the Explanatory Note section) the following three aims:

- First aim of the NPSE: Avoid significant adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.
- Second aim of the NPSE: Mitigate and minimise adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.
- Third aim of the NPSE: Where possible, contribute to the improvement of health and quality of life through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

The NPSE also states (paragraph 2.2) that “examples of noise management can be found in many areas including reducing noise source; the use of the land use and transport planning systems, compensation measures, the statutory nuisance and licensing regimes and other related legislation.”

The NPSE (in the Explanatory Note section) also introduces guidance to assist in defining the adverse impacts:

- NOEL – No Observed Effect Level: this is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to noise.
- LOAEL – Lowest Observed Adverse Effect Level: this is the level above which adverse effects on health and quality of life can be detected.
- SOAEL – Significant Observed Adverse Effect Level: this is the level above which significant adverse effects on health and quality of life occur.

These categories are discussed further in the Planning Practice Guidance section below.

The NPSE acknowledges (paragraph 2.15) that it is not possible to have a single objective noise-based measure that is mandatory and applicable to all sources of noise in all situations.

Planning Practice Guidance (PPG – Noise)

The government's Planning Practice Guidance web pages provide advice on various issues, including noise (<https://www.gov.uk/guidance/noise--2>). The noise advice (March 2014, last update July 2019) states in the context of considering when noise is relevant to planning, "noise needs to be considered when new development may create additional noise, or would be sensitive to the prevailing acoustic environment (including any anticipated changes to that environment from activities that are permitted but not yet commenced)." (Paragraph: 001, Reference ID: 30-001-20190722, Revision date: 22-07-2019.)

The Planning Practice Guidance pages also include more explanation of the effect level categories noted above, providing an explanatory Noise Exposure Hierarchy Table, which explores how actions such as a requirement for noise mitigation, or prevention of a development, might be assessed with respect to whether noise levels are considered above the category thresholds. The Noise Exposure Hierarchy Table (Paragraph: 005, Reference ID: 30-005-20190722, Revision date: 22-07-2019) is reproduced here:

Response	Examples of outcomes	Increasing effect level	Action
No Observed Effect Level			
Not present	No Effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level			
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

In summary, with respect to National Planning Policy, neither the Planning Practice Guidance pages, nor the National Planning Policy Framework or Noise Policy Statement for England documents, provide quantitative advice such as the use of absolute noise limits. Thus, authorities still generally interpret and express national and local non-quantitative policies by issuing quantitative noise-related planning conditions.

3.2 BS 4142:2014

BS 4142:2014+A1:2019 “Methods for Rating and Assessing Industrial and Commercial Sound” addresses the likelihood of adverse impact from noise generated by plant equipment. A noise rating is determined and compared with the existing local background sound level, and several cumulative acoustic feature corrections to the noise rating are available to apply where appropriate. For example, if the noise includes a distinguishable tone, impulse, intermittency, or other readily distinguishable sound characteristic.

BS 4142:2014 seeks to determine a “representative” background sound level, stating that “...the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods”.

The assessment of the impact depends upon the margin by which the rating level of the specific sound source exceeds the background sound level but also promotes a consideration of the context in which the sound occurs when making an assessment. BS 4142:2014 states that an initial estimate of the impact of the specific

sound is made by subtracting the measured background sound level from the rating level, while considering the following points:

- a) Typically, the greater this difference, the greater the magnitude of the impact.
- b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- c) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
- d) 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.

Note then, a BS 4142:2014 assessment may deduce a low impact where the specific sound level is approaching the background sound level, and thus may conclude that the specific noise is acceptable.

3.3 Camden Local Plan (2017)

Policy A1 of the Camden Local Plan outlines how the council aims to protect quality of life and how development will consider, amongst other factors, noise and vibration levels. The local plan also states that the Council will require an acoustic report to accompany any development that is likely to generate noise. The general guidance is given in Policy A4:

“We will not grant planning permission for:

a. development likely to generate unacceptable noise and vibration impacts; or

b. development sensitive to noise in locations which experience high levels of noise, unless appropriate attenuation measures can be provided and will not harm the continued operation of existing uses.

We will only grant permission for noise generating development, including any plant and machinery, if it can be operated without causing harm to amenity. We will also seek to minimise the impact on local amenity from deliveries and from the demolition and construction phases of development.”

The character of the noise for any noise generating uses must be taken into consideration. As well as the general guidance, the following specific thresholds are set out for industrial and commercial noise sources.

Existing noise sensitive receptor	Assessment location	Design Period	LOAEL	LOAEL to SOAEL	SOAL
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 57dB L _{Amax}	'Rating level' between 9dB below and 5dB above background or noise events between 57dB and 88dB L _{Amax}	'Rating level' greater than 5dB above background and/or events exceeding 88dB L _{Amax}
<p><i>*10dB should be increase to 15dB if the noise contains audible tonal elements. However if it can demonstrated that there is no significant different in the character of the residual background noise then this reduction may not be required.</i></p> <p><i>**Levels are given for dwellings, however, levels are use specific and different levels will apply dependent on the use of the premises.</i></p>					

The LOAEL/SOAEL definitions correspond to those given in NPPF and PPG – Noise.

The council will take into account the likely times of occupation for types of development.

4.0 NOISE SURVEY

To determine typical ambient (L_{Aeq}) and background (L_{A90}) noise levels at locations representative of the NSRs, a noise survey was undertaken between Tuesday 26th July and Thursday 28th July 2022.

4.1 Methodology

Measurements were taken between 10:00 on Tuesday 26th July and 09:00 on Thursday 28th July 2022 (approx. 47 hours).

Measurements were made with a Norsonic 140 precision sound level analyser set up to make consecutive 15-minute noise measurements with 1 minute precision. This equipment complies with BS EN IEC 61672 class 1. The meter uses a Norsonic 1225 free-field response microphone, mounted on a tripod of height 1.5 m, and NOR 1209 microphone pre-amplifier. The microphone position is considered to be free field. A field calibration of the sound level meter was completed at the beginning and end of the measurement session with a Norsonic 1251 sound calibrator, complying with BS EN IEC 60942 class 1. No significant calibration deviation occurred. Details of the equipment are given in Appendix A. The assessment was carried out in accordance with the principles of BS7445-1.

4.2 Survey Location

The measurement comprised one long-term, unattended outdoor measurement which was located on the (unoccupied) terrace of the first floor flat in 67 Charlotte Street. The location was selected to provide the current background noise levels at one of the nearest NSRs (the terrace itself) and was also considered to be representative of the other nearest NSRs. The microphone was positioned at a comparable distance from the existing sources of plant noise as the surrounding windows, and so the measured background noise levels are expected to be representative of the background noise levels at all the surrounding NSRs. The noise measurement location is shown in Figure 2.

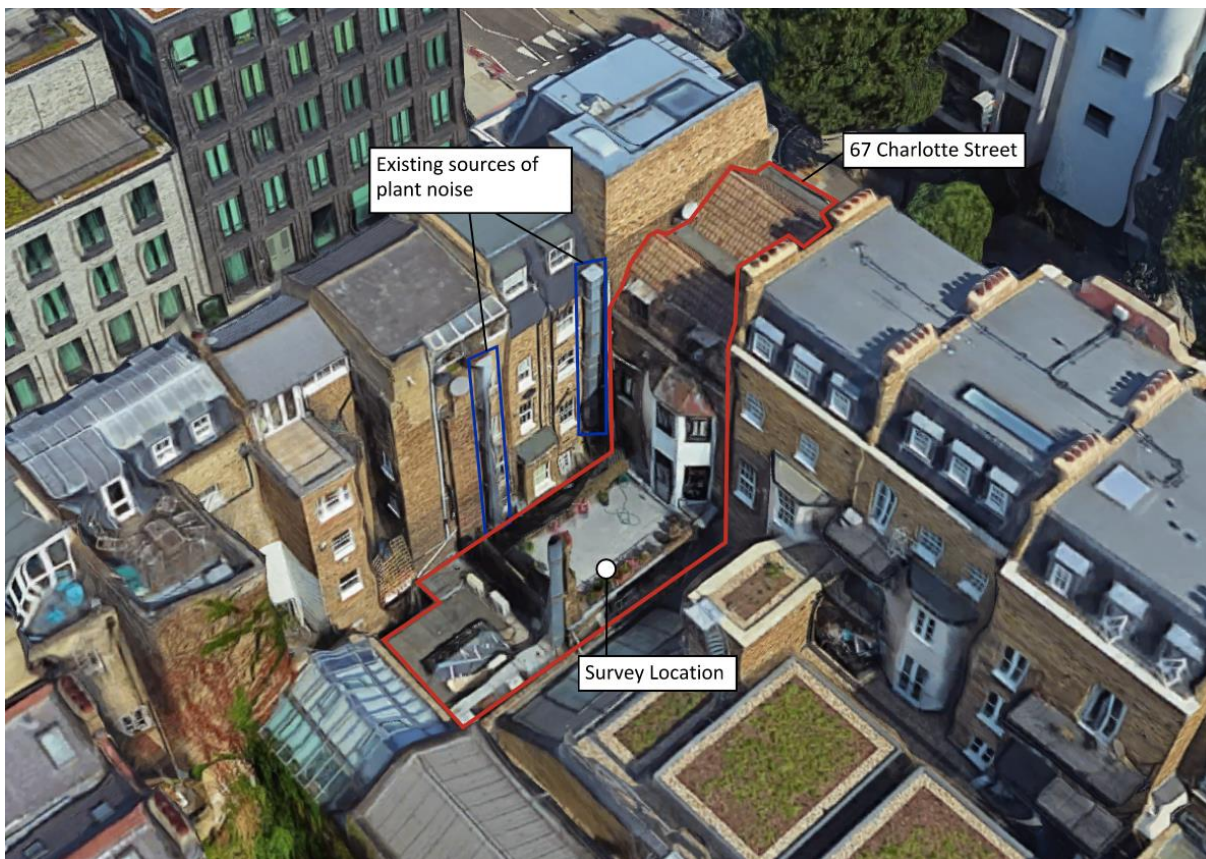


Figure 2: Location of long-term survey, and locations of existing sources of plant noise at the site.

4.3 Noise Climate

The local noise environment at the time of survey setup and collection was dominated by two sources of plant noise from nearby restaurants. These sources (marked on Figure 2) are located in the same outdoor space where the new plant is to be installed. There were also noise events from vehicles on Charlotte Street, but these were not expected to contribute significantly to the background noise levels.

4.4 Weather

The weather was dry throughout the measurement period, and wind speeds never exceeded 5 m/s. A windshield was used on the microphone. Weather conditions are not considered to have significantly affected the survey results. All weather data was taken from the Atomwide weather monitoring website using data recorded from the Westminster weather monitoring station, approximately 3.4 km from the site.

4.5 Survey Results

Figure 3 shows the long-term noise survey data, indicating maximum ($L_{AFmax,15min}$), mean ($L_{Aeq,15min}$), and background ($L_{AF90,15min}$) noise levels.

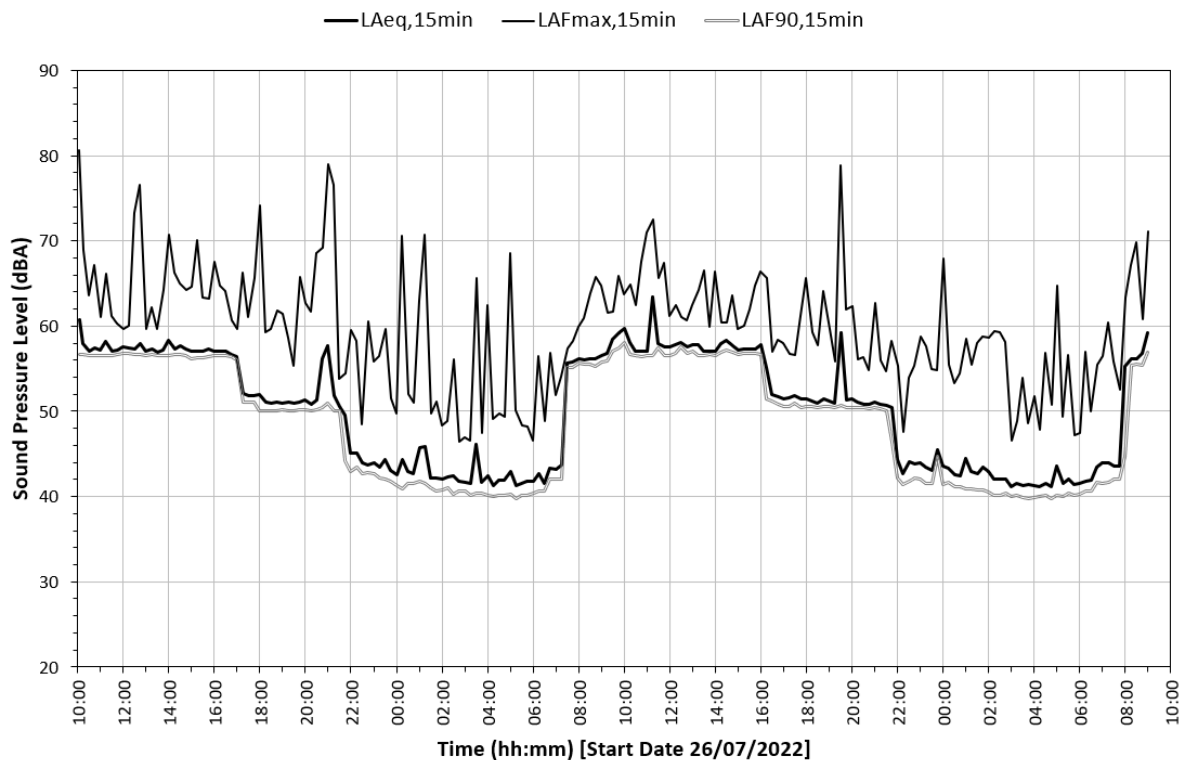


Figure 3: Results of long-term unattended measurement showing the background (L_{AF90}), ambient (L_{Aeq}) and maximum (L_{AFmax}) data for the measurement period.

The daytime, evening and night periods are conventionally taken to be as follows:

- Daytime: 07:00 – 19:00
- Evening: 19:00 – 23:00
- Night: 23:00 – 07:00

The representative background noise levels from these periods (40th percentile) are:

- Daytime: 56dB L_{A90}
- Evening: 50dB L_{A90}
- Night: 40dB L_{A90}

It is understood that the kitchen will be in operation between 10:00 – 22:00, and therefore the new plant equipment would not operate during the night-time period. As a conservative approach, the assessment of noise from new plant has been made relative to the existing background noise level during the full evening period (19:00 – 23:00).

5.0 NOISE IMPACT ASSESSMENT

5.1 Proposed External Plant Noise Emission limits

The period in which the restaurant is expected to operate falls within the period designated as day / evening (07:00-23:00), and therefore from the Camden Local Plan defines the lowest observable adverse effect level (LOAEL) as follows (Section 2.3):

- 10dB below background levels if the noise does not contain audible tonal elements
- 15dB below background levels if the noise does contain audible tonal elements.

The proposed plant noise is not determined to contain significant audible tonal elements, and therefore the LOAEL limit is set as 10dB below background levels. Applying this to the background levels found in Section 3.5, the LOAEL threshold is 40dB.

It can be seen from Figure 3 that the background noise levels during the daytime are approximately 56dB (6dB higher than the background noise levels after 17:00), and so if the new plant noise meets the requirement for the evening period, it would also meet the requirement for the daytime period.

5.2 Proposed Fixed Plant Equipment

The proposed plant comprises:

- 3 x Mitsubishi Electric split type, heat pump air conditioner, model PUZ-ZM50VKA2
- 1 x OC Innovations Electrostatic precipitator, model ESP RY5000
- 1 x FlaktWoods Ltd kitchen extract fan, model e power box 67-500-3-4.

It is proposed that the exposed sides of the kitchen extract fan should be lined with heavy mass lagging, to minimise noise breakout.

5.3 Proposed Plant Location and Location of NSRs

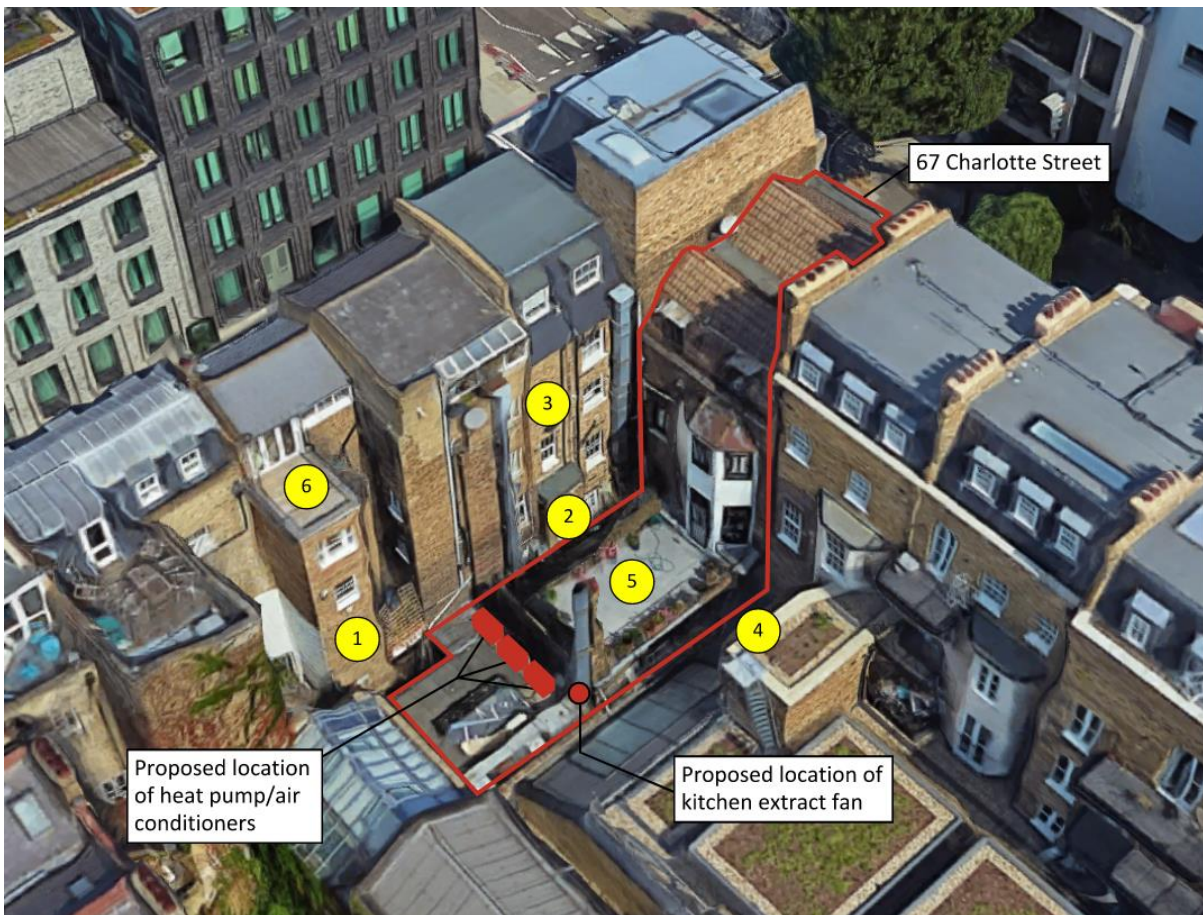


Figure 4: Proposed location of new heat pump/air conditioner and the six nearest identified noise-sensitive receptors.

The proposed location for the plant is shown in Figure 4, alongside the six nearest noise-sensitive receivers being considered (labelled by the yellow circles). This is the same location as the plant for the previous restaurant.

The heat pump/air conditioners will be on a section of the roof approximately 2 metres lower than the terrace of the 67 Charlotte Street first floor flat (labelled as NSR 5). This height difference provides additional screening between the proposed unit locations and NSRs 2 and 5. The extract fan is at the base of an existing exhaust riser, which is approximately 7 metres tall. The sound is modelled as emanating from the top of this exhaust riser as a point source. This is understood to be a conservative approach for most receptors, as it is expected that the sound power emanating from the exhaust will in reality be primarily orientated upwards, and therefore away from the majority of the nearest NSRs, in particular NSR 5.

5.4 Predicted Plant Noise Levels and Assessment

The noise emission from the proposed plant to the nearest NSRs has been calculated using manufacturers data which provided the sound pressure levels at 1m from the heat pump / air conditioners, and the sound power of the kitchen fan resulting from both the exhaust and the casing breakout.

In the case of the heat pump/air conditioners, the sound pressure level at 1m has been used in preference to the sound power because it is more representative of the noise emitted by the units in the direction of the NSRs.

The reduction in the noise level due to the distance of the NSRs to the proposed plant location was calculated, and where appropriate, the effects of screening have also been included.

Table 1: The calculated sound pressure levels at each of the NSRs due to the proposed plant without mitigation

NSR	Type	Plant noise rating limit (dBA)	A-weighted sound pressure level from new units without mitigation (dBA)	Criterion met?
1	1m from façade	≤ 40	46	No
2	1m from façade	≤ 40	46	No
3	1m from façade	≤ 40	47	No
4	1m from façade	≤ 40	48	No
5	Roof terrace / amenity space	≤ 40	49	No
6	Roof terrace / amenity space	≤ 40	47	No

Table 1 shows that the plant noise emission limits were not met in all cases. The results are dominated by noise from the kitchen extract fan. The following induct attenuation is therefore proposed for the kitchen extract fan (atmosphere side):

Table 2: Minimum insertion loss requirements for kitchen extract fan (atmosphere side)

Frequency / Hz	63	125	250	500	1000	2000	4000	8000
Atmosphere side insertion loss / dB	3	7	14	21	27	26	17	12

With the inclusion of the proposed mitigation, the plant noise levels are as given in Table 3. Table 3 shows that the sound pressure levels from the new plant are at least 10dB below the existing background levels, and are therefore compliant with the Camden Local Plan requirements. As a result, the noise from the proposed unit is considered to have a 'Low Observed Adverse Effect Level' (LOAEL) at the nearest noise-sensitive receptors.

Table 3: The calculated sound pressure levels at each of the NSRs due to the proposed plant with attenuation

NSR	Type	Plant noise rating limit (dBA)	A-weighted sound pressure level from new units with mitigation (dBA)	Criterion met?
1	1m from façade	≤ 40	39	Yes
2	1m from façade	≤ 40	34	Yes
3	1m from façade	≤ 40	37	Yes
4	1m from façade	≤ 40	37	Yes
5	Roof terrace / amenity space	≤ 40	37	Yes
6	Roof terrace / amenity space	≤ 40	36	Yes

6.0 CONCLUSION

Plant is proposed for the new restaurant at 67 Charlotte Street at the same location as previous (older) plant servicing the former restaurant. The new plant has been assessed against the representative evening background noise levels (19:00 – 23:00), which are more onerous than the levels during the day (07:00 – 19:00). Since the kitchen is understood to have operating hours of 10:00 – 22:00, the rooftop plant is not expected to be in operation during the night period (23:00 – 07:00).

The results show that, with the inclusion of induct attenuation to the kitchen extract fan, the proposed units are at least 10dB lower than the existing background noise levels during the whole daytime / evening period (07:00 – 23:00). This complies with the requirements of the Camden Local Plan and is expected to result in no significant impact at the identified noise-sensitive (residential) receptors.

7.0 APPENDICES

Appendix A – Noise Monitoring Equipment Details

The equipment summarised in the table below has been calibrated by a UKAS accredited laboratory in accordance with the laboratory requirements of the United Kingdom Accreditation Service (UKAS) on the dates indicated. UKAS calibration data sheets and certificates are available upon request.

Item	Make	Type	Serial no.	Calibration Intervals	Last Calibrated	Next Due Calibration	Calibration Certificate Number
Class 1 sound level meter	Norsonic	140	1405942	2 years	26/02/21	26/02/23	U37205 U37206
Microphone preamplifier	Norsonic	1209	15804	2 years	26/02/21	26/02/23	U37205 U37206
Microphone	Norsonic	1225	208215	2 years	26/02/21	26/02/23	37204
Calibrator	Norsonic	1251	34059	1 year	17/12/21	17/12/22	U39785

Table A1. Calibration details of noise survey equipment.

Appendix B – Glossary of Acoustic Terminology

SOUND POWER LEVEL, or L_w (decibels, dB)

The total amount of sound energy per unit of time generated by a particular sound source. This corresponds to a reference sound power of 10 pW.

SOUND PRESSURE LEVEL, SPL or L_p (decibels, dB)

A measure of the instantaneous sound pressure at a point in space. The threshold of hearing occurs at approximately $L_p=0$ dB (which corresponds to a reference sound pressure of 20 μ Pa).

A-WEIGHTED SOUND PRESSURE LEVEL, L_A (dBA)

A-weighted sound pressure level values are frequency-weighted in a way that approximates the frequency response of the human ear and allows sound levels to be expressed as a single figure value.

EQUIVALENT CONTINUOUS A-WEIGHTED SPL, $L_{Aeq,T}$ (dBA)

Energy average of the A-weighted sound pressure level over a time period, T. The level of a notional continuous sound that would deliver the same A-weighted sound energy as the actual fluctuating sound over the course of the defined time period, T.

MAXIMUM A-WEIGHTED SPL, L_{AFmax} (dBA)

Maximum A-weighted sound pressure level measured with fast time weighting.

BACKGROUND SOUND LEVEL, $L_{A90,T}$ (dBA)

The A-weighted sound pressure level of the residual noise at the assessment position that is exceeded for 90% of a given time interval, T, measured using time weighting, and quoted to the nearest whole number of decibels.

NOISE RATING LEVEL, $L_{Ar,Tr}$ (dBA)

The A-weighted specific sound level plus any adjustment for characteristic features of the sound (for example if the sound features impulsive or tonal components). Used in BS 4142:2014 assessments.

SPECIFIC SOUND LEVEL, $L_s = L_{Aeq,Tr}$ (dBA)

The equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, T_r .