NOISE IMPACT ASSESSMENT

126 Charing Cross Road, London, WC2H 0LA

6th February 2025

ISSUE 01

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1.0 INTRODUCTION

DAA Group has been appointed to carry out a BS4142:2014+A1:2019 Noise Impact Assessment at 126 Charing Cross Road, London, WC2H 0LA to support a Planning Application for the installation of a kitchen Extraction system.

The purpose of the survey is to ensure that the development does not prejudice the amenities of occupiers of nearby premises.

This report has been carried out in accordance with the provisions of:

- The National Planning Policy Framework, the Noise Policy Statement for England (NPSE)
- The World Health Organisation Guidelines for Community Noise 1999 (WHO)
- The Environmental Health legislation 'the Control of Odour and Noise from Commercial Kitchen Exhaust Systems (2018).'
- Policies S24, S29 and S32 of Westminster's City Plan (November 2016)
- Policies TACE 9 and ENV6 of Westminster Unitary Development Plan, adopted in January 2007

The technical content of this assessment has been provided by a Tech member of the Institute of Acoustics.

The Institute of Acoustics is the UK's professional body for those working in Acoustics, Noise and Vibration.

2.0 NOISE CRITERIA

2.1 NATIONAL PLANNING POLICY FRAMEWORK (NPPF)

The Department for Communities and Local Government introduced the National Planning Policy Framework (NPPF) in March 2012. The latest revision of the NPPF is dated December 2025.

The NPPF sets out the Government's planning policies for England and how these are expected to be applied. It provides a framework where local Councils can produce their own local and neighbourhood plans which reflect the needs of their communities.

In conserving and enhancing the natural environment, the planning system should prevent both new and existing development from contributing to, or being put at, unacceptable risk from environmental factors including noise.

Planning policies and decisions should aim to avoid noise giving rise to significant adverse impacts on health and quality of life as a result of new development. Conditions may be used to mitigate and reduce noise to a minimum so that adverse impacts on health and quality of life are minimised. It must be recognised that development will often create some noise and existing businesses wanting to

develop in continuance of their business should not have unreasonable restrictions put on them. Reference is made within NPPF to the Noise Policy Statement for England (NPSE) as published by DEFRA in March 2010.

2.2 NOISE POLICY STATEMENT FOR ENGLAND (NPSE)

The long-term vision of the NPSE is stated within the documents scope, to '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 policy aims are stated to:

- avoid significant adverse impacts on health and quality of life.
- mitigate and minimise adverse impacts on health and quality of life; and
- where possible, contribute to the improvement of health and quality of life.

The application of NPSE should mean that noise is properly considered at the appropriate time (for example in planning applications or appeals) where it must be considered alongside other relevant issues. The guiding principles of Government policy on sustainable development should be used to assist in the implementation of the NPSE.

The NPSE should apply to all types of noise apart from occupational noise in the workplace. The types of noises defined in the NPSE includes:

- Environmental noise from transportation sources.
- Neighbourhood noise which includes noise arising from within the community, industrial premises, trade and business premises, construction sites and noise in the street

The Noise Policy Statement England (NPSE) outlines observed effect levels relating to the

above, as follows:

- **NOEL – No Observed Effect Level**

o 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 the noise.

- **LOAEL – Lowest Observed Adverse Effect Level**

o This is the level above which adverse effects on health and quality of life can be detected.

- **SOAEL – Significant Observed Adverse Effect Level**

o This is the level above which significant adverse effects on health and quality of life occur.

As stated in The Noise Policy Statement England (NPSE), it is not currently possible to have a single objective-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Specific noise levels are not stated within the guidance for this reason and allow flexibility in the policy until further guidance is available.

2.3 ProPG: PLANNING AND NOISE

As outlined above, the National Planning Policy Framework encourages improved standards of design, although it provides no specific noise levels which should be achieved on site for varying standards of acoustic acceptability, or a prescriptive method for the assessment of

noise.
ProPG: Planning and Noise was published in May 2017 in order to encourage better acoustic design for new residential schemes in order to protect future residents from the harmful effects of noise. This guidance can be seen as the missing link between the current NPPF and its predecessor, PPG24 (Planning Policy Guidance 24: Planning and Noise), which provided a prescriptive method for assessing sites for residential development, but without the nuance of 'good acoustic design' as outlined in ProPG.
ProPG allows the assessor to take a holistic approach to consider the site's suitability, taking into consideration numerous design factors which previously may not have been considered alongside the noise level measured on site, for example the orientation of the building in relation to the main source of noise incident upon it.
It should be noted this document is not an official government code of practice, and neither replaces nor provides an authoritative interpretation of the law or government policy, and therefore, should be seen as a good practice document only.

2.4 BRITISH STANDARD 4142: 2014+A1:2019

British Standard (BS) 4142:2014 "Methods for rating and assessing industrial and commercial sound" describes methods for assessing the likely effects of sound on premises used for residential purposes.
It includes the assessment of sound from industrial and manufacturing processes, M&E plant and equipment, loading and unloading of goods and materials, and mobile plant/vehicles on the site. It can be used to assess sound from proposed, new, modified or additional industrial/commercial sources, at existing or new premises used for residential purposes.
The method described in BS4142: 2014 use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.
The standard describes methods to measure and determine ambient, background and residual sound levels, and the rating levels of industrial/commercial sound. BS 4142: 2014 requires consideration of the level of uncertainty in the data and associated calculations.
BS 4142 is not intended to be used for the derivation or assessment of internal sound levels, or for the assessment of non-industrial / commercial sources such as recreational activities, motorsport, music and entertainment, shooting grounds, construction and demolition, domestic animals, people, and public address systems for speech.
The Reference Time Interval, T, is defined in the standard as the "specified interval over which the specific sound level is determined", which is 1 hour during the daytime (07:00 to 23:00 hours) and 15 minutes during the night (23:00 to 07:00 hours).
Ambient sound is defined in BS 4142: 2014 as "totally encompassing sound in a given situation at a given time, usually composed of sound from many sources near and far". It comprises the residual sound and the specific sound when present.
Residual sound is defined in BS 4142: 2014 as "ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound".
The background sound level is the LA90, T of the residual sound level, and is the underlying level of sound. Measurements of background sound level should be undertaken at the assessment location where possible or at a comparable location.
The measurement time interval should be sufficient to obtain a representative value (normally not less than 15 minutes) and the monitoring duration should reflect the range of background sound levels across the assessment period. The background sound level used

for the assessment should be representative of the period being assessed.
The specific sound level is the LAeq,T of the sound source being assessed over the reference time interval, Tr. BS 4142: 2014 advises that Tr should be 1 hour during the day and 15 minutes at night.
The rating level is the specific sound level plus any adjustment for the characteristics of the sound (tone, impulse, intermittent or another acoustic feature). The standard describes subjective and objective methods to establish the appropriate adjustment. The adjustments for the different features and assessment methods are summarised in the table below.

Acoustic Feature Corrections in BS4142: 2014

Acoustic Feature	Adjustment for Acoustic Feature		
	Subjective Methods	Objective Methods	
Tonality	+2 dB if just perceptible +4 dB if clearly perceptible +6 dB if highly perceptible	Third Octave Analysis	Narrow Band Analysis
		+6 dB if tones identified	Sliding scale of 0 to +6 dB depending on audibility of tone
Impulsivity	+3 dB if just perceptible +6 dB if clearly perceptible +9 dB if highly perceptible	Sliding scale of 0 to +9 dB depending on prominence of impulsive sound	
Intermittency	+ 3 dB if intermittency is readily distinctive	n/a	
Other	+ 3 dB if neither tonal nor impulsive, but otherwise readily distinctive	n/a	

Where tonal and impulsive characters are present in the specific sound within the same reference period then these two corrections can both be taken into account. If one feature is dominant, it might be appropriate to apply a single correction. The rating level is equal to the specific sound level if there are no features present.
The level of impact is assessed by comparing the rating level of the specific sound source with the background sound level. Typically the greater the difference the greater the magnitude of the impact, depending on the context.
Other factors that may require consideration include the absolute level of sound, the character and level of the residual sound compared to the specific sound, and the sensitivity of the receptor and scope for mitigation.
When the rating level is above the background sound level, a difference of around +5 dB is likely to indicate an adverse impact and a difference of around +10 dB or more is likely to indicate a significant adverse impact, depending on the context.
The lower the rating level with respect to the background sound level, the less likely it is that the specific sound source will have an 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.

3.0 SITE SURVEYS

3.1 SITE DESCRIPTION

The application site is located on Charing Cross Road. The area is a mix of commercial and residential properties, typical for an urban cityscape environment. The proposed location of the plant is at the rear of the application site. The dominant noise source is plant noise from existing adjacent plant. See Figure 3.1)

Figure 3.1 – Site Location

3.2 ENVIRONMENTAL SITE SURVEY PROCEDURE

In order to characterise the sound profile of the area at the closest sensitive receptor (NSR), an environmental sound survey has been carried out from 22/01/2025 to 23/01/2025. The monitoring position was chosen in order to collect representative sound levels at the NSR and the proposed location of the plant.
Noise Measurements were carried out 1 meter from the façade. The monitoring location is shown in Figure 5.2.

3.3 EQUIPMENT

Instrument manufacturer	**Cirrus Research Plc**
Model	**IEC 61672-3:2013**
Serial Number	**G302987**
Microphone Type	**MK:224**
Serial Number	**214457A**
Cirrus CK: 675 Outdoor Kit	

All equipment used during the survey was field calibrated at the start and end of the measurement period with a negligible deviation of ≤0.5 dB. All sound level meters are calibrated every 24 months and all calibrators are calibrated every 12 months, by a third-party calibration laboratory. All microphones were fitted with a protective windshield for the entire measurements period.

3.4 METEOROLOGICAL CONDITIONS

As the environmental noise survey was carried out over a long un-manned period no localized records of weather conditions were taken. However, during the set up and collection of the monitoring equipment, the weather conditions have been documented in the following table. All measurements have been compared with met office weather data of the area, specifically the closest weather station, the data from the weather station is outlined in the table below. When reviewing the time history of the noise measurements, any scenarios that were considered potentially to be affected by the local weather conditions have been omitted. The analysis of the noise data includes statistical and percentile analysis and review of minimum and maximum values, which aids in the preclusion of any periods of undesirable weather conditions. The weather conditions were deemed suitable for the measurement of environmental noise in accordance with BS7445 Description and Measurement of Environmental Noise. The table below presents the average temperature, wind speed and rainfall range for each 24-hour period during the entire measurement.

Weather Conditions – Northolt Weather station				
Time Period	**Air Temp (◦C)**	**Rainfall mm/h**	**Prevailing Wind Direction**	**Wind Speed (m/s)**
22/01/2025 – 00:00 – 23:59	1 - 5	0.0	SW	2 - 5
23/01/2025 – 00:00 – 23:59	-1-8	0.0	WSW	5 - 9

Table 3.4 – Weather Summary

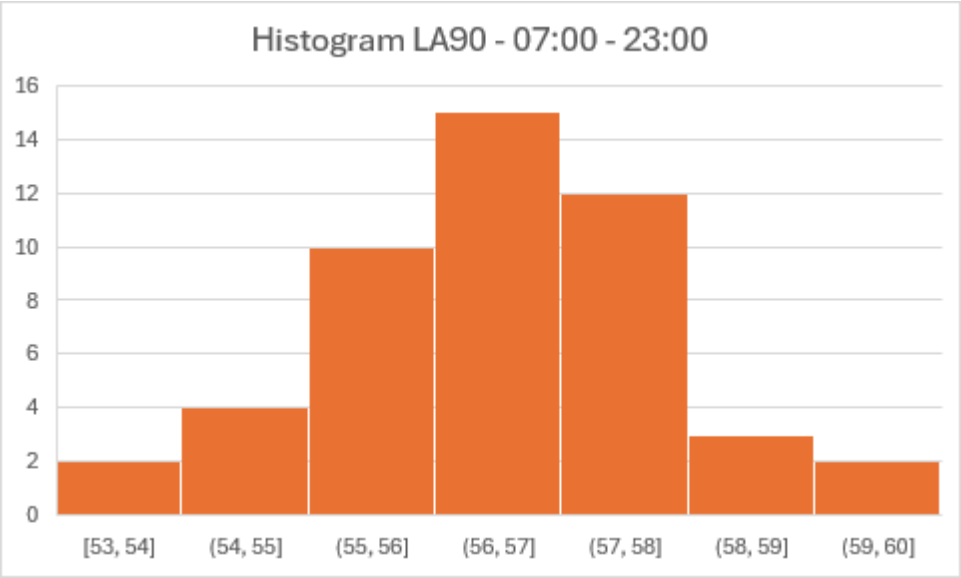
4.0 NOISE SURVEY

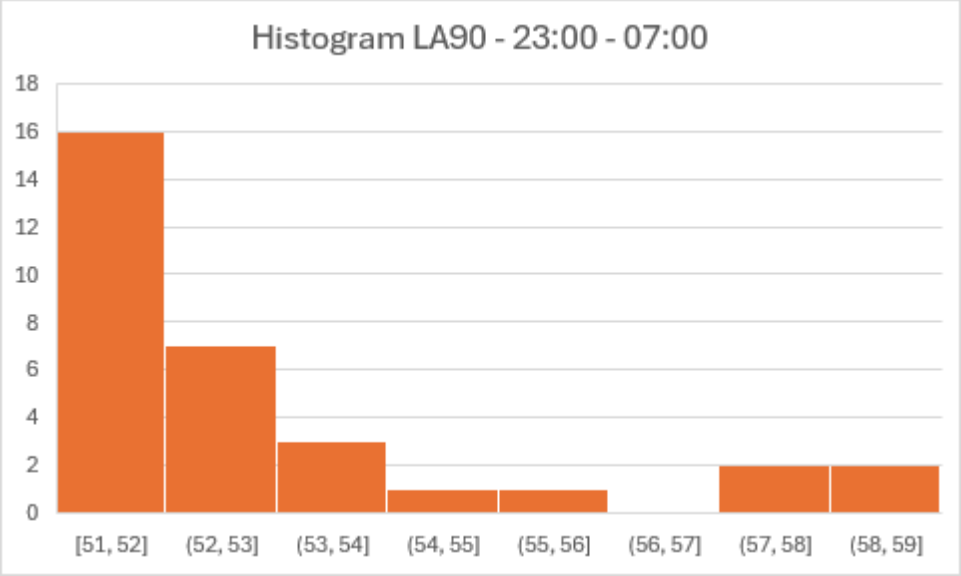
The background sound levels have been calculated in accordance with BS 4142:2014, which represents the most up-to-date guidance on the subject. Prior to the publication of the 2014 version of BS 4142, acousticians would use the lowest measured background sound levels; however, BS 4142: 2104 provides substantially more guidance on the determination of background sound levels. Section 8.1 of BS 4142: 2014 states that "for this purpose, the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods. Among other considerations, diurnal patterns can have a major influence on background sound levels, and, for example, the middle of the night can be distinctly different (and potentially of lesser importance) compared to the start or end of the night-time period for sleep purposes".
The guidance goes on to say that "a representative level ought to account for the range of background sound levels and ought not automatically to be assumed to be either the minimum or modal value".

Period	Lowest Recored $L_{A90, 15}$	Typical $L_{Aeq,15}$
07:00 – 19:00	55dB	62db
19:00 – 23:00	53dB	60dB
23.00 – 07.00	51dB	58dB
Operating Hours 11:30 – 02:00	51dB	61dB

Table 4.1 Background Sound Level Summary Results

N.b – At the time of the survey, the equipment has already been installed, but was not operating for the duration of the survey.


Histogram LA90 - 07:00 - 23:00
16
14
12
10
8
6
4
2
0
[53, 54]
(54, 55]
(55, 56]
(56, 57]
(57, 58]
(58, 59]
(59, 60]


Histogram LA90 - 23:00 - 07:00
18
16
14
12
10
8
6
4
2
0
[51, 52]
(52, 53]
(53, 54]
(54, 55]
(55, 56]
(56, 57]
(57, 58]
(58, 59]

5.0 NOISE IMPACT ASSESSMENT

5.1 PROPOSED PLANT

It is understood that the proposed plant is comprised of the following units:
•1 x PowerBox3 67-500-1– Outlet Fan

The location is shown below in figure 5.2

Proposed Plant	LWA (dB(A))
PowerBox3 67-500-1	44

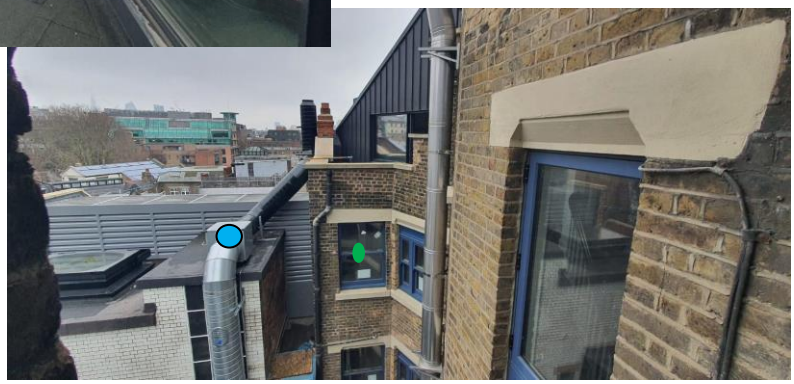
Table 5.1 – Manufacturer supplied Sound pressure level @ 3m away

There was no available detailed noise levels available from the manufacturer.

Manufacturer's noise level data gives the following sound power levels of the fan units. Corrections from sound attenuation due to bends, duct losses and end reflection, etc, have been taken where considered appropriate.

5.2 CLOSEST NOISE SENSITIVE RECEIVER

The closest noise sensitive receiver to the installation location of the plant has been identified as being a residential window located approximately 4 meters from the proposed location of the extraction outlet and approximately 8 meters from the proposed location of the extraction fan as shown in Figure 5.2.



●	Location Kitchen Extraction Outlet
●	Nearest Residential Noise Sensitive Window
●	Measurement Location
●	Location Kitchen Inlet

Figure 5.2 – NSR and Plant location

5.3 NOISE EMMISSION CRITERION

It is understood that the operating hours are between 11.30 and 02:00.

The property is in an area where the existing external ambient noise levels exceed WHO Guideline levels of either LAeq,12hrs 55dB daytime (07.00-19.00); LAeq,4hrs 50dB evening (19.00-23.00); LAeq,8hrs 45dB night-time (23.00-07.00):" (See table 4.1).
Therefore, the below condition is applicable.

Condition C46BC (a)
"Where the existing external noise level exceeds WHO Guideline levels of LAeq,12hrs 55dB daytime (07.00-19.00); LAeq,4hrs 50dB evening (19.00-23.00); LAeq,8hrs 45dB night-time (23.00-07.00):"
"either"
(a) "and where noise from the proposed development will not contain tones or be intermittent sufficient to attract attention, the maximum emission level (LAeq15min) should not exceed 10 dB below the minimum external background noise at the nearest noise sensitive properties. The background noise level should be expressed in terms of LA90,15min."

It is determined that the proposed kitchen extraction system is not considered to contain tones. In addition, the proposed operation of the equipment is also unlikely to be sufficiently intermittent to attract attention at the nearest noise sensitive property.

The criteria for plant sound, to be achieved at a point 1m from the closest noise sensitive window, has been set as shown in Table 5.3 in order to comply with the Local Authority requirements.

Time Period	Noise Criterion at Nearest Residential Receiver
11.30 – 02.00	**41 LAeq,Tm**

Table 5.3 - Proposed noise emissions criterion

5.4 BS4142 ASSESSMENT – 1m outside Nearest residential Window

BS4142:2014 Assessment	
Source Operating Period	Kitchen extraction system 11.30 – 02:00
Reference Time Interval (Tr) Element	15 minutes Level (dB)
Specific Sound Level	28
Representative Background Noise Level (LA90)	51
Acoustic feature correction	0
Rating Level	28 LAeq,15
Excess of Rating over Background Sound Level	-23

Westminster Noise Design Criteria	
Source Operating Period	Kitchen Extraction System 12:00 – 00:00
Reference Time Interval (Tr) Element	15 minutes Level (dB)
Representative Background Noise Level (LA90,15)	51
Noise Critera	41 LAeq,15
Plant Specific Noise Level	28 LAeq,15
Excess of Rating over Noise Criteria	-13

Detailed calculations are shown in Appendix B.

5.5 MITIGATION MEASURES

5.5.1 – Noise Emissions

In order to achieve the specific sound level and subsequent rating level shown in the assessment above, the following mitigation measures are required.

There are three main noise transmission paths to be considered from the fan to the receptor.

I. Discharge duct opening.
II. Fan casing & flexible connection noise break-out.
III. Duct break-out noise on the fan inlet ducting.

To reduce duct breakout noise on the fan an attenuator is required to be fitted on the discharge side of the fan, similar to an Acoustica CP03-C*-0500 -1D and the below insertion losses:

INSERTION LOSS (dB) – CENTRE BAND FREQUENCY								
Hz	63	125	250	500	1K	2K	4K	8K
CP03-C*-0500 -1D	2	3	6	14	14	12	10	5

The attenuator's acoustic media shall have to be lined with 'Melinex' to enable the kitchen extract system to be regularly steam cleaned.

5.5.2 – Breakout Noise

The extraction fan unit should be provided with an acoustic enclosure on the flat roof at the rear of the premises;

- The enclosure should consist of 4-sides with a closed top but should have adequate ventilation louvres on the back of the enclosure (i.e. facing away from the windows of the nearest dwelling overlooking the flat roof section) to allow for air circulation;
- The enclosure must be constructed of solid dense material and must have no holes or gaps in its construction, including at the base so as not to allow any sound to breakout;
- The enclosure should be constructed from solid material with a minimum mass per unit area of at least 15 kg/m2 ;
- It may therefore be typically constructed from solid timber of nominal 25mm thickness and density of at least 600 kg/m3 and with no holes or gaps in its construction;
- For example, the enclosure could consist of a 100mm thick timber frame filled with 100mm dense mineral wool insulation (minimum density at least 33 kg/m3) lined on each side with 15m thick marine plywood (or similar dense material).

5.5.3 - Vibration

In addition to the control of airborne noise transfer, it is important to consider the transfer of noise as vibration to adjacent properties as well as any sensitive areas of the same building. The duct should be isolated from the structure of the building using anti-vibration. The isolators shall incorporate rubber or neoprene high-frequency isolation pads. The fan should be installed with flexible connections to adjacent structures. Antivibration mounts are widely available from suppliers/installers often in pedestal rubber mountings.
Examples of these are MPO and MP1, and ISL Maxi pedestal vibration mounts. These types of anti-vibration and shock isolators are industry standard and commonplace for mechanical plant installations. They are designed to provide medium to high frequency isolation from vibration and noise via high resilience rubber.

5.6 BS8233 ASSESSMENT

The highest value of 41dB(A) is to be considered externally at 1m from the receiving residential window. Windows may be closed or partially closed leading to further attenuation, as follows.
Further calculations have been undertaken to assess whether the noise emissions from the plant unit installation would be expected to meet the recognized British Planning Compliance Review recommendations, in order to further ensure the amenity of nearby noise sensitive receivers.
British Standard 8233:2014 'Sound insulation and noise reduction for buildings – Code of Practice' gives recommendations for acceptable internal noise levels in residential properties. Assuming worst case conditions, of the closest window being for a bedroom, BS8233:2014 recommends 35dB(A) for internal resting/sleeping conditions during daytime hours.
A external level of 28dB(A) has been calculated, according to BS8233:2014, even a partially open window offers 10dB attenuation, thus leading to a further reduced interior noise level.

Receiver	Design Range – for resting/ sleeping conditions in a bedroom during daytime in BS8233:2014	Internal Noise Level at Receiver With Open Window (Due to Plant Installation)
Residential Window as in figure 5.2	35dB(A)	18dB(A)

6.0 SUMMARY AND CONCLUSIONS

DAA Group has been appointed to carry out a Noise Impact Assessment at 126 Charing Cross Road, London, WC2H 0LA. The purpose of the survey was to assess the level of noise emanating from the kitchen ventilation system to the nearest residential units and to advise on the level and type of mitigation that will be required.

Manufacturer's noise data of proposed kitchen extract system has been used to obtain Specific and Rated Noise Level at the nearest noise sensitive receiver in accordance with The London Borough of Westminster requirements.

The proposed kitchen extraction system is not considered to contain tones. In addition, the proposed operation of the equipment is also unlikely to be sufficiently intermittent to attract attention at the nearest noise sensitive property.

The existing external ambient noise level exceeds WHO Guideline levels of L_{Aeq}, 16hrs 55dB (daytime) during operating hours.

The 'A' weighted sound pressure level from the condenser, when operating at its noisiest, does not exceed a value of 10dB below the minimum external background noise, at a point 1 metre outside any window of any residential and other noise sensitive properties.

The plant-specific noise level is 28 $L_{Aeq,Tm}$ at 1 metre outside the nearest noise sensitive window. This is -13dB below the required noise criteria.

It has been concluded that noise emissions from the proposed plant meet Westminster Councils' criteria and would not have an adverse impact on the nearest residential receivers provided that the mitigation measures presented in 5.5 is followed.

APPENDIX A ACOUSTIC TERMINOLOGY

B.1 WEIGHTED DECIBEL, dB(A)

The unit generally used for measuring environmental, traffic or industrial noise is the A-weighted sound pressure level in decibels, denoted dB(A). The weighting is based on the frequency response of the human ear and has been found to correlate well with human subjective reactions to various sounds. An increase or decrease of approximately 10 dB corresponds to a subjective doubling or halving of the loudness of a noise, and a change of 2 to 3 dB is subjectively barely perceptible.

B.2 EQUIVALENT CONTINUOUS SOUND LEVEL, LAeq

Another index for assessment for overall noise exposure is the equivalent continuous sound level, L_{Aeq}. This is a notional steady level which would, over a given period, deliver the same sound energy as the actual time-varying sound over the same period.

B.3 MAXIMUM NOISE LEVEL, LAmax

The maximum noise level identified during a measurement period. Experimental data has shown that the human ear does not generally register the full loudness of transient sound events of less than 125 ms in duration.

B.4 NOISE RATING, NR

Noise ratings are used as a single figure criterion for specifying services noise in buildings. Each noise rating value has an associated spectrum of defined values in each third or octave frequency band. To determine the noise rating of a room the measured spectrum is compared to a set of noise rating curves. The highest NR curve that crosses any single frequency band of the measurement determines the noise rating for the room. The single figure noise rating is read at the 1 kHz band.

B.5 SOUND LEVEL DIFFERENCE (D)

The sound insulation required between two spaces may be determined by the sound level difference needed between them. A single figure descriptor which characterises a range of frequencies, the weighted sound level difference, D, is sometimes used (BS EN ISO 717-1). This parameter is not adjusted to reference conditions.

The standardized level difference, Dn, T is a measure of the difference in sound level between two rooms, in each frequency band, where the reverberation time in the receiving room has been normalised to 0.5 s. This parameter measures all transmission paths, including flanking paths.

The weighted standardized level difference, DnTw, is a measure of the difference in sound level between two rooms, which characterises a range of frequencies and is normalised to a reference reverberation time

B.6 SOUND REDUCTION INDEX (R)

The sound reduction index (or transmission loss) of a building element is a measure of the loss of sound through the material, i.e. its attenuation properties. It is a property of the component, unlike the sound level difference which is affected by the common area between the rooms and the acoustic of the receiving room. The weighted sound reduction index, Rw, is a single figure description of sound reduction index characterising a range of frequencies, which is defined in BS EN ISO 717-1: 1997. The Rw is calculated from measurements in an acoustic laboratory

B.7 STATISTICAL NOISE LEVELS (L_{A90}, (T) L_{A1}, (T) L_{A10}, (T) etc.)

For levels of noise that vary widely with time, for example road traffic noise, it is necessary to employ an index which allows for this variation. The L_{A10} is the level exceeded for ten per cent of the time under consideration, has historically been
adopted in the UK for the assessment of road traffic noise. The LA90 is the level exceeded for ninety per cent of the time, has been adopted to represent the background noise level. The L_{A1} the level exceeded for one per cent of the time, is representative of the maximum levels recorded during the sample period. A weighted statistical noise levels are denoted LA10, dB LA90, dB. etc. The reference time (T) is normally included, e.g. LA10, (5min), & LA90, (8hr).

B.8 TYPICAL NOISE LEVELS

Typical noise levels are given in the following table.

Noise Level dB(A)	Example
130	Threshold of pain
120	Jet aircraft take-offs at 100 m
110	Chain saw at 1 m
100	Inside disco
90	Heavy lorries at 5 m
80	Kerbside of busy street
70	Loud radio (in typical domestic room)
60	Office or restaurant
50	Domestic fan heaters at 1m
40	Living room
30	Ventilation Noise in Theatre
20	Remote countryside on still night
10	Sound insulated test chamber
0	Threshold of hearing.

APPENDIX B CALCULATIONS

NOISE EMISSION CALCULATION WITH MITIGATION														
ITEM	**PARAMETER**			**HZ**		**63**	**125**	**250**	**500**	**1K**	**2K**	**4K**	**8K**	**dBA**
1	**Schedule of Plant**	Qty												
2														
3	PowerBox3 67-500-1	1	Spl	dB	+	45	46	44	42	40	35	27	24	44
4														
5	Attenuator - Acoustica CP03-C*-0500-1D	1	Il	dB	-	2	3	6	14	14	12	10	5	
6	Revised Spl:	1	Spl	dB	+	43	43	38	28	26	23	17	19	34
7														
8														
9														
10														
11	Distance to nearest receptor Metres:	1		dB	-	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**
12	SPL=L1-20log(r/D22)	2												
13														
14														
15														
16	Spl at receptor			dB	+	49	49	44	34	32	29	23	25	28
17														
18														
19	Façade correction	3.0		dB	+	0	0	0	0	0	0	0	0	0
20	Intermittant noise correction			dB	+	0	0	0	0	0	0	0	0	0
21														
22														
23	Specific noise level at receptor			dB	+	49	49	44	34	32	29	23	25	28
24	(1m outside noise sensitive window)													
25	**Lowest Background Noise Levels:(L_{A90})**													
26	**Daytime (07:00 - 23:00)**													**53**
27	**Difference:** (Assessment level)			dB	-									**-25**
28														
29	**Night-time (23:00-07:00)**													**51**
30	**Difference:** (Assessment level)			dB	-									**-23**
	E&OE													

APPENDIX C MEASUREMENTS