

**Proposed Retention of
Mechanical Plant**

**48 Crouch End Hill,
London, N8 8AA**

Environmental Noise Assessment

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Project Address:	48 Crouch End Hill London N8 8AA
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1. INTRODUCTION

- 1.1 Acoustics Plus Ltd (APL) is an independent firm of multi-disciplinary acoustic engineers. APL is engaged by both private and public sector clients. APL is a registered member of The Association of Noise Consultants (ANC) and the author is a corporate member of The Institute of Acoustics (IOA).
- 1.2 APL has been instructed by the applicant Green Machine Crouch End Ltd, to consider and advise upon the noise implications of the retention of an installation of mechanical plant.
- 1.3 It is understood the Local Planning Authority (LPA) will require further information on noise levels from the installation in order to fully assess the noise impact upon the surrounding neighbourhood. This report provides the response to the LPA, on behalf of the Applicant.
- 1.4 This report has been prepared by Acoustics Plus Limited (APL) with all reasonable skill, care, and diligence in accordance with generally accepted acoustic consultancy principles and taking account the services and terms agreed between APL and our client.
- 1.5 Any information provided by third-parties and referred to herein may not have been checked or verified by APL unless expressly stated otherwise. Certain statements made in the report are predictions based on reasonable assumptions and good industry practice.
- 1.6 Such statements involve risk and uncertainty which could cause measured and predicted results to differ materially. APL does therefore not guarantee or warrant any prediction contained in this report.

2. BASELINE SITUATION

- 2.1 The Application Site (the “site”) is located at 48 Crouch End Hill, London, N8 8AA and is a mid-terraced ground floor café with residential accommodation located above. A site location plan is shown in Diagram 1 below. The site and its surroundings can be seen in Figures 1-12 appended to this report.

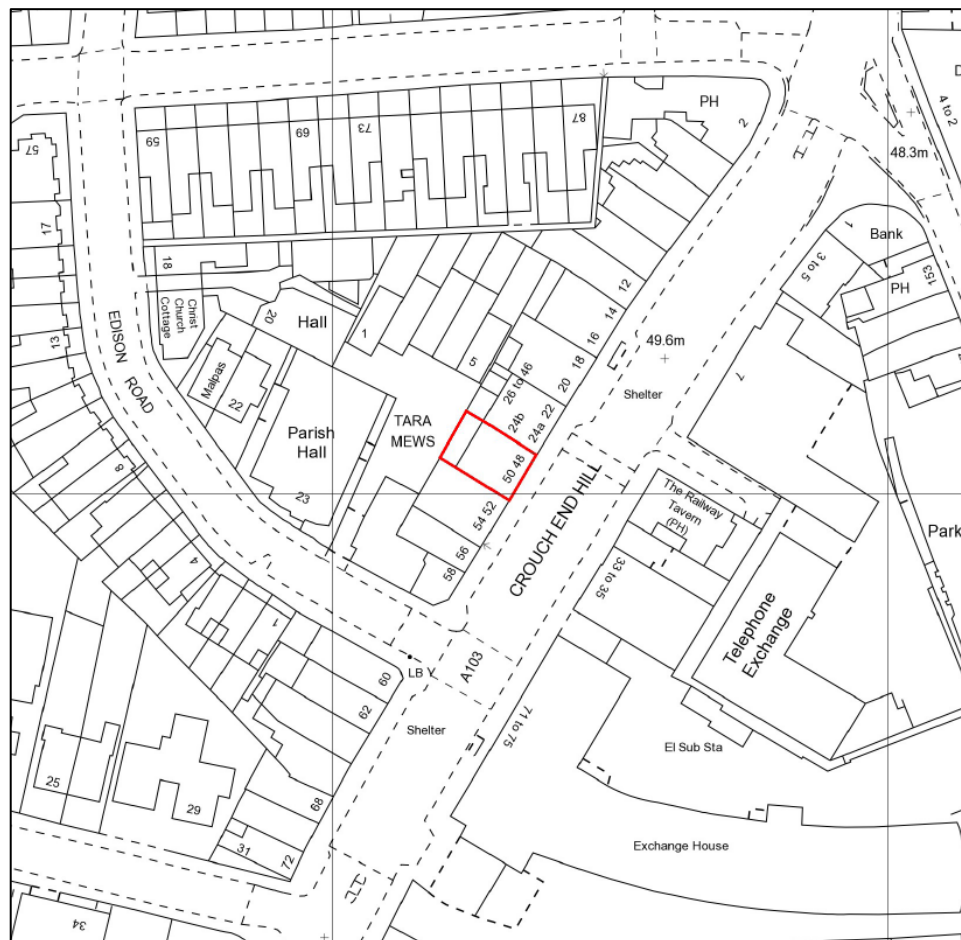


Diagram 1

- 2.2 It is understood that retrospective planning is being sought to retain the installation of 2no. items of mechanical plant that service the property.
- 2.3 The property features a mechanical climate control system. The external condensers required for this system are located externally on a section of ground floor roof at the rear of the site. The location of the condensers are visible from the upper windows of residential dwellings located on Tara Mews at the rear of the site. The rear windows of residential accommodation located above the site do not have line of sight of the condenser units due to the position of the access walkway to the flats.

2.4 The location of the condensers can be seen highlighted in Diagrams 2-4 below.

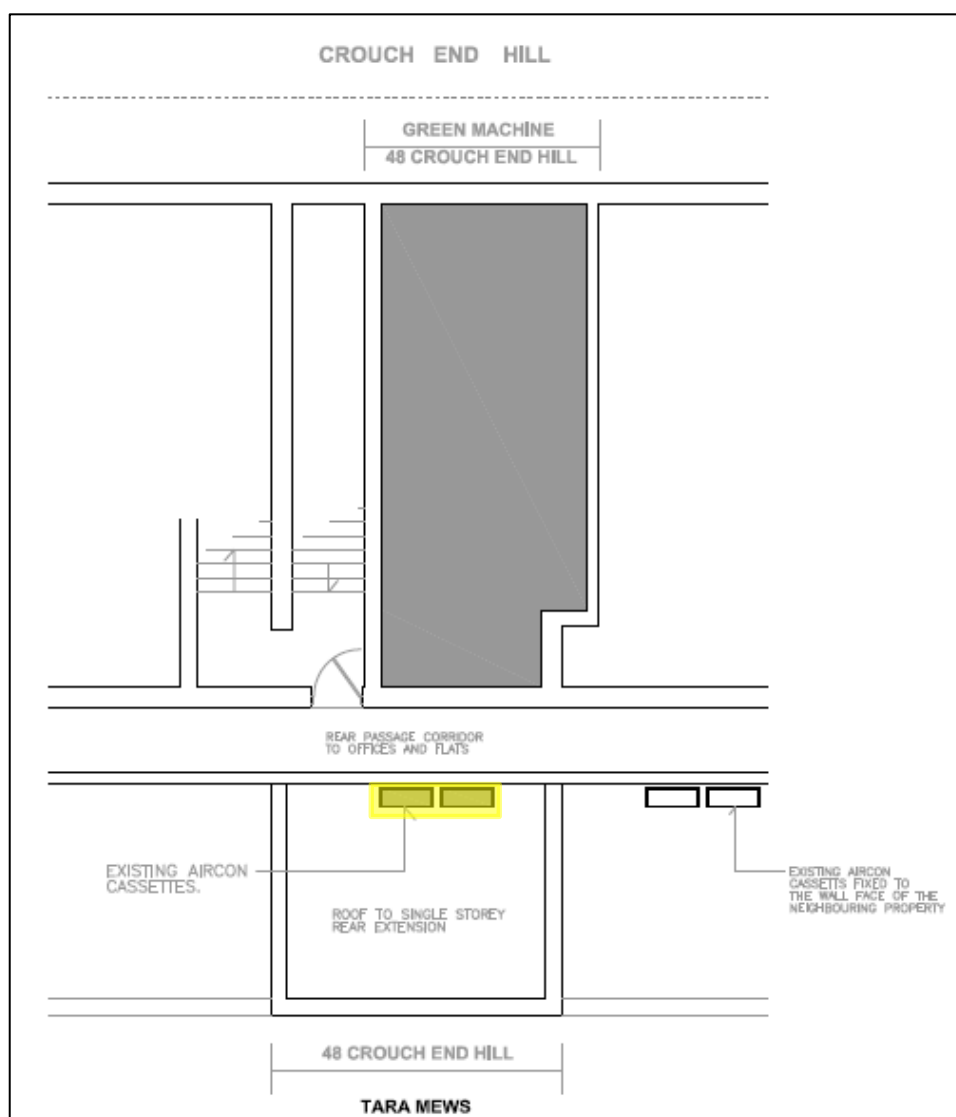


Diagram 2

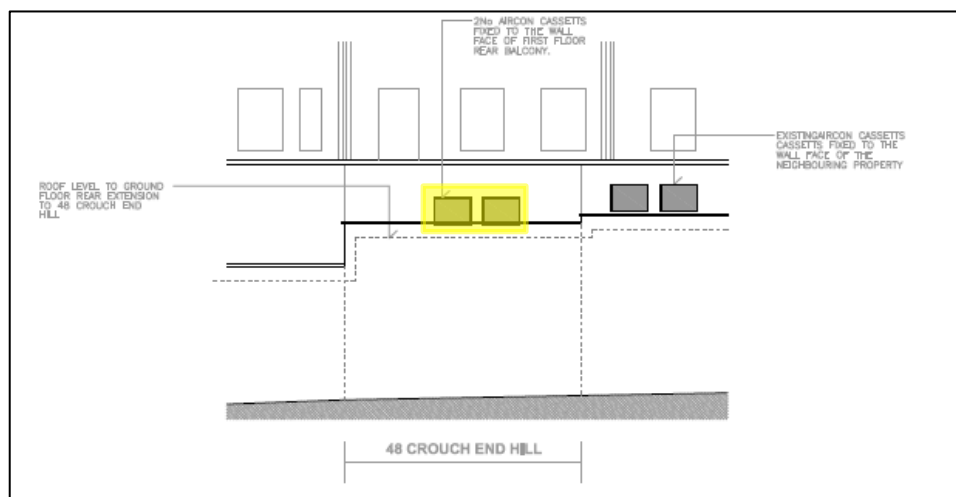


Diagram 3

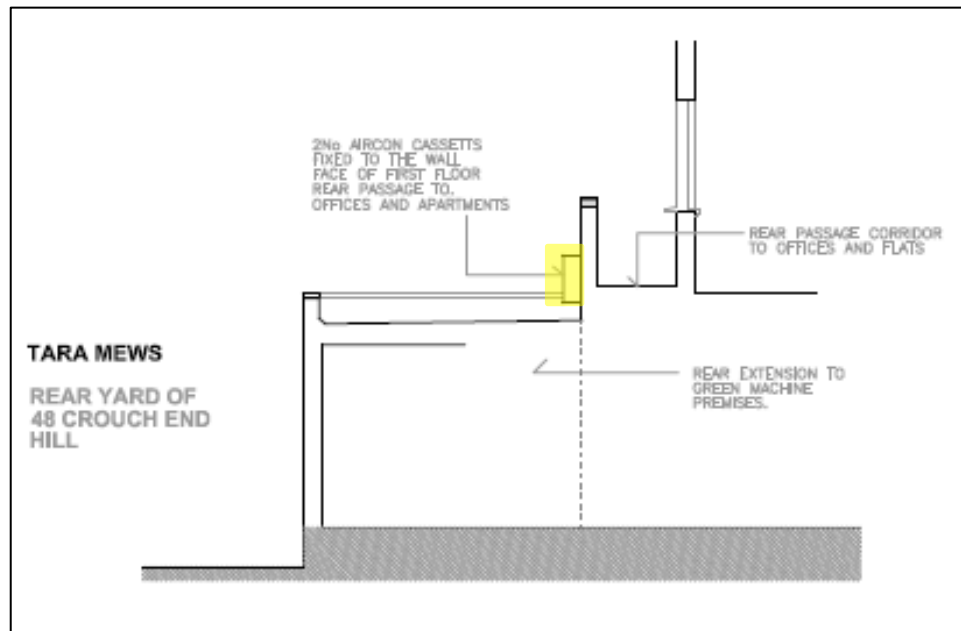


Diagram 4

- 2.5 The hours of operation of the system will be on demand during the operational hours of the café and as such could operate at any time during the period 08:00 to 18:00hrs.
- 2.6 The site is located in a mixed use area typically with ground floor commercial units with residential properties located above and the area behind the site consists of a residential cul-de-sac. The nearest noise sensitive property to the installation of plant is considered to be the upper floor front façade windows of no.5 Tara Mews.



Nearest noise
sensitive
window to
retained
condenser
units.

3. NOISE OUTLINE

- 3.1 In order to produce an environmental noise assessment, consideration must be given to the prevailing background noise in the locality of the installation.
- 3.2 Measurements of background noise were obtained over a 24 hour period at a location deemed representative of background noise levels experienced at the nearest noise sensitive façades. The data obtained during the exercise was captured at the following location. The installed units were isolated during the measurement exercise.



24hr
unattended
monitoring
location (to be
representative
of 5 Tara
Mews)

- 3.3 The particulars of the measurement exercise are recorded below. The weather conditions were considered appropriate to monitor environmental noise.

Date: 19th -20th July 2023.
Start Time: 12:00 hrs.
Location: First floor roof level, rear of 48 Crouch End Hill.

- 3.4 Minimum background and average noise levels over the trading hours of the café at the unattended monitoring location are shown in Table 1 below with the full 24 hour level vs time history shown in Diagram 3 (L_{Aeq} and L_{A90}).

Time period	Lowest $L_{A90,15min}$	Average $L_{Aeq,T}$
08:00 to 18:00hrs	44dB	52dB

Table 1

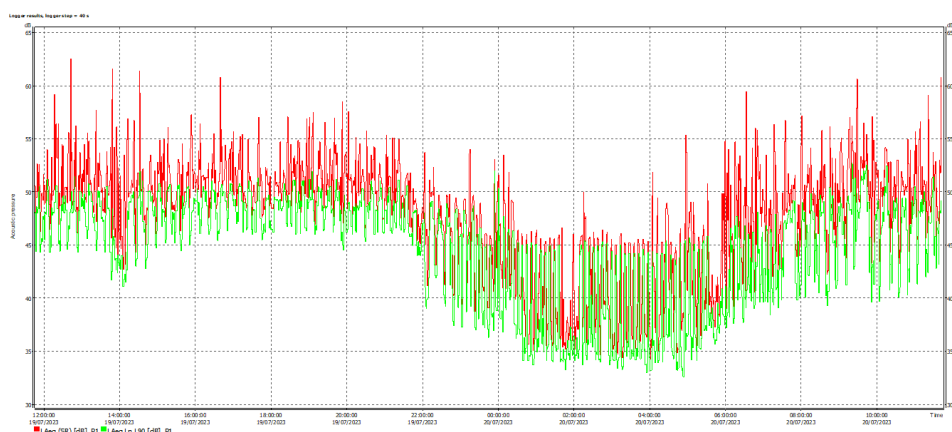


Diagram 5

4. DESIGN CRITERIA

- 4.1 Information regarding the noise levels not to be exceeded by the proposed installation was advised by the LPA (Royal Borough of Haringey).
- 4.2 A typical planning requirement relating to the installation of mechanical plant would require that:

“The criterion of the Council of The London Borough of Haringey for noise emissions of new plant states that the cumulative noise level L_{Aeq} arising from the proposed plant, measured or predicted at 1m from the façade of any residential premises shall be a rating level at least 5dB(A) below the background noise level L_{AF90} when assessed in accordance with BS4142:2014.”

- 4.3 In addition to the above, BS4142 provides an assessment method and is entitled “Methods for rating and assessing industrial and commercial sound”. The procedure contained in BS4142 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.
- 4.4 The specific sound level is converted to a rating level by adding penalties to account for either tonality or impulsivity. 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.
- 4.5 The commentary to paragraph 9.2 of BS 4142:2014+A1:2019 suggests the following subjective methods for the determination of the rating penalty for tonal, impulsive and/or intermittent specific sounds:

Intermittency

- 4.6 When the specific sound has identifiable on/off conditions, the specific sound level should be representative of the time period of length equal to the reference time interval which contains the greatest total amount of on time. If the intermittency is readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied.

Impulsivity

- 4.7 A correction of up to +9 dB can be applied for sound that is highly impulsive, considering both the rapidity of the change in sound level and the overall change in sound level. 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.

Tonality

- 4.8 For sound ranging from not tonal to prominently tonal the Joint Nordic Method gives a correction of between 0 dB and +6 dB for tonality. Subjectively, this can be converted to a rating 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.
- 4.9 If the subjective method is not sufficient for assessing the audibility of tones in sound or the prominence of impulsive sounds, BS4142:2014 suggests using the one-third octave method and/or the reference methods, as appropriate.
- 4.10 The $\frac{1}{3}$ octave method tests for the presence of a prominent, discrete-frequency spectral component (tone) and typically compares the $L_{Zeq,T}$ sound pressure level averaged over the time when the tone is present in a $\frac{1}{3}$ octave band with the time-average linear sound pressure levels in the adjacent $\frac{1}{3}$ octave bands. For a prominent, discrete tone to be identified as present, the time-averaged sound pressure level in the $\frac{1}{3}$ octave band of interest is required to exceed the time-averaged sound pressure levels of both adjacent $\frac{1}{3}$ octave bands by some constant level difference. The level differences between adjacent $\frac{1}{3}$ octave bands that identify a tone are:
- 15 dB in the low-frequency one-third-octave bands (25Hz to 125Hz);
 - 8 dB in the middle-frequency one-third-octave bands (160Hz to 400Hz); and
 - 5 dB in the high-frequency one-third-octave bands (500Hz to 10,000Hz).

Other Sound Characteristics

- 4.11 Where the specific sound features characteristics that are neither tonal nor impulsive, nor intermittent, though otherwise are readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied.
- 4.12 An initial estimate of the impact of the specific sound is obtained by subtracting the measured background sound level from the rating level of the specific sound. In the context of the Standard, adverse impacts include, but are not limited to, annoyance and sleep disturbance. Typically, the greater this difference, the greater is 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.*
 - *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.*
- 4.13 The background noise levels were assessed using statistical analysis of the measured data, as directed in BS4142. The histogram trading period 08:00 to 18:00 can be seen in Diagram 6.

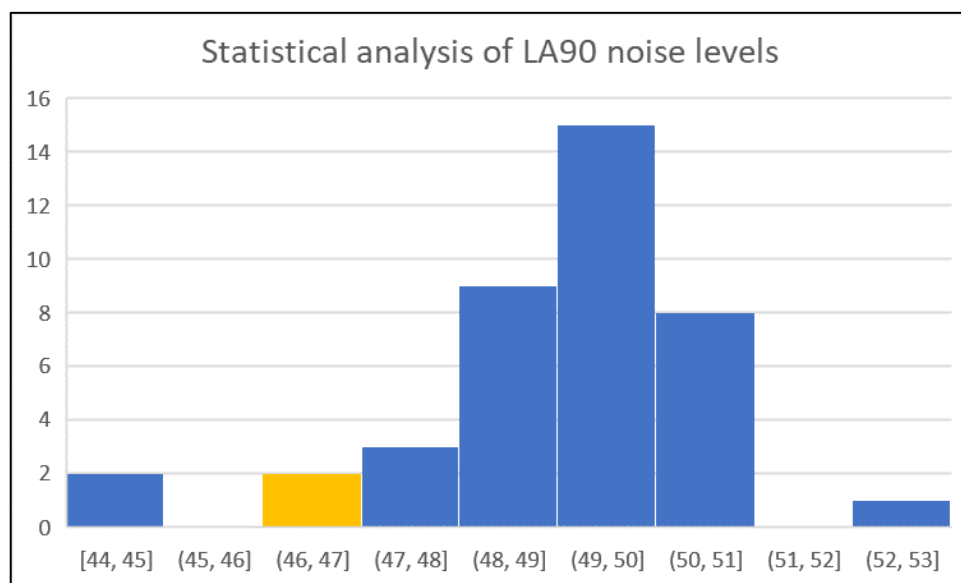


Diagram 6

- 4.14 The background noise level varied during the measurement period. The background noise was dominated by existing neighbouring installations of mechanical plant (see Figures 6, 11 & 12). The statistically most commonly occurring daytime background noise level was L_{A90} 49dB. In this instance a background noise level of L_{A90} 46dB is deemed indicative of the background noise level during the proposed trading hours of the café (08:00 to 18:00).
- 4.15 Based on the foregoing, the plant noise emission criteria that should not be exceeded is shown in Table 2 below. This level should not be exceeded at the nearest noise sensitive façade and is indicative of being 5dB less than the evaluated background noise. At such a level, there is an indication that the specific sound source will have a low impact.

Noise emission limit for mechanical plant
$L_{Aeq} \leq 41\text{dB}$

Table 2

5. EQUIPMENT

- 5.1 All background noise measurements were obtained using the following equipment:
- Svantek 971 Class 1 Serial No. 51704
 - Rion Calibrator Type NC-74 Class 1 Serial No. 00410215
- 5.2 The relevant equipment carries full and current traceable calibration. The equipment, where necessary, was calibrated prior to and after the measurements were carried out.

6. CALCULATIONS

- 6.1 In order to predict the noise impact of the operation of the condensers, consideration has been given to noise egress to the nearest noise sensitive façade using point source propagation. The cumulative noise level has been calculated on the assumption that it is feasible that both units could be operational simultaneously.
- 6.2 The installed condensers that will provide cooling/heating have been noted as follows. The sound output data sheet is contained within the appendix section of this report.
- a) 1no. Mitsubishi SRC25ZSP-W - 47dBA (cooling) & 45dBA (heating) @ 1m.
b) 1no. Mitsubishi SRC45ZSP-W - 51dBA (cooling) & 51dBA (heating) @ 1m.
- 6.3 A worst case noise output level during the cooling operation has been assessed during the calculation exercises.
- 6.4 Noise leaving the condensers was propagated over a distance of 10m and 11m, a position 1m in front of the nearest noise sensitive façade at the front of no.5 Tara Mews.

Noise impact condenser 1	L _p dBA
1no. Mitsubishi SRC25ZSP-W (cooling)	47dBA @ 1m
Distance attenuation (10m)	-20dB [20Log(10/1)]
Reflective plane correction (wall behind)	+3dB
Acoustic character correction (Other sound characteristic)	+3dB
Noise level at nearest noise sensitive façade	33 dBA

Table 3

Noise impact condenser 2	L _p dBA
1no. Mitsubishi SRC45ZSP-W (cooling)	51dBA @ 1m
Distance attenuation (11m)	-21dB [20Log(11/1)]
Reflective plane correction (wall behind)	+3dB
Acoustic character correction (Other sound characteristic)	+3dB
Noise level at nearest noise sensitive façade	36 dBA

Table 4

Noise impact condensers 1 & 2 combined	L _p dBA
1no. Mitsubishi SRC25ZSP-W (cooling), Table 3	33 dBA
1no. Mitsubishi SRC45ZSP-W (cooling), Table 4	36 dBA
Combined noise impact at no.5 Tara Mews	38 dBA

Table 5

- 6.5 In order to comply with the requirements of the LPA, any noise from the installation of mechanical plant should not exceed a level of 41 dBA at 1m from the nearest noise sensitive façade.
- 6.6 The calculated cumulative noise impact is 38 dBA. The calculation exercise (Tables 3-5) demonstrates that the installation meets the LPA criteria.

7. CONCLUSION

- 7.1 The foregoing assessment indicates that retaining the installation of mechanical plant should not result in a noise impact greater than L_{Aeq} 38dB at the nearest noise sensitive property. At such a level, there is an indication that the specific sound source will have a low impact and would meet the Royal Borough of Haringey's planning requirements.
- 7.2 If alternative operational hours were to be chosen, the noise impact should be checked prior to proceeding to ensure that the installation would still meet the requirements imposed by the LPA.

Figures

48 Crouch End Hill, London, N8 8AA



Figure 1



Figure 2



Figure 3



Figure 4



Figure 5



Figure 6



Figure 7



Figure 8



Figure 9



Figure 10



Figure 11



Figure 12

Appendix A

(2) Sound pressure level

(a) Rated capacity value

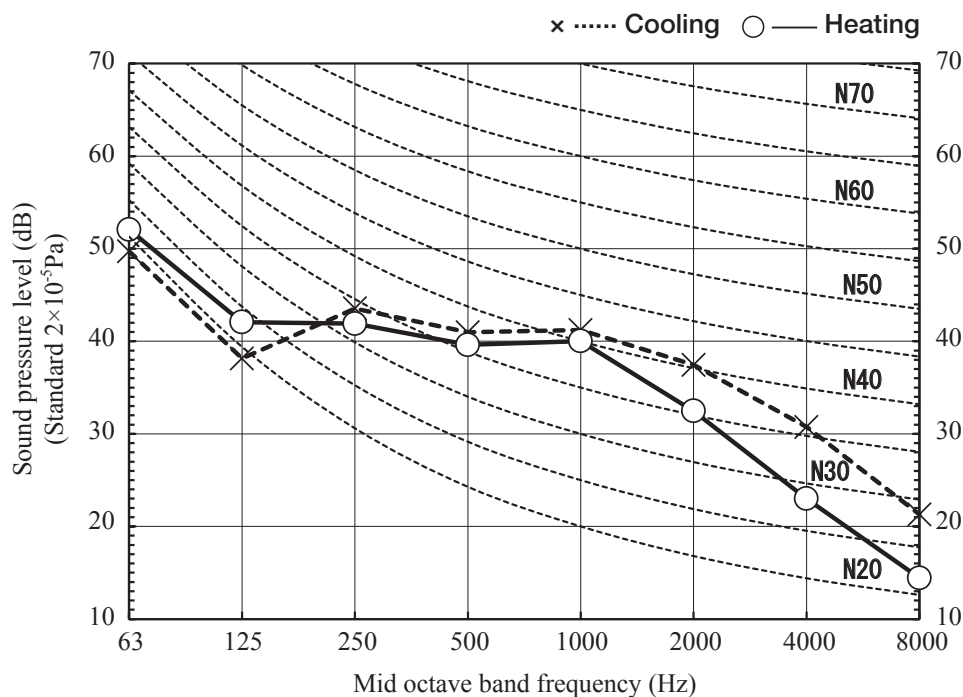
Model SRK25ZSP-W

(Indoor unit)

Model	SRK25ZSP-W	
Noise level	Cooling	45 dB(A)
	Heating	43 dB(A)

Condition	ISO5151 T1/H1
MODE	Rated capacity value (Hi)

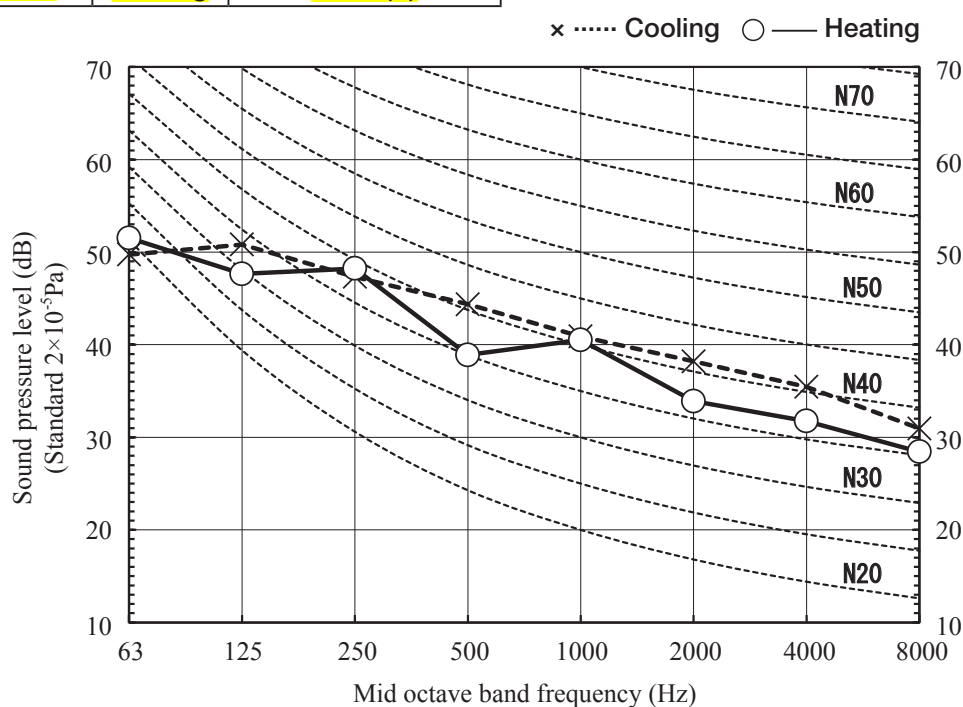
● Mike position



(Outdoor unit)

Model	SRC25ZSP-W	
Noise level	Cooling	47 dB(A)
	Heating	45 dB(A)

● Mike position: at highest noise level in position as mentioned below
Distance from front side 1m



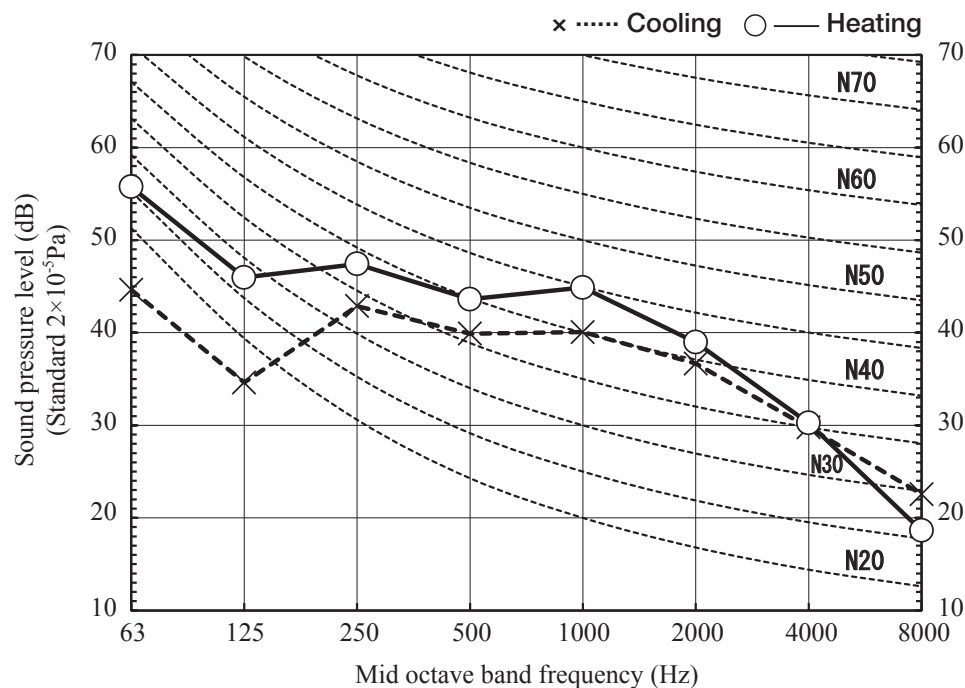
Model SRK45ZSP-W

(Indoor unit)

Model	SRK45ZSP-W	
Noise level	Cooling	44 dB(A)
	Heating	48 dB(A)

Condition	ISO5151 T1/H1
MODE	Rated capacity value (Hi)

● Mike position



(Outdoor unit)

Model	SRC45ZSP-W	
Noise level	Cooling	51 dB(A)
	Heating	51 dB(A)

● Mike position: at highest noise level in position as mentioned below
Distance from front side 1m

