NOISE IMPACT ASSESSMENT OF THE INSTALLATION OF THE PROPOSED AIR CONDITIONING SYSTEM

Client Name:	Jason Freeman
Client Address:	178a Sutherland Avenue London W9 1HR
Site Address:	178a Sutherland Avenue London W9 1HR
Date:	25/11/2021

www.novaacoustics.co.uk
info@novaacoustics.co.uk
0113 322 7977

Authorisation and Version Control	
Report Prepared By	Mr A Garcigoy, MSc, MIOA
Report Checked By	Mr P Soler, BEng, MIOA, MIET
Report Approved By	Mr A T Martin, MSc, MIOA, MCIEH, MIET, MInstSCE
Date	25/11/2021
Project Number	6820JF
Version Reference	01

Disclaimer

The opinions and interpretations presented in this report represent our best technical interpretation of the data made available to us. However, due to uncertainty inherent in the estimation of all parameters, we cannot, and do not guarantee the accuracy or correctness of any interpretation and we shall not, except in the case of gross or wilful negligence on our part, be liable or responsible for any loss, cost, damages or expenses incurred or sustained by anyone resulting from any interpretation made by any of our officers, agents or employees. The findings and opinions expressed are relevant to the dates of the site works and should not be relied upon to represent conditions at substantially later dates. If additional information becomes available which may affect our comments, conclusions or recommendations, the author reserves the right to review the information, reassess any new potential concerns and modify our opinions accordingly. Except for the provision of professional services on a fee basis, NOVA Acoustics Ltd does not have a commercial arrangement with any person or company involved in the interests that are the subject of this report. NOVA Acoustics Ltd cannot accept any liability for the correctness, applicability or validity for the information they have provided, or indeed for any consequential costs or losses in this regard. Our efforts have been made on a "best endeavours" basis and no responsibility or liability is warranted or accepted by NOVA Acoustics Ltd.

CONTENTS

Tables

Figures

Executive summary

An environmental noise survey and noise impact assessment have been undertaken at 178a Sutherland Avenue, London W9 1HR to assess the potential increase in noise levels from the installation of the proposed Air Conditioning system on the surrounding Noise Sensitive Receptors. The measured background sound levels have allowed a BS4142:2014 noise assessment to be carried out.

The BS4142:2014 assessment of the proposed Air Conditioning system indicates that, provided the unit/s is installed as specified within this report and the recommendations are implemented, the Rating Noise Level should be 10 dB below the background sound level. This indicates low impact in accordance with BS4142:2014 and 'No Observed Effect Level' when assessed in accordance with the NPSE and NPPF.

An overview of the recommendations can be found below:

Recommendations and Mitigation Measure Overview
- An acoustic enclosure capable of reducing the noise emissions of the unit by at least 12 dB should be installed around the unit. The proposed acoustic enclosure meets this reduction. - All mechanical plant should be fitted on appropriate anti-vibrational mounts. - The make, model and location of the external unit should not be altered. If alterations to the specification and location of the units are required further assessment may need to be undertaken.

The findings of this report will require written approval from the Local Authority prior to work commencing.

1. Introduction

Overview

NOVA Acoustics Ltd has been commissioned to prepare a noise assessment for the installation of the proposed A/C system (the Proposed Development') at 178a Sutherland Avenue, London W9 1HR ('the Site').

The applicant is preparing a planning application to be submitted ('the Application') to Westminster City Council.

The following technical noise assessment has been prepared to support the planning application to Westminster City Council. This report details the existing background sound climate at the nearest receptors, as well as the sound emissions associated with the Proposed Development.

This noise assessment is necessarily technical in nature; therefore, a glossary of terms is included in Appendix A to assist the reader.

Scope & Objectives

The scope of the noise assessment can be summarized as follows:

- Baseline sound monitoring survey to evaluate the prevailing background sound levels at the nearest sensitive receptor ('NSR') to Site;
- Detailed acoustic calculation and analysis in accordance with; ISO9613 – 1 ISO 9613-2 - Attenuation of sound during propagation outdoors prediction methodology, to predict sound levels at the NSR;
- A detailed assessment of the suitability of the Site, in accordance with relevant standards in respect of sound from the proposed sources; and
- Recommendation of mitigation measures, where necessary, to comply with the requirements of the National Planning Policy Framework (2019), Noise Policy Statement for England (2010) and British Standard BS 4142:2014+A1:2019 - Methods for rating and assessing industrial and commercial sound. Further information on the legislation can be found in Appendix B.

Local Policy Guidance (Westminster)

The Local Authority states that *'(…) the predicted noise level outside the most affected window will comply with the limits stated in our standard conditions. As a guideline, these limits are normally 10 dB below the lowest background LA90 (15mins). (…)'.*

2. Environmental Noise Survey

Measurement Methodology

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 the 17/11/2021 to 18/11/2021. The monitoring position was chosen in order to collect representative sound levels at the NSR during the typical operational periods of the proposed development. The sound level meter was positioned on a column at approximately 2m above the ground and 1m away from the façade. The monitoring location is shown in Figure 1.0.

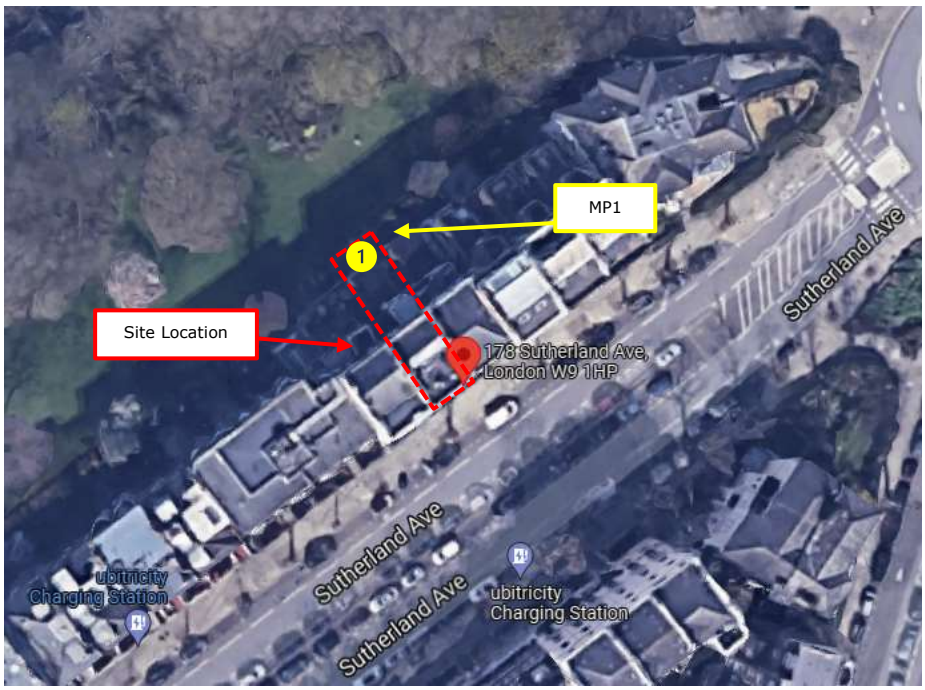


Figure 1.0 - Indicative Site Location

Figure 2.0 - Indicative Site Wide Layout

Figure 3.0 - Indicative Site Close-up Layout

Context & Subjective Impression

The area surrounding the site is primarily a quiet residential area in central London. To the south-east of the site runs Sutherland Road, which facilitates light to moderate levels of traffic flow. Four and five storey period residential units are situated along the road. To the rear of the property, we find a common garden area with light levels of noise. The noise profile of the area is dominated by traffic and other noise sources secondary in nature e.g. activity in the garden.

Environmental Noise Survey Results

The proposed plant may operate at any time. The table below outlines the background sound levels, during the operational period of the plant, that will be used as the baseline for the noise assessment. Further summary results for the entire measurement period can be found in Appendix D.

Measurement Position MP1				
Measurement Period ('t')	**$L_{A90,15min}$**	***SMR $L_{A90,15min}$**	**Min. $L_{A90,15min}$**	**Max. $L_{A90,15min}$**
Night 1 – 17/11/2021 – 23:00 – 06:59	38.0	39.0	36.0	44.0

Table 1.0 – Background Sound Level Summary Results

**Statistically Most Repeated*

As can be seen in the table above the lowest measured $L_{A90,15min}$ value is 36 dB. The range of measured background sound levels is moderate and as such, the lowest measured $L_{A90,15min}$ value is deemed 'Typical' and, in accordance to the Local Policy, will be used in the following analysis providing a robust assessment

3. BS4142:2014 Noise Assessment

The following section of the report analyses the expected impact from the noise emissions associated with the proposed Air Conditioning system The following equipment is to be installed:

Plant Equipment	Specific Noise Level @ 1m	NSR	Distance to NSR	Shield*[1]	Specific Noise Level at NSR*[2]	Acoustic Feature Correction *[3]
Daikin RXM35	49.0	1	3.5m	5.0	33.0	Tonality +2 Intermittency +3
		2	6.0m	0.0	33.0	
Cumulative Rating Noise Level $L_{AR,TR}$ @ NSR1				38.0 dB		
Cumulative Rating Noise Level $L_{AR,TR}$ @ NSR2				38.0 dB		

Table 2.0 – Plant Noise Emissions

[1] A shielding correction is applicable as a solid body e.g. balcony blocks the line of sight between the noise of source and the NSR.

[2] The noise level at the NSR has been calculated using the following equation 20log(r1/r2).

[3] The new source cannot be measured because it is only proposed, but the characteristics of similar sources can subjectively be assessed. Typically, the unit will switch on and off during the operational period, meaning the noise emissions will be intermittent. A penalty must also be added for perceptible tonality.

The BS4142 Assessment of the proposed Air Conditioning unit is outlined in the table below.

Results	NSRs Sound Level (dB)	Notes
Rating Sound Level	38.0	Acoustic feature corrections as shown in Table 2.0.
Background Sound Level	36.0	As shown in Table 1.0
Excess over Background Sound Level	+2.0	The assessment indicates; Negilgible Impact, Dependant on Context
Excess over Local Policy	+12.0	--

Table 3.0 – BS4142:2014 Noise Assessment

Discussion

The assessment above indicates that the rating level is above the background sound level at the noise sensitive receptor by 2 dB. This indicates the potential for Negilgible Impact, Dependant on Context impact on the surrounding residential Noise Sensitive Receptors. However, the rating level is above the Local Policy criteria at the noise sensitive receptor by 12 dB.

In order to ensure the noise emissions from the proposed plant units do not cause a significant adverse impact and are compliant with Local Authority noise policy, the client is proposing an acoustic enclosure capable of reducing the noise emissions by 25 dB. The proposed mitigation would exceed the required reduction by 13 dB.

Given the outcome of the assessment, no further mitigation measures are required.

3.1 Recommendations & Mitigation

The following section outlines the mitigation measures that are necessary to reduce the impact of the proposed Air conditioning unit.

- An acoustic enclosure capable of reducing the noise emissions of the unit by at least 12 dB should be installed around the unit. The proposed acoustic enclosure meets this reduction.
- All mechanical plant should be fitted on appropriate anti-vibrational mounts.
- The make, model and location of the external unit should not be altered. If alterations to the specification and location of the units are required further assessment may need to be undertaken.

Appendix A – Acoustic Terminology

Sound Pressure	Sound, or sound pressure, is a fluctuation in air pressure over the static ambient pressure.
Sound Pressure Level (Sound Level)	The sound level is the sound pressure relative to a standard reference pressure of 20μPa (20x10-6 Pascals) on a decibel scale.
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 log10 (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.
A-weighting, dB(A)	The unit of sound level, weighted according to the A-scale, which takes into account the increased sensitivity of the human ear at some frequencies.
Noise Level Indices	Noise levels usually fluctuate over time, so it is often necessary to consider an average or statistical noise level. This can be done in several ways, so a number of different noise indices have been defined, according to how the averaging or statistics are carried out.
$L_{eq,T}$	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 during the period T. Lmax is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall Leq noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
$L_{90,T}$	A noise level index. The noise level exceeded for 90% of the time over the period T. L90 can be considered to be the "average minimum" noise level and is often used to describe the background noise.
$L_{10,T}$	A noise level index. The noise level exceeded for 10% of the time over the period T. L10 can be considered to be the "average maximum" noise level. Generally used to describe road traffic noise.
Free-Field	Far from the presence of sound reflecting objects (except the ground), usually taken to mean at least 3.5m
Facade	At a distance of 1m in front of a large sound reflecting object such as a building façade.
Fast Time Weighting	An averaging time used in sound level meters. Defined in BS 5969.

In order to assist the understanding of acoustic terminology and the relative change in noise, the following background information is provided. The human ear can detect a very wide range of pressure fluctuations, which are perceived as sound. In order to express these fluctuations in a manageable way, a logarithmic scale called the decibel, or dB scale is used. The decibel scale typically ranges from 0 dB (the threshold of hearing) to over 120 dB. An indication of the range of sound levels commonly found in the environment is given in the following table.

Sound Level	Location
0dB(A)	Threshold of hearing
20 to 30dB(A)	Quiet bedroom at night
30 to 40dB(A)	Living room during the day
40 to 50dB(A)	Typical office
50 to 60dB(A)	Inside a car
60 to 70dB(A)	Typical high street
70 to 90dB(A)	Inside factory
100 to 110dB(A)	Burglar alarm at 1m away
110 to 130dB(A)	Jet aircraft on take off
140dB(A)	Threshold of Pain

The ear is less sensitive to some frequencies than to others. The A-weighting scale is used to approximate the frequency response of the ear. Levels weighted using this scale are commonly identified by the notation dB(A).

In accordance with logarithmic addition, combining two sources with equal noise levels would result in an increase of 3 dB(A) in the noise level from a single source. A change of 3 dB(A) is generally regarded as the smallest change in broadband continuous noise which the human ear can detect (although in certain controlled circumstances a change of 1 dB(A) is just perceptible). Therefore, a 2 dB(A) increase would not be normally perceptible. A 10 dB(A) increase in noise represents a subjective doubling of loudness.

A noise impact on a community is deemed to occur when a new noise is introduced that is out of character with the area, or when a significant increase above the pre-existing ambient noise level occurs.

For levels of noise that vary with time, it is necessary to employ a statistical index that allows for this variation. These statistical indices are expressed as the sound level that is exceeded for a percentage of the time period of interest. In the UK, traffic noise is measured as the L_{A10}, the noise level exceeded for 10% of the measurement period. The L_{A90} is the level exceeded for 90% of the

time and has been adopted to represent the background noise level in the absence of discrete events. An alternative way of assessing the time varying noise levels is to use the equivalent continuous sound level, L_{Aeq}.

This is a notional steady level that would, over a given period of time, deliver the same sound energy as the actual fluctuating sound. To put these quantities into context, where a receiver is predominantly affected by continuous flows of road traffic, a doubling or halving of the flows would result in a just perceptible change of 3 dB, while an increase of more than 25%, or a decrease of more than 20%, in traffic flows represent changes of 1 dB in traffic noise levels (assuming no alteration in the mix of traffic or flow speeds).

Note that the time constant and the period of the noise measurement should be specified. For example, BS4142:2014 specifies background noise measurement periods of 1 hour during the day and 15 minutes during the night. The noise levels are commonly symbolised as $L_{A90,1hour}$ dB and $L_{A90,15mins}$ dB. The noise measurement should be recorded using a 'FAST' time response equivalent to 0.125ms

Appendix B – Legislation, Policy and Guidance

This report is to be primarily based on the following legislation, policy and guidance.

B.1 - National Planning Policy Framework (2019)

Government policy on noise is set out in the National Planning Policy Framework (NPPF), published in 2019. This replaced all earlier guidance on noise and places an emphasis on sustainability. In section 15, Conserving and enhancing the natural and local environment, paragraph 170e, it states:

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. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans;

Paragraph 180 states:

Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

a) *Mitigate and reduce to a minimum potential adverse impact resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the 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; and*
c) *Limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.*

B.2 - Noise Policy Statement for England (2010)

Paragraph 180 of the NPPF also refers to advice on adverse effects of noise given in the Noise Policy Statement for England (NPSE). This document sets out a policy vision 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.

To achieve this vision the Statement identifies the following three aims:

Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- *Avoid significant adverse impacts on health and quality of life;*
- *Mitigate and minimise adverse impacts on health and quality of life;*
- *Where possible, contribute to the improvement of health and quality of life.*

In achieving these aims the document introduces significance criteria as follows:

SOAEL – Significant Observed Adverse Effect Level

This is the level above which significant adverse effects on health and quality of life occur. It is stated that "significant adverse effects on health and quality of life should be avoided while also considering the guiding principles of sustainable development".

LOAEL – Lowest Observed Adverse Effect Level

This is the level above which adverse effects on health and quality of life can be detected. It is stated that the second aim above lies somewhere between LOAEL and SOAEL and requires that: "all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also considering the guiding principles of sustainable development. This does not mean that such adverse effects cannot occur."

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 the noise. This can be related to the third aim above, which seeks: "where possible, positively to improve health and quality of life through the pro-active management of noise while also considering the guiding principles of sustainable development, recognising that there will be opportunities for such measures to be taken and that they will deliver potential benefits to society. The protection of quiet places and quiet times as well as the enhancement of the acoustic environment will assist with delivering this aim."

The NPSE recognises 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 and provides no guidance as to how these criteria should be interpreted. It is clear, however, that there is no requirement to achieve noise levels where there are no observable adverse impacts but that reasonable and practicable steps to reduce adverse noise impacts should be taken in the context of sustainable development and ensure a balance between noise sensitive and the need for noise generating developments.

Any scheme of noise mitigation outlined in this report will, therefore, aim to abide by the above principles of the NPPF and NPSE whilst recognizing the constraints of the site.

B.3 - British Standard BS 4142:2014+A1:2019 - Methods for rating and assessing industrial and commercial sound

Overview

BS4142:2014 sets out a method to assess the likely effect of sound from factories, industrial premises or fixed installations and sources of an industrial nature in commercial premises, on people who might be inside or outside a dwelling or premises used for residential purposes in the vicinity.

The procedure contained in BS4142:2014 for assessing the effect of sound on residential receptors is to compare the measured or predicted sound level from the source in question, the $L_{Aeq,T}$ 'specific sound level', immediately outside the dwelling with the $L_{A90,T}$ background sound level.

Where the sound contains a tonality, impulsivity, intermittency and other sound characteristics, then a correction depending on the grade of the aforementioned characteristics of the sound is added to the specific sound level to obtain the $L_{Ar,Tr}$ 'rating sound level'. A correction to include the consideration of a level of uncertainty in sound measurements, data and calculations can also be applied when necessary.

Rating Penalty

Section 9 of BS4142:2014 describes how the rating sound level should be derived from the specific sound level, by deriving a rating penalty.

BS4142:2014 states:

"Certain acoustic features can increase the significance of impact over that expected from a basic comparison between the specific sound level and the background sound level. Where such features are present at the assessment location, add a character correction to the specific sound level to obtain the rating level. This can be approached in three ways:

a) subjective method;
b) objective method for tonality;
c) reference method."

Due to the nature of the development the subjective method has been adopted to derive the rating sound level from the specific sound level. This is discussed in Section 9.2 of BS4142:2014, which states:

"Where appropriate, establish a rating penalty for sound based on a subjective assessment of its characteristics. This would also be appropriate where a new source cannot be measured because it is only proposed at that time, but the characteristics of similar sources can subjectively be assessed. Correct the specific sound level if a tone, impulse or other characteristics occurs, or is expected to be present, for new or modified sound sources."

BS4142:2014 defines four characteristics that should be considered when deriving a rating penalty, namely; tonality; impulsivity; intermittency; and other sound characteristics, which are defined as:

a) Tonality

A rating penalty of +2 dB is applicable for a tone which is "just perceptible", +4 dB where a tone is "clearly perceptible", and +6 dB where a tone is "highly perceptible".

b) Impulsivity

A rating penalty of +3 dB is applicable for impulsivity which is "just perceptible", +6 dB where it is "clearly perceptible", and +9 dB where it is "highly perceptible".

c) Other Sound Characteristics

BS4142:2014 states that where "the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distance against the residual acoustic environment, a penalty of +3 dB can be applied."

d) Intermittency

BS4142:2014 states that when the "specific sound has identifiable on/off conditions, the specific sound level ought to 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."

Background Sound Level

The background sound level is the underlying level of sound over a period, T, and is indicative of the relative quietness at a given location. It does not reflect the occurrence of transient and/or higher sound level events and is generally governed by continuous or semi-continuous sounds.

To ensure the background sound level values used within the assessment are reliable and suitably represent both the particular circumstance and periods of interest, efforts have been made to quantify a 'typical' background sound level for a given period. The purpose has not been to simply select the lowest measured value. Diurnal patterns have also been considered as they can have a major influence on background sound levels, 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.

Since the intention is to determine a background sound level in the absence of the specific sound that is under consideration, it is necessary to understand that the background sound level can in some circumstances legitimately include industrial and/or commercial sounds that are present as separate to the specific sound.

Assessment of Impact

BS4142:2014 states: "The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs". An estimation of the impact of the specific sound can be obtained by the difference of the rating sound level and the background sound level and considering the following:

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

Interpreting the guidance given in BS4142:2014, with consideration of the guidance given in the NPSE and NPPG Noise, an estimation of the impact of the rating sound is summarised in the following text:

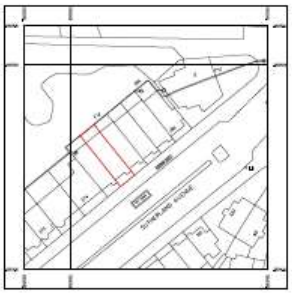
- A rating sound level that is +10 dB above the background sound level is likely to be an indication of a Significant Observed Adverse Effect Level;
- A rating sound level that is +5 dB above the background sound level is likely to be an indication of a Lowest Observed Adverse Effect Level;
- The lower the rating sound 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 sound level does not exceed the background sound level, this is an indication of the specific sound source having a negligible impact and would therefore classify as a No Observed Adverse Effect Level.

During the daytime, the assessment is carried out over a reference time period of 1-hour. The periods associated with day or night, for the purposes of the Standard, are 07.00 to 23.00 and 23.00 to 07.00, respectively.

Appendix C – Site Plans

GENERAL NOTES:

PROJECT NOTES:



LOCKSLEY
ARCHITECTS

178a Sutherland Avenue

Location Plan

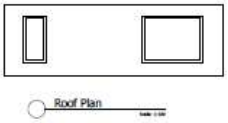
1075 | L01 | A

NORTH:

SCALE at A3:

GENERAL NOTES:

PROJECT NOTES:



Roof Plan

Ground Floor Plan

LOCKSLEY
ARCHITECTS

178a Sutherland Avenue

Proposed Plans

1075 | P01 | B

Appendix D – Environmental Survey

D.1 Tabulated Summary Noise Data

Measurement Position MP1				
Measurement Time Period ('t')	**$L_{Aeq,t}$**	**$L_{Amax,t}$**	**$L_{A90,t}$**	**$L_{A10,t}$**
Day 1 – 17/11/2021 – 14:12 – 22:59	45.0	83.0	43.0	45.0
Night 1 – 17/11/2021 – 23:00 – 06:59	41.0	59.0	38.0	44.0
Day 2 – 18/11/2021 – 07:00 – 14:09	60.0	87.0	45.0	66.0

LA90 Analysis				
Measurement Period ('t')	**$L_{A90,t}$**	**SMR $L_{A90,t}$**	**Min. $L_{A90,t}$**	**Max. $L_{A90,t}$**
Day 1 – 17/11/2021 – 14:12 – 22:59	43.0	41.0	39.0	43.0
Night 1 – 17/11/2021 – 23:00 – 06:59	38.0	39.0	36.0	44.0
Day 2 – 18/11/2021 – 07:00 – 14:09	45.0	43.0	41.0	56.0

Noise Survey Time History

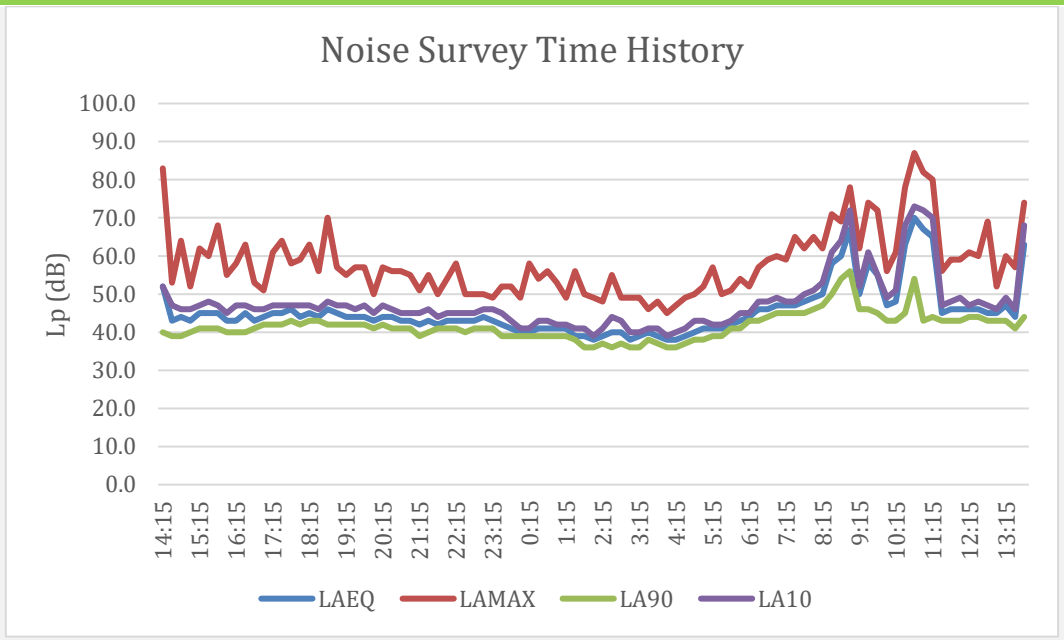


Table 4.0 – Sound Survey Summary Results

D.2 Surveying Equipment

Piece of Equipment	Serial No	Calibration Deviation
CESVA SC420 Class 1 Sound level meter	T250680	≤0.5
CESVA CB006 Class 1 Calibrator	902441	

Table 5.0 – Measurement Equipment

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. Calibration certificates can be provided upon request.

D.3 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 – Shepherd's Bush – Askew Weather Station				
Time period	Air temp (^{0}C)	Rainfall mm/h	Prevailing Wind Direction	Wind Speed (m/s)
17/11/2021 – 00:00 – 23:59	5.8 – 13.7	0.0 – 1.2	SSE	0.0 – 1.5
18/11/2021 – 00:00 – 23:59	5.5 – 14.1	0.0	S	0.0 – 1.75

Table 6.0 – Weather Summary

Appendix E – Technical Datasheets

environ™
Tel: 0870 383 3344
www.environ.co.uk

SELECTION MATRIX

environlite T12-865
Acoustic enclosures for Split AC Unit Applications

24 May 2018

CUSTOMER:	SITE / LOCATION / REFERENCE

ORIGINAL EQUIPMENT MANUFACTURERS PUBLISHED DATA					
MAKE, MODEL, DIMENSIONS, AIR FLOW & SOUND PRESSURE LEVEL @1.0M FREE FIELD					
MAKE:		MODEL:		AIR IN	AIR OUT
Daikin		RXM35		Rear & 1 Side	Front
WIDTH (MM)	DEPTH (MM)	HEIGHT (MM)	AIRFLOW (M³/S*)	SPL dB(A)	DISTANCE (M)
765	285	550	0.48		1

INNER CUBE DIMENSIONS		
950	400	800
WIDTH (MM)	DEPTH (MM)	HEIGHT (MM)
0.45	1.0	0
AIRFLOW (M³/S*)	DISTANCE (M)	SPL dB(A)

ENCLOSURE DETAIL		
1550	950	885
WIDTH (MM)	DEPTH (MM)	HEIGHT (MM)
0.45	1.0	-25
AIRFLOW (M³/S*)	DISTANCE (M)	SPL dB(A)

INLET AIRWAYS		
800	250	1
WIDTH (MM)	HEIGHT (MM)	NO.

DESIGN CRITERIA		
OK	OK	OK
UNIT SIZE	OUTLET	INLET

OUTLET AIRWAYS		
250	800	1
WIDTH (MM)	HEIGHT (MM)	NO.

AIRFLOW INFORMATION		
6	2.3	2.3
PD (MM*)	OUTLET (M/S*)	INLET (M/S*)

Select Inlet & Outlet Airway Sizes to ensure Airflows are kept below 6.0m/s

ENCLOSURE INFORMATION	WIDTH (MM)	DEPTH (MM)	HEIGHT (MM)
INLET AIRWAY	250		800
OUTLET AIRWAY	250		800
INDICATIVE EXTERNAL SIZE	1550	950	885
SOUND LEVEL RANGE @ 1.0m (Free Field)	-25	SPL dB(A) SOUND PRESSURE	

NOTES CONCERNING ENCLOSURE DESIGN

Enclosure 65kg
Estimated air flow

Specifications Table for RXM-M

					RXM20M2V1B	RXM25M2V1B	RXM35M2V1B	RXM42MV1B	RXM42M2V1B	RXM50MV1B	RXM50M2V1B	RXM60M2V1B	RXM71M2V1B
Dimensions	Unit		Height	mm	550	550	550	735	735	735	735	735	734
			Width	mm	765	765	765	825	825	825	825	825	870
			Depth	mm	285	285	285	300	300	300	300	300	320
Weight	Unit			kg	32	32	33	47	47	44	47	44	56
Compressor	Type				Hermetically sealed swing compressor	Hermetically sealed swing compressor	Hermetically sealed swing compressor		Hermetically sealed swing compressor	Hermetically sealed swing compressor	Hermetically sealed swing compressor	Hermetically sealed swing compressor	Hermetically sealed swing compressor
Operation range	Cooling	Ambient	Min.	°CDB				-10					
			Max.	°CDB				46					
	Heating	Ambient	Min.	°CWB				-15					
			Max.	°CWB				18					
Sound pressure level	Cooling		High	dBA	44	46	49	48		49		49	
			Nom.	dBA					48		48		47
			Low	dBA						44		44	
	Heating		High	dBA	47	47	49	48		49		49	
			Nom.	dBA					48		49		48
			Low	dBA						46		46	