NOISE IMPACT ASSESSMENT

88A Cleveland Street, London, W1T 6NJ

8th August 2024

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1.0 INTRODUCTION

DAA Group has been appointed to carry out a Noise Impact Assessment at 88A Cleveland Street, London, W1T 6NJ to support Planning Application for the installation of air conditioning.

- National Planning Policy Framework 2021 (NPPF)
- National Planning Practice Guidance (NPPG)
- The London Plan 2021

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 July 2021.

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 2015.

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**
  - 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**
  - 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.

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 BRISTISH STANDARD BS 4142:2014

British Standard 4142: 2014 'Methods for rating and assessing industrial and commercial sound' [BS 4142] is typically used when a new noise generating development is introduced close to noise sensitive receptors. Guidance is given for new noise sensitive developments close to existing noise generating activities is Section 8.5 of BS4142:2014 as follows: "Introduction of a new noise-sensitive receptor Measure the background sound at the intended location of any new noise-sensitive receptor(s) in the absence of any specific sound.

Where a new noise-sensitive receptor is introduced and there is existing industrial and/or commercial sound, it ought to be recognized that the industrial and/or commercial sound forms a component of the acoustic environment. In such circumstances other guidance and criteria in addition to or alternative to this standard can also inform the appropriateness of both introducing a new noise-sensitive receptor and the extent of required noise mitigation." Based on the above guidance and the nature of existing noise levels, we would recommend that an appropriate internal environment can be achieved through compliance with the Local Authority condition (with the noted legal exceptions), and the specifications given according to British Standard 8233:2014 in Section 2.5.

3.0 SITE SURVEYS

3.1 SITE DESCRIPTION

The site is located on Cleveland Street. The area is a mix of commercial and residential properties, typical for an urban cityscape environment. The dominant noise source is road noise from the surrounding roads. (See Figure 3.1)

Figure 3.1 – Proposed Site

3.2 ENVIRONMENTAL SITE SURVEY PROCEDURE

In order to characterise the sound profile of the area an environmental sound survey has been carried out from 05/08/2024 to 06/08/2024. Noise Measurements were carried out free field. The monitoring position was chosen in order to collect representative sound levels at the NSR and the location of the plant.

3.3 EQUIPMENT

Instrument manufacturer	**Rion**
Model	**NA-28**
Serial Number	**00501390**
Microphone Type	**UC-59**
Serial Number	**14934**
Calibrator	**NC-74**
Serial Number	**34504747**
Cirrus CK: 675 Outdoor Kit	

The calibration of the sound level meters was verified in-situ before any measurements were taken, using the handheld calibrator and reference tone of 114dB at 1kHz. Validation checks at the end of the survey indicated that all instruments had operated within permitted tolerances for drift and measured level.

Copies of Calibration certificates are available upon request.

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)**
05/08/2024 – 13:00 – 23:59	14 - 25	0.0	SW	6- 10
06/08/2024 – 00:00 – 13:00	15 - 21	0.0	SW	7 - 9

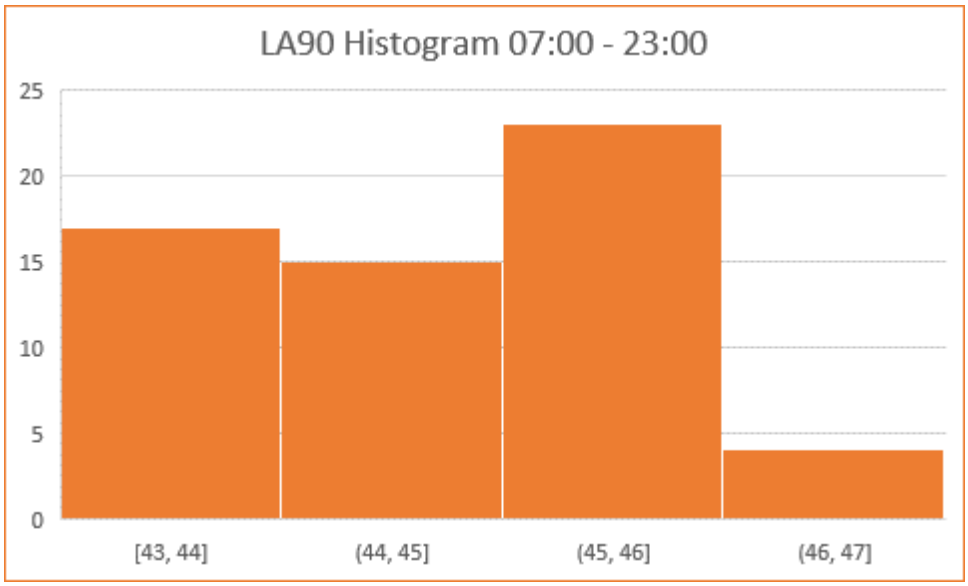
Table 3.4 – Weather Summary

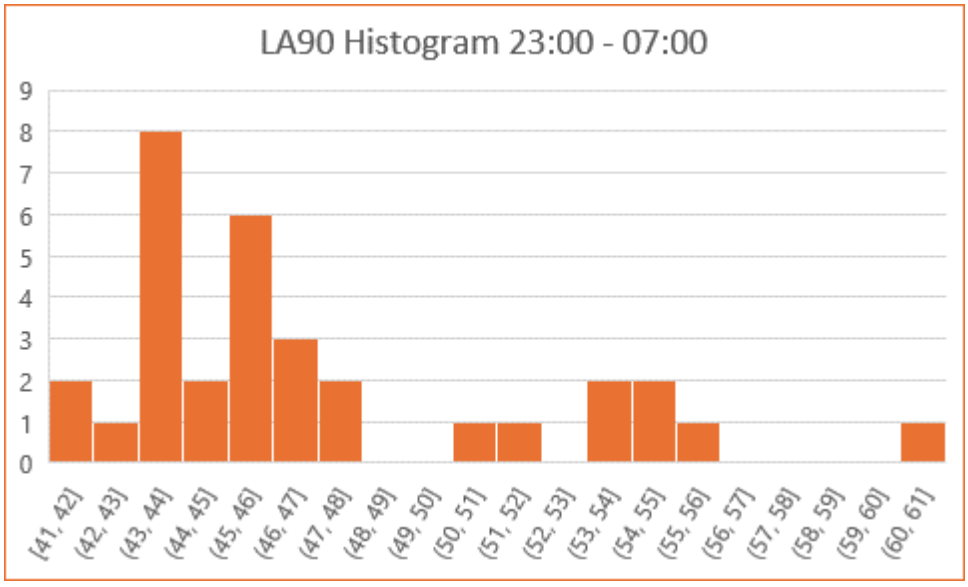
4.0 NOISE SURVEY

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	$L_{A90, 15}$
07:00 – 23.00	45dB
23:00 – 07:00	43dB

Table 4.1 Measurement Levels


LA90 Histogram 07:00 - 23:00
25
20
15
10
5
0
[43, 44]
(44, 45]
(45, 46]
(46, 47]


LA90 Histogram 23:00 - 07:00
9
8
7
6
5
4
3
2
1
0
[41, 42]
(42, 43]
(43, 44]
(44, 45]
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(46, 47]
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(55, 56]
(56, 57]
(57, 58]
(58, 59]
(59, 60]
(60, 61]

5.0 NOISE IMPACT ASSESSMENT

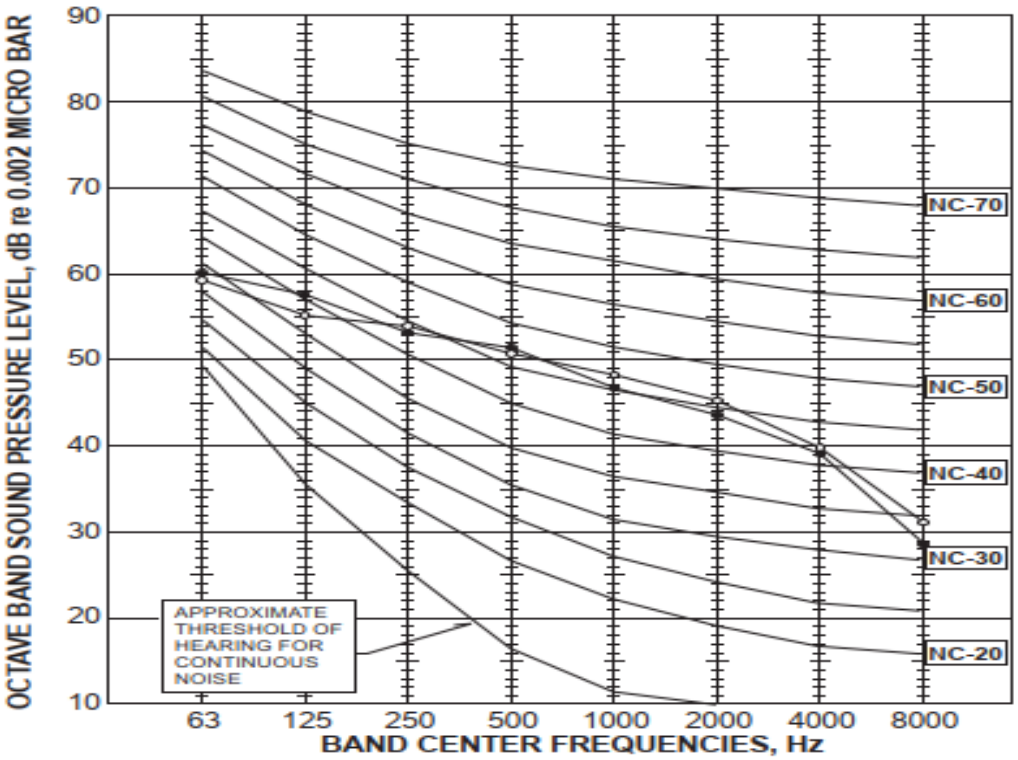
5.1 It is understood that the plant is comprised of the following units:

- 1X Mitsubishi – PUZ-SM100VKA2

The plant location is shown below in figure 5.2

Proposed Plant	SPL (dB(A))
PUZ-SM100VKA2	54

Table 5.1 – Manufacturer supplied Sound levels



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 approximately 3 metres from the plant as shown in Figure 5.2.

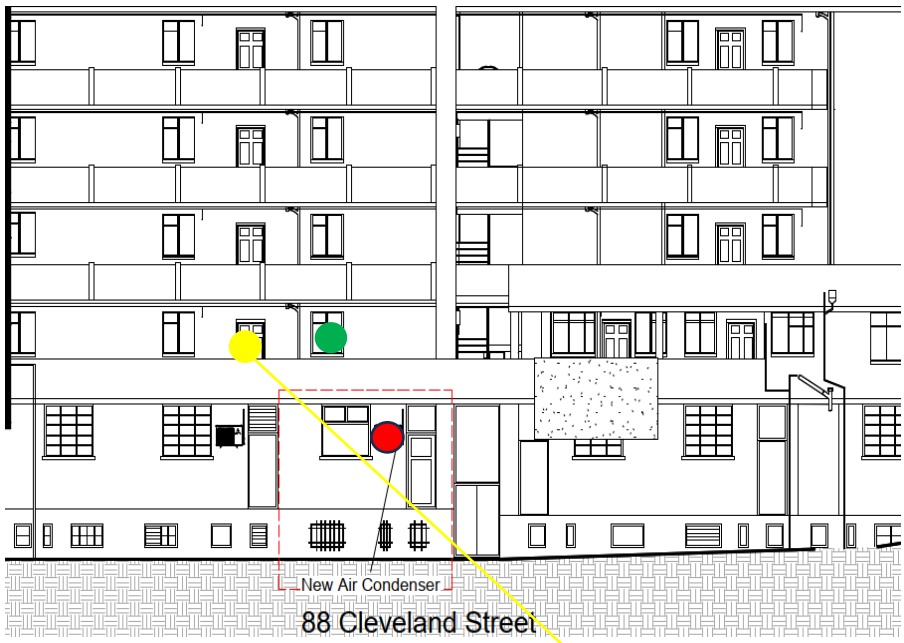
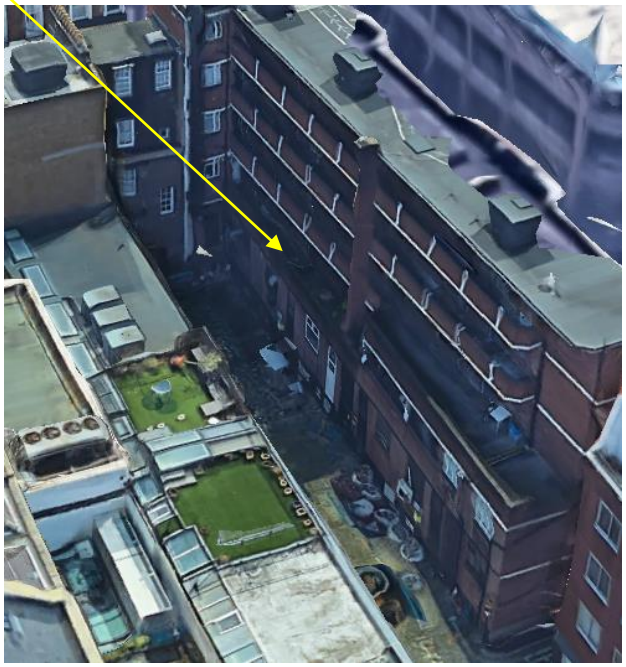


Figure 5.2 – Plant Location & NSR

	Proposed Location plant
	Nearest Residential Noise Sensitive Window
	Measurement Location



5.3 NOISE EMMISSION CRITERION

It is understood that the unit will be operating over a 24-hour period.

It is determined that the proposed unit 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
07:00 – 23.00	**35**
23:00 – 07:00	**33**

Table 5.3 - Proposed noise emissions criterion

5.4 BS4142 ASSESSMENT – 1m outside Nearest residential Window

BS4142 Noise Assessment		
Source Operating Period	Condenser Unit	
	07:00 – 23:00	23:00 – 07:00
Reference Time Interval (Tr) Element	15 minutes	
	Level (dB)	
Specific Sound Level	29	
Representative Background Noise Level (LA90)	45	43
Acoustic feature correction	3	
Rating Level	31	
Excess of Rating over Background Sound Level	-14	-12

Detailed calculations are shown in Appendix B.

5.5 MITIGATION MEASURES

BS 4142:2014 “Methods for rating and assessing industrial and commercial sound” presents a method for assessing the significance and possible adverse impact due to an industrial noise source, based on a comparison of the source noise levels, and the background noise levels, both of which are measured or predicted at a noise sensitive receiver e.g. a residential property.

The specific noise level due to the source is determined, with a series of corrections for tonality, impulsivity, intermittency or another unusual characteristic. The rating level is then compared to the background noise level and the significance of the new noise source likelihood of any adverse impact is determined in accordance with the following advice:

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

No mitigation is required.

6.0 SUMMARY AND CONCLUSIONS

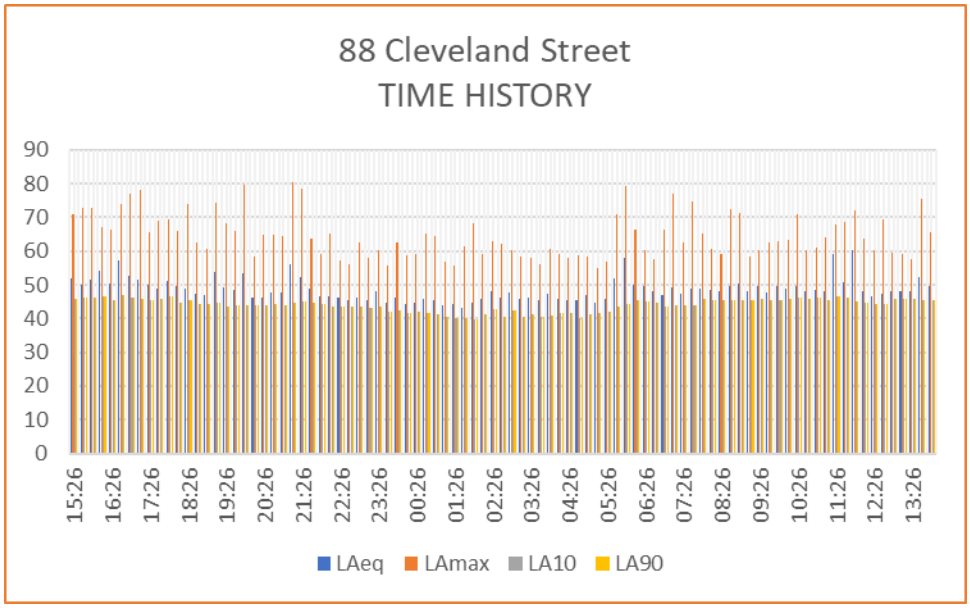
DAA Group has been appointed to carry out a Noise Impact Assessment at 88A Cleveland Street, London W1T 6NJ. The purpose of the survey was to assess the level of noise emanating from the condenser unit to the nearest residential units and to advise on the level and type of mitigation that will be required.

Manufacturer's noise data of proposed plant has been used to obtain Specific and Rated Noise Level at the nearest noise sensitive receiver in accordance with British Standard BS4142:2014+A1:2019 for compliance with Local Authority requirements.

The rating level was compared with the representative background noise level to assess the likelihood of impact considering the environmental noise context of the area as per the requirements of BS4142:2014+A1:2019.

It has been concluded that noise emissions from the plant would not have an adverse impact on the nearest residential receivers.

APPENDIX A – MEASUREMENTS



APPENDIX B - 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 C – CALCULATIONS

	88A Cleveland Street													
NOISE EMISSION CALCULATION														
ITEM	**PARAMETER**			**HZ**		**63**	**125**	**250**	**500**	**1K**	**2K**	**4K**	**8K**	**dBA**
1	**Schedule of Plant**	Qty												
2	**Mitsubishi**													
3	PUZ-SM100VKA2	1	Spl	dB	+	60	58	54	51	47	45	39	28	54
4														
5														
6	Revised Spl:	1	Spl	dB	+	60	58	54	51	47	45	39	28	54
7														
8														
9														
10														
11	Distance to nearest receptor Metres:	3		dB	-	**-10**	**-10**	**-10**	**-10**	**-10**	**-10**	**-10**	**-10**	**-10**
12	SPL=L1-20log(r/D22) r	1												
13														
14	Barier reduction			dB		15	15	15	15	15	15	15	15	15
15														
16	Spl at receptor			dB	+	35	33	29	26	22	20	14	3	29
17						0	0	0	0	0	0			
18														
19	Façade correction	3.0		dB	+	3	3	3	3	3	3	3	3	3
20	Intermittant noise correction			dB	+	0	0	0	0	0	0	0	0	0
21														
22														
23	Specific noise level at receptor			dB	+	38	36	32	29	25	23	17	6	31
24	(1m outside noise sensitive window)													
25	**Lowest Background Noise Levels:(L_{A90})**													
26	**Day Time (07:00-23:00)**													**45**
27	**Difference:** (Assessment level)			dB	-									**-14**
28														
29	**(23:00-07:00)**													**43**
30	**Difference:** (Assessment level)			dB	-									**-12**

APPENDIX D – ANTI VIBRATION

Big Foot Systems[14]

Mini Split Kit

[14] Big Foot Systems – TEL 01323 844355.