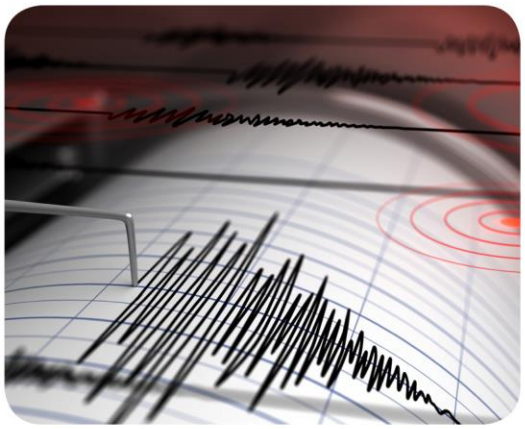

Air & Acoustic Consultants

St Mungo's

Prowse Place Recovery College

Noise Assessment

February 2020

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Noise Assessment

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St Mungo's

Prowse Place Recovery College

Noise Assessment

CONTENTS

1 Introduction

1.1 Brief

1.1.1 Air & Acoustic Consultants Limited have been commissioned by St Mungo's to undertake a Noise Assessment to support a planning application for a mixed use (Use Classes D1, B1 and A1) development.

1.2 Application Site

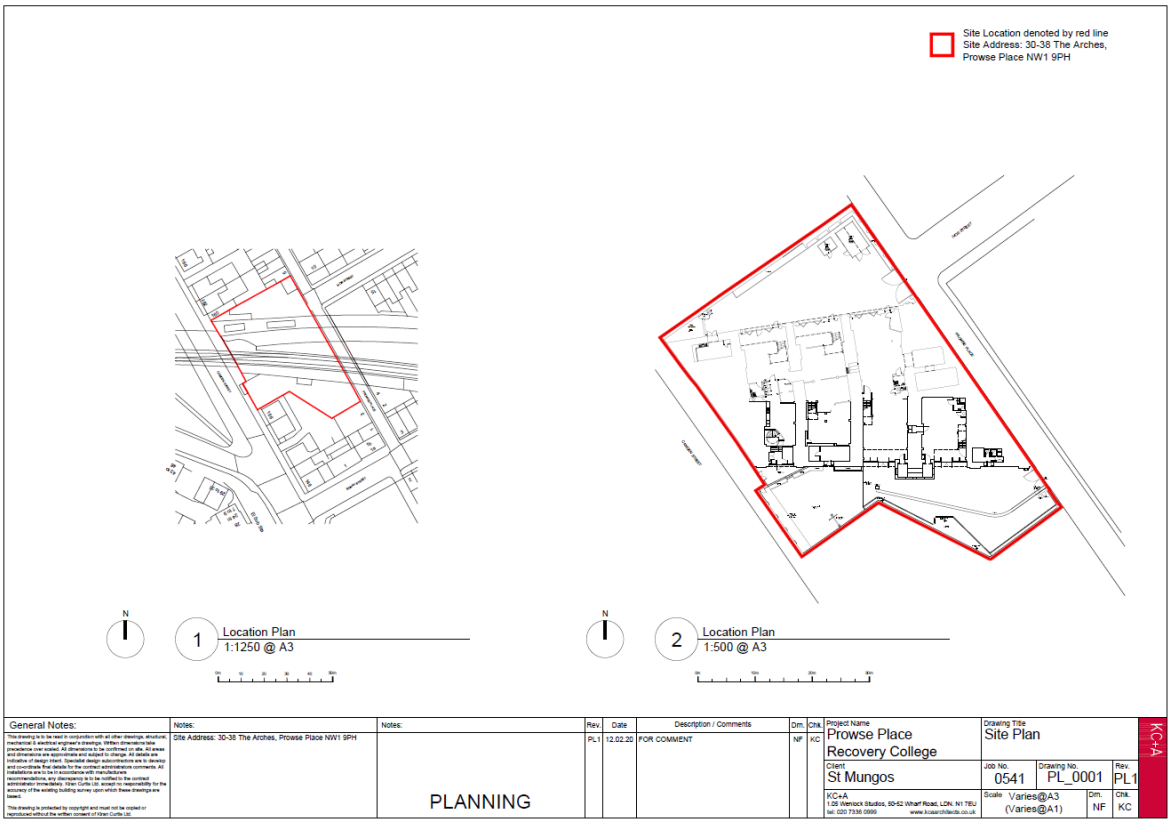
1.2.1 The Site is located is located at Arches 30-38 adjacent to 5 Prowse Place and 156 Camden Street, London, NW1 9PN and comprises of a row of double height arches beneath the London Overground line that runs east-west across the site towards Camden Road Station.

1.2.2 The Site was occupied for 10 years, (until 2018) by a Warren Evans who manufactured beds and mattresses under the current lawful use of Sui Generis, made up of a mixture of retail show rooms (Class A1), office space (Class B2) as well as some storage space (Class B8).

1.2.3 The surrounding area includes other commercial operations and existing residential properties on Prowse Place and Ivor Street.

1.2.4 The National Grid Reference for the centre of the site is, TQ 29026 84231, (British National Grid co-ordinates E: 529026, N: 184231) and the site location and surrounding area are shown in Figure 1.1.

Figure 1.1: Site Location



1.2.5 In terms of the existing noise climate around the site, during both the daytime and night-time this is dominated by noise from train use of the London Overground line but also road traffic travelling on the Camden Street, Prowse Place and Ivor Street.

1.2.6 The Environmental Noise Directive (END) requires, on a five-yearly cycle, the production of strategic noise maps. The Regulations identify Defra as the competent authority for preparing and adopting Noise Action Plans for agglomerations, major roads and major railways. An extract from the 29 March 2019 Noise Maps is provided in Figure 1.2

Figure 1.2: DEFRA Noise Action Planning Mapping

1.3 Development Proposals

1.3.1 The proposed development to which this Noise Assessment relates, is for the:

"Change of use from Sui Generis to a mixed D1, B1 and A1 use and other associated works including minor alterations to the external facades to accommodate new plant and the provision of landscaping and cycle parking."

1.3.2 The facilities that will be provided include classrooms, computer suites, event/ teaching/ mediation rooms, offices, staff facilities and storage. Part of the unit will also provide a Construction Skills facility and an ancillary Class A1 use is sought to enable the potential sale of plants.

1.3.3 AAC have been commissioned to undertake a noise impact assessment in order to predict the likely noise effects upon the existing residential amenity in the vicinity of the Site.

1.3.4 This report concerns the assessment and / or control of atmospheric noise from the proposed development affecting neighbouring noise sensitive receptors.

1.4 Assessment Scope

1.4.1 The proposed development has the potential to cause noise effects from the following sources:

- The associated construction works (minor and temporary)
- Changes in road traffic flows on the local highway network; and
- Operational noise from fixed plant and equipment.

1.4.2 The assessment considers the suitability of the Site for the proposed use with reference to the following guidance, (which are further discussed in Section 2):

- National Planning Policy Framework 2019; (NPPF);
- Planning Practice Guidance (Noise), 2014;
- Noise Policy Statement for England 2010; (NPSE);
- The World Health Organisation Guidelines for Community Noise, 1999 (WHO);
- British Standard BS: 5228-1:2009 + A1:2014, Code of Practice for Noise and Vibration Control on Construction and Open Sites;
- British Standard BS: 7445-1 ISO 1996-1, Guidance on Sound Measurement and Attenuation of Sound During Propagation Outdoors: and
- British Standard BS: 4142:2014 Methods for rating and Assessing Industrial and Commercial Sound.

1.4.3 To assist with the understanding of this report a glossary of acoustic terms is provided in Appendix A.

2 Legislation and Policy Context

2.1 Introduction

2.1.1 The prediction and assessment of the likely noise impacts of the proposed development has been considered against the relevant legislation policy and guidance regarding noise, which are discussed in turn below.

2.2 National Planning Policy Framework (NPPF), 2019

2.2.1 The NPPF sets out the Government's planning policy for England. At its heart is an intention to promote more sustainable development. The NPPF addresses noise as a planning issue primarily through the following statement, at paragraph 180:

"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 impacts 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

** for the definition of adverse impacts reference is made here to the Explanatory Note to the NPSE 2010 i.e. the observable effect levels."*

2.2.2 Paragraph 182 introduces the "Agent of Change" principal as follows:

"Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities..... Existing businesses and facilities should not have unreasonable restrictions placed upon them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'Agent of Change') should be required to provide suitable mitigation before development has been completed"

2.2.3 The NPPF refers to the Noise Policy Statement for England (NPSE) for advice on the achievement of these policy aims, and particularly in connection with the explanation of "adverse impacts."

2.3 Noise Policy Statement for England (NPSE), 2010

2.3.1 The NPSE is the overarching Government policy on noise. It seeks to clarify the underlying principles and aims in past and existing policy documents, legislation and guidance in relation to all forms of noise including environmental noise, neighbour noise and neighbourhood noise (but not noise in the workplace).

2.3.2 It uses the established concepts of No Observed Effect Level (NOEL) and Lowest Observed Adverse Effect Level (LOAEL). The NPSE extends these by introducing Significant Observed Adverse Effect Level (SOAEL). This is the level above which significant adverse effects on health and quality of life occur. However, the explanatory note to the NPSE states that it is not possible to identify a single objective value to define SOAEL for noise that is applicable to all sources of noise in all situations. It is likely to be different for different noise sources, for different receivers and at different times.

2.3.3 The NPSE's vision is 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.

This long-term vision is supported by the following aims:

- *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, through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development."*

2.3.4 The second aim of the NPSE refers to noise impacts that lie somewhere between LOAEL and SOAEL. The NPSE asserts that, while this means that all reasonable steps should be taken to mitigate and minimise adverse effects, this does not mean that such adverse effects cannot occur.

2.4 Planning Practice Guidance (Noise), 2019

2.4.1 The Government has published Planning Practice Guidance on a range of subjects including noise. The guidance forms part of the NPPF and provides advice on how to deliver its policies. The PPGN reiterates general guidance on noise policy and assessment methods provided in the NPPF, NPSE and British Standards, and contains examples of acoustic environments commensurate with various effect levels.

2.4.2 Paragraph 006 of PPGN explains that:

'The subjective nature of noise means that there is not a simple relationship between noise levels and the impact on those affected. This will depend on how various factors combine in any particular situation.'

2.4.4 The guidance contained within the PPGN provides advice on how to deliver the policies of the NPPF. The PPGN reiterates general guidance on noise policy and assessment methods provided in the NPPF, NPSE and British Standards and contains examples of acoustic environments commensurate with various effect levels. Paragraph 005 (Reference ID: 30-005-20140306) of the PPGN describes the different effect levels which are defined and briefly outlined below:

- No Observable Effect Level (NOEL);
- Lowest Observable Adverse Effect Level (LOAEL); and
- Significant Observed Adverse Effect Level (SOAEL).

2.4.5 The PPGN describes noise that is not noticeable to be at levels below the NOEL. Noise exposures in this range are below the LOAEL and no mitigation is required. The PPGN suggests that noise exposures above the LOAEL cause small changes in behaviour. Examples of noise exposures above the LOAEL provided in the PPGN are having to turn up the volume on the television; needing to speak more loudly to be heard; or, where there is no alternative ventilation, closing windows for some of the time because of the noise. In line with the NPPF and NPSE, the PPGN states that consideration needs to be given to mitigating and minimising effects above the LOAEL, but also to taking account of the economic and social benefits being derived from the activity causing the noise. The PPGN suggests that noise exposures above the SOAEL cause material changes in behaviour. Examples of noise exposures above the SOAEL provided in the PPGN are, where there is no alternative ventilation, keeping windows closed for most of the time or avoiding certain activities during periods when the noise is present. In line with the NPPF and NPSE, the PPGN states that effects above the SOAEL should be avoided and that whilst the economic and social benefits derived from the activity causing the noise must be taken into account, such exposures are undesirable.

2.4.6 The non-numeric guidance contained within the PPGN, based upon the starting point in the NPSE, is summarised in Table 2.1.

Table 2.1: Summary of Guidance from NPSE and PPGN

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

2.4.7 In line with the NPPF and the NPSE, the guidance confirms that significant adverse effects should be avoided. At the next level down in the hierarchy, where there is an observed adverse effect, the PPG(N) confirms that effects should be mitigated and reduced to a minimum (as far as reasonably practicable). No mitigation measures are required for effects that are considered to be below the lowest observed adverse effect level (LOAEL).

2.4.8 However, along with the NPSE it does not provide any numerical of definition of the NOEL, LOAEL and SOAEL.

2.4.9 The Noise Policy Statement for England refers to the World Health Organisation (WHO) when discussing noise impacts. The WHO Guidelines for Community Noise (1999) suggest guideline values for internal noise exposure which take into consideration the identified health effects and are set, based on the lowest effect levels for general populations. Guideline values for amenity which relate to external noise exposure are set at 50 or 55 dB(A), representing daytime levels below which the majority of the adult population will be protected from becoming moderately or seriously annoyed respectively.

2.5 Local Planning Policy

2.5.1 The Camden Local Plan was adopted in July 2017 and replaced the Core Strategy and Camden Development Policies documents as the basis for planning decisions and future development in the borough.

2.5.2 Policy A4 *Noise and Vibration*, states:

"Development should have regard to Camden's Noise and Vibration Thresholds (Appendix 3). We will not grant planning permission for:

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

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

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

2.5.3 Appendix 3: Noise thresholds, provides further guidance on specific noise assessments which is set out in has been provided as Appendix B.

3 Assessment Approach

3.1.1 In general, the method of prediction and assessment for each of the different noise sources associated with the proposed development, (see paragraph 1.4.1) is different. The assessment methodologies used for each element are described below.

3.1 Approach to the Assessment

3.1.1 This Noise Assessment has been undertaken by means of:

- A Review of National and Local Planning Policy;
- A review of the existing noise sources;
- A review of the development proposals;
- A qualitative assessment of potential the construction impacts;
- A quantitative assessment of the operational impacts;
- Provision of recommendations of mitigation measures, where appropriate, designed to minimise any adverse noise impacts; and
- The identification of any residual impacts resulting from the Proposed Development.

3.2 Construction Impacts

3.2.1 The development does not include any demolition or construction work and is limited to fitting out the existing structure for the new proposed use.

3.2.2 The potential adverse effects from temporary fitting out works have been considered based upon the typical type of activity, the nature of the existing structure and the location of the potential receptors. The assumptions have been based upon the experience of working on similar projects

3.3 Operational Impacts

BS4142:2014 - Methods for Rating and Assessing Industrial and Commercial Sound

3.3.1 This standard commenced on 31st October 2014, replacing BS4142:1997 Method for Rating Industrial Noise Affecting Mixed Residential and Industrial Areas. There are several changes from the previous standard especially regarding the penalties applied for acoustic features and the rating scale. The current standard can be used for assessing sound from:

- industrial and manufacturing processing;
- fixed installations which comprise mechanical and electrical plant;
- sound from loading and unloading of goods and materials at industrial and/or commercial premises; and
- Sound from mobile plant and vehicles which are an intrinsic part of the overall process such as forklift trucks, train or ship movements on or around an industrial and/or commercial site.

3.3.2 The standard indicates that certain 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, the standard requires that a character correction be added to the specific sound level to obtain the rating level. The standard describes various methods for determining the character correction including a subjective approach which is summarised in Table 3.5.

Table 3.5: Subjective Corrections to be Applied to Specific Sound Level if These Features Exist at the Receptor Location.

Tonality	Impulsivity	Other sound Characteristics	Intermittency

+2 dB just perceptible +4 dB clearly perceptible +6 dB highly perceptible	+3 dB just perceptible +6 dB clearly perceptible +9 dB highly perceptible	Where specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual environment, a penalty of 3 dB can be applied.	Where specific sound has identifiable on off conditions which are readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied.
The standard indicates that where tonal and impulsive characteristics are present within same reference period these two corrections can both be considered. If one feature is dominant, then it might be appropriate to apply a single correction. Where both features are likely to affect perception and response, the corrections are normally added in a linear fashion.			

3.3.3 Once the specific sound level is corrected to the rating level, the representative background sound level is subtracted from the rating level to provide an initial estimate of the impact - the greater the difference, the greater the magnitude of the impact. The standard states that:

- 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;
- 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; and
- 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.

3.3.4 The standard indicates that, consideration of the context includes taking account of, as appropriate, the absolute noise level of the sound, the character and level of the specific sound compared to that of the residual sound and the sensitivity of the receptors including the existence or otherwise of any façade insulation treatment.

4 Construction Impacts

4.1.1 The development does not include any demolition or construction work and is limited to fitting out the existing structure for the new proposed use.

4.1.2 The fitting out work is anticipated to be completed within 3 months so the site can be operational by September 2020

4.1.3 During the Fitting out work some activities may lead to the generation of noise, however, as the external works are considered to be minimal and as the noise from the internal fit-out will partly be attenuated by the structure the potential for adverse impacts are not considered to be significant.

4.1.4 It should be noted that the noise levels at the receptors will vary depending on what area of the site the activities are taking place in, i.e. the levels are likely to be lower when works are on the furthest part of the site, and higher when on the nearest part of the site. Considering the proximity of some of the receptors to the site boundary, it is possible that the works may be audible when the activities are taking place in the proximity of a specific receptor However, it is unlikely that the activity would be in such location for a significant period of time, and therefore significant adverse effects from works would not be expected.

4.1.5 The work will be carried out under the Considerate Contractors Scheme, which, as one of its objectives, aims to reduce adverse noise impacts on nearby residents.

4.1.6 Overall, based on the experienced gained from similar sites, elsewhere, the distance between the site and the closest residential receptors combined with the existing noise from the local highway network, it is anticipated that the main fitting out phases may be audible at times but will result in a negligible impact at the identified receptors.

5 Operational Impacts

5.1 Operation Activity

5.1.1 All the office and event / staff training for the Recovery College element will work normal office hours Mondays-Friday with no working on weekends. Some staff will arrive as early as 7.30 in the Construction Skills section but will be finished between 3-4pm.

5.1.2 Most client attendance will be between 10am to 3pm.

5.1.3 Access for staff and visitors will be via the existing access points from Camden Street to the west and Prowse Place to the east into the southern part of the site.

5.1.4 While the main operation is considered to be car free the proposals does include 1 parking space for the Construction Skills, 1 disabled space and 1 loading bay. Visitors and Staff will be expected to travel to the site via public transport, cycle or walking. Cycle parking for staff and visitors will be provided in the southern courtyard to meet London Plan standards.

5.1.5 The existing / previous retail based use of the unit would have included collections and deliveries of goods using large ridged lorries. The proposed use is considered to represent a reduction in real terms with minimal deliveries and only using light goods vehicles such as small to medium size vans.

5.2 Operational Plant

5.2.1 The proposals include the upgrading of the existing air conditioning system with the provision of new mechanical services which will serve the office and building.

5.2.2 It is noted that there is an existing air handling unit on the northern façade as shown in Figure 5.1.

Figure 5.1: Existing Air Handling Units

5.2.3 The proposal included the prevision of new Daikin VRV IV S-series - RXYSQ-TY1 heat pumps which will be located on the northern façade while the new Daikin 2MXM-M unit will be fixed to the southern facade as shown in the proposal Elevations drawing (ref 0541-TN_3000 – Propose External Elevations)

5.2.4 The upgrading of the mechanical services is intended to provide a more efficient air conditioning system while also improving the working and ambient environment for staff, clients, visitors and neighbouring residents. The proposed plant has specifically selected to ensure that any noise emissions are minimised.

5.2.5 The closest receptors to the northern façade is the residential units at 5 Prowse Place, however the receptors do not have windows that overlook the proposed site and the closest receptor windows are on the front and rear façade without direct line of sight to the proposed air handling units.

5.2.6 The closest receptors to the southern façade are at 3 Prowse Place which is a neighbouring commercial unit (again the windows do not overlook the site but are on the front and rear facades), and 156 Camden Street

5.2.7 Table 5.1 provides a summary of the Dailkin 2MXM-M unit which will be installed on the southern façade and will operate in both heating and cooling modes. The manufactures technical data is provided in Appendix C and summarised in Table 5.1.

Table 5.1: Southern Façade – Equipment Sound Pressure Levels (dB)

Description	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	Overall
Dailkin 2MXM-M Cooling	50	50	47	44	41	36	29	-	46
Dailkin 2MXM-M Heating	52	52	48	46	42	38	33	-	48

5.2.8 The units to be installed on the Northern façade are the Dailkin VRV IV S-series heat pumps. The specific model to be installed has not been selected at this time, however the acoustic data for whole range of heat pumps is provided in Appendix C and summarised in Table 5.2

Table 5.2: Northern Façade - Equipment Sound Pressure Levels (dB)

Description	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	Overall
RXYSQ4TV1 Cooling	56	52	50	47	45	43	36	24	50
RXYSQ5TV1 Cooling	57	50	51	47	48	47	43	26	51
RXYSQ6TV1 Cooling	57	53	50	47	46	43	38	28	51
RXYSQ8TY1 Cooling	60	63	54	52	48	48	42	34	55
RXYSQ10TY1 Cooling	65	57	54	53	50	57	41	33	55
RXYSQ12TY1 Cooling	67	61	57	54	52	48	43	36	57

5.2.9 Based upon the manufactures data provided and the authors experience, the relatively small air handling units that are proposed generate a typically broadband type of noise, without any strong tonal or intermittent characteristic and are not enough to attract attention.

5.2.10 It is not anticipated that the overall noise from the proposed plant will stand out from the background noise especially with the existing rail and road transport noise sources.

6 Summary & Conclusions

6.1 Fitting Out Phase

6.1.1 The assessment of construction noise has indicated that while some temporary adverse effects are expected during the work especially when taking place close to the receptors, significant adverse effects are not expected. Noise from all construction works will be mitigated and minimised using appropriate best practicable means (BPM) measures as required.

6.2 Operational Phase

6.2.1 The proposal represents an improvement in terms of a reduction in traffic and operating hours, and mechanical plant noise when compared to the existing / previous use of the site.

6.2.2 As the proposed use will operate as a predominantly car free development the potential for the development traffic to result in an adverse impact is considered to be negligible.

6.2.3 The replacement of the existing air conditioning system with a new more efficient system is considered to represent a further improvement in terms of ambient noise levels for the staff, client's visitors and neighbouring receptors.

6.2.4 The manufacturers technical data sheets have been provided to demonstrate that the proposed units are not anticipated to pose any risk of adverse impacts to any of the noise sensitive receptors.

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Appendices

Appendix A – Definition of Terms

This Appendix is an introduction to the units, scales and indices used to measure and describe noise.

Decibels dB - Noise is commonly defined as unwanted sound. The range of audible sound is from 0dB to 140dB, which is taken to be the threshold of pain. The sound pressure detected by the human ear covers an extremely wide range. The decibel (dB) is used to condense this range into a manageable scale by taking the logarithm of the ratio of the sound pressure and a reference sound pressure.

'A' Weighted Decibels dB(A) - The frequency response of the ear is usually taken to be about 18Hz (number of oscillations per second) to 18,000Hz. The ear does not respond equally to different frequencies at the same level. It is more sensitive in the mid-frequency range than at the lower and higher frequencies, and because of this, the low and high frequency component of a sound are reduced in importance by applying a weighting (filtering) circuit to the noise measuring instrument. The weighting which is most used, and which correlates best with the subjective response to noise, including that of music, is the dB(A) weighting. This electronic filter matches the variation in the frequency sensitivity of the meter to that of the human ear. This is an internationally accepted standard for noise measurements.

Examples of typical noise levels are shown below:

Equivalent Continuous Sound Level ($L_{Aeq,T}$)

The subjective response to a noise is dependent not only upon the sound pressure level and its frequency, but also its intermittency. Various indices have been developed to try and correlate annoyances with the noise level and its fluctuations. The parameter used for this measure is the Equivalent Continuous Sound Pressure Level (L_{Aeq}). The A-weighted sound pressure level of a steady sound that has, over a given period, the same energy as the fluctuating sound under investigation. The L_{Aeq} provides a single value to express the average sound energy over the measurement period and is the most widely used indicator for environmental noise.

The decibel scale is logarithmic and therefore when two noise sources are present together, they must be combined logarithmically. Examples showing this effect to the nearest whole number, are presented below:

a) 50dB + 50dB = 53dB

b) 50dB + 40dB = 50dB

c) 50dB + 45 dB = 51dB

Therefore, when two sound sources of the same sound pressure level are combined the resultant level is 3dB(A) higher than the single source. However, in subjective terms the ear can distinguish a difference in 'loudness' between two simple noises sources when there is a 3dB(A) difference between them. I emphasis, loudness, not a measure of annoyance. Again, for simple sources, when two sounds differ by 10dB(A) one is said to be twice as loud as the other.

Other Noise Units:

$L_{A90,T}$: This is the 'A' weighted noise level exceeded for 90% of the measurement period,T. This is normally used to describe the background noise.

$L_{A10,T}$: This is the 'A' weighted noise level exceeded for just 10 % of the measurement period, (T). This is normally used to describe traffic noise.

$L_{Amax,T}$: This is the maximum 'A' weighted noise level recorded during the measurement period, (T).

$L_{A10,\ 18\ hour}$: This is the arithmetic average of the $L_{A10,\ 1\text{-}hour}$ values for each of the eighteen one-hour periods between 06:00 – 24:00 hours.

$L_{night,\ outside}$: the 'A' weighted long-term average sound pressure level over the night-time period (generally 23:00 – 07:00) as defined in ISO 1996-2:1987 determined over all the night-time periods of a year. This is a free-field noise level and does not include any correction for façade reflection.

Observed Effects

The Noise Policy Statement for England (2010) defines several key terms in relation to the observed effects of noise. The three key terms are defined below.

- **No Observed Effect Level (NOEL):** 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.
- **Lowest Observed Adverse Effect Level (LOAEL):** This is the level above which adverse effects on health and quality of life can be detected.
- **Significant Observed Adverse Effect Level (SOAEL):** This is the level above which significant adverse effects on health and quality of life occur.

Appendix B – Camden Local Plan

Appendix 3: Noise Thresholds

Appendix 3: Noise Thresholds

The significance of noise impact varies dependent on the different noise sources, receptors and times of operation presented for consideration within a planning application. Therefore, Camden's thresholds for noise and vibration evaluate noise impact in terms of various 'effect levels' described in the National Planning Policy Framework and Planning Practice Guidance:

- NOEL – No Observed Effect Level
- LOAEL – Lowest Observed Adverse Effect Level
- SOAEL – Significant Observed Adverse Effect Level

Three basic design criteria have been set for proposed developments; these being aimed at guiding applicants as to the degree of detailed consideration needed to be given to noise in any planning application. The design criteria outlined below are defined in the corresponding noise tables. The values will vary depending on the context, type of noise and sensitivity of the receptor:

- Green – where noise is considered to be at an acceptable level.
- Amber – where noise is observed to have an adverse effect level, but which may be considered acceptable when assessed in the context of other merits of the development.
- Red – where noise is observed to have a significant adverse effect.

Proposed Developments likely to be Sensitive to Noise

Special consideration will need to be given to noise sensitive developments that are proposed in areas which are, or expected to become, subject to levels of noise likely to have an adverse effect. The threshold of acceptability of the noise will primarily depend on two factors: the intended use of the noise sensitive development and the source of the noise experienced, or likely to be experienced.

Table B: Noise levels applicable to noise sensitive residential development proposed in areas of existing noise

Dominant Noise Source	Assessment Location	Design Period	LOAEL (Green)	LOAEL to SOAEL (Amber)	SOAEL (Red)
Anonymous noise such as general environmental noise, road traffic and rail traffic ~	Noise at 1 metre from noise sensitive façade/free field	Day	<50dB$L_{Aeq,16hr}$*	50dB to 72dB$L_{Aeq,6hr}$*	>72dB$L_{Aeq,16hr}$*
		Night	<45dB$L_{Aeq,8hr3}$ <40 dB$L_{Aeq,8hr}$**	45dB to 62dB$L_{Aeq,8hr}$* >40dBL_{night}**	>62dB$L_{Aeq,8hrs}$*
	Inside a bedroom	Day	<35dB$L_{Aeq,16hr}$	35dB to 45dB$L_{Aeq,16hr}$	>45dB$L_{Aeq,16hr}$
		Night	<30dB$L_{Aeq,8hr}$ 42dB$L_{Amax,fast}$	30dB to 40dB$L_{Aeq,16hr}$ 40dB to 73dB$L_{Amax,fast}$	>40dB$L_{Aeq,8hr}$ >73dB$L_{Amax,fast}$
	Outdoor living space (free field)	Day	<50dB$L_{Aeq,16hr}$	50dB to 55dB$L_{Aeq,6hr}$	>55dB$L_{Aeq,16hr}$
Non-anonymous noise	See guidance note on non-anonymous noise				

*LAeq, T values specified for outside a bedroom window are façade levels

**Lnight values specified for outside a bedroom window are free field levels

The levels given above are for dwellings, however, levels are use specific and different levels will apply dependent on the use of the premises. The Council will also take into account the likely times of occupation for types of development and will be amended according to the times of operation of the establishment under consideration.

Industrial and Commercial Noise Sources

A relevant standard or guidance document should be referenced when determining values for LOAEL and SOAEL for non-anonymous noise. Where appropriate and within the scope of the document it is expected that British Standard 4142:2014 'Methods for rating and assessing industrial and commercial sound' (BS 4142) will be used. For such

cases a 'Rating Level' of 10 dB below background (15dB if tonal components are present) should be considered as the design criterion).

Table C: Noise levels applicable to proposed industrial and commercial developments (including plant and machinery)

Existing Noise sensitive receptor	Assessment Location	Design Period	LOAEL (Green)	LOAEL to SOAEL (Amber)	SOAL (Red)
Dwellings**	Garden used for main amenity (free field) and Outside living or dining or bedroom window (façade)	Day	'Rating level' 10dB* below background	'Rating level' between 9dB below and 5dB above background	'Rating level' greater than 5dB above background
Dwellings**	Outside bedroom window (façade)	Night	'Rating level' 10dB* below background and no events exceeding 57dB L_{Amax}	'Rating level' between 9dB below and 5dB above background or noise events between 57dB and 88dB L_{Amax}	'Rating level' greater than 5dB above background and/or events exceeding 88dB L_{Amax}

*10dB should be increased to 15dB if the noise contains audible tonal elements. (day and night). However, if it can be demonstrated that there is no significant difference in the character of the residual background noise and the specific noise from the proposed development then this reduction may not be required. In addition, a frequency analysis (to include, the use of Noise Rating (NR) curves or other criteria curves) for the assessment of tonal or low frequency noise may be required.

**levels given are for dwellings, however, levels are use specific and different levels will apply dependent on the use of the premises.

The periods in Table C correspond to 0700 hours to 2300 hours for the day and 2300 hours to 0700 hours for the night. The Council will take into account the likely times of

occupation for types of development and will be amended according to the times of operation of the establishment under consideration.

There are certain smaller pieces of equipment on commercial premises, such as extract ventilation, air conditioning units and condensers, where achievement of the rating levels (ordinarily determined by a BS:4142 assessment) may not afford the necessary protection. In these cases, the Council will generally also require a NR curve specification of NR35 or below, dependant on the room

(based upon measured or predicted Leq,5mins noise levels in octave bands) 1 metre from the façade of affected premises, where the noise sensitive premise is located in a quiet background area.

Appendix C – Air Conditioning Unit Technical Data Sheets

Air & Acoustic Consultants

DAIKIN

Air Conditioning

Technical Data

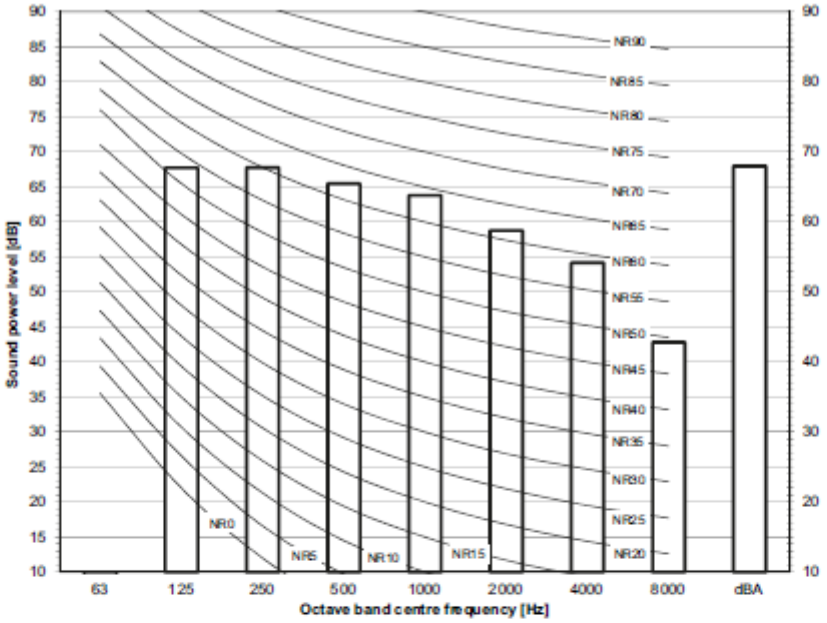
VRV IV S-series heat pump

EEDEN16-200_2

11 Sound data

11 - 1 Sound Power Spectrum

RXYSQ4TV1
RXYSQ4TY1



3D098212

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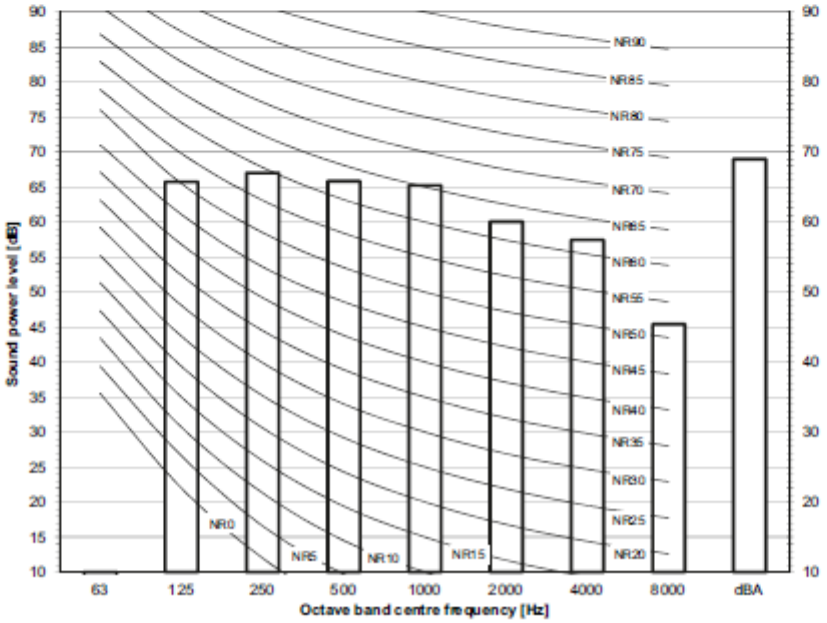
RXYSQ5TY1



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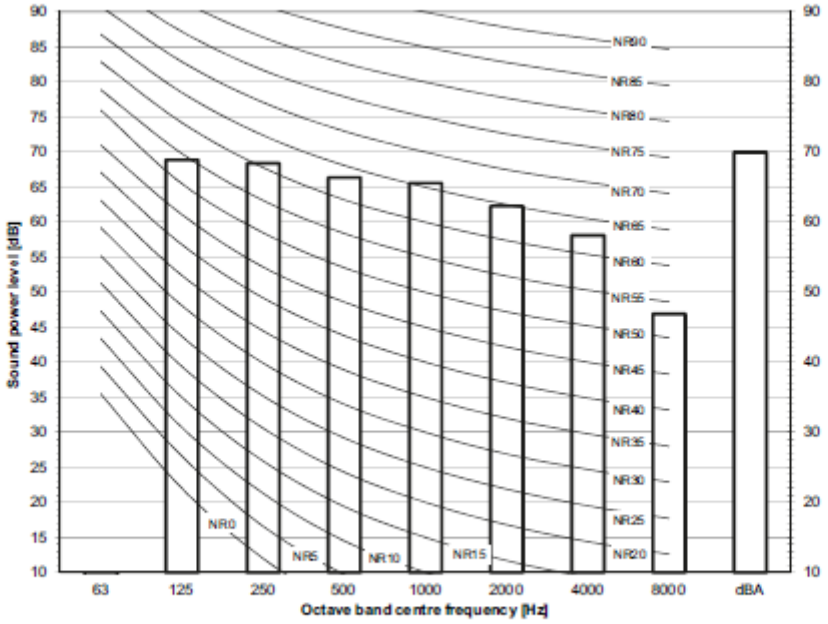
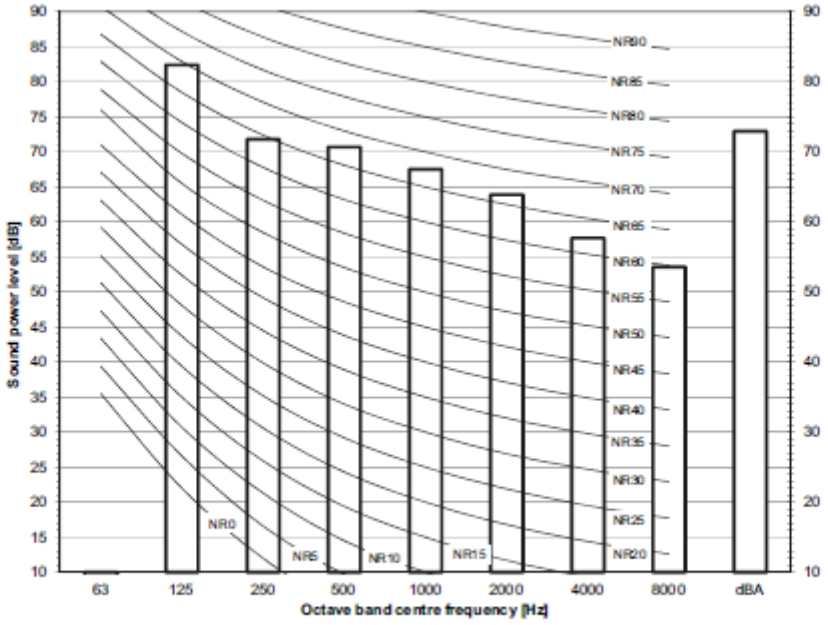


Note:
- dBA =A-weighted sound power level (A scale according to IEC).
- Reference acoustic intensity 0dB =10E-6pW/m²
- Measured according to ISO 3744

3D098214

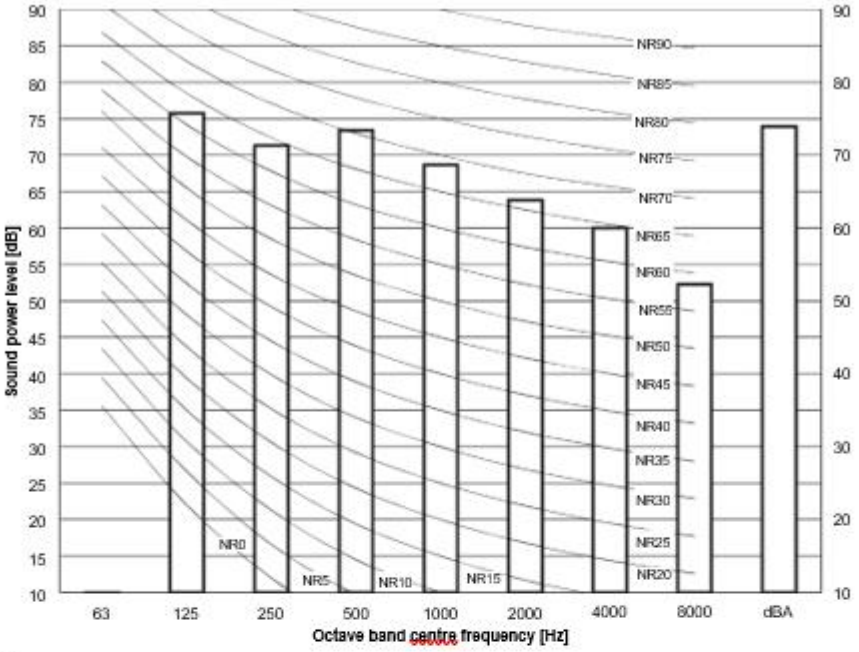
RXYSQ8TY1



Note:
- dBA =A-weighted sound power level (A scale according to IEC).
- Reference acoustic intensity 0dB =10E-6pW/m²
- Measured according to ISO 3744

3D098240

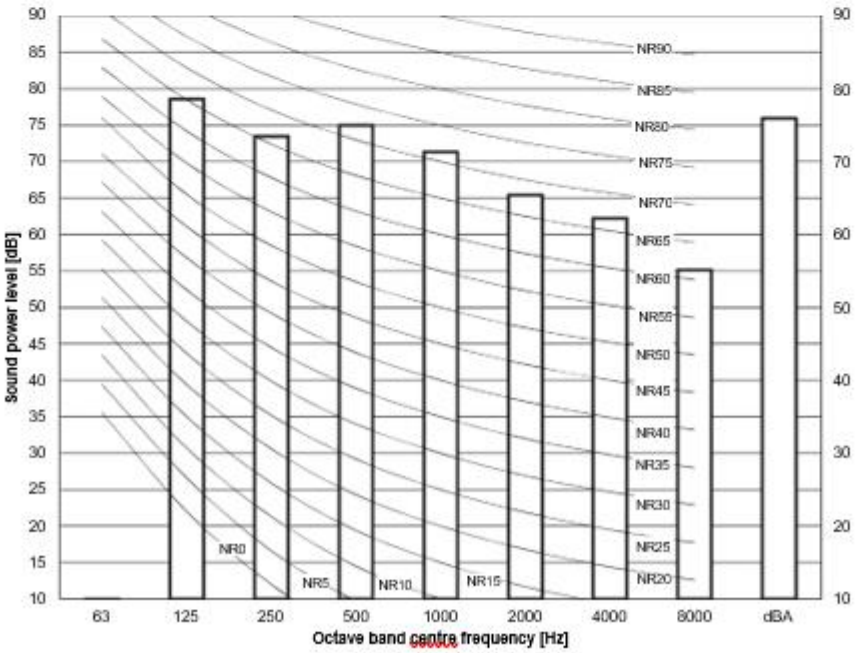
RXYSQ10TY1



Note:
- dBA = A-weighted sound power level (A scale according to IEC)
- Reference acoustic intensity 0dB = 10^-6pW/m²
- Measured according to ISO 3744

3D098241

RXYSQ12TY1



Note:
- dBA = A-weighted sound power level (A scale according to IEC)
- Reference acoustic intensity 0dB = 10^-6pW/m²
- Measured according to ISO 3744

3D098242

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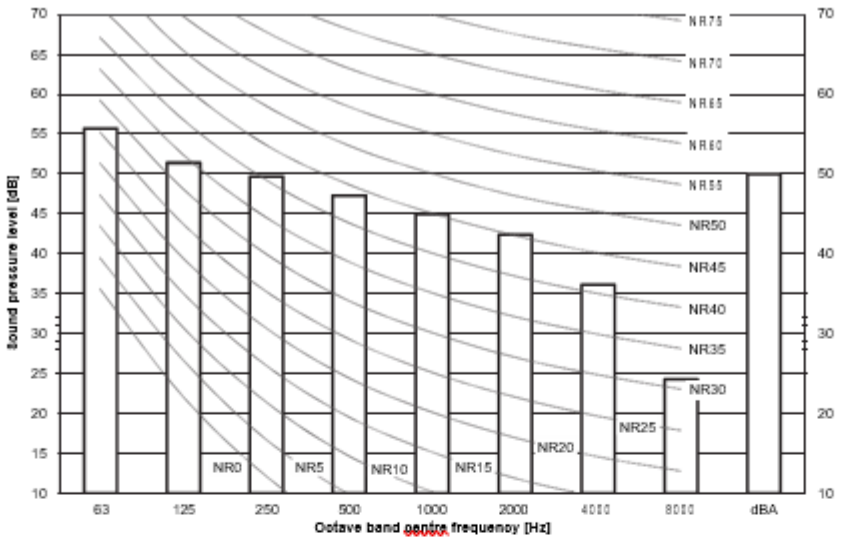
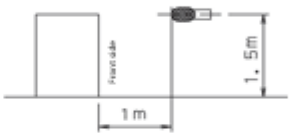
RXYSQ4TY1

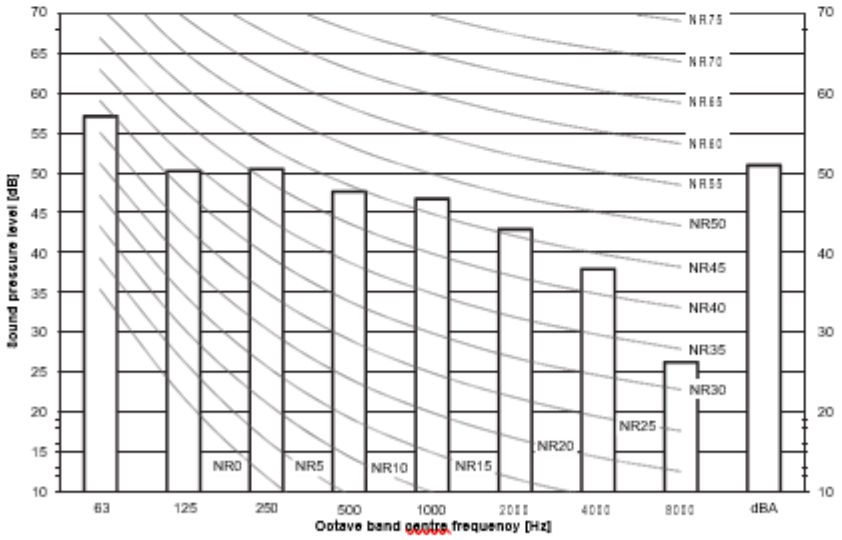


Notes:
- Data is valid at free field condition.
- Data is valid at nominal operation condition.
- dBA = A-weighted sound pressure level (A scale according to IEC).
- Reference acoustic pressure 0 dB = 20 μPa

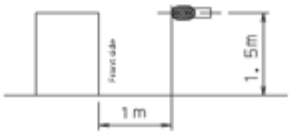


3D098215

RXYSQ5TV1
RXYSQ5TY1

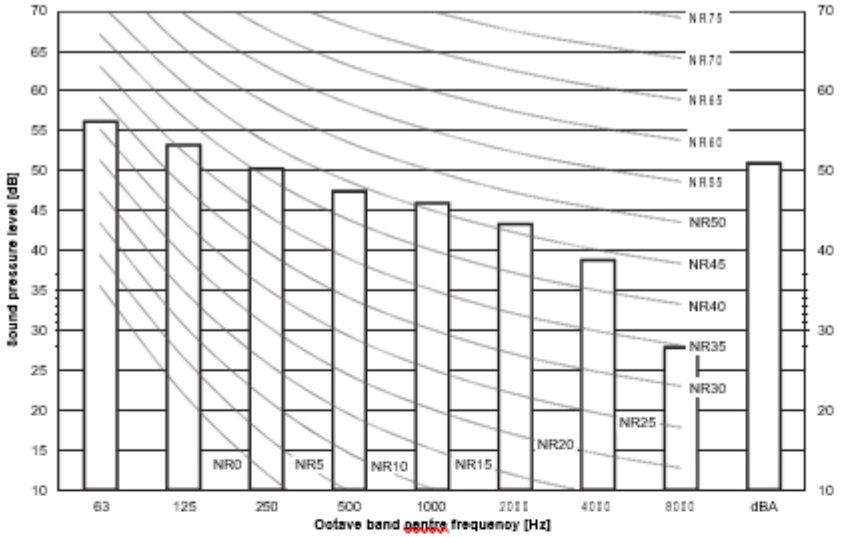


Notes:
- Data is valid at free field condition.
- Data is valid at nominal operation condition.
- dBA = A-weighted sound pressure level (A scale according to IEC).
- Reference acoustic pressure 0 dB = 20 μPa

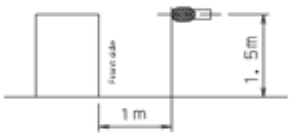


3D098216

RXYSQ6TV1
RXYSQ6TY1



Note:
- Data is valid at free field condition.
- Data is valid at nominal operation condition.
- dBA = A-weighted sound pressure level (A scale according to IEC).
- Reference acoustic pressure 0 dB = 20 μPa



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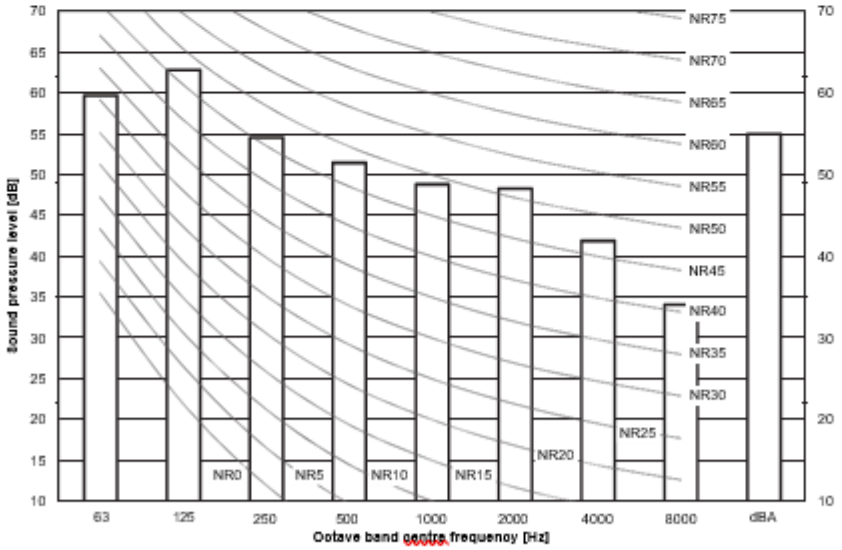
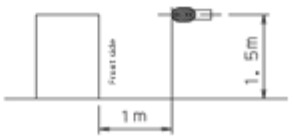
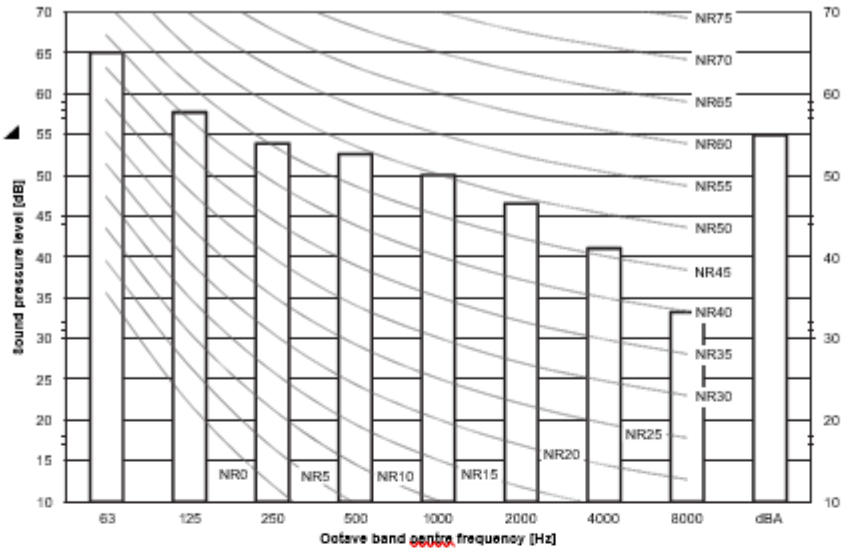


Note:
- Data is valid at free field condition.
- Data is valid at nominal operation condition.
- dBA = A-weighted sound pressure level (A scale according to IEC).
- Reference acoustic pressure 0 dB = 20 μPa

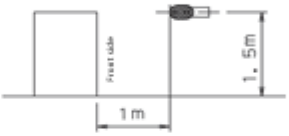


3D098245

RXYSQ10TY1



Note:
- Data is valid at free field condition.
- Data is valid at nominal operation condition.
- dBA = A-weighted sound pressure level (A scale according to IEC).
- Reference acoustic pressure 0 dB = 20 μPa



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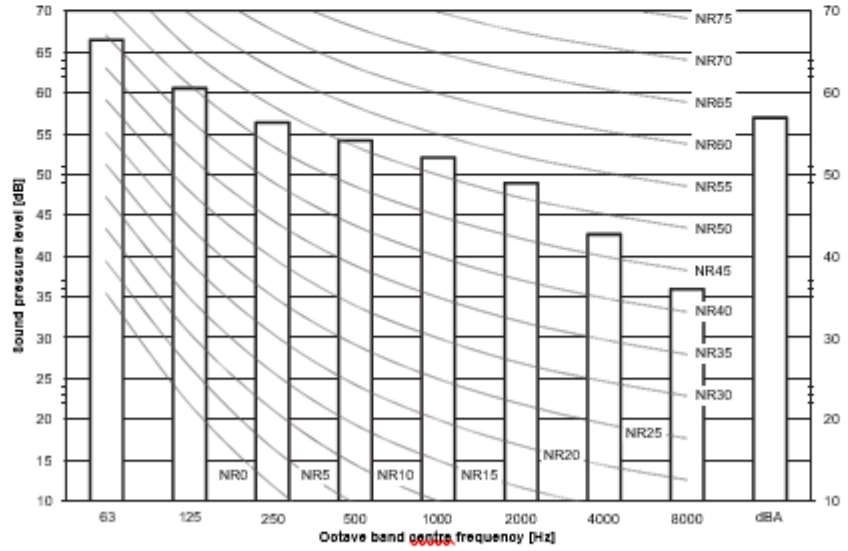
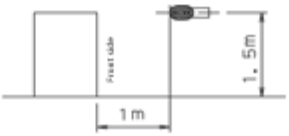
RXYSQ12TY1



Note:
- Data is valid at free field condition.
- Data is valid at nominal operation condition.
- dBA = A-weighted sound pressure level (A scale according to IEC).
- Reference acoustic pressure 0 dB = 20 μPa



3D098247

Air & Acoustic Consultants

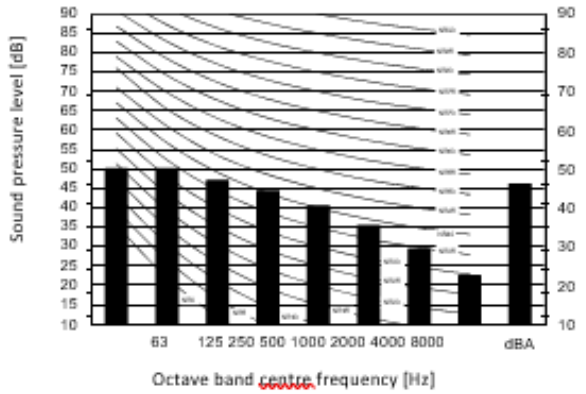
DAIKIN

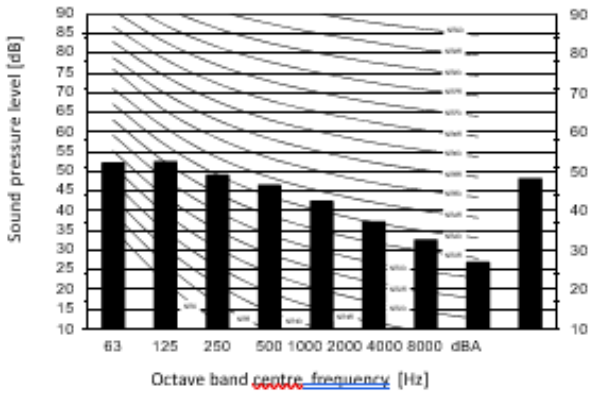
Air Conditioning Technical Data

10 Sound data

10 - 1 Sound Pressure Spectrum

2MXM40M



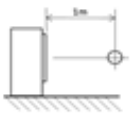


Legend

dBA = A-weighted sound pressure level (A scale according to IEC).

A Scale

B Fan speed: High

Location of microphone	Cooling	Total dB
	A	B
	dBA	dB

Heating	Total dB
A	B
dBA	dB

Notes

1. Background noise already taken into account.
2. Operating conditions: power source 220-240 V/220 V 50/60 Hz; JIS standard
3. Operating noise varies depending on operation and ambient conditions.
4. The operation noise measuring method is in accordance with JISC 9612.
5. Measuring location: anechoic chamber

3D102207A

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London
020 7293 0217

Manchester
0161 974 3208

Oxford
01865 389 440

Reading
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