

# 5-6 St Georges Mews

# Environmental Noise Survey Report

16 June 2023

# Client: Max Barney

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QA23142/ENS



# **Document Control**

## **Document Information**

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## For Information

#### Please Note

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## 1.0 INTRODUCTION

It is proposed to install two new condenser units on the roof of 5-6 St Georges Mews. Quantum Acoustics have been appointed to undertake an environmental noise survey and plant noise impact assessment to support the planning application. This report presents our methodology and findings.

## 2.0 SITE DESCRIPTION

5-6 St Georges Mews site is located in Camden. The location is shown below, outlined in red.



Figure 1: Site Plan (Google Imagery 2022, The GeoInformation Group)

The surrounding area is a mix of commercial and residential properties.

# 3.0 ENVIRONMENTAL NOISE SURVEY

An automated environmental noise survey was undertaken from approximately 13:00 hours on 1 June 2023 to approximately 13:00 hours on 2 June 2023.



Weather conditions were mainly dry and with light winds. The conditions were therefore deemed generally suitable for the measurement of environmental noise.

#### 3.1 Measurement Procedure

Noise monitoring equipment was attached to an arial at roof level, at the location shown below:



Figure 2. Measurement Location Plan (Google Imagery 2022, The GeoInformation Group)



### 3.2 Equipment

Details of the equipment used for the survey are summarized in the following table:

Description	Manufacturer	Туре	Serial Number
Type 1 Sound Level Meter	Svantek	971A	124770
Acoustic Calibrator	Svantek	SV 33B	99005

Calibration of the equipment is traceable to national standards. Calibration certificates are available upon request. Calibration certificates for the equipment, traceable to national standards, used in this survey are available upon request.

Calibration checks were carried out prior to and on completion of the survey, with no significant calibration drift observed.

## 4.0 SURVEY FINDINGS

The following section uses the following acoustic terms:

**A-weighted** noise levels are frequency-weighted in a way that approximates the frequency response of the human ear and allows sound levels to be expressed as a single figure value. The A-weighted level is therefore a measure of the subjective loudness, rather than physical amplitude.

 $L_{90}$  is the noise levels that is exceeded for 90% of the measurement period. It reflects the quiet periods during that time and is often referred to as the "background noise level". It is often used as a basis for setting noise emission criteria.

 $L_{eq}$  is the level of a notional continuous sound that would deliver the same sound energy as the actual fluctuating sound over the measurement period. This may be thought of as the "average" level during the measurement period.



### 4.1 Noise Level Results

The noise survey results are presented in the graph below, showing the A-weighted  $L_{90}$  and  $L_{eq}$  noise levels measured during each consecutive 15-minute period of the survey.



### The measured modal background $(L_{90})$ noise levels are presented in the table below:

Modal Background L <sub>90</sub> Noise Levels				
Position	Daytime	Night-time		
	(07:00 – 23:00)	(23:00 – 07:00)		
Position A	45	37		

#### The measured minimum background (L<sub>90</sub>) noise levels are presented in the table below:

Minimum Background L <sub>90</sub> Noise Levels			
Position Daytime Night-tim (07:00 – 23:00) (23:00 – 07			
Position A	39	36	



### 4.2 Noise Climate

During the periods that we were present at site, the noise climate was quiet and subjectively comprised distant road traffic plus occasional local vehicles and pedestrians.

# 5.0 RELEVANT PLANNING POLICIES AND NOISE ASSESSMENT GUIDANCE

#### 5.1 Noise Policy Statement for England

The Noise Policy Statement for England (NPSE) was published in March 2010. The NPSE is the primary statement of noise policy for England and applies to all forms of noise other than occupational noise. The NPSE sets out the long term vision of Government noise policy which 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."

"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; and
- where possible, contribute to the improvement of health and quality of life."

The Explanatory Note to the NPSE introduces guidance to assist in defining the adverse impacts:

#### NOEL – No Observed Effect Level

This is the level below which no effect can be detected and below which there is no detectable effect on health and quality of life due to noise.

#### LOAEL – Lowest Observable 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.

These categories are further discussed in the Planning Practice Guidance section below.

The NPSE acknowledges that it is not possible to have a single objective noise level based measure that is mandatory and applicable to all sources of noise in all situations.



### 5.2 Planning Practice Guidance

The government's Planning Practice Guidance is a web based resource and provide advice on various issues, including noise (https://www.gov.uk/guidance/noise--2). The advice (March 2014, latest update July 2019) states in the context of considering when noise is relevant to planning, "noise needs to be considered when new development may create additional noise, or would be sensitive to the prevailing acoustic environment (including any anticipated changes to that environment from activities that are permitted but not yet commenced)."

The Planning Practice Guidance pages also include more explanation of the effect level categories noted above, providing an explanatory Noise Exposure Hierarchy Table, which explores how actions such as a requirement for noise mitigation, or prevention of a development, might be assessed with respect to whether noise levels are considered above the category thresholds.

Response	Examples of outcomes	Increasing effect level	Action	
No Observed Effect Level				
Not present	No effect	No Observed Effect	No specific measures required	
Present 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	e Effect Level		
Present 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.	Observed Adverse Effect	Mitigate and reduce to a minimum	
	Significant Observed Adver	se Effect Level		
Present and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding ertain activities during periods of intrusion; where there is no alternative ventilation, aving to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in etting to sleep, premature awakening and ifficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid	
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 hard, e.g. auditory and non- auditory		Unacceptable Adverse Effect	Prevent	



### 5.3 National Planning Policy Framework

The following paragraph is from the National Planning Policy Framework (NPPF). The NPPF was revised in July 2021.

'185. 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'* 

### 5.4 BS8233:2014

We understand it is required that internal noise levels of the development comply with BS8233. This is in line with likely Local Authority expectations and our recommendation is to base internal noise criteria on the latest 2014 document.

Guideline values for dwellings with respect to internal and external noise levels are included in BS 8233:2014 Guidance on sound insulation and noise reduction for buildings (BSi).

The standard states 50 dB  $L_{Aeq, T}$  as being desirable as a steady state noise level not to be exceeded in gardens. It also states 55 dB  $L_{Aeq, T}$  as an upper guideline value. The time period T is usually taken to be the 16 hour day (07:00h to 23:00h).

Paragraph 7.7.3.2 of the standard goes on to say the following:

"For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB  $L_{Aeq,T}$ , with an upper guideline value of 55 dB  $L_{Aeq,T}$  which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited.

Other locations, such as balconies, roof gardens and terraces, are also important in residential buildings where normal external amenity space might be limited or not available, i.e. in flats, apartment blocks, etc. In these locations, specification of noise limits is not necessarily appropriate. Small balconies may be included for uses such



as drying washing or growing pot plants, and noise limits should not be necessary for these uses. However, the general guidance on noise in amenity space is still appropriate for larger balconies, roof gardens and terraces, which might be intended to be used for relaxation. In high-noise areas, consideration should be given to protecting these areas by screening or building design to achieve the lowest practicable levels. Achieving levels of 55 dB  $L_{Aeq,T}$  or less might not be possible at the outer edge of these areas, but should be achievable in some areas of the space."

It can be seen that external noise levels, especially on small balconies to apartment blocks, are not proposed to be a controlling index by which suitability of a residential site is defined.

Therefore, when designing noise sensitive developments that incorporate gardens or other external amenity areas, the intent shall be to provide an area for each property in which the noise levels are consistent with these standards. Where these standards cannot be achieved, then reasonable measures shall be employed to provide screening or other forms of mitigation so as to minimise the noise levels in the external amenity areas.

An important principle here is that sustainable development sites will often be exposed to relatively high levels of environmental noise, and while means are available to insulate internal spaces, they are not always available to protect external spaces. Strict adherence to the enforcement of such external noise criteria would preclude development in the majority of areas considered for development in semi-urban or urban environments or in areas in the vicinity of transportation noise sources. This is why the external standards shall be viewed as targets or triggers of mitigation measures rather than thresholds not to be exceeded in all circumstances.

Buildings can be designed to achieve specific levels of insulation against external noise. It is reasonable, therefore, to set specific internal noise standards as the test of whether a development satisfies the requirements of the NPPF and the aims of the NPSE. In essence, these require a high-quality design that achieves a good standard of amenity.

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room Dining	35 dB L <sub>Aeq</sub> , 16h	-
Dining	room/area	40 dB <i>L<sub>Aeq</sub>,</i> 16h	-
Sleeping (daytime resting)	Bedroom	35 dB <sub>LAeq</sub> , 16h	30 dB <i>L<sub>Aeq</sub>,</i> 8h

Guidance in respect of indoor ambient noise levels is contained in Table 4 of BS 8233:2014 and tabulated below.

Note 7 Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved.

The previous edition of BS 8233 included quantitative guidance with respect to night-time  $L_{Amax}$  noise levels in bedrooms. BS 8233:2014 does not provide such guidance, however in paragraph 7.7.5.1.1 it is noted that the recommendations for ambient noise in hotel bedrooms are similar to those for living accommodation and Table H.3 in Annex H.3 gives example night-time  $L_{Amax}$  limits in hotel bedrooms of 45-55 dB.



The WHO study informing the 1999 Guidelines derived the  $L_{Amax}$  night time noise standard on the basis of 10 to 15 occurrences per night.

#### 5.5 Local Authority Requirements

The London Borough of Camden Local Plan 2017 Appendix 3 advises the following:

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 57dBLAmax	'Rating level' between 9dB below and 5dB above background or noise events between 57dB and 88dB LAmax	'Rating level' greater than 5dB above background and/or events exceeding 88dBLAmax

\*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.

### 5.6 BS 4142:2014

BS 4142:2014+A1:2019 "Methods for Rating and Assessing Industrial and Commercial Sound" addresses the likelihood of adverse impact from noise generated by plant equipment. A noise rating is determined and compared with the existing local background sound level, and several cumulative acoustic feature corrections to the noise rating are available to apply where appropriate. For example if the noise includes a distinguishable tone, impulse, intermittency or other readily distinguishable sound characteristic.

BS 4142:2014 seeks to determine a "representative" background sound level, stating that "...the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods".

The assessment of the impact depends upon the margin by which the rating level of the specific sound source exceeds the background sound level but also promotes a consideration of the context in which the sound occurs when making an assessment. BS 4142:2014 states that an initial estimate of the impact of the specific sound is made by subtracting the measured background sound level from the rating level, while considering the following points:

a) Typically, the greater this difference, the greater the magnitude of the impact.

b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.

c) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.

d) 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.



# 7.0 PLANT NOISE EMISSION CRITERIA

Based on the London Borough of Camden requirements detailed in Section 5.5 and the noise survey results presented in Section 4.0, we propose that the following plant noise emission criteria be achieved at 1 metre from the nearest noise sensitive residential property:

	Daytime (07:00 – 23:00)	Night-time (23:00 – 07:00)
Rating Level BS4142:2014	35 dBA	27 dBA

In addition to the above criteria, we recommend noise levels at 1m from openable windows of nearby offices do not exceed 55dBA.

The above criteria apply to cumulative noise level of all plant operating simultaneously, under normal operating conditions.

If plant contains tonal characteristics, the above criteria should be reduced by 5dBA.

Relaxations of the above criteria may be acceptable for emergency plant, but should be considered on a case-by-case basis.

8.0 To control plant noise emissions to nearby receptors, it is proposed to enclose the plant in an acoustic enclosure.

The nearest noise sensitive residential receptors are located to the rear/south. It is therefore proposed that the enclosure has a solid wall along the rear/south elevation.

The remaining three sides and top are proposed to comprise acoustic louvres. These shall be specified so as to reduce atmospheric noise emissions from the condensers by at least 5dBA and achieve the criteria set out in the table above (whichever is more onerous).



# 9.0 PLANT NOISE ASSESSMENT

As stated above, the nearest noise sensitive residential receptors are located to the rear/south. It is therefore proposed that the enclosure has a solid wall along the rear/west elevation. With a solid wall along the rear/west elevation, the critical nose sensitive receptors are located at least approximately 15m away.

### 9.1 Proposed New Plant

#### We understand the proposed plant comprises:

			Sound
			Pressure
Quantity	Manufacturer	Model	level
			@1m
			dBA
2	Mitsubishi	PUMY-SP112VKM	52
		or similar	

### 9.2 Plant Noise Impact Assessment

The following table summarises our assessment of noise from the proposed plant to the nearest noise sensitive receptors.

ltem	Sound Pressure Level	
	Daytime	Night
Condenser	52@1m	52@1m
Correction for 2No	+3	+3
Correction for reduced load (residential load at night)	-	-3
Total	55@1m	52@1m
Attenuation from acoustic enclosure	-5	-5
Distance Loss (at least approximately 15m)	-23	-23
Façade reflection	+3	+3
Calculated Total Plant Noise Rating Level	30	27

The predicted noise levels are lower than the maximum criteria presented in Section 7, therefore complying with the requirements of London Borough of Camden.



# 10.0 CONCLUSIONS

Quantum Acoustics have undertaken a fully automated environmental noise survey to establish the existing noise levels.

Environmental plant noise emission criteria have been proposed, on the basis of the noise survey results, in accordance with the relevant guidance including the requirements of London Borough of Camden.

Environmental noise emissions from the proposed plant have been assessed to nearby noise sensitive receptors. Our calculations indicate that environmental plant noise emissions should comply with the proposed criteria.

With regard to atmospheric plant noise emissions, we therefore see no reason why planning permission cannot be granted.



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