UCL Bidborough House

Environmental Noise Survey Report

22 May 2023

Client:

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Document Control

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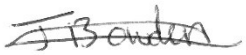
Document Approvals

Role	Name	Signature	Date
Preparation	**Josh Bowden**		22/05/2023
Approval	**John Ridpath** **BSc(Hons), MIOA**		22/05/2023

For Information

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Contents

1.0 INTRODUCTION

Quantum Acoustics Ltd have been appointed to undertake an environmental background noise level survey and to assess the noise emissions of the proposed new external mechanical services plant. This report presents our methodology and findings.

2.0 SITE DESCRIPTION

The UCL Bidborough House site is located at 38-50 Bidborough Street as shown below, outlined in red.

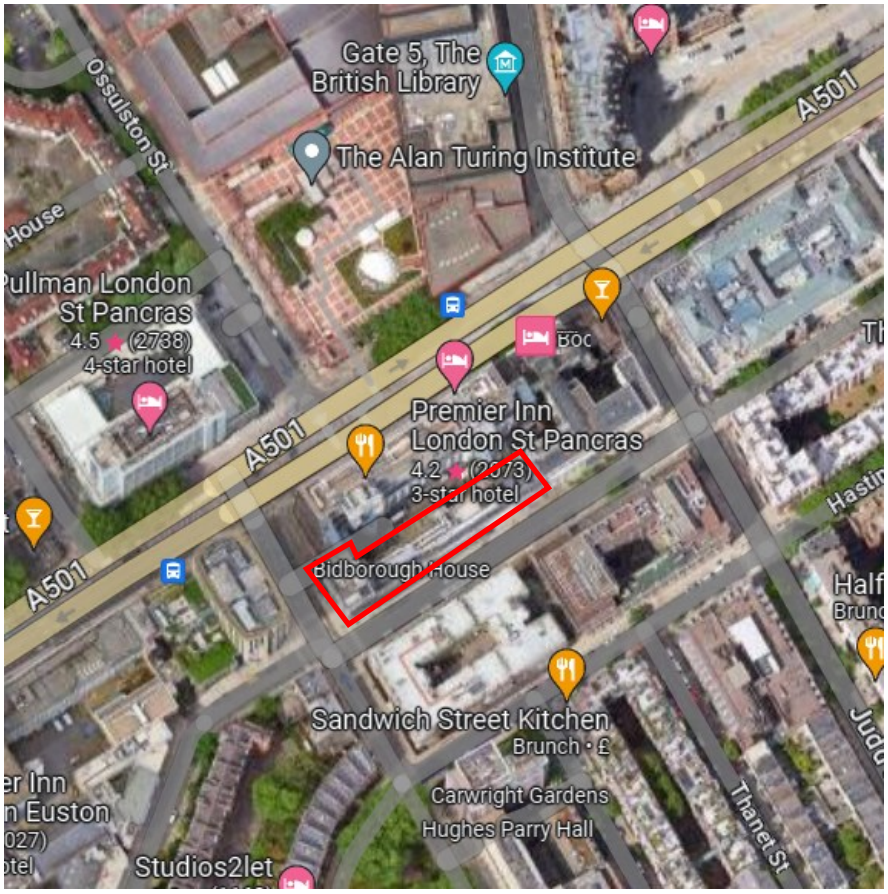


Figure 1: Site Plan (Google Imagery 2023, The GeoInformation Group)

The UCL Bidborough House site is located within the jurisdiction of Camden. The surrounding area is a mixture of residential properties and commercial offices.

3.0 ENVIRONMENTAL NOISE SURVEY

An automated environmental noise survey was undertaken from approximately 14:00 hours on 11th May 2023 to approximately 12:00 hours on 15th May 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 located at the following location:

Position	Description
Position A	The sound level meter was located to the top of a wall between the proposed new external plant area and the neighbouring building.

The measurement location is indicated on the following plan.

Figure 2. Measurement Location Plan (Google Imagery 2023, The GeoInformation Group)

3.2 Equipment

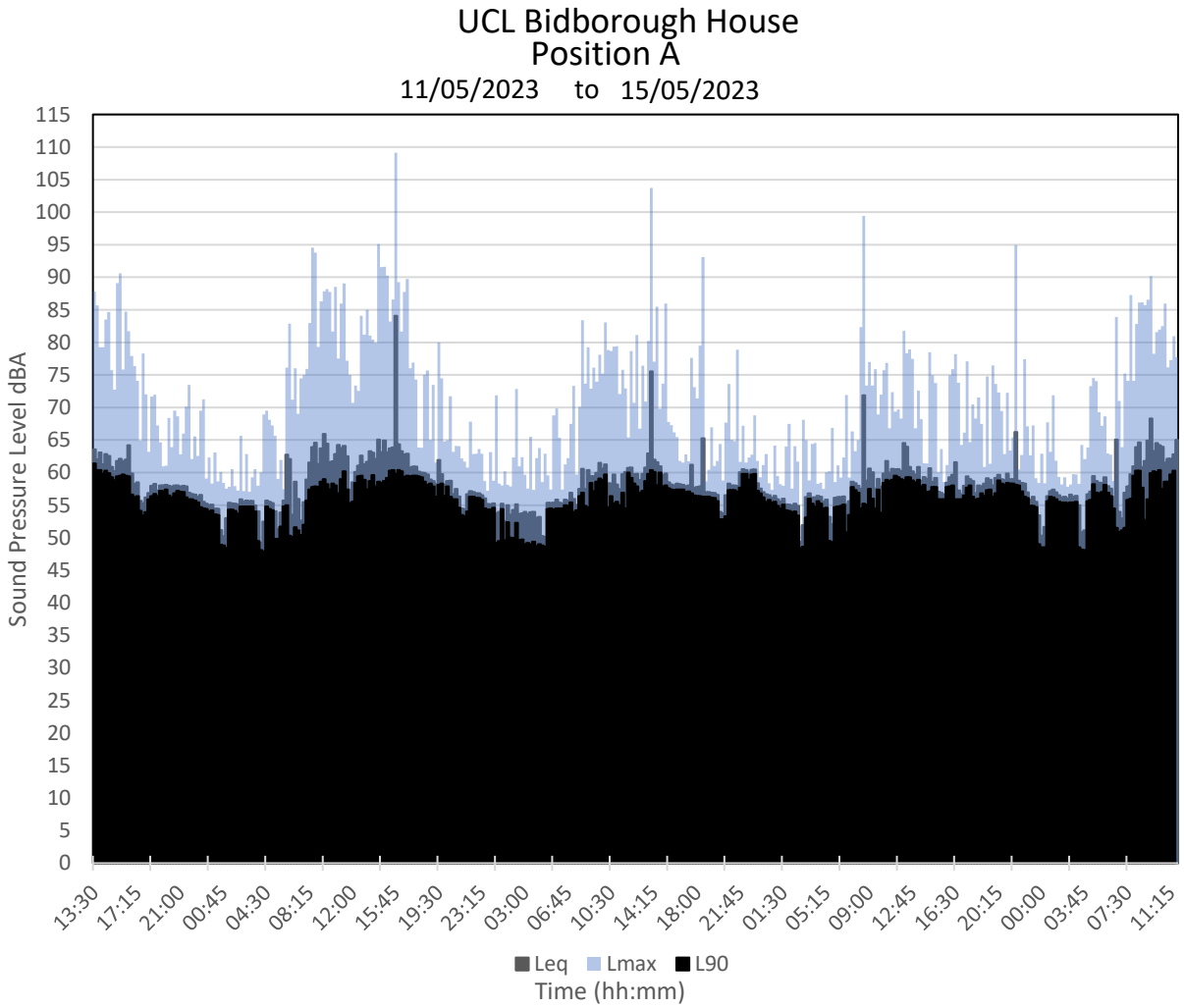
Details of the equipment used for the survey are summarized in the following table:

Description	Manufacturer	Type	Serial Number
Type 1 Sound Level Meter	Svantek	971A	124770

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

4.0 SURVEY FINDINGS

The noise survey results are presented in the graph below, showing the A-weighted L_{90}, L_{eq} and L_{max} 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:

Position	Modal Background L_{90} dB re2x10^{-5}Pa	
	Daytime (07:00 – 23:00)	Night-time (23:00 – 07:00)
Position A	57	54
	58	55
	57	55
	58	56
	56	n/a

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

Position	Minimum Background L_{90} dB re2x10^{-5}Pa	
	Daytime (07:00 – 23:00)	Night-time (23:00 – 07:00)
Position A	53	48
	50	49
	53	48
	54	48
	51	n/a

4.2 Noise Climate

During the periods that we were present at site, the subjectively dominant noise sources were construction works on nearby buildings and local road traffic movements.

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 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 Adverse 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
Present 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 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 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 57dBL_{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 88dBL_{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.

5.5 BS4142:2014

BS 4142:2014+A1:2019 '*Method for Rating industrial noise affecting mixed residential and industrial areas'* describes a method for rating and assessing the effects of sound levels of an industrial and/or a commercial nature "*on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident*".

The impact of a specific sound is indicated by subtracting the existing background noise level from the rating level (i.e. noise level from the proposed items of plant/machinery/etc. plus any acoustic feature corrections).

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

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

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

BS 4142states that:

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

- *"Typically, the greater this difference, the greater the magnitude of the impact."*

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

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

- *"The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context."*

6.0 PLANT NOISE EMISSION CRITERIA

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

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

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

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

d) Intermittency
BS4142:2014 states that when the "specific sound has identifiable on/off conditions, the specific sound level ought to be representative of the time period of length equal to the reference time interval which contains the greatest total amount of on time. if the intermittency is readily distinctive against the residual acoustic environment, a penalty of +3 dB can be applied."

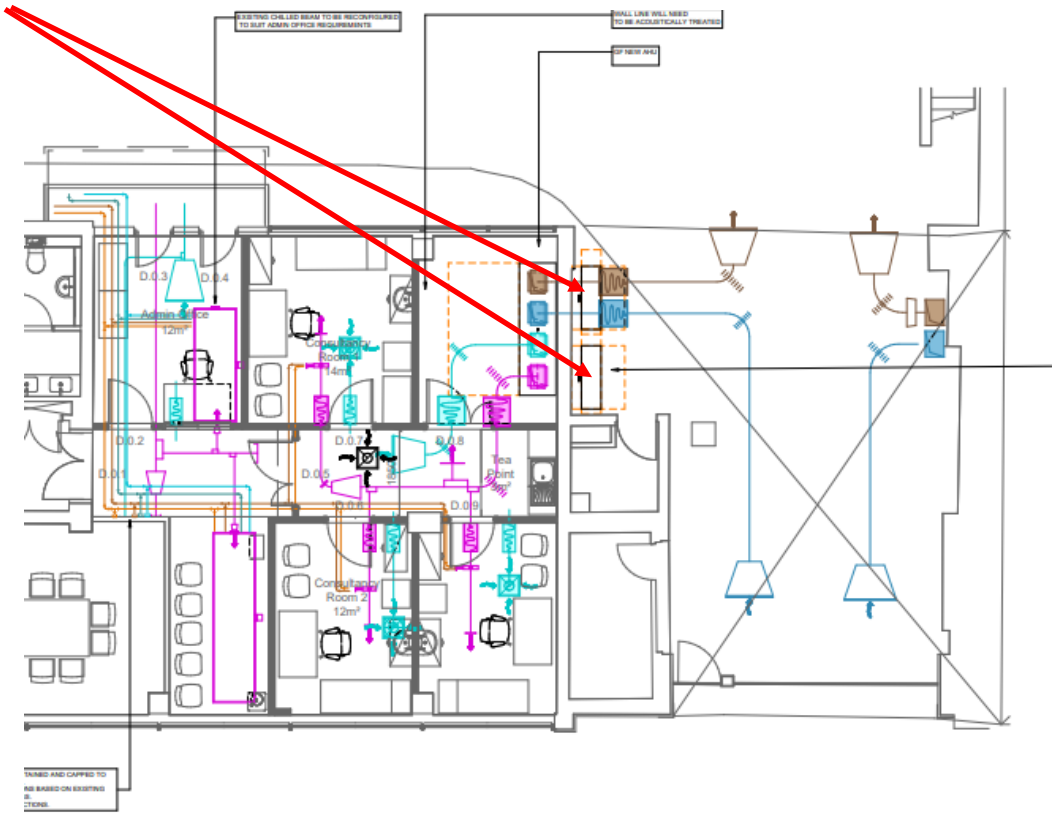
To comply the aforementioned guidance including the Local Authority's requirements, and on the basis of the noise survey results, the following environmental plant noise emission criteria are proposed to be achieved at the nearest window of the adjacent noise sensitive building:

Plant Noise Rating Level Limits L_{eq} dB re2x10^{-5}Pa	
Daytime (07:00 – 23:00)	**Night-time (23:00 – 07:00)**
46	44

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

7.0 PLANT NOISE ASSESSMENT

The proposed plant location is on the ground floor facing 88 Euston Road, as shown on the following drawing. The condensers are proposed for daytime use only.



7.1 Nearest Noise Sensitive Property

The nearest noise sensitive building is 88 Euston Rd, London NW1 2RA which is a 9-storey hotel. The nearest façade of 88 Euston Road is approximately 12 metres from the proposed new external plant location.

7.2 Proposed New Plant

We understand the proposed external plant comprises 2No. condenser units:

Quantity	Manufacturer	Model	Sound Pressure dBA @ 1m
1	Mitsubishi Electric	PUZ-ZM100VKAZ	51 (heating mode noisier than cooling mode)
1	Mitsubishi Electric	PUZ-ZM200YKA2R1	62 (heating mode noisier than cooling mode)

7.3 Plant Noise Impact Assessment

The following tables present the calculated noise level emissions from the proposed plant, to the nearest noise sensitive adjacency.

Item	Manufacturer	Model	Sound Pressure Level dBA
Condenser Unit	Mitsubishi Electric	PUZ-ZM100VKAZ	51@1m
Distance Loss (to 12m approx.)			-21
BS4142 Intermittency Correction			+3
1/8 Spherical radiating correction			+6
Calculated Plant Noise Rating Level			**39**

Item	Manufacturer	Model	Sound Pressure Level dBA
Condenser Unit	Mitsubishi Electric	PUZ-ZM200YKA2R1	62@1m
Distance Loss (to 12m approx.)			-21
BS4142 Intermittency Correction			+3
1/8 Spherical radiating correction			+6
Calculated Plant Noise Rating Level			**50**

The calculated plant noise rating level of the PUZ-ZM100VKAZ condenser of 39dBA is 7dBA below the proposed daytime plant noise rating level limit. No further attenuation is required.

The PUZ-ZM200YKA2R1 condenser however exceeds the proposed daytime plant noise rating level limit by 4dBA.

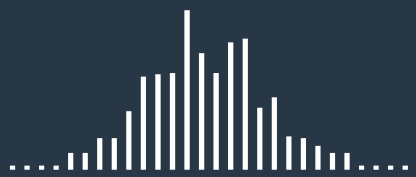
We therefore recommend the PUZ-ZM200YKA2R1 condenser be located within an acoustic enclosure providing a minimum 5dBA attenuation (only 4dBA attenuation required if considered individually but 5dBA attenuation when considered with the cumulative effect of the other condenser)

7.0 CONCLUSIONS

Quantum Acoustics have undertaken a fully automated environmental noise survey to establish the existing background noise levels at UCL Bidborough House.

Environmental plant noise emission criteria have been proposed, on the basis of the noise survey results, in accordance with the relevant guidance including the Local Authority's requirements.

Environmental noise emissions from the proposed plant have been assessed to nearby noise sensitive receptors. Our calculations indicate that the plant noise emissions should comply with the proposed noise emission criteria provided the proposed acoustic enclosure is installed around the noisier of the 2 proposed condenser units.



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