18 VINE HILL
LONDON
EC1R 5DZ

Environmental Noise Survey & Plant Noise Assessment Report

2 January 2024

Client:

Modus Workspace Limited
Gordon House
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QA23176/ENS

Document Control

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Document Approvals

Role	Name	Signature	Date
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For Information

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Contents

1.0 INTRODUCTION

Quantum Acoustics Ltd have been appointed to undertake an environmental background noise survey and plant noise assessment at 18 Vine Hill located in the London borough of Camden.

The application seeks permission for the installation of new external air conditioning units.

2.0 SITE DESCRIPTION

The site is located is outlined in red:

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

The site is in an area which is mainly comprised of commercial and residential properties. It is located within the jurisdiction of the London Borough of Camden.

3.0 ENVIRONMENTAL NOISE SURVEY

An automated environmental noise survey was undertaken from approximately 13:30 hours on Tuesday 28th November 2023 to approximately 14:30 hours on Wednesday 29th November 2023.

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

3.1 Measurement Procedure

One sound level meter was positioned towards the north-eastern boundary of the site and set up approximately 1.5m above roof level on the 2nd floor external terrace.

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

As the external roof terrace has been built in last 18 months, satellite imagery does not show its construction. Below is a picture which shows where the sound level meter was set up.

Figure 3. Location of sound level meter on the 2nd roof terrace

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	124647

The sound level meter was placed inside a weatherproof case and connected via an extension cable and fitted with a microphone windshield.

Calibration of the equipment is traceable to national standards. Calibration certificates are available on 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.

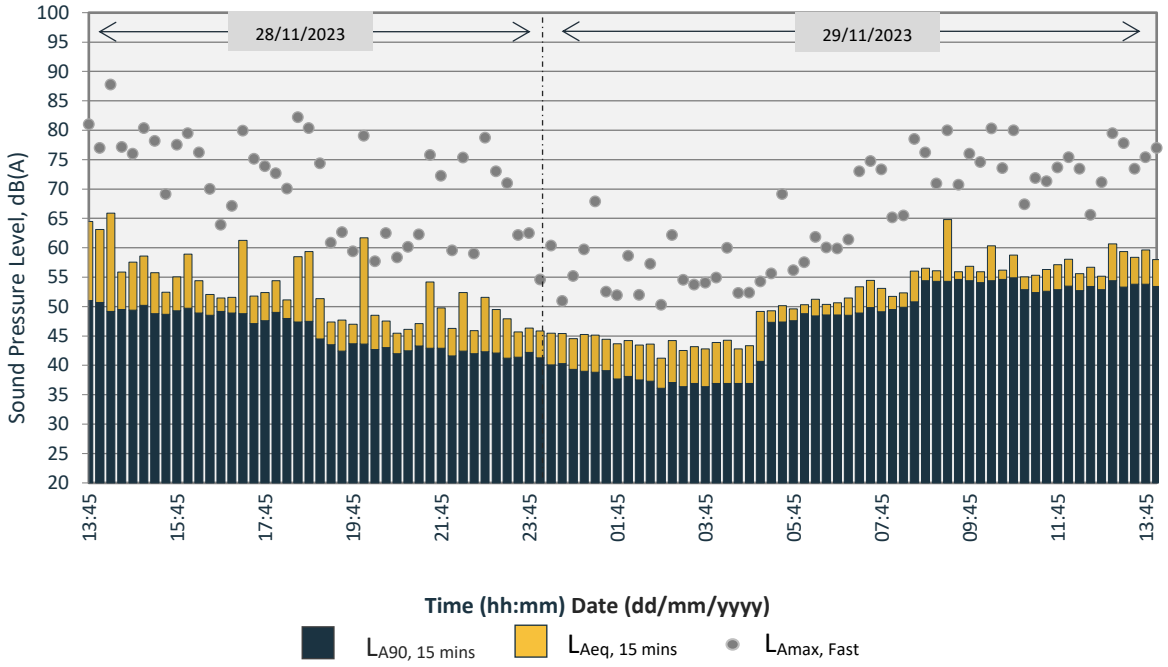
L_{eq} is the level of a notional continuous sound that would deliver the same sound energy as the actual fluctuating sound over the measurement period. This may be thought of as the "average" level during the measurement period.

L_{max} is the maximum noise level during the measurement period.

4.1 Noise Level Results

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

Position 1 – 2nd Floor Terrace



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

Modal Background L_{90} dB re2x10^{-5}Pa		
Position	**Daytime (07:00 – 23:00)**	**Night-time (23:00 – 07:00)**
1	54	37

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

Minimum Background L_{90} Noise Levels		
Position	Daytime (07:00 – 23:00)	Night-time (23:00 – 07:00)
1	42	36

The equivalent continuous (L_{eq}) noise levels are presented in the table below:

Equivalent Continuous L_{eq} Noise Levels		
Position	Daytime (07:00 – 23:00)	Night-time (23:00 – 07:00)
1	57	47

4.2 Noise Climate

During the periods that we were present at site, the subjectively dominant noise sources were noted to be local road traffic and noise.

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 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
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 effect (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:*
>
> *a) mitigate and reduce to a minimum potential adverse impact resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;*
> *b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason'*

5.4 Local Authority Requirements

The planning conditions that have been applied (ref 2020/0984/P) are as follows:

- ***Condition 17*** *– The external noise level emitted from plant, machinery or equipment at the development must meet the minimum Amber noise criteria set in The Camden Local Plan, Table C at the nearest and/or most affected noise sensitive premises, with all machinery operating together at maximum capacity.*

.

- ***Condition 33*** *– Noise levels at a point 1 metre external to sensitive facades shall be at least 10dB(A) less than the existing background measurement (LA90), expressed in dB(A) when all plant/equipment (or any part of it) is in operation unless the plant/equipment hereby permitted will have a noise that has a distinguishable, discrete continuous note (whine, hiss, screech, hum) and/or if there are distinct impulses (bangs, clicks, clatters, thumps), then the noise levels from that piece of plant/equipment at any sensitive façade shall be at least 15dB(A) below the LA90, expressed in dB(A).*

5.5 Proposed Plant Noise Emission Limits

5.5.1 Planning Condition 17

Planning Condition 17 refers to The Camden Local Plan Table C at the nearest and/or most affected noise sensitive premises, with all machinery operating together at maximum capacity.

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}

Therefore, the requirement is for the plant 'Rating level' to be between 9dB below and 5dB above the background noise level.

The Modal background noise level was measured to be as follows:

Modal Background L_{90} dB re2x10^{-5}Pa		
Position	Daytime (07:00 – 23:00)	Night-time (23:00 – 07:00)
1	54	37

The plant Rating level limits are therefore:

Daytime - 45dB(A) – 59dB(A)

Night-time - 28dB(A) – 42dB(A)

5.5.2 Planning Condition 33

Noise levels at a point 1 metre external to sensitive facades shall be at least 10dB(A) less than the existing background measurement (LA90), expressed in dB(A)

The Modal background noise level was measured to be as follows:

Modal Background L_{90} dB re2x10^{-5}Pa	
Daytime (07:00 – 23:00)	Night-time (23:00 – 07:00)
54	37

We therefore propose the following plant noise emission limits:

Proposed Plant Noise Emission Limits	
Daytime (07:00 – 23:00)	Night-time (23:00 – 07:00)
44	27

The requirements of Planning Condition 33 are more onerous than the requirements of Planning Condition 17. Compliance with the requirement of Planning Condition 33 should automatically result in compliance with Planning Condition 17.

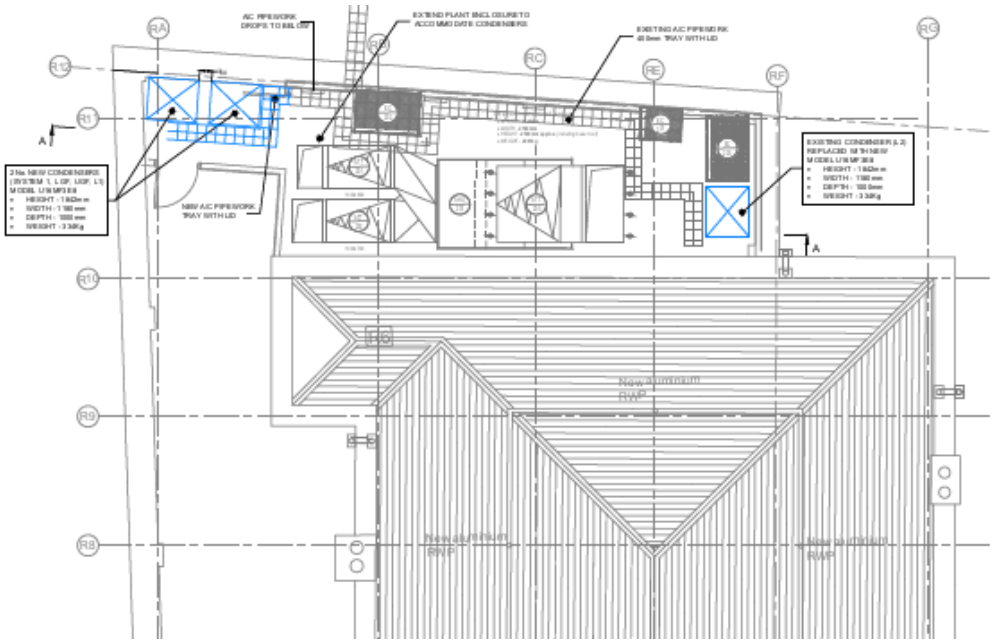
6.0 PLANT PROPOSALS

6.1 Proposed Plant

The proposed condenser units are intended to be installed on the 2nd floor external terrace and the tower rooftop.

6.1.1 2nd Floor Terrace

Three Panasonic U-16MF3E8 condenser units (blue) restricted to daytime hours only (07:00-23:00) and operating in Quiet Mode are proposed on the northern boundary of the 2nd floor external terrace. The locations of these units are shown in the diagram below.

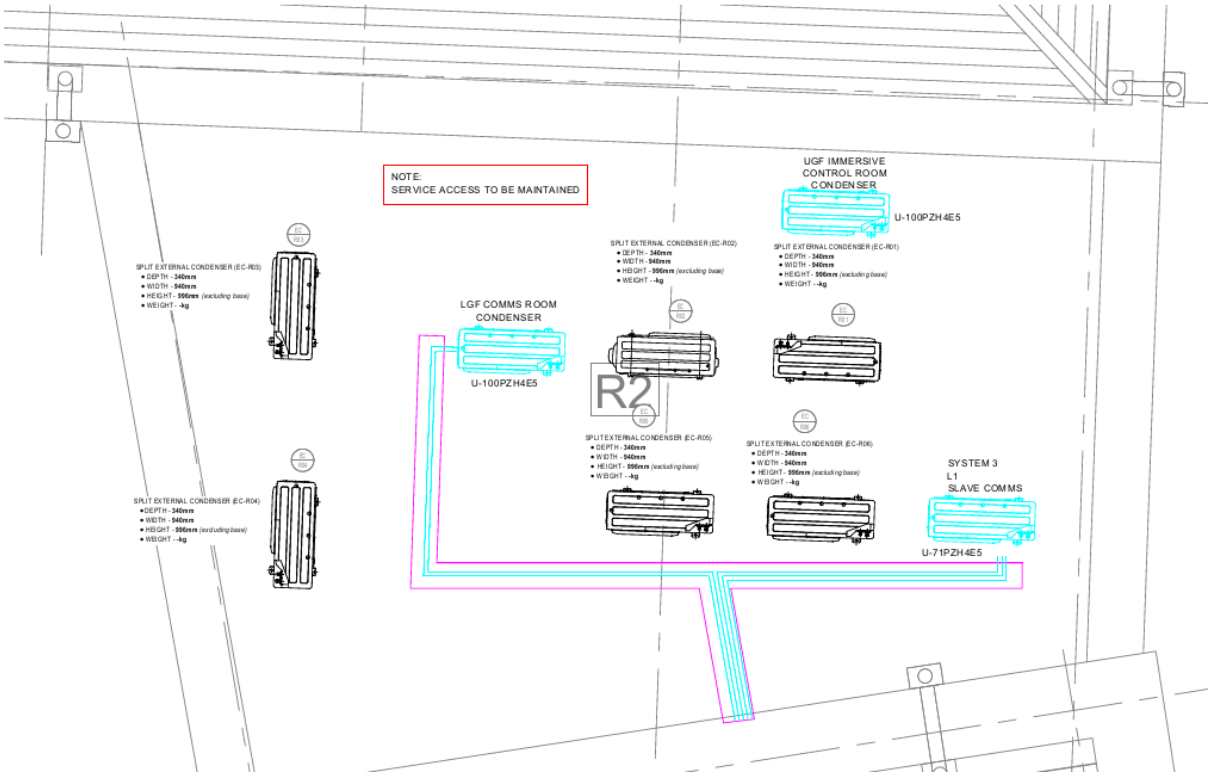


The sound level data for the U-16MF3E8 is shown in the table below:

Sound Pressure Level dB at Octave Band Centre Frequency (Hz)									Sound Pressure Level dB(A) @ 1m
	63	125	250	500	1k	2k	4k	8k	
U-16MF3E8 (Quiet Mode)	62	71	61	56	52	42	36	32	59

6.1.2 Tower Rooftop

A Panasonic U-71PZH4E8 and two Panasonic U-100PZH4E8 condenser units are proposed to be installed on the Tower rooftop. The locations of these units are shown in blue in the diagram below:



The sound level data for both of the condenser units are shown in the table below:

Sound Pressure Level dB at Octave Band Centre Frequency (Hz)									Sound Pressure Level dB(A) @ 1m
	63	125	250	500	1k	2k	4k	8k	
U-71PZH4E5	46	50	52	45	41	36	30	23	48
U-100PZH4E5	50	55	53	51	46	42	36	31	52

6.2 Nearest Noise Sensitive Receptors

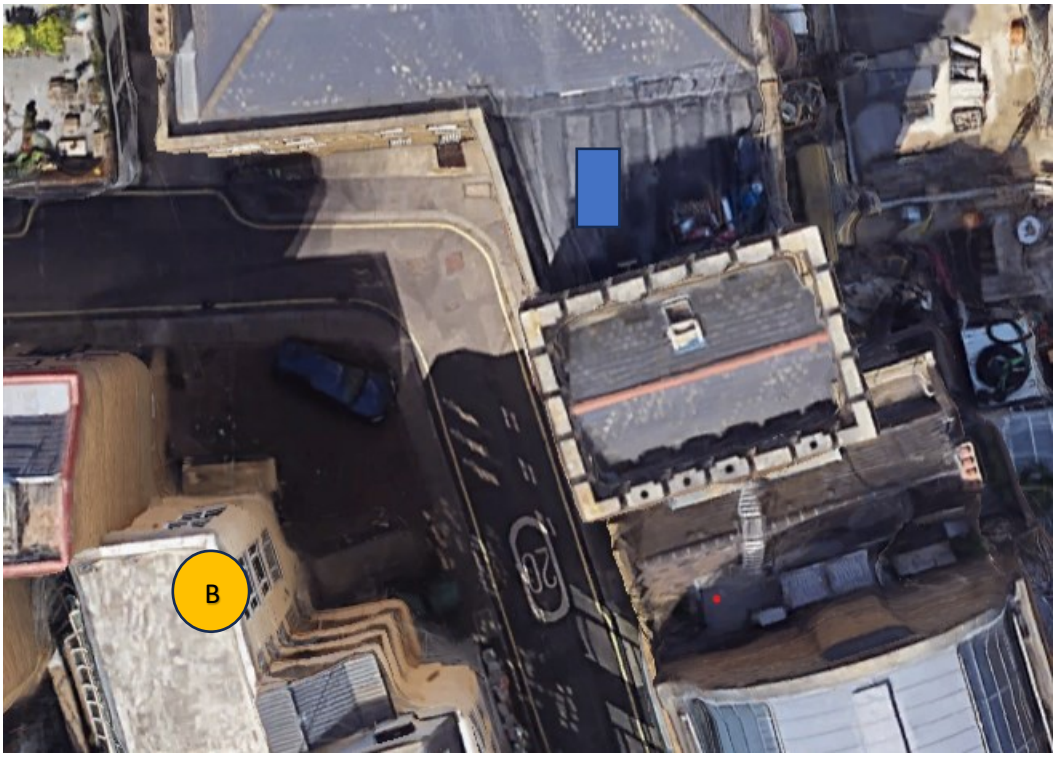
6.2.1 2nd Floor External Terrace Plant

The nearest potentially affected noise-sensitive receptor to the proposed roof plant area is a rear window of a residential dwelling in a residential building named Rosebery Square West. The building is located on Rosebery Avenue. The window (marked A in yellow) is approximately 11m from the nearest proposed external plant unit (marked 1 in blue.)

Figure 4. Nearest Identified Receptor Location (Google Imagery 2022, The GeoInformation Group)

6.2.2 Tower Roof Plant

The nearest potentially affected noise-sensitive receptor to the proposed plant on the tower roof is a 4th floor window located at 22 Vine Hill. The window (marked A in yellow) is approximately 22m from the nearest proposed external plant unit (marked 1 in blue.)



7.0 PLANT NOISE IMPACT ASSESSMENT

Calculations have been undertaken in general accordance with *"ISO:9613-2:1996 – The attenuation of sound during propagation outdoors: Part 2 General Method of Calculation"* and are based on the manufacture's technical datasheets, aerial photography and site observations.

Corrections have been applied throughout to account for directivity of the noise source relative to the receiver. It is assumed that all plant may operate at any time.

7.1 2nd Floor External Terrace Plant

We understand the condensers will run only during the daytime hours (07:00-23:00) and in Quiet Mode.

2x Condensers (north-west corner of site)

Calculated Noise Level, dBA @ Nearest Noise Sensitive Receptor		
	Panasonic U-16MF3E8	
Noise level of Condenser Unit @ 1m dBA	59	59
Distance to Noise Receptor	11m	12m
Geometrical Divergence dBA	-21	-22
Façade Correction	+3	+3
Calculated Noise Level @ 1m from nearest noise sensitive window dBA	**41**	**40**
Cumulative Noise Level @ 1m from nearest noise sensitive window dBA	**44**	

1x condenser (north-east corner of site)

Calculated Noise Level, dBA @ Nearest Noise Sensitive Receptor	
	Panasonic U-16MF3E8
Noise level of Condenser Unit @ 1m dBA	59
Distance to Noise Receptor	18
Geometrical Divergence dBA	-25
Screening	-6
Façade Correction dBA	+3
Calculated Noise Level @ 1m from nearest noise sensitive window dBA	**31**

The calculated cumulative plant noise level @1m from the nearest noise sensitive window is 44dBA which complies with the proposed daytime plant noise emission limit.

7.2 Tower Roof Plant

We understand the **c**ondensers will potentially run in both the daytime and night time.

Calculated Noise Level, dBA @ Nearest Noise Sensitive Receptor		
	U-100PZH4E5	U-100PZH4E5
Noise level of Condenser Unit @ 1m dBA	52	52
Distance to Noise Receptor	23m	23m
Geometrical Divergence dBA	-27	-27
Façade Correction	+3	+3
Screening	**-5**	**-5**
Calculated Noise Level @ 1m from nearest noise sensitive window dBA	**23**	**23**
Cumulative Noise Level @ 1m from nearest noise sensitive window dBA	**26**	

Calculated Noise Level, dBA @ Nearest Noise Sensitive Receptor	
	Panasonic U-71PZH4E5
Noise level of Condenser Unit @ 1m dBA	48
Distance to Noise Receptor	22m
Geometrical Divergence dBA	-26
Screening	-5
Façade Correction dBA	+3
Calculated Noise Level @ 1m from nearest noise sensitive window dBA	**20**

The calculated cumulative plant noise level @1m from the nearest noise sensitive window is 27dBA which complies with the proposed night time plant noise emission limit.

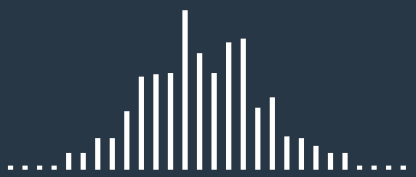
8.0 CONCLUSIONS

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

Environmental plant noise emission criteria have been proposed based on the noise survey results and in accordance with the relevant guidance including the requirements of Camden Council.

Environmental noise emissions from the proposed plant have been assessed to nearby noise sensitive receptors.

Our calculations indicate that the proposed plant is compliant with the local authority plant noise emission requirements.



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