LIGHTHOUSE LONDON
HOLY TRINITY CHURCH
FINCHLEY ROAD, SOUTH HAMPSTEAD
LONDON, NW3 5HT

Environmental Noise Survey & Plant Noise Impact Assessment

02 April 2025

Storey Project Management
7B St Pancras Way
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London
NW1 0PB

25085/ENS-PNIA

Document Control

Document Information

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Document History

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0	25 March 2025	-
1	02 April 2025	- Updated Rooftop plan (7.4) - Plant Screening (7.6) - Nighttime Assessment (7.9)

Document Approvals

Role	Name	Signature	Date
Preparation	Nat Cartier Assistant Consultant BSc, MSc		02 April 2025
Approval	Andrew Fermer Director BSc (Hons) MIOA		02 April 2025

For Information

Please Note
Quantum Acoustics Ltd have prepared this report with generally accepted acoustic consultancy principles, using all reasonable skill, care and diligence. This is as per the terms agreed between Quantum Acoustics Ltd and our Client. Information referred to herein which may have been provided by third parties should not be assumed to have been checked and verified by Quantum Acoustics Ltd, unless specifically confirmed to the contrary. Both confidential and commercially sensitive information is contained within this document, and as such it should not be disclosed to third parties. Any third party choosing to rely on this document does so at their own risk.

Contents

1.0 INTRODUCTION

Site Details

1.1 The site is located within the Finchley Road/Swiss Cottage Town Centre, opposite Finchley Road tube station and the O2 shopping centre.

1.2 The site is bounded by Finchley Road to the west, Lief House and associated surface car parking to the north/northwest, Alban House to the east and 120 Finchley Road to the south/southeast.

1.3 Holy Trinity Church occupies the majority of the site, with the main entrance accessed via a series of steps from Finchley Road. A second accessible entrance is situated on the northern elevation, accessed via a pedestrian footpath which runs from Finchley Road to Alban House, a residential building, located to the rear of the Church.

1.4 The site is not listed, nor is it located in a Conservation Area, however it does sit adjacent to the Fitzjohns Netherhall Conservation Area and opposite the South Hampstead Conservation Area.

1.5 The development comprises '"*The extension and refurbishment of the existing Holy Trinity Church (Use Class F1) to provide improved worship space and an ancillary café, with a new level access provided from Finchley Road.*"

1.6 Quantum Acoustics have been appointed by Storey Project Management to undertake an environmental background noise survey to establish appropriate plant noise emission criteria and subsequently assess the acceptability of atmospheric noise emission from the proposed plant.

1.7 This report presents our methodology and findings.

2.0 SITE DESCRIPTION

Location

2.1. The Lighthouse site is located on Finchley Road, South Hampstead, London, NW3 5HT. The location Is shown below, outlined in red:

Site Plan (Google Imagery 2025, The GeoInformation Group)

2.2. The surrounding area is mixed commercial and residential.

2.3. The Lighthouse London site is located within the jurisdiction of London borough of Camden.

3.0 ENVIRONMENTAL NOISE SURVEY METHODOLOGY

Site Description

3.1 An automated environmental noise survey was undertaken from approximately 13:00 hours on 26 February 2025 to approximately 11:30 hours on 03 March 2025.

3.2 The atmospheric conditions were deemed suitable for the measurement of environmental noise. Where conditions have been found to affect the measurement survey, this is reported.

Measurement Procedure

3.3 Noise monitoring equipment was located at the following positions:

Position	Description
Position A	Located externally approximately 2.5m above ground level
Position B	On the rooftop in a free-field location, approximately 1.5m above roof level
Position C	On the rooftop in a free-field location, approximately 1.5m above roof level

3.4 The noise monitoring positions are indicated on the following plan.

Plan Showing Measurement Positions (Google Imagery 2025, The GeoInformation Group)

3.5 The sound level meters were set up to continuously measure the A-weighted (dBA) L_{90}, L_{eq} and L_{max} sound pressure levels over sampling periods of 15 minutes duration.

Equipment

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

Location ID	Description	Manufacturer	Type	Serial Number
Position A	Type 1 Sound Level Meter	Convergence	nsrt_mk4	CHveJHWa0de1ghPCT6h5PD
Position B	Type 1 Sound Level Meter	Svantek	971A	124647
Position C	Type 1 Sound Level Meter	Convergence	nsrt_mk4	CHB0D1W4e9U9opvgy6JRvD
Position	Type 1 Sound Level Meter	Convergence	nsrt_mk4	ANB8Jf2wWXe3oDFCY0J5HD
Position	Type 1 Sound Level Meter	Svantek	971A	133519
-	Acoustic Calibrator	Svantek	SV 33B	99005

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

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

4.0 SURVEY FINDINGS

4.1 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.

Noise Survey Results

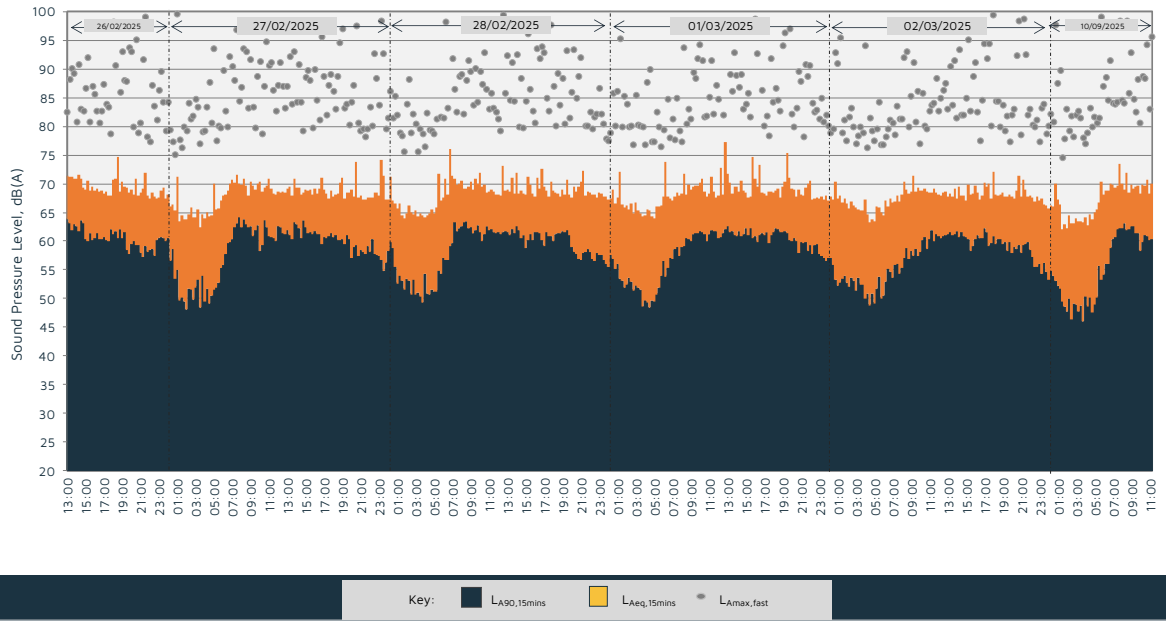
4.2 The noise survey results are presented in the graphs below, showing the A-weighted L_{90}, L_{eq} and L_{max} noise levels measured during each consecutive 15-minute period of the survey.

Graph A

Project: 25085

Measurement Location: Position A

Survey Date: 26 February - 03 March 2025

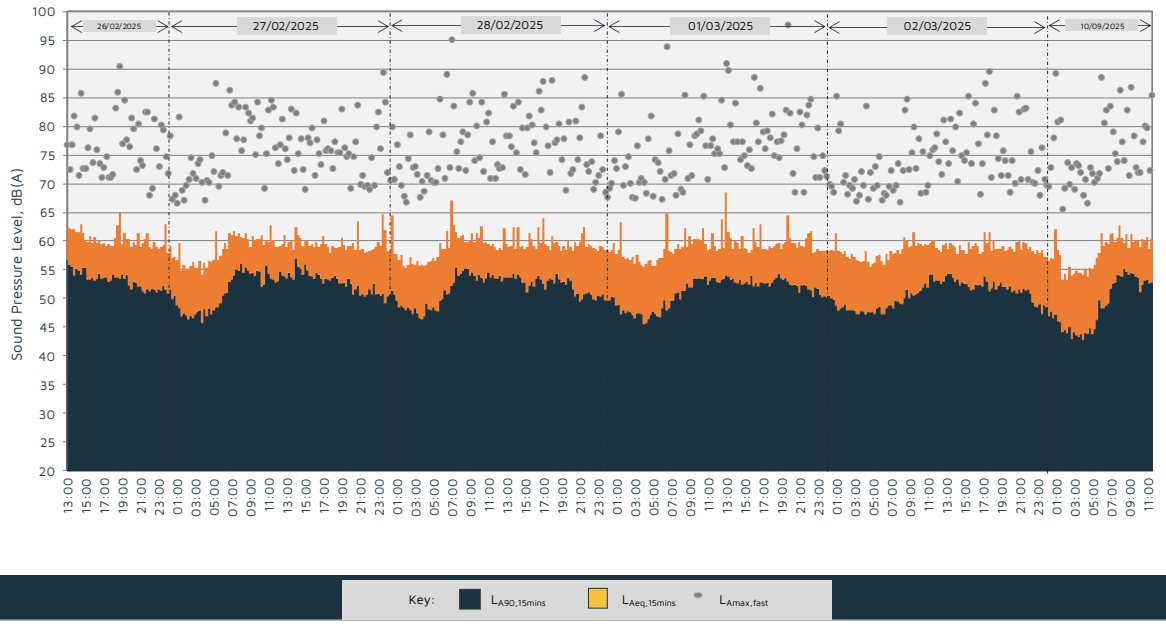


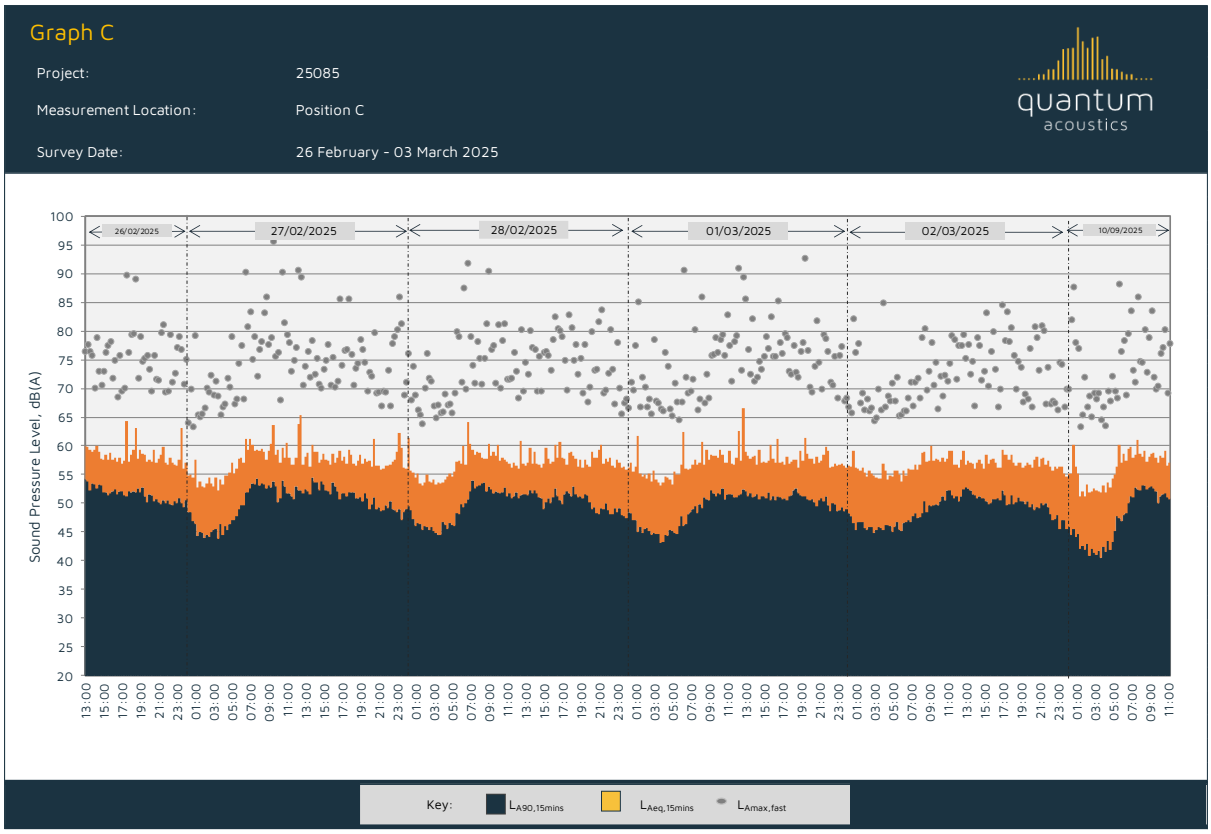
Graph B

Project: 25085

Measurement Location: Position B

Survey Date: 26 February - 03 March 2025





4.3 The measured daytime $L_{Aeq\ (16\ hour)}$ and night-time $L_{Aeq\ (8\ hour)}$ noise levels are presented in the table below:

L_{eq} Noise Levels		
Position	Daytime (07:00 – 23:00)	Night-time (23:00 – 07:00)
Position A	70	67
Position B	60	58
Position C	58	56

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

Position	Modal Background L90 dB re2x10-5Pa	
	Daytime (07:00 – 23:00)	Night-time (23:00 – 07:00)
Position A	61	52
Position B	54	47
Position C	51	45

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

Minimum Background L90 Noise Levels		
Position	Daytime (07:00 – 23:00)	Night-time (23:00 – 07:00)
Position A	57	48
Position B	50	46
Position C	48	44

Noise Climate

4.6 During the periods we were present on site, the subjectively dominant noise sources was road traffic noise.

5.0 RELEVANT PLANNING POLICIES AND NOISE ASSESSMENT GUIDANCE

Noise Policy Statement for England

5.1 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."

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

NOEL – No Observed Effect Level

5.3 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

5.4 This is the level above which adverse effects on health and quality of life can be detected.

SOAEL – Significant Observed Adverse Effect Level

5.5 This is the level above which significant adverse effects on health and quality of life occur.

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

5.7 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.

Planning Practise Guidance

5.8 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)."

5.9 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

National Planning Policy Framework

5.10 The following paragraph is from the National Planning Policy Framework (NPPF). The NPPF was revised in December 2024.

'198. 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'

London Plan 2021

5.11 The London Plan 2021 Policy D14 advises the following:

In order to reduce, manage and mitigate noise to improve health and quality of life, residential and other non-aviation development proposals should manage noise by:

1) avoiding significant adverse noise impacts on health and quality of life

2) reflecting the Agent of Change principle as set out in Policy D13 Agent of Change

3) mitigating and minimising the existing and potential adverse impacts of noise on, from, within, as a result of, or in the vicinity of new development without placing unreasonable restrictions on existing noise-generating uses

4) improving and enhancing the acoustic environment and promoting appropriate soundscapes (including Quiet Areas and spaces of relative tranquillity

5) separating new noise-sensitive development from major noise sources (such as road, rail, air transport and some types of industrial use) through the use of distance, screening, layout, orientation, uses and materials – in preference to sole reliance on sound insulation

6) where it is not possible to achieve separation of noise-sensitive development and noise sources without undue impact on other sustainable development objectives, then any potential adverse effects should be controlled and mitigated through applying good acoustic design principles

7) promoting new technologies and improved practices to reduce noise at source, and on the transmission path from source to receiver.

Local Authority Requirements

5.12 The site lies within the jurisdiction of London borough of Camden.

5.13 *Appendix 3: Noise thresholds* of the Camden Local Plan states the following:

"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 Camden Local Plan | Appendices 347 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}

BS 4142:2014

5.14 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.

5.15 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".

5.16 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.

6.0 PLANT NOISE EMISSION CRITERIA

6.1 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 1 metre from the noise sensitive residential window.

Plant Noise Emission Limits L_{eq} dB re2x10^{-5}Pa		
Receptor	Daytime (07:00 – 23:00)	Night-time (23:00 – 07:00)
120 Finchley Road (R1)	51	42
Alban House, 5 Sumpter Cl (R2)	41	35

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

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

6.4 Relaxations of the above criteria may be acceptable for emergency plant, however they must be considered on a case-by-case basis.

7.0 PLANT NOISE IMPACT ASSESSMENT

Nearest Noise Sensitive Receptor

7.1 The potentially most affected noise-sensitive receptor to the proposed plant is a residential hotel window at the Quarters 120 Finchley Road (R1) and a residential window at Alban House (R2) approximately 6 metres and 32 metres respectively, from the planned plant location. The identified noise sensitive receptors are indicated by the yellow circle below:

Nearest Noise Sensitive Receptor (Google Imagery 2025, The GeoInformation Group)

Proposed Plant Selections

7.2 We understand indicative plant selections comprise:

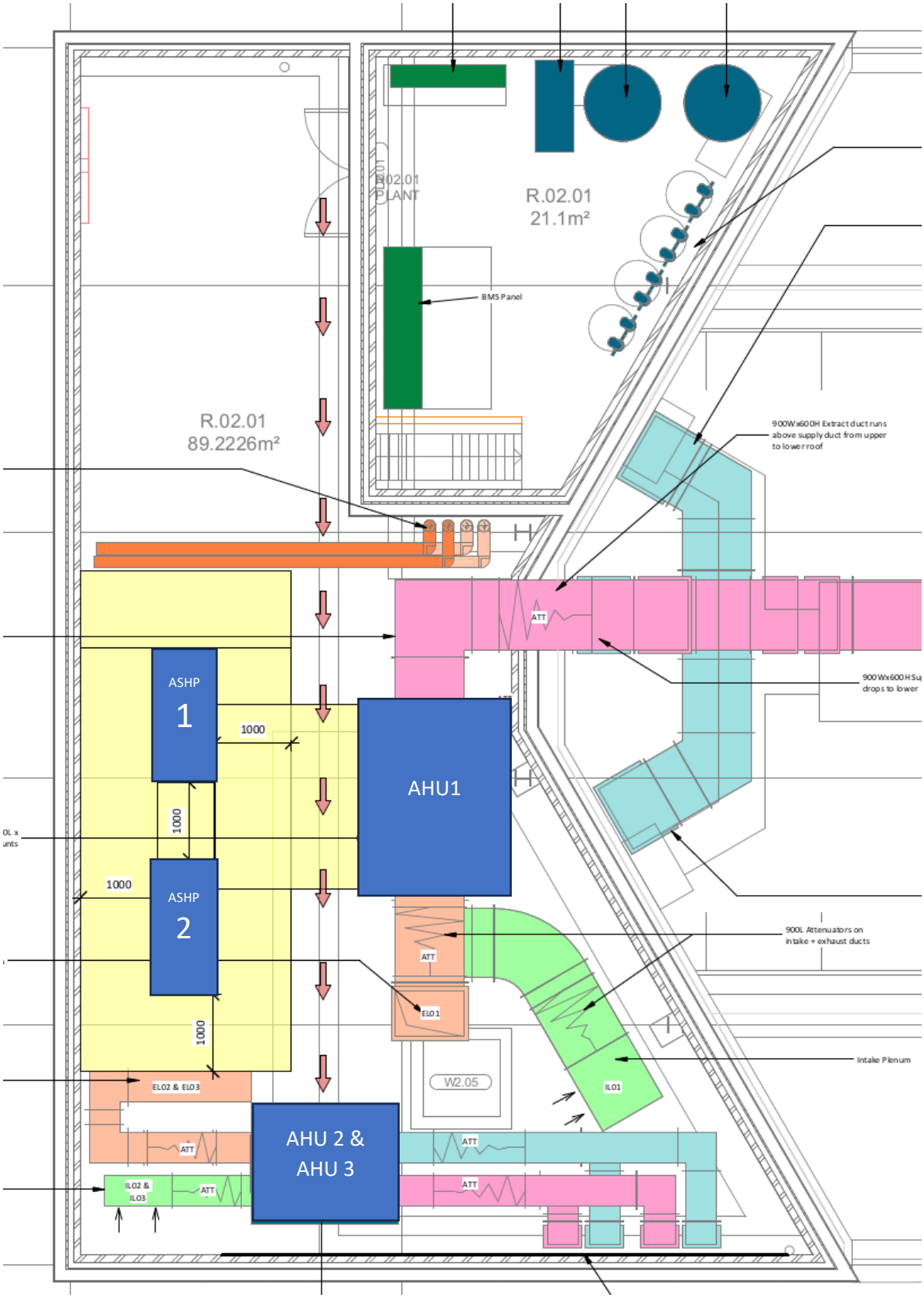
Manufacturer	Model	Reference
Mitsubushi	CAHV-R450YA-HPB	ASHP 1 & 2
Nuaire	BOXER NEPTUNE VERTICAL UNIT SIZE 32	AHU 1
Nuaire	BOXER NEPTUNE XBC+ SIZE 65	AHU 2
Nuaire	BOXER NEPTUNE XBC+ SIZE 55	AHU 3

7.3 The following table presents noise levels of the indicative cooling plant selections.

Plant	Reference	Sound Pressure Level (L_p) (dBA)
CAHV-R450YA-HPB (1)	ASHP 1	72 at 1m
CAHV-R450YA-HPB (2)	ASHP 2	72 at 1m

In-duct sound power levels at octave band centre frequencies have been provided for the proposed Air Handling Units

7.4 The rooftop layout is shown in the following drawing:


R.02.01
PLANT
R.02.01
21.1m²
BMS Panel
R.02.01
89.2226m²
900Wx600H Extract duct runs above supply duct from upper to lower roof
ATT
900Wx600H Su drops to lower
ASHP
1
1000
AHU1
1000
ASHP
2
1000
900L Attenuators on intake + exhaust ducts
ATT
EL01
Intake Plenum
W2.05
IL01
EL02 & EL03
AHU 2 &
AHU 3
ATT
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IL02 &
IL03
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Attenuation

7.5 For the purpose of this plant noise assessment receptor R1 has been identified as the potentially worst affected noise sensitive window, with subsequent attenuation advice. Levels at R2 have also been demonstrated for compliance. We understand only daytime running needs to be considered for all items under assessment as the plant will not run at night.

7.6 If the plant and screen are such that there is a line of sight to any windows of R1 or R2, our calculations indicate that that an attenuation package to the ASHP units giving 18dB would be required. If the plant and screen height can be located such that there is no line of sight (as appears likely), attenuation of -13dB would be required. In order for only a -8dB attenuation package to work for the daytime, the screen/ASHP would need to be configured such that the line of sight is more than fully interrupted from all parts of the units.

Item	Manufacturer	Model	Sound Pressure dBA at R1	
			No attenuation	With attenuation and/or screening as described (-13dB)
ASHP 1	Mitsubushi	CAHV-R450YA-HPB	62	44
ASHP 2	Mitsubushi	CAHV-R450YA-HPB	62	44
Cumulative ASHP Sound Pressure at R1			65	47

7.7 Our calculations based on the indicative AHU plant selections described suggest the required Local Authority plant noise emission limits can be met through suitable in-duct attenuation as follows.

Item	Duct	Attenuation Suggestion	Sound Pressure dBA at R1
AHU 1	Intake	45%/900	40
AHU 1	Discharge	30%/900	37
AHU 2	Intake	50%/900	36
AHU 2	Discharge	50%/900	38
AHU 3	Intake	40%/900	38
AHU 3	Discharge	50%/900	37
Cumulative AHU Sound Pressure at R1			46

Assessment Summary

7.8 The following table summarises our assessment of cumulative plant noise to both identified noise sensitive residential windows R1 and R2 with attenuation as suggested, compared to the established plant noise emission limit.

Item	Sound Pressure [dBA] at R1	Sound Pressure [dBA] at R2
Total ASHP	47	35
Total AHU	46	35
Total Noise	49	38
Criterion	51	41
Compliance	YES	YES

Nighttime Assessment

7.9 Our report is based on daytime running, the night-time criteria is more onerous. Reduced duty running and night-time setback modes will be required overnight to reduce levels by -7dB in addition to the attenuation specified for daytime running.

8.0 CONCLUSIONS

8.1 Quantum Acoustics have undertaken an automated environmental noise survey to establish the existing noise levels.

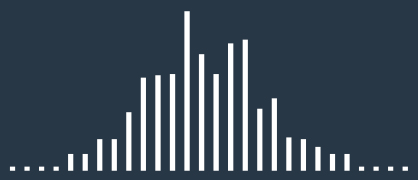
8.2 Environmental plant noise emission criteria have been proposed based on the noise survey results and in accordance with the relevant guidance including the Local Authority's requirements.

8.3 Environmental noise emissions from indicative plant selections have been assessed to noise sensitive receptors. Attenuation has been specified where needed.

8.4 Our calculations indicate that environmental plant noise emissions should comply with the proposed criteria if our suggested attenuation is implemented.

8.5 Compliance with the proposed plant noise emission criteria will ensure the proposed plant has no significant adverse noise impact on nearby noise sensitive receptors.

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



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