

ACOUSTICS CENTRAL



T4 Wood Green

Planning Noise Report

20230308-0 R1

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20230308-0 R1

Delta Bravo

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Executive Summary

It is proposed to install 2 new fans (supply and extract) at 6 The Broadway, Wood Green, N22 6DS as part of the fit out for a T4 Bubble Tea shop. Planning permission has been granted, and Condition 3 attached to the permission requires an assessment of the noise from the proposed plant.

The aim of the assessment is to demonstrate that noise emissions from proposed plant will be suitably controlled to noise sensitivities within the vicinity of the site. Acoustics Central has therefore been instructed to undertake the acoustic assessment.

To address the requirements of Planning Condition 3 regarding the control of noise from proposed plant, a noise assessment has been carried out. The assessment establishes limits based on the existing background noise levels which were measured as part of a noise survey carried out at the site.

The assessment concluded that the noise arising as a result of the proposed plant items was calculated to meet the noise limits established based on the requirements of Planning Condition 3. As such, the proposed plant items are expected to meet the requirements of Planning Condition 3 with the inclusion of in-duct silencers that are already included within the scheme. Anti-vibration fixings will also be used to support the plant.

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Document Naming and Version Control Policy

1 Introduction

- 1.1 It is proposed to install 2 new fans (supply and extract) at 6 The Broadway, Wood Green, N22 6DS as part of the fit out for a T4 Bubble Tea shop. Planning permission has been granted, and Condition 3 attached to the permission requires an assessment of the noise from the proposed plant.
- 1.2 The aim of the assessment is to demonstrate that noise emissions from proposed plant will be suitably controlled to noise sensitivities within the vicinity of the site. Acoustics Central has therefore been instructed to undertake the acoustic assessment.
- 1.3 This report provides details of a noise survey undertaken at the site to gain an understanding of the existing noise climate, the details of the assessment undertaken using the data as a basis, and any subsequent conclusions or recommendations.
- 1.4 The report is necessarily technical in nature, however every effort has been made to make it as clear as possible. In this regard, the Glossary of Acoustics Terms attached as Appendix A gives further explanation on relevant acoustics terminology used within the report.

2 Site Layout

2.1 General

2.1.1 The site is located at 6 The Broadway, Wood Green, N22 6DS as indicated in the following figures.



F1 Figure indicating the location and arrangement of the site

2.1.2 The site comprises a 3-storey building with retail at ground floor and residential use above.

2.2 Proposals

- 2.2.1 It is proposed to install 2 fans (supply and extract) which will terminate just above the single storey ground-floor flat roof to the rear of the building.

2.3 Site Context

- 2.3.1 The buildings within the vicinity of the site have the same arrangement as the site itself, with retail at ground floor with residential use above. The closest noise sensitive residential premises potentially affected by the proposed plant are those on the upper floors of the site itself, i.e. the residences on the 1st floor at 6 The Broadway.

2.4 Noise Climate

- 2.4.1 To the front of the building, the noise climate is controlled by road traffic on the A105. To the rear, noise from the road contributes, along with existing mechanical services plant serving the site and other buildings within the vicinity.

3 Design Requirements

- 3.1 Planning permission for the scheme was granted by the London Borough of Haringey; application reference HGY/2023/0337. Planning Condition 3 of the planning approval states the following:

"Noise arising from the use of the extractor fan and any associated equipment shall not increase the existing background noise level (LA90,15mins) when measured (LAeq 15mins) 1 metre externally from the nearest residential or noise sensitive premises. To prevent the transmission of noise and vibration into neighbouring premises, the flue and associated ducting shall be isolated from the building structure in accordance with a scheme that shall be submitted and approved by the Local Planning Authority before the commencement of any works."

- 3.2 In order to address the above, the Section 4 of this report sets out the quantification of the existing background noise levels and using these establishes limits in-line with the requirements of the condition. Following this, Section 5 sets out the assessment of the noise from the proposed plant and compares these with the limits.

4 Noise Survey

4.1 General

- 4.1.1 In order to quantify the noise levels at and around the site, an environmental noise survey was carried out, commencing at 15h00 on Monday 3rd April and concluding at 13h00 on Wednesday 5th April 2023.

4.2 Guidance and Standards

- 4.2.1 The survey instrumentation, methodology and reporting of results has been carried out following guidance contained within British Standard 7445-1:2003 - *'Description and measurement of environmental noise - Part 1: Guide to quantities and procedures'*,

4.3 Measurement Positions

- 4.3.1 Noise measurements were made for a period of 46 hours at a single position located on the flat roof at the rear of the building (MP1). This location is illustrated on the following figure, and a description given below.



F2 Figure indicating the environmental noise survey measurement position

- MP1 The sound level meter microphone was fixed to the top of a tripod located on the flat roof at the rear of the building at a height of approximately 1m above roof level. Measurements made at this position were intended to quantify the noise climate at a location representative of the closest potentially affected noise sensitivities to the proposed plant locations.

4.4 Noise Monitoring Equipment

4.4.1 All noise measurements were made with the equipment detailed in the following table.

Item	Manufacturer	Type
Sound Level Analyser	NTi	XL2-TA
Acoustic Calibrator	NTi	CAL200

T1 Equipment used during unattended external noise measurements

4.4.2 The sound level analyser presented in the above table conforms to the Type 1 specification as given in BS EN 61672-1:2003 - *'Electroacoustics - Sound level meters - Part 1: Specifications'*. The calibrator presented in the above table conforms to the Class 1 specification as specified in IEC 60942:2003 - *'Electroacoustics - Sound calibrators'*.

Traceable Calibration

- 4.4.3 The measurement instrumentation, including sound level analyser, preamplifier and microphone has undergone traceable calibration by either a competent laboratory or the equipment manufacturer within the last two years.
- 4.4.4 The acoustic calibrator has undergone traceable calibration by either a competent laboratory or the equipment manufacturer within the last two years. The calibration certificates for the above equipment can be provided on request.
- 4.4.5 The noise measurement equipment was calibrated before and after the survey to ensure a consistent and acceptable level of accuracy is maintained. No significant drift (greater than 0.1dB) was noted to have occurred.

4.5 Data Recorded

- 4.5.1 Noise data was recorded over consecutive 15-minute periods in all relevant indices, including L_{Aeq} , L_{A90} , and $L_{Amax,F}$ ¹. See attached Appendix A for an explanation of noise units used.
- 4.5.2 Octave band data for each of the above indices was also recorded at all positions, the filters for which met the requirements of BS EN 61260:1996, Class 1.
- 4.5.3 Audio recordings were also made throughout the duration of the survey for the purposes of identification of any atypical noise conditions occurring during the measurements.

4.6 Meteorological Conditions

- 4.6.1 During the survey temperatures were generally mild in the daytime up to 15°C with clear skies and low wind speeds i.e. < 5m/s. Temperatures dropped low but not freezing over night. The ground was noted to be dry when on-site, and no precipitation was recorded in publicly available weather data during the survey.

¹ Maximum A-weighted sound pressure level using time-weighting "F" and "S". As stated in BS EN 61672-1:2003 Design-goal time constants are 0.125 s for time-weighting F (Fast) and 1 s for time weighting S (Slow).

4.7 Results

- 4.7.1 The attached time-history figures TH1 – TH2 present the noise levels measured at MP1. It can be seen that plant from nearby commercial units dominates the noise climate in the daytime, from around 9am. A summary of relevant results is presented in the following table.

Period / Index	MP1
Lowest Daytime (07h00 – 23h00) Background, $L_{A90,15min}$	51
Lowest Night-time (23h00 – 07h00) Background, $L_{A90,15min}$	47

T2 Summary of Noise Survey Results

- 4.7.2 The value noted for the daytime is established from the period prior to the other commercial units in the area turning their plant on.

4.8 Limits

- 4.8.1 As set out in Section 3, Planning Condition 3 requires the existing background noise levels not to be increased. This effectively means designing to a level 10 dB below the existing background noise levels. As such, using the measured noise levels along with these requirements, the following plant noise emission limits are to apply at the nearest noise sensitive premises:

Location	Plant Noise Emission Limits, L_{Aeq} dB	
	Daytime 07h00-23h00	Night-time 23h00-07h00
Noise Sensitivities to the Rear of 6 The Broadway	41	37

T3 Plant Noise Emission Limits

- 4.8.2 The above limits apply to the cumulative noise emissions from all new plant items under normal operating conditions, and are to apply at 1 m from the outside of the windows of the worst-affected noise sensitive receptors within the vicinity of the site.

5 Atmospheric-Side Plant Noise Assessment

5.1 General

- 5.1.1 In order to compare the proposed plant items with the requirements, an atmospheric plant noise assessment has been carried out.
- 5.1.2 In essence, the assessment starts with manufacturer's plant noise levels, takes account of any system or propagation losses, and compares the resultant levels with the plant noise limits established in the previous section.
- 5.1.3 Our calculations take into account propagation losses such as distance and, where relevant, screening from roof and wall edges where these obscure the plant from direct view. The attached Calculation Sheets CS1 – CS2 set out the calculations undertaken as part of this process.

5.2 Assessment Locations

- 5.2.1 As discussed in Section 2.3, the closest noise sensitive residential premises potentially affected by the proposed plant are those on the upper floors of the site itself, i.e. the residences on the 1st floor 6 The Broadway.

5.3 Proposed Scheme

- 5.3.1 It is proposed to install 2 fans (supply and extract) which will terminate just above the single storey ground-floor flat roof to the rear of the building, which comprise the following items:
- 2no. Helios RR 200 B Fans (SF-01 and EF-01)
- 5.3.2 The noise data for the proposed plant items can be seen in the attached Plant Noise Schedule SCH1, and their approximate locations are indicated on the following figure.



F3 Figure indicating approximate proposed plant locations

5.4 Mitigation

- 5.4.1 In order to reduce the noise levels from the proposed plant items, both the fans are to be fitted with atmospheric-side silencers, the minimum insertion losses for which are set out in the attached Mitigation Schedule SCH2.
- 5.4.2 The performances noted in the schedule are the minimum that must be achieved in each octave band. Based upon specific selections from *Allaway Acoustics*, the silencers will likely need to be rectangular splitter silencers of 1500mm length, with a free area of 33%.
- 5.4.3 We would expect the size of the silencers to be approximately 400x300mm, however this is indicative guidance only and the M&E sub-contractor will need to ensure they are sized appropriately to avoid creating excessive pressure drops or regenerative noise that might otherwise increase the assessed noise at the receptor.
- 5.4.4 With a silencer specified to meet the performance required at 125Hz, it is likely the insertion losses at higher frequencies will be in excess of the minimum required and therefore even lower noise levels are likely to be found in practice.

5.5 Hours of Operation

- 5.5.1 We understand the fans are expected to operate approximately 08h00-20h00 during store opening hours; however, to give some flexibility, we have considered the hours of 07h00-23h00 for the purposes of our assessment.

5.6 Assessment Results

- 5.6.1 By utilising the methodology set out above we calculate noise levels at the aforementioned assessment positions as presented in the following table. The noise limits are also reproduced for ease of comparison.

Location	Day (07h00 - 23h00)		Night (23h00 – 07h00)	
	Noise Limit	Calculated	Noise Limit	Calculated
Closest Residences	41 dBA	41 dBA	37 dBA	N/A

T4 Noise limits and levels calculated for the proposed plant

- 5.6.2 As the above table T4 shows, the noise arising as a result of the proposed plant items is calculated to meet the noise limits established based on the requirements of Planning Condition 3 (the silencers specifically specified to meet the limit). As such, the proposed plant items are expected to meet the requirements of the planning condition without the need for any further mitigation beyond the silencers already included within the scheme.

5.7 Anti-Vibration Mounts

- 5.7.1 As required by Planning Condition 3, to prevent the transmission of noise and vibration into neighbouring premises, the flue and associated ducting shall be isolated from the building structure in accordance with a scheme that shall be submitted and approved by the Local Planning Authority before the commencement of any works.
- 5.7.2 In this regard, the fans will be resiliently fixed to the underside of the soffit. Either fan manufacturer (Helios) optional anti-vibration mounting accessory kit should be utilised, or proprietary anti-vibration mounts selected to achieve minimum 2mm static deflection under load (e.g. 2no. RS Pro Anti Vibration Mount, Male to Male Bobbin Stock number 126-3942; this selection is based upon the fan being support by 2 mounts with fan weight of 5kg; the model to be confirmed once exact loadings of system are known).
- 5.7.3 The associated ductwork will be connected to the fan (on both sides) by way of flexible collar connections to minimise transfer of vibration from the fan to the rest of the system.
- 5.7.4 With the fan isolated from the building structure and the ductwork isolated from the fan at source, the ductwork and flue should therefore not have an adverse effect on the structure, as per the requirements of condition 3.

6 Conclusions

- 6.1 To address the local planning authority's requirements with regards to the control of noise from proposed plant, a noise assessment has been carried out. The assessment establishes limits based on the existing background noise levels which were measured as part of a noise survey carried out at the site.
- 6.2 The assessment concluded that the noise arising as a result of the proposed plant items was calculated to meet the noise limits established based on the requirements of Planning Condition 3. As such, the proposed plant items are expected to meet the requirements of Planning Condition 3 without the need for any further mitigation beyond the silencers already specified as part of the system.

Figure 20230308-0 R1 TH1

Noise Levels Recorded at Position MP1, 3rd - 4th April 2023

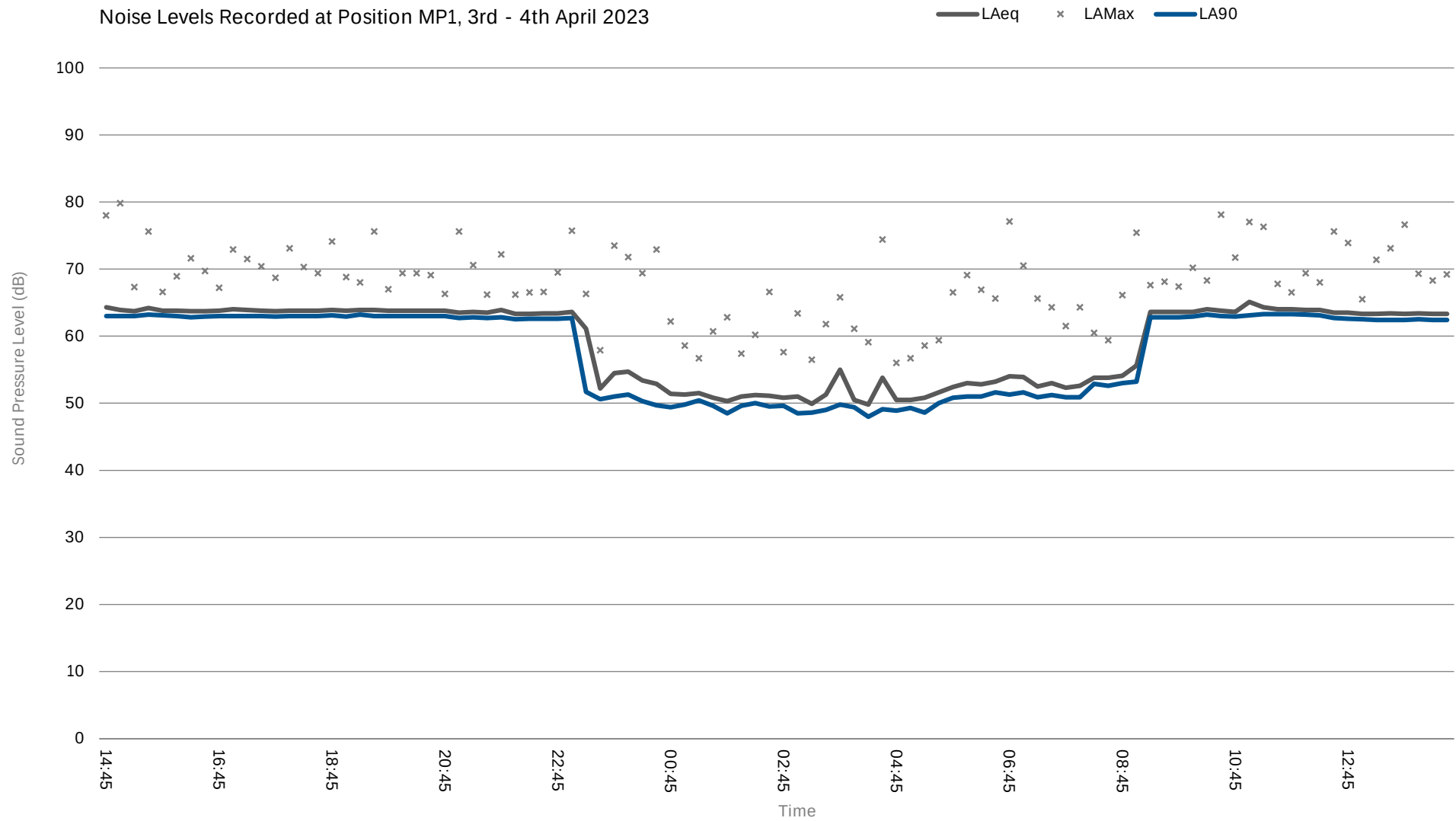
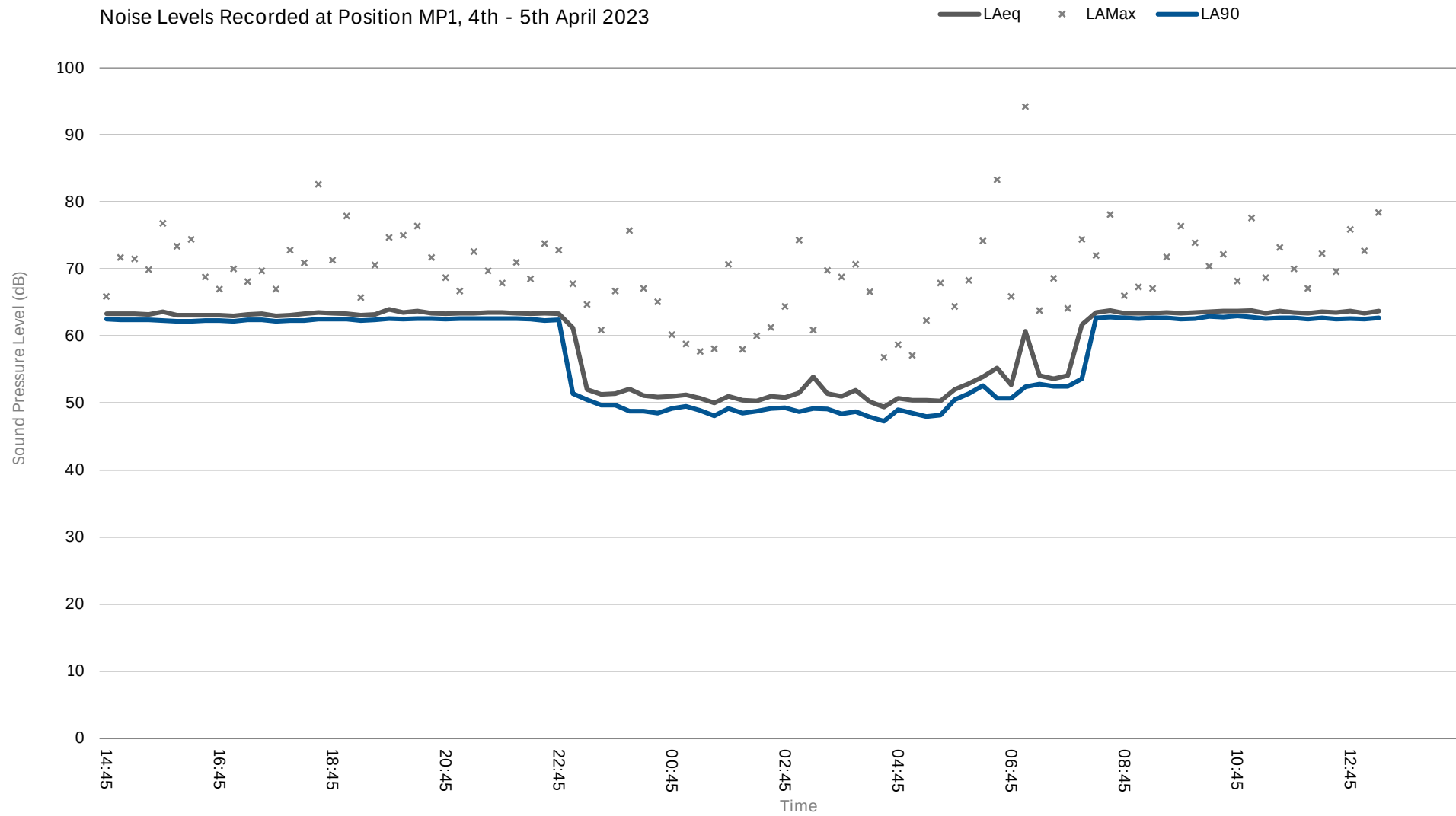


Figure 20230308-0 R1 TH2

Noise Levels Recorded at Position MP1, 4th - 5th April 2023



Plant Noise Schedule

Reference	Description	Unit Details	Data Source	Noise Level Type	dB(A)	Noise Levels (dB)							
						63	125	250	500	1k	2k	4k	8k
SF-01 FAI	Supply Fan - Fresh-Air Intake	Helios RR 200 B	Man	Sound Power, Lw	-	78.1	75.6	72.2	66.0	61.8	61.0	58.1	
EF-01 EXH	Extract Fan - Atmospheric-Side Exhaust	Helios RR 200 B	Man	Sound Power, Lw	-	78.1	75.6	72.2	66.0	61.8	61.0	58.1	

Mitigation Schedule

Reference	Description	Location	Pressure Drop (Pa)	Face Velocity (m/s)	Insertion Losses (dB)							
					63	125	250	500	1k	2k	4k	8k
AS-01	Min. Insertion Loss	Supply Fan (atmospheric side)			8	17	20	22	25	20	18	10
AS-02	Min. Insertion Loss	Extract Fan (atmospheric side)			8	17	20	22	25	20	18	10

Calculation Sheet
SF-01 FAI to AP1

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Noise Source									
Noise Source - SF-01 FAI									
Sound Power Levels		-	78.1	75.6	72.2	66.0	61.8	61.0	58.1 73.5 dBA
Silencer									
Silencer - AS-01									
		-	-17.0	-20.0	-22.0	-25.0	-20.0	-18.0	-10.0
Bend Loss									
Dimension (mm)	200.0								
No. of Bends (no.)	1.0								
Type - Unlined Radius Bend									
		-	-1.0	-2.0	-3.0	-3.0	-3.0	-3.0	-3.0
Cowl									
Split (%)	50.0								
		-	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
Point Source Radiation Loss									
Radiation - Quarterspherical									
		-	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
Point Source Distance Loss									
Start Distance (m)	1.0								
End Distance (m)	1.8								
		-	-5.1	-5.1	-5.1	-5.1	-5.1	-5.1	-5.1
External Receiver									
External Receiver - AP1									
Sound Pressure, Lp		-	47.0	40.5	34.1	24.9	25.7	26.9	32.0 38.2 dBA

Calculation Sheet
EF-01 EXH to AP1

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
<i>Noise Source</i>									
Noise Source - EF-01 EXH									
Sound Power Levels		-	78.1	75.6	72.2	66.0	61.8	61.0	58.1 73.5 dBA
<i>Silencer</i>									
Silencer - AS-02									
		-	-17.0	-20.0	-22.0	-25.0	-20.0	-18.0	-10.0
<i>Circ Unlined Duct Losses</i>									
Diameter (m)	0.2								
Length (m)	4.0								
		-	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4
<i>Bend Loss</i>									
Dimension (mm)	200.0								
No. of Bends (no.)	1.0								
Type - Unlined Radius Bend									
		-	-1.0	-2.0	-3.0	-3.0	-3.0	-3.0	-3.0
<i>Cowl</i>									
Split (%)	50.0								
		-	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0
<i>Point Source Radiation Loss</i>									
Radiation - Quarterspherical									
		-	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0	-5.0
<i>Point Source Distance Loss</i>									
Start Distance (m)	1.0								
End Distance (m)	1.8								
		-	-5.1	-5.1	-5.1	-5.1	-5.1	-5.1	-5.1
<i>External Receiver</i>									
External Receiver - AP1									
Sound Pressure, Lp		-	46.6	40.1	33.7	24.5	25.3	26.5	31.6 37.8 dBA

Appendix A

Glossary of Acoustics Terms – Noise Levels

Single Figures and Spectra

Generally speaking, the human ear is capable of hearing noise within the frequency range 20Hz to 20kHz. To make handling of data more meaningful and manageable, the range is often divided into 'bands', each of which covers a specific part.

For most acoustics applications, either octave or third-octave bands are used. Each band has a specific centre frequency which is used to identify it. When reported, the band centre frequency is given, along with the associated noise level, e.g. 63dB L_{eq} at 500Hz.

Noise levels can also be reported as single figure values where all energy contained within the measured frequency range is summed to provide a single figure. However, as the human ear does not hear noise at different frequencies with equal loudness, a weighting curve is often applied to levels before summing to account for this fact.

The most common curve is the A-weighting curve, and its use is denoted by including the letter 'A' with either the index e.g. 63dB L_{Aeq} , or with the decibel suffix (if the index is described elsewhere), e.g. 63dBA. 'B' and 'C' weighting curves may also be applied, depending on the application. A 'Z' is used to indicate a single figure where no weighting has been applied, e.g. 63dB L_{Zeq} .

Noise Level Indices

Noise level measurements can be made and reported in a variety of indices. The index is reported using the letter L to indicate Level, followed by, for example, abbreviations to represent the specifics of the index, and time intervals where applicable. The most commonly used are given below.

$L_{eq,T}$ (dB) - Equivalent Continuous Sound Pressure Level

The $L_{eq,T}$ value is the sound pressure level in decibels of a continuous steady sound that within a specified time interval, T , has the same mean-squared sound pressure as a sound that varies with time. It is often used as a descriptor of the **ambient noise climate**, and commonly seen as a single A-weighted figure $L_{Aeq,T}$.

L_{max} (dB) - Maximum Sound Pressure Level

The L_{max} value is the highest recorded sound pressure level in decibels averaged across a specified time constant during a noise measurement of certain duration. Two time constants are used, Fast and Slow, where the time constants are 0.125s and 1s respectively. The time constant is denoted in the index, $L_{max,F}$ for Fast and $L_{max,S}$ for Slow. It is often used to identify transient events that have a high-level relative to the ambient noise climate, and commonly seen as a single A-weighted figure L_{Amax} .

$L_{10,T}$ (dB) - Equivalent Continuous Sound Pressure Level

The $L_{10,T}$ value is the sound pressure level in decibels that is exceeded for 10% of a given time interval, T. It is often used as a measurement of noise from transportation sources such as road and rail. It is commonly seen as a single A-weighted figure $L_{A10,T}$.

$L_{90,T}$ (dB) - Equivalent Continuous Sound Pressure Level

The $L_{90,T}$ value is the sound pressure level in decibels that is exceeded for 90% of a given time interval, T. It is often used as a descriptor of the **background noise climate**, and commonly seen as a single A-weighted figure $L_{A90,T}$.

Appendix B

Document Naming and Version Control Policy

All documents are issued with a unique number which comprises the principle 8-digit project and 1-digit subsection numbers, for example 20151203-0, and a reference indicating iteration of document type, for example R1 for Report 1, M2 for Memorandum 2 etc.

All documents employ version control through the use of a unique version number. The version numbers employ two levels of hierarchy, and use the format illustrated below:

V 1 . 2

Major Minor

Major

A major revision occurs when the report is revised to reflect significant changes in design strategy. For example, wide scale changes to building footprint or general arrangements, changes to principle construction type (e.g. masonry to lightweight), reselection of mechanical services plant etc. A change in strategy that takes place within the same RIBA work stage for example will prompt a major revision to a document.

Minor

A minor revision occurs when the report is revised to reflect minor changes to the design implementation. For example a change in the type of natural vent, extract fan, surface finish etc. to be used, on the project. Minor revisions will also occur when there is a change in wording of the report text.

Reporting

The Document History and Version Control table on the second page of each report identifies the versions through which the document has moved, along with the date, author that produced the version, and a description of its purpose or change.

Electronic File Naming

Reports issued electronically use the following format:

2012xxxx	-	x	Rx	Noise Assessment Report	v1.0	yyyy.mm.dd.pdf
Project Number		Subsection	Report Number	Report Name	Version	Date File Extension

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