ACOUSTICS CENTRAL

103 Drummond Street, London

Planning Noise Report

2016073-0 R1

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103 Drummond Street, London

Planning Noise Report

2016073-0 R1

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Document History and Version Control

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Executive Summary

As part of the redevelopment of 103 Drummond Street in London, it is proposed to install some mechanical service plant to serve the building. As part of this, it will need to be demonstrated to the satisfaction of the local planning authority (in this case Camden Council) that granting planning permission for the plant will not give rise to a disturbance to existing residences within the vicinity.

As such, Acoustics Central has been commissioned to undertake the necessary noise assessment, and identify mitigation measures where necessary and practicable.

103 Drummond Street is bounded on nearly all sides by buildings which comprise a mix of residential and commercial uses. The closest potentially affected residential premises to the proposed plant location are the residences located on the upper storeys of Cobourg Street, as well as those on the opposite side of Drummond Street from the site.

The general noise climate at the site comprises predominantly noise from plant serving buildings within the vicinity of the site, as well as traffic on local roads, as occasional aircraft noise.

Using noise data collected as part of a noise survey carried out at the site as a basis, plant noise limits have been established in accordance with the relevant local authority policy.

An assessment of the predicted noise levels from the proposed plant has been undertaken to the nearest noise sensitive residential premises, and compared with the plant noise limits.

The noise assessment has demonstrated that the plant noise criteria are expected to be met without the need for specific mitigation.

As such, the noise levels from the proposed plant are concluded to comply with criteria set out in Camden Development Policies 2010 – 2025 – Local Development Framework.

ACOUSTICS CENTRAL

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Attachments

1 Introduction

1.1 As part of the redevelopment of 103 Drummond Street in London, it is proposed to install some mechanical service plant to serve the building. As part of this, it will need to be demonstrated to the satisfaction of the local planning authority (in this case Camden Council) that granting planning permission for the plant will not give rise to a disturbance to existing residences within the vicinity.

1.2 As such, Acoustics Central has been commissioned to undertake the necessary noise assessment, and identify mitigation measures where necessary and practicable.

1.3 This report sets out the environmental noise measurements undertaken at the site, the noise assessment undertaken using the measured data as a basis, and conclusions drawn from the assessment.

1.4 This report is necessarily technical in nature, and for an explanation of the acoustic terminology used please refer to Appendix A.

2 Site Layout

2.1 General

2.1.1 The site is located on Layton Road in Brentford, TW8 0QJ, and is indicated on Figure F1 below.

F1 Site Plan Indicating Noise Survey Measurement and Assessment Positions – Imagery © 2016 Google

2.1.2 As Figure F1 shows, the site is bounded on nearly all sides by buildings which comprise a mix of residential and commercial uses.

2.2 Noise Climate

2.2.1 The general noise climate at the site comprises predominantly noise from plant serving buildings within the vicinity of the site, as well as traffic on local roads, as occasional aircraft noise.

2.3 Site Context

2.3.1 As mentioned above, the site is bounded on nearly all sides by buildings which comprise a mix of residential and commercial uses.

2.3.2 The closest potentially affected residential premises to the proposed plant location are the residences located on the upper storeys of Cobourg Street, as well as those on the opposite side of Drummond Street from the site.

3 Design Standards

3.1 As noted previously, the local planning authority is Camden Council. With regards to noise generated by mechanical service plant, the Camden Development Policies 2010 – 2025 – Local Development Framework[1] contains the following criteria:

Table E: Noise levels from plant and machinery at which planning permission will not be granted

Noise description and location of measurement	Period	Time	Noise level
Noise at 1 metre external to a sensitive façade	Day, evening and night	0000-2400	5dB(A) <LA90
Noise that has a distinguishable discrete continuous note (whine, hiss, screech, hum) at 1 metre external to a sensitive façade.	Day, evening and night	0000-2400	10dB(A) <LA90
Noise that has distinct impulses (bangs, clicks, clatters, thumps) at 1 metre external to a sensitive façade.	Day, evening and night	0000-2400	10dB(A) <LA90
Noise at 1 metre external to sensitive façade where LA90>60dB	Day, evening and night	0000-2400	55dBL_{Aeq}

[1] http://www.camden.gov.uk/ccm/cms-service/download/asset?asset_id=2614532

4 Environmental Noise Survey

4.1 General

4.1.1 In order to quantify the existing noise levels within the vicinity of the site, an environmental noise survey was carried out. The survey took place over a period of 24 hours commencing at 13h00 on Thursday 21st July 2016.

4.2 Guidance and Standards

4.2.1 The survey instrumentation, methodology and reporting of results was 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 Unattended noise measurements were made for 24 hours using an unattended noise monitor. The measurement position is indicated on Figure F1, and a photograph of the arrangement is shown in the attached Appendix C. A description of the position is given below.

MP1 The sound level meter microphone was fixed to a pole extended to a distance of 1m through an open window that faced south east, and through which the closest residential premises were visible. The primary purpose of this position was to measure noise levels currently experienced by the closest noise sensitive premise to the propose plant location.

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
Sound Level Analyser	NTi	CAL200

T1 Equipment used during internal noise measurements

4.4.2 The sound level analysers presented in the above table conform 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 year. 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 0.2dB) was noted to have occurred.

4.5 Data Recorded

4.5.1 Noise data was recorded in all relevant indices, including L_{Aeq}, L_{A90}, and $L_{AMax,F}$. 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, 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.

4.6 Meteorological Conditions

4.6.1 During the survey, temperatures were generally warm, ranging between 24 °C – 25 °C during the day to 14 °C – 17 °C during the night. Wind speeds were generally low, being below 5 m/s. Conditions were dry at the commencement and termination of the unattended measurements. Some light rain was reported on the morning of Friday 22nd July, however this is not expected to have significantly affected the measurements. Skies ranged from being clear to overcast.

4.7 Results

4.7.1 The attached time-history figure TH1 presents the noise levels measured at MP1. The lowest background noise levels measured during the day, evening and night-time periods were 54 dB, 51 dB and 47 dB L_{A90} respectively.

4.8 Mechanical Services Noise Limits

4.8.1 As detailed in section 3.1, Camden Council require mechanical services plant to be designed such that noise from it does not exceed a level 5 dB below the existing background noise levels where it does not contain distinguishing acoustic features, and 10 dB below the existing background noise levels where it does.

4.8.2 On this basis, the limits set in-line with local authority requirements to apply at 1m from noise sensitive premises within the vicinity of the plant locations are as shown in the following table.

Location	Plant Noise Limits, dBA		
	Day (07h00 – 19h00)	Evening (19h00 – 23h00)	Night (23h00 – 07h00)
Residents within the vicinity	49	46	42

T2 Noise Limits for Mechanical Services Plant

4.4.4 The acoustic calibrator has undergone traceable calibration by either a competent laboratory or the equipment manufacturer within the last year. The calibration certificates for the above equipment can be provided on request.

5 Scheme

5.1 General

Ventilation

5.1.1 Ventilation will be provided to the offices by way of an air-handling which will be located in the basement level plant room to the north-west of the site.

5.1.2 The unit will take in fresh-air by way of ductwork which will terminate in the wall facing into the lightwell located to the north of the building on Drummond Street.

5.1.3 Air is then exhausted through ductwork travelling from basement to roof level where it terminates.

Heating / Cooling

5.1.4 Heating / Cooling is provided by 3 condensing units located on the roof of the building.

5.1.5 We understand the plant will operate during the day-time only, and our assessment has been carried out on that basis.

5.2 Plant Items

5.2.1 The following plant items are under consideration as part of the scheme:

- 1no. IV Product 850-1V Air Handling Unit (AHU-01)
- 1no. Samsung AM220JXVHGH/EU Condensing Unit (CU-01)
- 2no. Samsung AM260HXVAGH/EU Condensing Units (CU-02)

5.3 Mitigation

5.3.1 The condensers will be screened from any near-by residences by way of blanked-off louvres located around the units.

5.4 Data Used

5.4.1 Noise levels provided by the manufacturers of the above equipment are presented in the Plant Noise Schedule SCH1.

5.4.2 To facilitate the assessment, the following Waterman drawings have been used:

2049-00-DR-1 rev P01
2049-00-DR-109 rev P01
2049-00-DR-110 rev P01
2049-00-DR-111 rev P01
2049-00-DR-120 rev P01
2049-00-DR-401 rev P01
2049-00-DR-402 rev P01
2049-00-DR-601 rev P01
2049-00-DR-602 rev P01

6 Plant Noise Assessment

6.1 In order to demonstrate compliance with the external noise level requirements, an atmospheric plant noise assessment has been carried out to the following locations:

- AP1 Ibis Hotel on Drummond Street
- AP2 Residences on Cobourg Street

6.2 The above assessment positions are illustrated on the site plan shown on Figure F1.

6.3 Our calculations take into account the effects of distance and, where relevant, screening from roof and wall edges where these obscure the plant from direct view.

6.4 In addition, as set out in Section 3.1, where plant has distinctive acoustic features as heard 1m from the residences, a 5 dB penalty will be applied.

6.5 Details of all calculations undertaken as part of the atmospheric noise assessment are presented on the attached calculation sheets CS1-CS6.

6.6 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	Noise Emission Limits, dB	Predicted Levels, dB
	Assessed Operation *07h00 – 19h00*	Assessed Operation *07h00 – 19h00*
AP1 Ibis Hotel on Drummond Street	49 □40	
AP2 Residences on Cobourg Street	49	43

T3 Noise limits and calculated levels for condensing unit

6.7 As the above table shows, the noise levels arising as a result of the proposed plant are expected to fall within the plant noise limits.

7 Conclusions

7.1 Using noise data collected as part of a noise survey carried out at the site as a basis plant noise limits have been established in accordance with the relevant local authority policy.

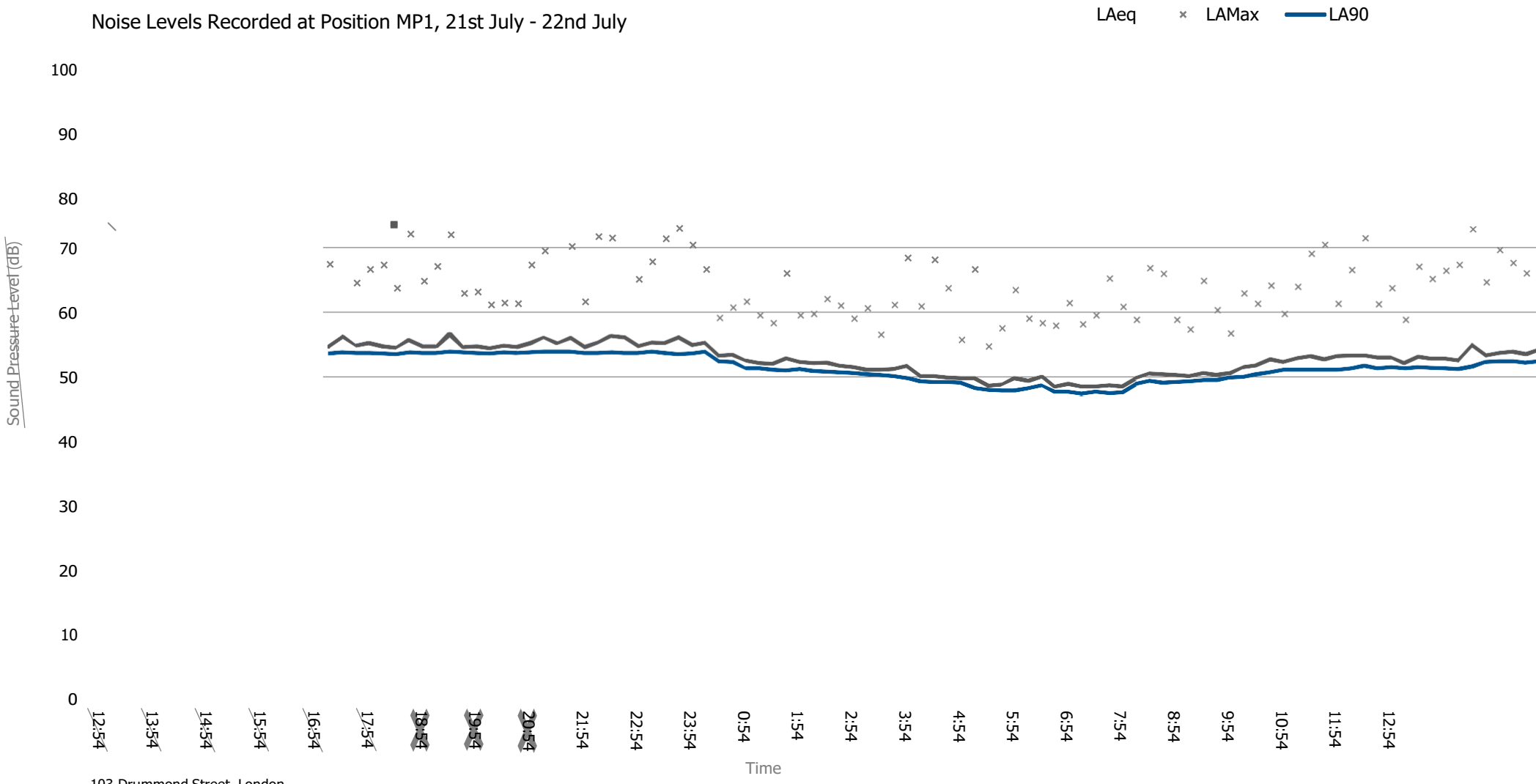
7.2 An assessment of the predicted noise levels from the proposed plant has been undertaken to the nearest noise sensitive residential premises, and compared with the plant noise limits.

7.3 The noise assessment has demonstrated that the plant noise criteria are expected to be met without the need for specific mitigation.

7.4 As such, the noise levels from the proposed plant are concluded to comply with criteria set out in Camden Development Policies 2010 – 2025 – Local Development Framework.

Figure 2016073-0 R1TH1

Noise Levels Recorded at Position MP1, 21st July - 22nd July



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
AHU-01 FAI	Main AHU Fresh Air Intake	IV Product 850-1V	Man	Sound Power, Lw		68	73	68	62	57	50	47	39
AHU-01 EXH	Main AHU Exhaust	IV Product 850-1V	Man	Sound Power, Lw		77	83	80	78	78	75	73	70
CU-01	Condenser Type 1	Samsung AM220JXVHGH/EU	Man	Sound Pressure, Lp @ 1m		66	66	66	60	59	52	45	42
CU-02	Condenser Type 2	Samsung AM260HXVAGH/EU	Man	Sound Pressure, Lp @ 1m		67	67	65	61	60	58	52	40

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Calculation Sheet

AHU-01 FAI to AP1

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Noise Source										
Noise Source - AHU-01 FAI										
Sound Power Levels		68	73	68	62	57	50	47	39	65dBA
Rect Unlined Duct Losses										
Width (m)	2									
Height (m)	1									
Length (m)	2									
		-1	*-1*	*0*	*0*	*0*	*0*	*0*	*0*	
Bend Loss										
Dimension (mm)	1040									
No. of Bends (no.)	2									
Type - Unlined Square Bend - No Vanes										
		-2	*-10*	*-16*	*-8*	*-6*	*-6*	*-6*	*-6*	
End Reflection - Rect Flush										
Width (m)	2									
Height (m)	1									
		-2	*-1*	*0*	*0*	*0*	*0*	*0*	*0*	
External Grille Directivity										
Width (m)	2									
Height (m)	1									
Angle (°)	30									
		2	*3*	*3*	*4*	*4*	*4*	*4*	*4*	
Point Source Radiation Loss										
Radiation - Quarterspherical										
		-5	*-5*	*-5*	*-5*	*-5*	*-5*	*-5*	*-5*	
Point Source Distance Loss										
Start Distance (m)	1									
End Distance (m)	15									
		-24	*-24*	*-24*	*-24*	*-24*	*-24*	*-24*	*-24*	

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	Octave Band Centre Frequency (Hz)								
	63	125	250	500	1k	2k	4k	8k	
External Receiver									
External Receiver - AP1									
Sound Pressure, Lp	36	36	26	29	27	20	17	9	31dBA

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Calculation Sheet

AHU-01 EXH to AP1

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Noise Source										
Noise Source - AHU-01 EXH										
Sound Power Levels		77	83	80	78	78	75	73	70	83dBA
Rect Unlined Duct Losses										
Width (m)	2									
Height (m)	1									
Length (m)	8									
		-4	*-2*	*-2*	*-1*	*-1*	*-1*	*-1*	*-1*	
Bend Loss										
Dimension (mm)	1040									
No. of Bends (no.)	3									
Type - Unlined Square Bend - No Vanes										
		-3	*-15*	*-24*	*-12*	*-9*	*-9*	*-9*	*-9*	
End Reflection - Rect Flush										
Width (m)	2									
Height (m)	1									
		-2	*-1*	*0*	*0*	*0*	*0*	*0*	*0*	
External Grille Directivity										
Width (m)	2									
Height (m)	1									
Angle (°)	90									
		-4	*-7*	*-10*	*-13*	*-15*	*-15*	*-15*	*-15*	
Point Source Radiation Loss										
Radiation - Hemispherical										
		-8	*-8*	*-8*	*-8*	*-8*	*-8*	*-8*	*-8*	
Point Source Distance Loss										
Start Distance (m)	1									
End Distance (m)	15									
		-24	*-24*	*-24*	*-24*	*-24*	*-24*	*-24*	*-24*	

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		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Maekawa Screening Loss										
Path DiVerence (m)	0									
		-6	*-6*	*-8*	*-9*	*-12*	*-14*	*-17*	*-20*	
External Receiver										
External Receiver - AP1										
Sound Pressure, Lp		27	20	5	11	10	4	0	-6	14dBA

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Calculation Sheet

CU-01 to AP1

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Noise Source										
Noise Source - CU-01										
Sound Pressure Levels @ 1m		66	66	66	60	59	52	45	42	63dBA
Point Source Distance Loss										
Start Distance (m)	1									
End Distance (m)	15									
		-24	*-24*	*-24*	*-24*	*-24*	*-24*	*-24*	*-24*	
Maekawa Screening Loss										
Path DiVerence (m)	0									
		-5	*-5*	*-5*	*-6*	*-6*	*-7*	*-9*	*-11*	
External Receiver										
External Receiver - AP1										
Sound Pressure, Lp		38	38	37	31	29	21	13	8	34dBA

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Calculation Sheet

CU-01 to AP2

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Noise Source										
Noise Source - CU-01										
Sound Pressure Levels @ 1m		66	66	66	60	59	52	45	42	63dBA
Point Source Distance Loss										
Start Distance (m)	1									
End Distance (m)	10									
		-20	*-20*	*-20*	*-20*	*-20*	*-20*	*-20*	*-20*	
Maekawa Screening Loss										
Path DiVerence (m)	0									
		-5	*-5*	*-5*	*-6*	*-6*	*-7*	*-9*	*-11*	
External Receiver										
External Receiver - AP2										
Sound Pressure, Lp		41	41	41	34	33	25	16	11	38dBA

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Calculation Sheet

CU-02 to AP1

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Noise Source										
Noise Source - CU-02										
Sound Pressure Levels @ 1m		67	67	65	61	60	58	52	40	65dBA
+10 log (N)										
N	2									
		3	*3*	*3*	*3*	*3*	*3*	*3*	*3*	
Point Source Distance Loss										
Start Distance (m)	1									
End Distance (m)	15									
		-24	*-24*	*-24*	*-24*	*-24*	*-24*	*-24*	*-24*	
Maekawa Screening Loss										
Path DiVerence (m)	0									
		-5	*-5*	*-5*	*-6*	*-6*	*-7*	*-9*	*-11*	
External Receiver										
External Receiver - AP1										
Sound Pressure, Lp		42	42	39	35	33	30	23	9	38dBA

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Calculation Sheet

CU-02 to AP2

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Noise Source										
Noise Source - CU-02										
Sound Pressure Levels @ 1m		67	67	65	61	60	58	52	40	65dBA
+10 log (N)										
N	2									
		3	*3*	*3*	*3*	*3*	*3*	*3*	*3*	
Point Source Distance Loss										
Start Distance (m)	1									
End Distance (m)	10									
		-20	*-20*	*-20*	*-20*	*-20*	*-20*	*-20*	*-20*	
Maekawa Screening Loss										
Path DiVerence (m)	0									
		-5	*-5*	*-5*	*-6*	*-6*	*-7*	*-9*	*-11*	
External Receiver										
External Receiver - AP2										
Sound Pressure, Lp		45	45	43	38	37	34	26	12	42dBA

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2016073-0 R1 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 $L_{A90,T}$.

2016073-0 R1 Appendix B

Document Naming and Version Control Policy

All documents are issued with a unique number which comprises the principle 7-digit project and 1-digit subsection numbers, for example 2015123-0, and a reference indicting 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. Prior to issue, the document will be signed (physically or electronically) by the most recent author and reviewer.

Electronic File Naming

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2015xxx	-	x	Rx	Noise Assessment Report	v1.0	15.02.12	.pdf
Project Number		Subsection	Report Number	Report Name	Version	Date	File Extension

2016073-0 R1 Appendix B

Photographs of Noise Monitoring Equipment

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