

for Arta Architectural Ltd Portland House 51 Colney Hatch Lane Muswell Hill N10 1LJ Page 1 of 8

Dated: 18 August 2017

ENVIRONMENTAL PLANT NOISE ASSESSMENT

7 – 8 MIDFORD PLACE

LONDON

W1T 5BG

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1. **INTRODUCTION**

AIRO has been commissioned by Arta Architectural Limited on behalf of Amber Properties Ltd to provide an independent environmental noise assessment in relation to the potential impact of sound arising from intake/exhaust openings associated with the intended conversion to offices of 7 – 8 Midford Place, London, W1T 5BG.

This report presents the results of noise level measurements made at the site together with an environmental noise assessment based upon the measurement data and details of the plant and ductwork associated with the proposals.

The primary source of guidance for the measurement survey and subsequent assessment has been British Standard BS 4142 entitled "Methods for rating and assessing industrial and commercial sound" (ref 1).

2. DESCRIPTION OF THE SITE AND LOCALITY

Data Sheet G/7107/1 shows the site and its surroundings, the measurement position used to establish pre-existing sound levels, and the position understood to be the nearest residential location.

The general area in this location is surrounded by at least 3 storey buildings to Midford Place, Tottenham Court Road and Grafton Way that appear to be predominantly commercial associated with the retail outlets. There is extensive plant already in this area including condenser units, extraction systems and flues rising up from the buildings as can be seen from the photographs on Data Sheet G/7107/2.

It appears that the nearest apparently residential dwelling is a building in Grafton Way across from the site as indicated on the Data Sheets.

3. NOISE LEVEL UNITS

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Noise levels are generally presented in terms of 'A-weighted' decibels. The 'A-weighting' is an internationally agreed frequency response similar to that of the average human ear, so that 'A-weighted' sound levels correspond reasonably well with what is heard.

Typical noise sources do not radiate sound at a continuous steady level but tend to vary in level over a given time period. The Equivalent Continuous Sound Pressure Level, L_{Aeq} , is the most widely used objective averaging technique which expresses the acoustic energy of a fluctuating noise climate over a given period as the single continuous level having the same energy as the time varying signal.

To measure background environmental noise levels the statistical index L_{90} is commonly preferred over the L_{eq} index. The L_{90} is the Sound Pressure Level that is exceeded for 90% of the measurement period. The L_{90} therefore discriminates against short duration peaks of noise and is consequently considered to provide a better representation of typical minimum noise levels compared with the L_{eq} .

In some circumstances it is useful to quantify the maximum level of fluctuating noise and a commonly used descriptor is L_{max} . This represents the maximum reading given by a sound level meter for a given event or period of time and would normally be qualified by either 'fast' or 'slow' according to the response time setting of the meter.

It is currently correct practice to identify noise levels as 'A-weighted' by incorporation of the 'A' within the index descriptor such that 'A-weighted' L_{eq} , L_{90} or L_{max} are expressed as L_{Aeq} , L_{A90} and L_{Amax} respectively

4. NOISE MEASUREMENTS

Noise level measurements were made at the site over the period commencing at approximately 12:00 on 15 August 2017 and ending at approximately 12:00 on 16 August 2017.

An automatic data logging sound level meter logged the noise level every two seconds throughout the period together with hourly values across a range of indices.



The measurement position is shown on Data Sheet G/7107/1. Details of the measurement instrumentation are presented in Appendix A along with the weather conditions.

Table 1 presents the relevant measured noise levels.

Table 1 - Noise Levels from the Data Logging Sound Level Meter											
Period	Noise Le	vel in dB									
(Hour Commencing)	L _{Aeq}	L _{A90}									
12:00	56	54									
13:00	56	54									
14:00	56	55									
15:00	56	54									
16:00	56	54									
17:00	56	54									
18:00	56	54									
19:00	56	54									
20:00	56	54									
21:00	56	54									
22:00	56	54									
23:00	54	45									
00:00	49	43									
01:00	48	43									
02:00	49	42									
03:00	49	42									
04:00	48	41									
05:00	49	42									
06:00	49	44									
07:00	51	45									
08:00	53	48									
09:00	55	51									
10:00	56	54									
11:00	56	55									

5. **ASSESSMENT – BS 4142**

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A long established method of assessing the significance of industrial noise on residential areas is set out in BS 4142 - "Methods for rating and assessing industrial and commercial sound".

The BS 4142 assessment method considers the effects of sound from specific sources on residents of nearby sensitive properties.

The potential impact is assessed by comparing the sound levels from the specific source under investigation against typical prevailing background sound levels. The audible characteristics of the source are also taken into account.

Daytime and night-time operating periods are considered separately such that typical periods of 1 hour and 15 minutes, respectively, are used in the assessment.

The relative sound levels for the assessment are determined at residential buildings where people are likely to be affected.

The margin by which sound levels due to the specific sources under consideration exceed the prevailing background sound level enables the impact to be estimated.

BS 4142 provides indicators of the likely impact based on the resultant value of the rating level minus the background sound level.

BS 4142 says

- "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."



Planning authorities, particularly in central London, typically require the rating level to be at least 10 dB below the background sound level.

The measurements show that the representative background sound level during normal office hours is 54 dB.

Therefore, the maximum permissible plant sound rating level at the nearest residential unit is 44 dB.

Details of the services layout, the condensers air handling units (AHU's) and silencers provided to AIRO may be found in Appendix B. There is a cupboard mounted condenser and AHU proposed at each of ground to 3^{rd} floor i.e. 4 no. condensers and 4 AHU's in total. Silencers are shown either side of these units with ductwork to external terminations on the intake side. The terminations are at 2^{nd} and 3^{rd} floor level to the rear.

To calculate the sound power level at the termination to atmosphere, the sound power level of the condensers and AHU's has been reduced by the attenuation due to the length of ductwork, the number of bends and the end correction of the opening to atmosphere. In addition the reductions due to the silencers have been applied. As the supply and extract sides of each unit are very similar, the sound power level of the fan has been increased by 3 dB to account for both sides of the system in order to simplify the calculations. The calculations have been made in octave frequency bands based on the data supplied. An example of the full calculation for the 3rd floor condenser and AHU is set out in Appendix C.

Table 2 summarises and completes the calculations by including the attenuation with distance between the terminations and the nearest residential window, together with the regenerated noise at the atmospheric grille terminations given in the supplied information.

Table 2 – Summa	Table 2 – Summary of Plant Noise Calculations (Con = Condenser)														
		Source													
Description	Unit	(3	1	st	21	nd	3rd							
		Con	AHU	Con	AHU	Con	AHU	Con	AHU						
Unit Sound Power Level, L _{WA}	dB	82	76	82	76	82	76	82	76						
Attenuation of silencer, ductwork, bends and end correction	dB	36	25	36	25	25	25	30	25						
L _{WA} at termination	dB	46	51	46	51	57	51	52	51						
Combined L _{WA}	dB		5	5		60									
Regenerated noise at grilles L _{WA}	dB		5	5			5	50							
Combined termination and regenerated noise	dB		5	8			6	60							
Distance to Dwelling	m		12	2.5		11									
Attenuation for distance and power to pressure adjustment	dB		3	0		29									
Level at dwelling L _{Aeq}	dB		2	8			3	31							
Combined level at dwelling for all plant, L _{Aea}	dB				33										

It may be seen that the overall calculated plant sound level at the nearest property is 54 - 33 = 21 dB below the background sound level.

6. **CONCLUSIONS**

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This report has presented the results of sound level measurements at 7 - 8 Midford Place, London, W1T 5BG. BS 4142 has been used to assess the sound based on the measurement data.

The calculated specific sound level of the plant at the nearest dwelling is 33 dB L_{Aeq} which is 21 dB below the daytime background sound level of 54 dB L_{A90} determined from the measurement survey.

Report Approved by:

Report Author:

A J Jones

D L Watts

A J Jones BSc PhD CPhys MInstP HonFIOA Managing Director Eur Ing D L Watts BEng CEng FIOA Principal Consultant

REFERENCES

 British Standard BS 4142
Methods for rating and assessing industrial and commercial sound British Standards Institution, 2014.





DATA SHEET

No.

Date AUGUST 2017

G/7107/2

Client Arta Architectural Ltd

7-8 Midford Place Photographs











A	TF	20	

|--|

Table A1 - Schedule of Noise Instrumentation											
Use	Serial No.										
Measuring System	Cirrus CRL 702	012622									
Microphone	Cirrus MK 224	890259									
Calibrator	Cirrus CRL 511	014087									

CALIBRATION

AIRO is accredited by the United Kingdom Accreditation Service as a UKAS testing laboratory No. 0483 and although the measurements carried out for this survey are not listed on our schedule of accreditation, all of AIRO's noise and vibration measurement equipment is routinely calibrated as part of the calibration regime in our Quality Manual and these calibrations are traceable to National Standards.

In addition, the calibration level of the measuring equipment was checked at the start and the end of each survey period using the appropriate calibrator for the relevant meter.

Table A2 - Weather Conditions 15	and 16 August 2017
Temperature °C	10 – 23
Relative Humidity %	51 - 93
Wind Direction	W
Wind Speed, m/s	0 - 5



APPENDIX B

Information supplied to AIRO









Supply: 1,346 l/s	GRILLES								
Extract: 77 l/s									
Weather Louvre: 12,881 l/s	55 grilles								
	ASSET REFERENCE:	SD3/1	SD2/1	SD1/3	SDG/1	SD3/1 Option lower throw	SD2/1 Option lower throw	SD1/3 Option lower throw	SDG/1 Option lower throw
DESIGN	Supply / Extract	S	S	S	S	S	S	S	S
INFORMATION	Room Air Balance (S/E)	+ve	+ve	+ve	+ve	+ve	+ve	+ve	+ve
	Equipment Description	Jet Diffuser	Jet Diffuser	Jet Diffuser	Jet Diffuser	Bar Diffuser (curved)	Bar Diffuser (curved)	Bar Diffuser (curved)	Bar Diffuser (curved)
	Air Systems	AHU 3	AHU 2	AHU 1	AHU 6	AHU 3	AHU 2	AHU 1	AHU 6
	Condenser Air Systems								
	Connected to	Fresh Air System	Fresh Air System	Fresh Air System	Fresh Air System				
	No of slots / No of Grilles	4	4	5	5	4	4	5	5
	Grille Air flow	34 l/s	34 l/s	40 l/s	40 l/s	34 l/s	34 l/s	40 l/s	40 l/s
	Throw (m)	10.0 m	10.0 m	10.0 m	15.0 m	2.0 m	2.0 m	2.0 m	4.0 m
	Static Pressure (Pa)	30 Pa	30 Pa	30 Pa	40 Pa	10 Pa	10 Pa	10 Pa	20 Pa
	Noise Level	20 dBA	20 dBA	20 dBA	22 dBA				
	Fixings	Screws through flange	Screws through flange	Screws through flange	Screws through flange				
	Plenum Box	No	No	No	No	No	No	No	No
	Finish	Special	Special	Special	Special	Special	Special	Special	Special
	VCD	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Connection: Circular Duct Ø	160mm Dia	160mm Dia	160mm Dia	160mm Dia				
	Comments	High throw grille to reach far room corners	Fitted direct to duct c/w 50% perf plate and 35 deg angle	Fitted direct to duct c/w 50% perf plate and 35 deg angle	Fitted direct to duct c/w 50% perf plate and 35 deg angle	Fitted direct to duct c/w 50% perf plate and 35 deg angle			
INSTALLATION	Manufacturers Name	Systemair	Systemair	Systemair	Systemair	Waterloo	Waterloo	Waterloo	Waterloo
DATA	Model	AJD	AJD	AJD	AJD	2RV	2RV	2RV	2RV
	Size (W)					225 mm	225 mm	225 mm	225 mm
	Size (H)					75 mm	75 mm	75 mm	75 mm
	Size (Dia)	160 mm	160 mm	160 mm	160 mm				
	Туре	Jet Diffuser	Jet Diffuser	Jet Diffuser	Jet Diffuser	Bar Diffuser (curved)	Bar Diffuser (curved)	Bar Diffuser (curved)	Bar Diffuser (curved)
	Shape	Circular	Circular	Circular	Circular	Rectangular	Rectangular	Rectangular	Rectangular
	Construction	Steel	Steel	Steel	Steel	Steel	Steel	Steel	Steel
	Installation Date	2017	2017	2017	2017	2017	2017	2017	2017
		40 years	40 years	40 years	40 years				
LOCATION	Building Name	Midford Place W11	Midford Place W11	Midford Place W11	Midford Place W11				
	Address / Location	7-8 Midford Place W1T 5BG	7-8 Midford Place W1T 5BG	7-8 Midford Place W1T 5BG	7-8 Midford Place W1T 5BG				
	Floor	3	2	1	G	3	2	1	G
	Grid Ref x-y coord								
	Room Name(s)	Third Office	Second Office	First Office	Ground Office	Third Office	Second Office	First Office	Ground Office
				r inst meeting room West				This meeting room West	
				First Meeting Room East				First Meeting Room East	

GRILLES									
ASSET REFERENCE:	EG3/1	EG2/1	EG1/1	EGG/1	WL3/1 Condenser Discharge	WL3/2 Condenser Intake	WL3/3 Fresh / Spill Air	WL2/1 Condenser Discharge	WL2/2 Condenser Intake
Supply / Extract	E	E	E	E	WL	WL	WL	WL	WL
Room Air Balance (S/E)	+ve	+ve	+ve	+ve	+ve	-ve	-ve	+ve	-ve
Equipment Description	Circular Exhaust Valve	Circular Exhaust Valve	Circular Exhaust Valve	Circular Exhaust Valve	Weather Louvre	Weather Louvre	Weather Louvre	Weather Louvre	Weather Louvre
Air Systems	EF3	EF2	EF1	EF6			AHU 3		
Condenser Air Systems					CU3a & 3b	CU3a & 3b		CU2a & 2b	CU2a & 2b
Connected to	Extract Air System	Extract Air System	Extract Air System	Extract Air System	Condenser Air	Condenser Air	Fresh Air System	Condenser Air	Condenser Air
No of slots / No of Grilles	2	2	2	2	1	1	1	1	1
Grille Air flow	10 l/s	10 l/s	10 l/s	10 l/s	916 l/s	916 l/s	157 l/s	1,666 l/s	1,666 l/s
Throw (m)	N/A for Extract	N/A for Extract	N/A for Extract	N/A for Extract	N/A for WL	N/A for WL	N/A for WL	N/A for WL	N/A for WL
Static Pressure (Pa)	4 Pa	4 Pa	4 Pa	4 Pa	16 Pa	16 Pa	18 Pa	3 Pa	3 Pa
Noise Level	5 dBA	5 dBA	5 dBA	5 dBA	43 dBA	43 dBA	20 dBA	45 dBA	45 dBA
Fixings	Hidden fixing	Hidden fixing	Hidden fixing	Hidden fixing	Screws through flange	Screws through flange	Screws through flange	Screws through flange	Screws through flange
Plenum Box	Yes (insulated)	Yes (insulated)	Yes (insulated)	Yes (insulated)	Yes (internally lined)	Yes (internally lined)	Yes (internally lined)	Yes (internally lined)	Yes (internally lined)
Finish	White RAL9010	White RAL9010	White RAL9010	White RAL9010	Brown	Brown	Brown	Brown	Brown
VCD	Yes	Yes	Yes	Yes	No	No	No	No	No
Connection: Circular Duct Ø	100mm Dia	100mm Dia	100mm Dia	100mm Dia					
Comments									
Manufacturers Name	Waterloo	Waterloo	Waterloo	Waterloo	Waterloo	Waterloo	Waterloo	Waterloo	Waterloo
Model	VB	VB	VB	VB	YGB	YGB	YGB	YGB	YGB
Size (W)					1,200 mm	1,200 mm	1,000 mm	1,200 mm	1,200 mm
Size (H)					600 mm	600 mm	300 mm	1,200 mm	1,200 mm
Size (Dia)	100 mm	100 mm	100 mm	100 mm					
Туре	Valve	Valve	Valve	Valve	Weather Louvre	Weather Louvre	Weather Louvre	Weather Louvre	Weather Louvre
Shape	Circular	Circular	Circular	Circular	Rectangular	Rectangular	Rectangular	Rectangular	Rectangular
Construction	Steel	Steel	Steel	Steel	Aluminium	Aluminium	Aluminium	Aluminium	Aluminium
Installation Date	2017	2017	2017	2017	2017	2017	2017	2017	2017
Life Expectancy (yrs)	40 years	40 years	40 years	40 years	40 years				
Building Name	Midford Place W1T	Midford Place W1T	Midford Place W1T	Midford Place W1T	Midford Place W1T				
Address / Location	7-8 Midford Place W1T 5BG	7-8 Midford Place W1T 5BG	7-8 Midford Place W1T 5BG	7-8 Midford Place W1T 5BG	7-8 Midford Place W1T 5BG	7-8 Midford Place W1T 5BG			
Floor	3	2	1	G	3	3	3	2	2
Grid Ref x-y coord									
Room Name(s)	Third Toilets	Second Toilets	First Floor Toilet	Ground Toilet N	Third Office	Third Office	Third Office	Second Office	Second Office
				Ground Tollet 5			Third Tollets		

GRILLES					Ħ
55 grilles					
	MI 2/2	WI 2/A	WI 2/5	WI 2/6	PC1
ASSET REFERENCE.	Fresh / Spill Air	Intake/ Discharge Plenum	Intake/ Discharge Plenum	Intake/ Discharge Plenum	KG I
Supply / Extract	WL	WL	WL	WL	WL
Room Air Balance (S/E)	-ve	-ve	+ve	+ve	+ve
Equipment Description	Weather Louvre	Weather Louvre	Weather Louvre	Weather Louvre	Roof Cowl
Air Systems	AHU 2	AHU1 AHU6 & AHU5		AHU 5	
Condenser Air Systems		CU1 & CUG	CU1 & CUG		
Connected to	Fresh Air System	FA+Cond Air	Condenser Air	Fresh Air System	Fresh Air System
No of slots / No of Grilles	1	2	1	1	1
Grille Air flow	156 l/s	1,906 l/s	3,332 l/s	210 l/s	50 l/s
Throw (m)	N/A for WL	N/A for WL	N/A for WL	N/A for WL	N/A for Louvres
Static Pressure (Pa)	18 Pa	16 Pa	18 Pa	12 Pa	10 Pa
Noise Level	20 dBA	45 dBA	55 dBA	40 dBA	25 dBA
Fixings	Screws through flange	Screws through flange	Screws through flange	Screws through flange	Screws through flange
Plenum Box	Yes (internally lined)	Yes (internally lined)	Yes (internally lined)	Yes (internally lined)	Yes (internally lined)
Finish	Brown	Brown	Brown	Brown	Brown
VCD	No	No	No	No	No
Connection: Circular Duct Ø					
Comments		Construct penthouse louvre box with 4 sides	NOTE: Getting a bit noisy quiet if 2m wide which takes up floor space !		
Manufacturers Name	Waterloo	Waterloo	Waterloo	Waterloo	Lindab
Model	YGB	YGB	YGB	YGB	VHL
Size (W)	1,000 mm	2,200 mm	1,600 mm	800 mm	
Size (H)	300 mm	600 mm	1,600 mm	200 mm	
Size (Dia)					160 mm
Туре	Weather Louvre	Weather Louvre	Weather Louvre	Weather Louvre	Roof Cowl
Shape	Rectangular	Rectangular	Rectangular	Rectangular	Circular
Construction	Aluminium	Aluminium	Aluminium	Aluminium	Steel
Installation Date	2017	2017	2017	2017	2017
Life Expectancy (yrs)	40 years	40 years	40 years	40 years	40 years
Building Name	Midford Place W1T	Midford Place W1T	Midford Place W1T	Midford Place W1T	Midford Place W1T
Address / Location	7-8 Midford Place W1T 5BG	7-8 Midford Place W1T 5BG	7-8 Midford Place W1T 5BG	7-8 Midford Place W1T 5BG	7-8 Midford Place W1T 5BG
Floor	2	1		В	1
Grid Ref x-y coord					
Room Name(s)	Second Office	First Office		Basement Store	First Meeting Room West
	Second Toilets	First Meeting Room West		Basement Store Basement Shower West	First Meeting Room East
		Ground Office Basement Store		Basement Shower East Basement Disabled WC	









	ASSET REFERENCE:	S	3 C	ond	ens	er RI	DXYQ8	T Syste	m		S	3 a	tmo	sph	eric					
DESIGN S	System	CU 3									AHU 3									
					Thi	Third					Third									
Ň	lo off	~~~~~~			2	2				2										
A	hir Flow (m3/s)				0.92	m3/s							0.14	m3/s						
	Frequency	63 Hz	125 Hz	250 Hz	500 Hz	1 KHz	2 KHz	4 KHz	8 KHz	63 Hz	125 Hz	250 Hz	500 Hz	1 KHz	2 KHz	4 KHz	3 KHz	63 Hz		
	an SWL	75 dB	72 dB	80 dB	78 dB	73 dB	71 dB	61 dB	58 dB	74 dB	75 dB	69 dB	73 dB	63 dB	63 dB	61 dB	62 dB	74 dB		
	Silencer Details		Caic	e_MDA	_1200W	/400H9(00L_0.3	FA	I	Νι	uaire_XE	BOXER	XBC25	_445W3	303H120	00L_FA		Nu		
	Loss	7 dB	11 dB	17 dB	26 dB	33 dB	34 dB	28 dB	19 dB	5 dB	6 dB	12 dB	27 dB	34 dB	20 dB	13 dB	9 dB	9 dB		
	Construction				Galva	nised				Galvanised							•••••			
<u>V</u>	Veight (kg)				100	kg				37 kg										
	Diameter (mm)																			
	leight (mm)				400	mm				303 mm										
V	Vidth (mm)				1,200) mm							445	mm						
	.ength (mm)				900	mm							1,200) mm						
P	Pressure Drop (Pa)			*****	60	Pa			******				15	Pa						
l F	ace Velocity			~~~~~~	1.9 m/s					1.0 m/s										
C	Comments									2 mat	ching s	ilence Su	rs to fit pply six	directly ke show	v onto N vn	luaire U	nit.	3 matc		
	lanufacturers Name	Caice							Nuaire											
Α	Address	Rive	erside H Wi	łouse, 3 nnersh,	Winne Woking	rsh Fielo jham, R	ls, Gazo G41 5Q	elle Clos S	se,	Western Industrial Estate, Caerphilly, CF83 1NA								We		
DATA M	lodel				M	DA							XBC	25						

_	<u>.</u>			
	Installation Date	2017	2017	
	Life Expectancy (yrs)	40	40	
	Initial Value (£)			
LOCATION	Building Name	Midford Place W1T	Midford Place W1T	
	Building Reference	7-8 Midford Place W1T 5BG	7-8 Midford Place W1T 5BG	
	Floor	3	3	
	Room Name	Third Office	Third Office	







ASSET REFERENCE:		S 3	sy	ster	n			S2 Condenser RDXYQ8T System							S2 atmospheric								
System		AHU 3							CU 2							AHU 2							
		Third								Second							Second						
No off	2										2								2	~~~~~~			
Air Flow (m3/s)	0.14 m3/s										1.67	m3/s							0.14 ı	m3/s			
Frequency	125 Hz	250 Hz	500 Hz	1 KHz	2 KHz	4 KHz	8 KHz	63 Hz	125 Hz	250 Hz	500 Hz	1 KHz	2 KHz	4 KHz	8 KHz	63 Hz	125 Hz	250 Hz	500 Hz	1 KHz	2 KHz	4 KHz	
Fan SWL	75 dB 69 dB 73 dB 63 dB 63 dB 61 dB 62 dB							75 dB	72 dB	80 dB	78 dB	73 dB	71 dB	61 dB	58 dB	74 dB	75 dB	69 dB	73 dB	63 dB	63 dB	61 dB	
Silencer Details	iaire_XBOXER XBC25_445W303H1600L_ FA						4		Cai	ce_MDA	_1200W	/400H9(00L_0.3	FA		N	uaire_XI	BOXER	XBC25	_445W3	303H12	200L_ FA	
I Loss	13 dB 23 dB 42 dB 55 dB 49 dB 32 dB 25 dB						7 dB	11 dB	17 dB	26 dB	33 dB	34 dB	28 dB	19 dB	5 dB	6 dB	12 dB	27 dB	34 dB	20 dB	13 dB		
Construction		(Galva	nised				Galvanised								Galvanised							
Weight (kg)			50	kg							100	kg							37	kg			
Diameter (mm)																							
Height (mm)			303	mm				400 mm									303	mm					
Width (mm)			445	mm				1,200 mm						445 mm									
Length (mm)			1,600) mm				900 mm							1,200 mm								
Pressure Drop (Pa)			15	Pa				60 Pa							15 Pa								
Face Velocity			1.0 ı	m/s				3.5 m/s								1.0 m/s							
Comments	ching s	ching silencers to fit directly onto Nuaire Unit. Supply sixe shown														3 matching silencers to fit directly onto Nuaire Supply sixe shown							
Manufacturers Name			Nua	aire							Cai	се				Nuaire							
Address	estern I	ndustrial	Estate	e, Caerp	hilly, CF	-83 1N/	ł	Rive	erside W	House, 3 'innersh,	Winner Woking	rsh Fielo ham, R	ds, Gazo G41 5Q	elle Clos S	ie,	Western Industrial Estate, Caerphilly, CF83 1NA							
Model			XBC	25							ME)A				XBC 25							

Installation Date	2017	2017	2017
Life Expectancy (yrs)	40	40	40
Initial Value (£)			
Building Name	Midford Place W1T	Midford Place W1T	Midford Place W1T
Building Reference	7-8 Midford Place W1T 5BG	7-8 Midford Place W1T 5BG	7-8 Midford Place W1T 5BG
Floor	3	2	2
Room Name	Third Office	Second Office	Second Office







ASSET REFERENCE:				S	2 sy	stei	m			S1 Condenser RDXYQ8T Syster							em	S1 atmosph					
System					AHL	J 2							CU	1							AH	U 1	
					Seco	ond	******				~~~~~		Fir	st					~~~~~		Fi	rst	
No off					2								2)		•••••						2	
Air Flow (m3/s)					0.14 ı	m3/s							1.67	m3/s							0.21	m3/s	
Frequency	8 KHz	63 Hz	3 Hz 125 Hz 250 Hz 500 Hz 1 KHz 2 KHz 4 KHz 8 KHz					63 Hz	125 Hz	250 Hz	500 Hz	1 KHz	2 KHz	KHz	8 KHz	63 Hz	125 Hz	250 Hz	500 Hz	1 KHz			
Fan SWL	62 dB	74 dB	75 dB	69 dB	73 dB	63 dB	63 dB	61 dB	62 dB	75 dB	72 dB	80 dB	78 dB	73 dB	71 dB	i1 dB	58 dB	74 dB	75 dB	69 dB	73 dB	63 dB	
Silencer Details	١	Ni	Nuaire_XBOXER XBC25_445W303H1600L_ FA							Caic	e_MDA	_1200W	/400H9	00L_0.3 F	4		Nı	uaire_X	BOXER	XBC2	5_445W3		
l Loss	9 dB	9 dB	13 dB	23 dB	42 dB	55 dB	49 dB	32 dB	25 dB	7 dB	11 dB	17 dB	26 dB	33 dB	34 dB 🗄	8 dB	19 dB	5 dB	6 dB	12 dB	27 dB	34 dB	
Construction					Galva	nised				Galvanised											Galva	anised	
Weight (kg)					50	kg				100 kg											37	' kg	
Diameter (mm)																							
Height (mm)					303	mm							400	mm				303 mr				mm	
Width (mm)					445	mm							1,200) mm				445 mm				mm	
Length (mm)					1,600) mm							900	mm							1,20	0 mm	
Pressure Drop (Pa)					15	Pa							60	Pa							15	Pa	
Face Velocity					1.0	m/s							3.5 ו	m/s							1.6	m/s	
Comments	Jnit.	3 mat	3 matching silencers to fit directly onto Nuaire Unit. Supply sixe shown													3 matching silencers to fit directly Supply sixe show				t directly ixe shov			
Manufacturers Name			Nuaire					Caice							Nuaire				aire				
Address	١	W	Western Industrial Estate, Caerphilly, CF83 1NA					Riverside House, 3 Winnersh Fields, Gazelle Close, Winnersh, Wokingham, RG41 5QS							se,	W	/estern	Industria	al Estat	te, Caerp			
Model			XBC 25						MDA								XBC 25						

Installation Date	2017	2017	2017
Life Expectancy (yrs)	40	40	40
Initial Value (£)			
Building Name	 Midford Place W1T	Midford Place W1T	Midford Place W
Building Reference	7-8 Midford Place W1T 5BG	7-8 Midford Place W1T 5BG	7-8 Midford Place W1
Floor	 2	1	1
Room Name	Second Office	First Office	First Office





ASSET REFERENCE:	eric	;				S	1 sy	ster	m			S	G C	onc	lens	err	DXYQ8	T Syste	em		S	G a'		
System							AHU	J 1							CU	3								
							Fir	st							Grou	nd								
No off					••••••		2			••••••				••••••	2		••••••		•••••					
Air Flow (m3/s)							0.21	m3/s							1.67 m	13/s								
Frequency	/ 2 KHz	4 KHz	8 KHz	63 Hz	125 Hz	250 Hz	500 Hz	1 KHz	2 KH:	z 4 KHz	8 KHz	63 Hz	125 Hz	250 Hz	500 Hz	1 KHz	2 KHz	4 KHz	8 KHz	63 Hz	125 Hz	250 Hz		
Fan SWL	63 dB	61 dB	62 dB	74 dB	74 dB 75 dB 69 dB 73 dB 63 dB 63 dB 61 dB 62 dB						: dB 75 dB 72 dB 80 dB 78 dB 73 dB 71 dB 61 dB 58 df							58 dB	74 dB	75 dB	69 dB			
Silencer Details	303H12	00L_ FA	ł	N	Nuaire_XBOXER XBC25_445W303H1600L_ FA						Caice_MDA_1200W400H900L_0.3 FA								N	uaire_XE	BOXER			
l Loss	20 dB	13 dB	9 dB	9 dB	13 dB	23 dB	42 dB	55 dB	49 dE	3 32 dB	25 dB	3 7 dB 11 dB 17 dB 26 dB 33 dB 34 dB 28 dB 19 dB								8 dB 19 dB 5 dB 6 dB 12				
Construction							Galva	nised				Galvanised										(
Weight (kg)							50	kg				100 kg												
Diameter (mm)				1																				
Height (mm)							303	mm							400 n	۱m								
Width (mm)							445	mm							1,200	mm								
Length (mm)							1,600) mm							900 n	۱m								
Pressure Drop (Pa)				Ι			15	Pa							60 F	а								
Face Velocity							1.6	m/s							3.5 n	n/s								
Comments	onto I vn	Nuaire	Unit.	3 mat	tching s	ilencer Su	rs to fit pply six	directly ke show	y ontc wn	Nuaire	Unit.									3 mat	ching s	ilencer Sup		
Manufacturers Name					Nuaire						Caice													
Address	hilly, Cl	F83 1NA	1	N	Western Industrial Estate, Caerphilly, CF83 1NA					Riv	erside ⊦ Wi	louse, 3 nnersh,	3 Winners Wokingh	h Fiel am, R	ds, Gaz G41 5C	elle Clos S	se,	W	'estern I	ndustria				
Model				T	XBC 25							MDA							••••••					

Installation Date		2017	2017	
Life Expectancy (yrs)		40	40	
Initial Value (£)				
Building Name	1T	Midford Place W1T	Midford Place W1T	Mid
Building Reference	T 5BG	7-8 Midford Place W1T 5BG	7-8 Midford Place W1T 5BG	7-8 Midf
Floor		1	G	
Room Name		First Office	Ground Office	G







	1																					
ASSET REFERENCE:	tmo	MOSPheric AHU 6 Ground						S	G	syste	m			SB Condenser RDXYQ8T System								
System	AHU	U 6							1	AHU 6							CU	В				
	Gro	und						******	(Ground	*****					~~~~~	Baser	ment			~~~~~	
No off	2	2	•••••	~~~~~	••••••			~~~~~~		2	~~~~~				•••••		2		••••••		*****	
Air Flow (m3/s)	0.2 n	n3/s							0).2 m3/s							1.67 r	m3/s				
Frequency	/ 500 Hz	1 KHz	2 KHz	4 KHz	8 KHz	63 Hz	125 Hz	250 Hz	50	00 Hz 1 KHz	2 KHz	4 KHz	8 KHz	63 Hz	125 Hz	250	Hz 500 Hz	1 KHz	2 KHz	4 KHz	8 KHz	63 Hz
Fan SWL	73 dB	63 dB	63 dB	61 dB	62 dB	74 dB	75 dB	69 dB	73	′3 dB 63 dB	63 dB	61 dB	62 dB	75 dB 72 dB 80 dB 78 dB 73 dB 71 dB 61 dB 58 dB							58 dB	74 dB
Silencer Details	XBC25_445W303H1200L_FA Nuaire_XBOXER XBC25_445W303H1600L_FA						Caice_MDA_1200W400H900L_0.3 FA							Nu								
l Loss	27 dB	27 dB 34 dB 20 dB 13 dB 9 dB				9 dB 13 dB 23 dB 42 dB 55 dB 49 dB 32 dB 25 dB						25 dB	7 dB 11 dB 17 dB 26 dB 33 dB 34 dB 28 dB 19 dB							5 dB		
Construction	Galva	Galvanised							Ga	alvanised				Galvanised								
Weight (kg)	37	kg								50 kg				100 kg								
Diameter (mm)																						
Height (mm)	303	mm							3	303 mm				400 mm								
Width (mm)	445	mm							4	445 mm							1,200	mm				
Length (mm)	1,200) mm							1,	,600 mm							900	mm				
Pressure Drop (Pa)	15	Pa								15 Pa							60 I	Pa				I
Face Velocity	1.5 ı	m/s								1.5 m/s							3.5 r	n/s				I
Comments	s to fit oply six	directly xe show	onto /n	Nuaire	Unit.	3 ma	tching s	silence Su	ers to uppl	to fit directly	/ onto l vn	Nuaire	Unit.									3 mat
Manufacturers Name	Nua	Nuaire							I	Nuaire				Caice								
Address	I Estate	e, Caerpl	nilly, C	F83 1N/	Ą	v	Vestern	Industri	ial E	Estate, Caerp	hilly, Cl	-83 1N/	Ą	Rive	erside H Wir	louse	e, 3 Winner rsh, Woking	sh Fielo ham, R	ds, Gazo G41 5C	elle Clos S	se,	W
Model	XBC	25				T)	XBC 25			~~~~~	MDA							T	

Installation Date	2017	2017	2017	
Life Expectancy (yrs)	40	40	40	
Initial Value (£)				
Building Name	ford Place W1T	Midford Place W1T	Midford Place W1T	
Building Reference	ford Place W1T 5BG	7-8 Midford Place W1T 5BG	7-8 Midford Place W1T 5BG	
Floor	G	G	В	
Room Name	round Office	Ground Office	Basement Office	





ASSET REFERENCE:	S	в а	tmo	spł	nerio	C		SB system									
System			AHU	J 5							AHU	J 5					
			Base	ment	••••••						Base	ment			~~~~~		
No off			2		~~~~~					******	2		••••••	*******	******		
Air Flow (m3/s)			0.17 ו	m3/s							0.17	m3/s					
Frequency	125 Hz	250 Hz	500 Hz	1 KHz	2 KHz	4 KHz	8 KHz	63 Hz	125 Hz	250 Hz	500 Hz	1 KHz	2 KHz	4 KHz	8 KHz		
Fan SWL	75 dB	69 dB	73 dB	63 dB	63 dB	61 dB	62 dB	74 dB	75 dB	69 dB	73 dB	63 dB	63 dB	61 dB	62 dB		
Silencer Details	iaire_X	ire_XBOXER XBC25_445W303H1200L_ FA						N	uaire_X	BOXER	XBC25	_445W	303H16	00L_ F/	ł		
l Loss	6 dB	12 dB	27 dB	34 dB	20 dB	13 dB	9 dB	9 dB 13 dB 23 dB 42 dB 55 dB 49 dB 32 dB 25 d									
Construction			Galva	nised				Galvanised									
Weight (kg)			37	kg							50	kg					
Diameter (mm)																	
Height (mm)			303	mm				303 mm									
Width (mm)			445	mm							445	mm					
Length (mm)			1,200) mm							1,600) mm					
Pressure Drop (Pa)			15	Pa				Ι			15	Pa					
Face Velocity			1.3 ı	m/s							1.3	m/s					
Comments	ching s	silencer Su	rs to fit pply six	directly ke shov	/ onto l vn	Nuaire	Unit.	3 mat	ching s	ilence Su	rs to fit pply six	directly ke show	/ onto l vn	Nuaire	Unit.		
Manufacturers Name		Nuaire						Nuaire									
Address	estern	stern Industrial Estate, Caerphilly, CF83 1NA						N	/estern∣	Industria	al Estate	e, Caerp	hilly, Cl	F83 1NA	ł		
Model			XBC	25				XBC 25									

Installation Date	2017	2017
Life Expectancy (yrs)	40	40
Initial Value (£)		
Building Name	Midford Place W1T	Midford Place W1T
Building Reference	7-8 Midford Place W1T 5BG	7-8 Midford Place W1T 5BG
Floor	В	В
Room Name	Basement Office	Basement Office



APPENDIX C

Example Calculations

Example Calculations of Noise Level at Terminations to Atmosphere of Plant

			Octave Band Centre Frequency (Hz)											
Condenser 3b			63	125	250	500	1000	2000	4000	8000	A			
Fan Lw			78	75	83	81	76	74	64	61	82			
	Length	Height												
Duct	2.8	0.4	2	2	1	0.5	0.5	0.5	0.5	0.5				
	Number													
Bends	1		0	4	7	5	3	3	3	3				
	Length	Height												
Termination	1.2	0.4	6	2	0	0	0	0	0	0				
Silencer			7	11	17	26	33	34	28	19				
Result			63.0	56.0	58.0	49.5	39.5	36.5	32.5	38.5	52.1			

	İ				Octav	e Band Cent	tre Frequenc	v (Hz)			
AHU 3b			63	125	250	500	1000	2000	4000	8000	A
Fan Lw			77	78	72	76	66	66	64	65	75.5
	Length	Diameter									
Duct	5.5	0.3	0.6	0.6	0.6	1	1	1	1	1	
	Number										
Bends	1	(lined)	0	0	0	7	16	18	16	17	
	Cross sect	tional area									
Termination		0.07	12	7	3	1	0	0	0	0	
Silencer			5	6	12	27	34	20	13	9	
Result			59.4	64.4	56.4	40.0	15.0	27.0	34.0	38.0	51.4