

# 65 CLERKENWELL ROAD LONDON EC1R 5B

Environmental Noise Survey & Plant Noise Impact Assessment Report (inc BREEAM Pol05)

26 September 2023

Client: Cast Fit Out Ltd

T/A Cast Interiors Unit 8, Tallon Road Hutton Brentwood CM13 1TF

QA22017/ENS



# **Document Control**

### **Document Information**

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0	9 May 2023	
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### **Document Approvals**

Role	Name	Signature	Date
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### 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.



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# 1.0 INTRODUCTION

65 Clerkenwell Road, London comprises an existing building with 6 levels of office accommodation. The building is to be refurbished. This will involve installing new items of building services plant externally.

Quantum Acoustics Ltd have been appointed 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.

This report presents our methodology and findings.

# 2.0 SITE DESCRIPTION

The site is located at 65 Clerkenwell Road, London, EC1R 5B. The location is shown below, outlined in red.



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

The building is located within the jurisdiction of Camden.



# 3.0 ENVIRONMENTAL NOISE SURVEY

An automated environmental noise survey was undertaken from approximately 12:15 on the 21 February to approximately 15:45 on the 22 February 2023.

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

#### 3.1 Measurement Position

Noise monitoring equipment was installed at the position shown on the following plan.



Figure 2. Measurement Positions (Google Imagery 2022, The GeoInformation Group)

The microphone was positioned at roof level.

#### 3.2 Equipment

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



Description	Manufacturer	Туре
Type 1 Sound Level Meter	Svantek	971A
Acoustic Calibrator	Svantek	SV 33B

The sound level meter was located within a weather-proof case. The external microphone was connected via an extension cable and fitted with a microphone windshield.

The complete measurement chain (including extension cable) was calibrated prior to and on completion of the survey, with no significant calibration drift occurring.

### 4.0 SURVEY FINDINGS

The following section uses the following acoustic terms:

**A-weighted** noise levels are frequency-weighted in a way that approximates the frequency response of the human ear and allows sound levels to be expressed as a single figure value.

 $L_{90}$  is the noise levels that is exceeded for 90% of the measurement period. It is a measure of the background noise level.

 $L_{eq}$  is the level of a notional continuous sound that would deliver the same sound energy as the actual fluctuating sound over the measurement period. It is a measure of the average noise level.

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

#### 4.1 Noise Level Results

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





#### The measured modal background noise levels (L<sub>90</sub>) are presented in the table below:

Modal Background L <sub>90</sub> dB re2x10 <sup>-5</sup> Pa					
Daytime (07:00 – 18:00)	Evening (18:00 – 23:00)	Night-time (23:00 – 07:00)			
54	50	46			

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

Min Background L <sub>90</sub> dB re2x10 <sup>-5</sup> Pa					
Daytime (07:00 – 18:00)	Evening (18:00 – 23:00)	Night-time (23:00 – 07:00)			
51	48	43			



#### 4.2 Noise Climate

During the periods that we were present at site, the environmental noise climate was dominated by local road traffic noise.

# 5.0 RELEVANT PLANNING POLICIES AND NOISE ASSESSMENT GUIDANCE

#### 5.1 Noise Policy Statement for England

The Noise Policy Statement for England (NPSE) was published in March 2010. The NPSE is the primary statement of noise policy for England and applies to all forms of noise other than occupational noise. The NPSE sets out the long term vision of Government noise policy which is to:

"Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development."

"Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- avoid significant adverse impacts on health and quality of life;
- mitigate and minimise adverse impacts on health and quality of life; and
- where possible, contribute to the improvement of health and quality of life."

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

#### NOEL – No Observed Effect Level

This is the level below which no effect can be detected and below which there is no detectable effect on health and quality of life due to noise.

#### LOAEL – Lowest Observable Adverse Effect Level

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

#### SOAEL – Significant Observed Adverse Effect Level

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

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

The NPSE acknowledges that it is not possible to have a single objective noise level based measure that is mandatory and applicable to all sources of noise in all situations.



### 5.2 Planning Practice Guidance

The government's Planning Practice Guidance is a web based resource and provide advice on various issues, including noise (https://www.gov.uk/guidance/noise--2). The advice (March 2014, latest update July 2019) states in the context of considering when noise is relevant to planning, "noise needs to be considered when new development may create additional noise, or would be sensitive to the prevailing acoustic environment (including any anticipated changes to that environment from activities that are permitted but not yet commenced)."

The Planning Practice Guidance pages also include more explanation of the effect level categories noted above, providing an explanatory Noise Exposure Hierarchy Table, which explores how actions such as a requirement for noise mitigation, or prevention of a development, might be assessed with respect to whether noise levels are considered above the category thresholds.

Response	Examples of outcomes	Increasing effect level	Action
	No Observed Effect	t 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	e 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 Adver	se Effect Level	
Present and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding ertain activities during periods of intrusion; where there is no alternative ventilation, aving to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in etting to sleep, premature awakening and ifficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Interdiministed due to change in acoustic character of the area.   Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g.   Present and very disruptive regular sleep deprivation/awakening; loss of appetite, significant, medically definable hard, e.g. auditory and non-		Unacceptable Adverse Effect	Prevent



#### 5.3 National Planning Policy Framework

The following paragraph is from the National Planning Policy Framework (NPPF). The NPPF was revised in July 2021.

'185. Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely 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'* 

#### 5.4 London Plan 2021

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.



### 5.5 BS 4142:2014

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.

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".

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.

#### 5.6 London Borough of Camden Requirements/Guidance

The London Borough of Camden Local Plan 2017 Appendix 3 advises the following:

Industrial and Commercial Noise Sources

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 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).



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 57dBLAmax	'Rating level' between 9dB below and 5dB above background or noise events between 57dB and 88dB LAmax	'Rating level' greater than 5dB above background and/or events exceeding 88dBLAmax

# Table C: Noise levels applicable to proposed industrial and commercial developments (including plant and machinery)

\*10dB should be increased to 15dB if the noise contains audible tonal elements. (day and night). However, if it can be demonstrated that there is no significant difference in the character of the residual background noise and the specific noise from the proposed development then this reduction may not be required. In addition, a frequency analysis (to include, the use of Noise Rating (NR) curves or other criteria curves) for the assessment of tonal or low frequency noise may be required. \*\*levels given are for dwellings, however, levels are use specific and different levels will apply dependent on the use of the premises. The periods in Table C correspond to 0700 hours to 2300 hours for the day and 2300 hours to 0700 hours for the night. The Council will take into account the likely times of occupation for types of development and will be amended according to the times of operation of the establishment under consideration. There are certain smaller pieces of equipment on commercial premises, such as extract ventilation, air conditi4oning units and condensers, where achievement of the rating levels (ordinarily determined by a BS:4142 assessment) may not afford the necessary protection. In these cases, the Council will generally also require a NR curve specification of NR35 or below, dependant on the room (based upon measured or predicted Leq,5mins noise levels in octave bands) 1 metre from the façade of affected premises, where the noise sensitive premise is located in a quiet background area.

#### 5.7 BREEAM Pol 05

To comply with BREEAM Pol 05 – Reduction of noise pollution:

• A suitably qualified acoustician will be appointed to carry out the required noise measurements for the noise rating level resulting from new noise sources, post-installation, in accordance with BS 4142.



- The appointed suitably qualified acoustician holds a recognised acoustic qualification and membership of an appropriate professional body, such as the Institute of Acoustics.
- The noise level from the assessed building, as measured in the locality of the nearest or most exposed noise-sensitive development, must be at least 5dB lower than the background noise throughout the day and night.
- If the noise sources from the assessed building are greater than the levels described in criterion 4, measures have been installed to attenuate the noise at its source to a level where it will comply with the criterion.

The London Borough of Camden's requirements for controlling atmospheric noise emissions from building services plant are more onerous than the criteria required by BREEAM Pol 05. Therefore, compliance with the proposed criteria will ensure compliance with BREEAM Pol 05.

Quantum Acoustics was appointed at an early stage of the project to provide acoustic design advice. All of Quantum's consultancy team hold recognised acoustic qualifications and are Members or Fellows of the Institute of Acoustics. This report has been prepared by John Gibbs MIOA and checked by Eur Ing Simon Hancock BEng(Hons), CEng, FIOA, MIMechE, MCIBSE. Both have over 30 years of experience as acoustic consultants.

# 6.0 PLANT NOISE EMISSION CRITERIA

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 nearest noise sensitive residential window:

Min Background L <sub>90</sub> dB re2x10 <sup>-5</sup> Pa					
Daytime (07:00 – 18:00)	Evening (18:00 – 23:00)	Night-time (23:00 – 07:00)			
44	40	36			

We also recommend that noise levels at openable windows of nearby offices do not exceed 55dBA.

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

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

Relaxations of the above criteria may be acceptable for emergency plant, but should be considered on a case by case basis



# 7.0 PLANT NOISE ASSESSEMNT

We understand the proposed plant will run during normal office hours (0800-1800 Monday to Friday)

### 7.1 Nearest Noise Sensitive Property

The nearest residential property is Ziggurat Building, located approximately 25m south west of the proposed plant area on the opposite side of Onslow Street. Residential properties are also located on the opposite side of Clerkenwell road, at approximately 30m from the proposed plant area. All other nearby buildings are of commercial use.



#### 7.2 Proposed New Plant

We understand the proposed external plant comprises:

ltem	Quantity	Manufacturer	Model	Sound Pressure at 1m dBA	Sound Power dBA
Condenser	1No	Daikin	REYA10A	58	78.8
Condenser	1No	Daikin	REYA12A	60.8	82.5
Condenser	4No	Daikin	REYA20A*	67*	87.9*
Air Source Heat Pump	1No	Mitsubishi QAHV- N560YA-HPB	Mitsubishi QAHV- N560YA-HPB	56	

\*See section 7.3 regarding attenuation for model REYA20A



There are various items of air handling equipment, including:

- Swegon heat recovery unit.
- Various extract fans are also proposed to serve toilets and tea points. These fans are small (handling only circa 0.25m<sup>3</sup>/s to 0.34m<sup>3</sup>/s.

All such air handling equipment will be attenuated with suitable in-duct atmospheric attenuators (see attached Appendix A), to achieve the required environmental noise criteria. As such, we have excluded such fans and air handling equipment from the following calculation.

#### 7.3 Attenuation

Condenser model REYA20A requires at least 6dB attenuation such that it is no noisier than the other condensers. We understand bespoke attenuation will be provided by Environ Group Ltd, to achieve the required attenuation.

We understand the proposed mitigation proposed by Environ Group Ltd includes an attenuator fitted above the fan discharge, to achieve the following insertion losses:

Insertion Loss (dB) at Octave Band Centre Frequency (Hz)							
63 125 250 500 1000 2000 4000 8000							
5 9 15 21 26 23 22 20							

Our assessment assume REYA20A will not exceed 61dBA at 1m and sound power level of 83dBA.

#### 7.4 Plant Noise Impact Assessment

The following tables presents the calculated noise level emissions from the proposed plant to the nearest noise sensitive property.



ltem	Manufacturer	Model	Sound Pressure at 1m	Sound Power
			dBA	dBA
Condenser	Daikin	REYA10A	56.3	78.3
Condenser	Daikin	REYA12A	60.8	82.5
Condenser	Daikin	REYA20A*	61	83
Condenser	Daikin	REYA20A*	61	83
Condenser	Daikin	REYA20A*	61	83
Condenser	Daikin	REYA20A*	61	83
Air Source Heat Pump	Mitsubishi QAHV- N560YA-HPB	Mitsubishi QAHV- N560YA-HPB	56	
Total			68	
Propagation Losses (to 25m approx.)			-27	
Reflection Correction			+3	
Total			44	

With refence to Section 6, the calculated noise level should comply with the proposed criteria.



# 8.0 CONCLUSIONS

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

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

Environmental noise emissions from the proposed plant have been assessed to nearby noise sensitive receptors. Condenser model REYA20A requires at least 6dB attenuation such that it is no noisier than the other condensers. We understand this can be achieved by fitting it with an attenuation kit available from Environ Group Ltd. Our assessment assume REYA20A will not exceed 61dBA at 1m and sound power level of 83dBA.

With the proposed attenuation, our calculations indicate that environmental plant noise emissions should comply with the proposed criteria

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

The London Borough of Camden's requirements for controlling atmospheric noise emissions from building services plant are more onerous than the criteria required by BREEAM Pol 05. Therefore, compliance with the proposed criteria will ensure compliance with BREEAM Pol 05.



# Appendix A

esg(cast)
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Attenustors																		
Reference	System	Model	Qty	Flow	ow Pressure Dimensions						In	ertio		Weight	Notes			
	· ·		1	Rate	Drop	Width	Height	Length	63	125	250	500	1k	2k	4k	8k	, v	
				l/s	Pa	mm	mm	mm	dB	dB	dB	dB	dB	dB	dB	dB	kg	
ATT.LG.01	10P MR CTA	LRLB-350-300-950-RJFP20	1	100	1	350	300	950	3	10	15	19	17	19	15	13	TBC	1
ATT.LG.02	4P MR CTA	LRLB-200-200-950-RJFP20	1	40	1	200	200	950	3	9	16	21	23	20	15	14	TBC	1
										-								
ATT.00.01	Kitchen Extract	SLXU-125-300-50	1	15	1	2350	•	365	0	3	7	9	17	25	15	14	3	1
ATT.00.02	Kitchen Extract	SLXU-125-300-50	1	15	1	2350	-	365	0	3	7	9	17	25	15	14	3	1
ATT.00.03	AHU Attenution	TUNE-5-200/200-400-350-1100	1	670	16	400	350	1100	4	6	12	24	26	17	10	8	TBC	1
ATT 00.04	AHU Attenution	TUNE-5-200/200-400-350-1100	1	670	16	400	350	1100	4	6	12	24	26	17	10	8	TBC	1
ATT.00.05	AHU Attenution	TUNE-S-200/200-400-350-1100	1	670	16	400	350	1100	4	6	12	24	26	17	10	8	TBC	1
ATT.00.06	AHU Attenution	TUNE-5-200/200-400-350-1100	1	670	16	400	350	1100	4	6	12	24	26	17	10	8	TBC	1
			-						-	-						-		-
ATT 01 01	10P MR CTA	LBLB-350-300-950-8 (EP20	1	100	1	350	300	950	•	10	15	19	17	19	15	12	TRC	4
ATT.01.02	Kitchen Extract	SLXU-125-300-50	1	15	1	2356	-	365	6	3	7	9	17	25	15	14	3	1
ATT 01 03	Kitchen Extract	SIXU-123-300-50	-	11	-	2356		365	0	-	7	9	17	25	13	14		-
ATT 01 04	AHU Attenution	TUNE 5 200/200 400 300 1000	-	450	12	400	300	1000	2	÷	44	22	24	13			TRC	-
ATT 01.05	ANU Attenution	TUNE-5-200/200-400-300-2000	+	450	42	400	300	1000	,	÷		22	24		2	•	TOC	-
ATT 01.05	AHU Attenution	TUNE 5-200/200-400-300-2000	+	410	12	400	300	1000		÷	44	22	24	13		-	TRC	-
ATT 01 07	AHU Attenution	TURE 5 300/300 400 300 1000	-	450	42	400	200	1000	-	÷	44	22	24		-	-	TRC	-
ATT 04.00	AND Attenution	1042-5-200/200-400-500-200	-	400		400	300	2000	-	÷					42	-	100	-
A11.01.06	AND ALLENGUON	3240-130-300-30	-	40	-	1500	-	3/3	-	-	-		~	10	13	•		-
ATT 02.01	10P MP CTA	1818-250-200-850-815820	4	100	4	250	200	950		10	-	10	17	10	-	12	TRC	4
ATT 02.02	Vitchen Extract	SIVIL-125-200-50	-	15	-	2254	300	265	-				47	2.5		14	2	-
ATT 02.02	Kitchen Extract	500-125-300-50	+		-	2350		303		-	-		47	2.2		14		-
ATT 02.03	All Attenution	SEXU-123-300-30	1	15	1	2300	200	363	-	-	1 44	32	24	25	10	14	3	1
ATT 02.04	ANU Attenution	TUNE 5 200/200-400-300-2000	-	450	42	400	300	1000	-	÷		22	24		2	•	TOC	-
ATT 02.05	ANU Attenution	TUNE-S-200y200-400-300-2000	-	400	42	400	300	1000	-	÷		22	24		-	÷	TOC	-
ATT 02.06	AHU Attenution	TUNE-S-200/200-400-300-2000	1	410	12	400	300	1000	3	÷	11	22	24	15	2		TEC	
ATT 02.07	ANU Attenution	TUNE-5-200/200-400-300-2000	-	400	12	400	300	2000	-	-		44	24	10	- 2	-	100	-
A11.02.06	AND ALLENGUON	32/0-130-300-30	-	40	-	1300		3/3		-	-			10	13	•		-
ATT.03.01	10P MR CIA	CKUB-350-500-550-K0FP20	1	100	1	330	300	950	-	10	15	19	17	19	10	15	180	1
ATT.03.02	Kitchen Extract	52X0-125-300-50	1	15	1	2550		363		-	-	3	17	25	10	14	3	-
A11.03.03	Kitchen Extract	SEX0-123-300-30	1	15	1	2300		360		-		9	1/	25	15	14	3	1
A11.03.04	AHU Attenution	TUNE-S-200/200-400-300-1000	1	450	12	400	300	1000	3	-	11	22	24	15	9	8	TBC	1
ATT.03.05	AHU Attenution	TUNE-S-200/200-400-300-1000	1	450	12	400	300	1000	3	+	11	22	24	15	3	8	TBC	1
ATT.03.06	And Attenution	TUNE-S-200y200-400-300-2000	-	410	42	400	300	1000	-	÷		22	24		-	<u></u>	700	-
A11.03.07	AHU Attenution	TUNE-3-200/200-400-300-1000	1	400	12	400	300	1000	3	-	11	22	24	15	9	8	TBC	1
A11.03.08	AHU Attenution	SLX0-150-300-50	1	40	1	1500		3/3	0	3	2	11	21	18	15	ă	5	1
477.04.04	100 140 (774	1010-250-200-050-015020		100		380	200	050		40		40	47	40		42	TRC	4
477.04.02	10P MR CIA	CRUB-SSO-SOO-950-RJFP20	1	100	1	330	300	950	2	10	15	19	17	19	15	15	IBC.	1
ATT.04.02	Kitchen Extract	SLX0-123-300-30	1	13	1	2330		363	0		-	-	1/	20	10	14		1
ATT.04.03	ARCHEN EXTRACT	SLXU-125-300-50	1	13	1	2330	200	363	2	-	7	9	17	23	-13	14	5	1
ATT 04.05	ANU Attenution	TUNE-S-200/200-400-300-1000	-	450	12	400	300	1000	3	-		22	24	10	2	•	TRC	-
ATT 04.05	AHU Attenution	TUNE-5-200/200-400-300-1000	1	430	12	400	300	1000	3	-		22	24	15	2	-	TRC	1
ATT 04.05	AHU Attenution	TUNE-5-200/200-400-300-1000	4	410	12	400	300	1000	3		44	22	24	15	3	0	TRC	4
ATT 04.02	AHUAttenution	SIVIL-150-200-200	-	400	4	1504	300	275	-			44	24	10	12	-	2	4
ATT.04.05	And Attendion	3640-130-300-30	-	40	-	1000	-	3/3		3	-			10	13	•	3	*
ATT OS CH	W/C ANU Attenuates	VDCSSLUCAACE		275	•		430	1050	4	10	47	10	22	40			22	,
ATT 05.02	WC AHU Attenuator	XBC35-HE-MC4	4	275	7	399	430	1050	-	6	12	15	15	11		4	34	2
ATT 05 02	WC AHLI Attenuator	XRC55-UCAACH	-	275	, 0	100	420	1050	4	10	17	19	22	10	1.	11	32	2
ATT 05.04	WC ANU Attenuator	VDCSS-UE-MC4	-	275	7	200	430	1050	-		12	13	13	44		4	36	
ATT 05.05	CIL 05.02 Attenuator	Environ Coasial	-	2/3	Tec	205	1250	1140		0	1.	24	20	22	22	20	30	
ATT 05.05	CU.05.05 Attenuator	Environ Special	1	3347	TRC	393	1350	1140		3	15	21	26	23	22	20	TRC	3
ATT 05.07	CU 05.05 Attenuator	Environ Special	-	3547	TPC	303	1250	1140	÷		1.5	24	20	23	22	20	TPC	2
ATT 05.00	CIL 05.05 Attenuator	Environ Special	-	3547	Tec	205	1250	1140	÷		1.5	24	20	23	22	20	TRC	2
ATT.05.08	CO.05.06 Attendator	Environ special	-	3347	IBC	393	1500	1140	2	3	15	21	20	23	22	20	TBL	3
							1											

NOTES: 1. Equipment selection is to be manufactured by Lindab or equal and approved and must be installed in accordance with the manufacturers instructions. 2. Equipment selection is to be manufactured by Nuaire (attenuators match to AHU) and must be installed in accordance with the manufacturers instructions. 3. Equipment selection is bespoke by The Environ Group Ltd and must be installed in accordance with the manufacturers instructions.



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