

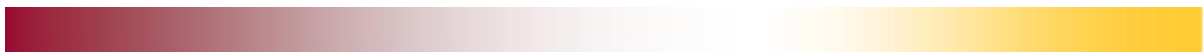
Able Acoustics

MR V. SANTOMAURO

12-14 HIGH STREET, GRAVESEND

ACOUSTIC ASSESSMENT

OCTOBER 2023



Able Acoustics

MR V. SANTOMAURO

12-14 HIGH STREET, GRAVESEND

ACOUSTIC ASSESSMENT

OCTOBER 2023

This report has been prepared by Able Acoustics Limited for Mr V. Santomauro in accordance with the terms of the proposal using all reasonable skill and care. The contents of this document must not be copied or reproduced in whole or in part without the written consent of Able Acoustics Limited.

Able Acoustics Limited accepts no responsibility for any data provided by other bodies or any liability arising from the use by persons other than the addressee of this report, of the data or the opinions contained herein.

P1547/01	October 2023	Position	Signature
<i>Prepared By:</i>	<i>Edward Crofton-Martin</i>	<i>Principal Acoustic Consultant</i>	
<i>Checked By:</i>	<i>Edward Crofton-Martin</i>	<i>Principal Acoustic Consultant</i>	
<i>Approved By:</i>	<i>Edward Crofton-Martin</i>	<i>Principal Acoustic Consultant</i>	

Able Acoustics Ltd
Unit 20, Connect 10
Foster Road
Ashford
Kent
TN24 0FE
England
www.ableacoustics.com
info@ableacoustics.com

CONTENTS

1. INTRODUCTION	1
1.1 Introduction	1
2. UNITS AND STANDARDS	2
2.1 General	2
2.2 Planning and Noise	3
2.3 Assessment of Industrial and Commercial Sound	4
3. SITE LAYOUT AND ENVIRONMENT	7
3.1 Site Layout	7
3.2 Operations	7
3.3 Environment	7
3.4 Sensitivity of the Receptor	8
3.5 Façade Insulation Treatment at Receptor	8
3.6 Alternative Ventilation Measures at Receptor	8
3.7 Acoustic Screening	8
3.8 Assessment History	8
4. MEASUREMENTS	9
4.1 General	9
4.2 Instrumentation	9
4.3 Source Measurements	9
4.4 Unattended Measurements	10
4.5 Analysis	11
5. ASSESSMENT	13
5.1 Assessment	13
5.2 Context	14

5.3	Potential Impact of Uncertainty	14
5.4	Internal levels.....	15
6.	CONCLUSIONS.....	16
6.1	Summary of Conclusions	16
6.2	Mitigation	16
6.3	Statement of Competence	18
7.	REFERENCES	19

FIGURES

APPENDIX A – Calibration Certificates

APPENDIX B – Unattended Measurements

APPENDIX C – Source Measurements

APPENDIX D – 3rd Party Product Information



1. INTRODUCTION

1.1 Introduction

- 1.1.1 Permission has been granted on appeal for: *Retrospective application for the change of use from A1 (retail) to A3 (restaurant) including the installation of a new shopfront,* at Julius Caesar Restaurant, 12-14 High Street, Gravesend, Kent, DA11 0BQ.
- 1.1.2 The planning inspector has attached conditions to the appeal decision and a 3rd party has undertaken an assessment which included details for mitigation measures. Mr V. Santomauro has installed mitigation different from that recommended by the third party and has commissioned Able Acoustics Ltd to assess the impact of sound generated from the mitigated units.
- 1.1.3 This report presents the measurements undertaken and the results of the assessment.



2. UNITS AND STANDARDS

2.1 General

- 2.1.1 Noise is defined as unwanted sound. The range of audible sound is from 0 dB to 140 dB and a range of typical noise levels is presented in Table 2.1 below.

Table 2.1 Typical Sound Levels

Sound Pressure Level dB(A)	Source	Subjective Level
130 - 140	Jet (at 10m)	Threshold of pain
120 - 130	Pneumatic Drill (at 1m)	Extremely Loud
110 - 120	Loud Car Horn (at 1m)	Very Loud
100 - 110	Alarm Bell (at 1m)	Very Loud
80 - 90	Inside General Factory	Loud
70 - 80	Average Traffic (on street corner)	Loud
60 - 70	Conversational Speech	Moderate
50 - 60	Typical Business Offices	Moderate
40 - 50	Living-room Urban Area	Quiet
30 - 40	Library	Quiet
20 - 30	Bedroom (at night)	Very Quiet
10 - 20	Broadcasting Studio	Very Quiet

- 2.1.2 For variable sources, a difference of 3 dB(A) is just distinguishable. For road traffic or railway sound sources, a doubling of traffic flow will increase the overall noise by 3 dB(A). The "loudness" of a noise is a purely subjective parameter, but it is generally accepted that an increase/decrease of 10 dB(A) corresponds to a doubling/halving in perceived loudness.
- 2.1.3 The frequency response of the ear is usually taken to be about 20 Hz (number of oscillations per second) to 20 kHz. The ear does not respond equally to different frequencies at the same level. It is more sensitive in the mid-frequency range than the lower and higher frequencies and because of this, the low and high frequency components of a sound are reduced in importance by applying a weighting (filtering) circuit to the noise measuring instrument. The weighting which is most widely used and which correlates best with subjective response to noise is the dB(A) weighting. This is an internationally accepted standard for noise measurements.
- 2.1.4 External sound levels are rarely steady, but rise and fall according to activities within an area at any given time. To produce a figure that relates this variable noise level to subjective response, a number of indices have been developed. These include:

i) $L_{Aeq,T}$ sound level

This is the "equivalent continuous A-weighted sound pressure level, in decibels", and is defined in British Standard BS 7445 [1] as the "value of the A-weighted sound pressure level of a continuous, steady sound that, within a specified time interval, T, has the same mean square sound pressure as a sound under consideration whose level varies with time". In simpler terms, it is a measure of energy within the varying noise.

ii) The L_{Amax} level

This is the maximum noise level recorded over the measurement period.

iii) The L_{A90} level

This is the level that is exceeded for 90% of the measurement period and gives an indication of the level during quieter periods. It is often referred to as the background sound level and is used in the assessment of disturbance from industrial sound.

iv) Ambient Sound

This is the totally encompassing sound in a given situation at a given time, usually composed of sound from many sources near and far. The ambient sound comprises the residual sound and the specific sound when present.

v) Residual Sound

This is the sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound.

vi) Specific Sound

This is the sound from the sound source under investigation. The specific sound may be determined by subtracting the measured Residual Sound Level from the measured Ambient Sound Level.

2.2 Planning and Noise

2.2.1 Planning Permission has been granted on appeal [2] and the planning inspector has attached conditions to the appeal decision at least one of which relates to noise stating:

“Unless within three months of the date of this decision a scheme for a extract ventilation system and odour control equipment particularly regarding odour elimination abilities and likely noise emissions, is submitted in writing to the local planning authority for approval, the use of the site shall cease and all equipment and materials bought onto the land for the purposes of such use shall be removed until such time as a scheme is approved and implemented. If no scheme in accordance with this condition is approved within three months of the date of this decision, the use of the site shall cease and all equipment and material bought onto the land for the purposes of such use shall be removed until such time as a scheme approved by the local planning authority is implemented. Upon implementation of the approved scheme specified in this condition, that scheme shall thereafter remain in use and maintained in accordance with the manufacturer’s instructions. In the event of a legal challenge to this decision, or to a decision made pursuant to the procedure set out in this condition, the operation of the time limited specified in this condition will be suspended until that legal challenge has been finally determined.”

2.3 Assessment of Industrial and Commercial Sound

BS 4142 Method

- 2.3.1 BS 4142:2014+A1:2019 [3] provides methods for rating and assessing industrial and commercial sound. The Standard is used by local authorities and consultants to rate sound from fixed installations. The Standard was considerably revised 2014 and amended in 2019.
- 2.3.2 The Standard advocates the use of L_{Aeq} , a level which is directly measurable. The L_{Aeq} is either measured or calculated at a receptor location and termed the "Specific Sound Level". The Specific Sound Level may then be corrected for the character of the sound and is then termed the "Rating Level".
- 2.3.3 When presenting values to be used in an assessment BS 4142:2014 requires that levels should be expressed as whole numbers on the grounds that expressing to one or more decimal places implies an improper degree of precision.¹
- 2.3.4 BS 4142 states that the assessment position should be in the free field (at least 3.5m away from any reflecting façades) and at a preferred height of between 1.2 and 1.5 m above ground level. Where it is necessary to take measurements above ground floor level, choose a location which is approximately 1m from the façade on the relevant floor of the building if it is not practical to make the measurements at least 3.5m from the façade at this elevation.
- 2.3.5 When used to assess the impacts, the Rating Level is determined and the L_{A90} background sound level is subtracted from it, the result is then considered alongside a range of pertinent factors to determine the context. The Standard states:
- "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."*

The Standard notes that more than one assessment may be necessary² and continues to further qualify the assessment protocol by outlining conditions to the comparative assessment and stating that "not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact", thus implying that all sites should be assessed on their own merits and specifics. The Standard quantifies the typical reference periods (for the purposes of the standard) to be used in the assessment and these are shown in Table 2.2 below:

¹ This convention has also been applied in the presentation of the measured levels in the Appendices for consistency.

² Note 1 to Clause 11 Assessment of the impacts.

Table 2.2 Reference Periods

Period	Hours	Assessment Period
Typical Daytime	07:00 – 23:00	1hr assessment period
Typical Night-time	23:00 – 07:00	15min assessment period

- 2.3.6 The Standard notes that sound with prominent impulses has been shown to be more annoying than continuous types of sound (without impulses or tones) with the same equivalent sound pressure level. The Standard outlines a number of methods for defining appropriate “character corrections” within the Rating Sound Level to account for tonal qualities, impulsive qualities, other sound characteristics and/or intermittency. These are a) the Subjective Method, b) the Reference Method for tonality and c) the Objective Methods for assessing both tonality and impulsivity. It is noted by the Standard that where multiple features are present the corrections should be added in a linear fashion to the Specific Sound Level. The Subjective Method is based on the following corrections shown in Table 2.3 below:

Table 2.3 Subjective Method Rating Corrections

Level of Perceptibility	Tonal Correction	Impulsivity Correction	Intermittency Correction	Correction for “Other sound characteristics”
No Perceptibility	+0dB	+0dB	If intermittency is readily identifiable +3dB	When neither tonal nor impulsive, nor intermittent but clearly identifiable +3dB
Just Perceptible	+2dB	+3dB		
Clearly Perceptible	+4dB	+6dB		
Highly Perceptible	+6dB	+9dB		

- 2.3.7 The Objective Methods are based around the actual quantification of frequency data and the impulsive prominence of the sound under investigation where possible.
- 2.3.8 It should be noted that the Standard states that the assessment methodology provided is not intended for the derivation of internal levels arising from sound levels outside or for the assessment of low frequency sound.
- 2.3.9 The Standard requires that when assessing the impacts the initial estimate of the impact may need to be modified due to context in which case pertinent factors need to be taken into consideration which include:
- The absolute level of sound in comparison to the residual sound level
 - The character and level of the residual sound compared with the character³ and level of the specific sound, e.g. does the residual sound contain already existing sources of impulsive or tonal sound and do these operate at similar times to a proposed new source and to what degree this would represent an incongruous sound by comparison with the acoustic environment in the absence of the specific sound.
 - The sensitivity of the receptor and whether dwellings or other premises used for

³ The use of the word “character” in association with terms residual sound and specific sound indicates consideration be given to acoustic features which may increase the significance of impact of a sound.

residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions, such as:

- i) Façade insulation treatment
- ii) Ventilation and/or cooling that will reduce the need to have windows open so as to provide rapid or purge ventilation
- iii) Acoustic screening



3. SITE LAYOUT AND ENVIRONMENT

3.1 Site Layout

3.1.1 The application site is located at 12-14, High Street, Gravesend, Kent, England, DA11 0AP and is shown in Figure 01.

3.2 Operations

3.2.1 The restaurant operates 6 days a week and the opening times are understood to be:

- Mondays closed;
- Tuesdays to Thursdays 12:00-22:00hrs;
- Fridays to Saturdays 12:00-23:00hrs; and
- Sundays 12:00-21:00hrs.

3.2.2 There are three air handling units and one extraction system in the rear yard/shared area that services the restaurant. No details have been provided for the extraction system, while the air handling units are as follows:

- 1No. Mitsubishi SRC35ZSP Series, Serial No. 884104754BE
- 1No. Mitsubishi FDC100VNA Series, Serial No. AD8000406NF
- 1No. Mitsubishi FDC100VNA Series, Serial No. AD8002257NF

3.2.3 The two Mitsubishi FDC100VNA series units have a stamped sound power level of 70dB(A). No details are stated on the SRC35ZSP series unit; however, the manufacturer's brochure indicates a Sound Power Level of 60dB(A).

3.2.4 Manufacturer's data has been obtained indicating a sound power level of 70dB(A) for the FDC100VNA series units and a sound power level of 56dB(A) for the SRC35ZSP series unit.

3.2.5 A summary of the sound pressure level values is provided in the table below however it should be recognised that due to maintenance and installation values may differ in the field from controlled measurement conditions:

Unit	1/1 Octave Centre Frequency Band in Hz								Total dB(A)
	63	125	250	500	1k	2k	4k	8k	
SRC35ZSP	-	-	-	-	-	-	-	-	45
FDC100VNA	55	51	50	46	45	36	34	31	49

3.2.6 No manufacturer's data has been provided for the extraction system.

3.3 Environment

3.3.1 The application site is located in a mixed residential and commercial area located in an urban environment and is shown in Figure 01.

3.3.2 The nearest and potentially most noise sensitive residential premises are located Thames View Court also shown in Figure 01.

3.4 Sensitivity of the Receptor

3.4.1 The receptor location is a residential dwelling and is considered to be sensitive.

3.5 Façade Insulation Treatment at Receptor

3.5.1 On site observations record that windows that resemble double glazed units (with one pane of glass) were present nearest noise sensitive premises. However, no data has been provided with regards to the makeup or acoustic performance of these units and it is not possible to quantify or estimate their likely acoustic performance. For the purpose of this assessment, it is considered that additional façade insulation treatment is present, but its performance level is unquantified.

3.6 Alternative Ventilation Measures at Receptor

3.6.1 The internal layout of the properties is not known and facades facing the site have been photographed. The photographs record that not all windows featured alternative ventilation in the form of trickle vents, and it is possible some dwellings rely on open windows for ventilation.

3.7 Acoustic Screening

3.7.1 The eastern boundary of the courtyard area features a timber ~1.8m boundary fence with a gate with a gap at the bottom. The boundary fence obscures the line of sight from the air handling units when viewed from the units to the nearest residential windows at ground floor level but not above ground floor level and not for the extract system flue. Other premises may benefit from screening resulting in only a partial line of sight due to site geometry.

3.8 Assessment History

3.8.1 An assessment was carried out in February 2023 by a 3rd party whose contract has been determined.⁴ The 3rd party assessment found continued operation of the system in the format assessed would result in a significant adverse impact and recommended mitigating all sources by approximately 12dB. The 3rd party report suggested mitigation as follows:

- Wall mounted air handling unit (SRC35ZSP Series) to be louvred or moved to floor level in conjunction with a Caice SHSH150 acoustic louvre.
- Twin Air handling units (FDC100VNA units) to be situated within an acoustic enclosure providing at least a total 12dB of attenuation.
- An ISL Acoustic fan jacket to be fitted to the extraction system to provide at least 12dB of attenuation.
- A silencer to the cowl of the extraction system.

3.8.2 Site photographs indicate that to date none of the recommendations put forward by the 3rd party report have been implemented. However, non-acoustically certified attempts have been made to mitigate the level of sound generated by the extract fan and the twin air handling units at ground level and these are shown in Figure 02 and Figure 03.

⁴ This report does not provide any form of review of the 3rd party report other than to recognise its existence and findings.

4. MEASUREMENTS

4.1 General

4.1.2 To establish levels at the site, a series of attended and unattended measurements have been made.

4.2 Instrumentation

4.2.1 The following instrumentation was used for the measurements:

- Rion type NL-52 Sound Level Meter (Serial No. 00710388)
- Rion type NH-25 Pre-amplifier (Serial No. 10931)
- Rion type UC-59 Microphone (Serial No.19664)
- Rion type NL-52 Sound Level Meter (Serial No. 00843175)
- Rion type NH-25 Pre-amplifier (Serial No. 31989)
- Rion type UC-59 Microphone (Serial No.06717)
- Rion type NC-74 Sound Level Calibrator (Serial No 34936366)

4.2.2 All equipment was within current manufacturer's periods of calibration/conformance and calibration/conformance certificates are attached in Appendix A.

4.2.3 Additionally, the following instrumentation was used to monitor the weather conditions:

- Lutron type LM-8000A 4 in 1 Measuring Instrument (Serial No AG.39828)

4.3 Source Measurements

4.3.1 Source measurements were made at a distance of 1m from the units as both single figure A-weighted values and also in 1/3 Octave centre frequency bands.

4.3.2 The measurements have been logarithmically averaged to provide a single figure at each frequency band as well as the overall A weighted Value. The values are presented as whole numbers as is the convention in BS 4142. A summary of the measurements is provided in the tables below:

Table 4.1 Source Levels – Air Handling Unit SRC35ZSP⁵

Frequency (Hz)	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500
Level	49	60	50	52	52	51	52	44	46	44	44	43	40	43
Frequency (Hz)	630	800	1 k	1.25 k	1.6 k	2 k	2.5 k	3.15 k	4 k	5 k	6.3 k	8 k	10 k	Total dB(A)
Level	40	42	37	35	33	31	29	29	28	28	27	26	26	48

⁵ Site notes record staff were not familiar with the unit and it is noted the measured levels were significantly lower than the manufacturer's stated output and the level in the 3rd party report. It is possible this unit may have been suffering a malfunction or not operating at standard capacity in which case further assessment of this unit may be required.

Table 4.2 Source Levels - Air Handling Units (Twin Fans) FDC100VNA

Frequency (Hz)	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500
Level	57	58	70	59	58	67	61	67	62	55	50	50	47	48
Frequency (Hz)	630	800	1 k	1.25 k	1.6 k	2 k	2.5 k	3.15 k	4 k	5 k	6.3 k	8 k	10 k	Total dB(A)
Level	50	54	50	46	44	43	43	42	40	39	35	40	39	60

Table 4.3 Source Levels – Extract System

Frequency (Hz)	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500
Level	59	48	47	46	45	43	47	49	57	42	45	54	46	45
Frequency (Hz)	630	800	1 k	1.25 k	1.6 k	2 k	2.5 k	3.15 k	4 k	5 k	6.3 k	8 k	10 k	Total dB(A)
Level	48	48	45	48	44	45	45	46	37	32	28	30	25	57

4.4 Unattended Measurements

- 4.4.1 Unattended measurements were undertaken at one location at a position considered representative of the closest and potentially most noise sensitive premises.
- 4.4.2 The unattended measurements were made between 15:30 on Sunday 24th September 2023 to 14:15 on Tuesday 26th September 2023 and cover the most sensitive periods over which the units could operate.
- 4.4.3 The monitoring position was in a shared courtyard area effectively enclosed in all directions and during the survey the meteorological conditions were understood to be dry. A temperature of 22° Celsius was measured with no discernible breeze at the start of the survey and a temperature of 24° Celsius again with no discernible breeze was measured at the end of the survey.
- 4.4.4 Before the survey commenced, the calibration of the instrumentation was checked using the acoustic calibrator to a reference level of 94.0dB and a meter reading of 94.0dB was recorded. At the end of the survey the meter was checked again using the acoustic calibrator to a reference level of 94.0dB and a meter reading of 94.0dB was also recorded.
- 4.4.5 At the start and end of the survey the acoustic environment was subjectively noted to be primarily influenced by sound from the extraction system, distant road traffic, alarm type chirp sounds, on birdsong and air traffic.
- 4.4.6 The sound level meter was set to record the following metrics automatically over 15-minute periods:
- L_{eq}
 - L_{Max}
 - L_{90}
- 4.4.7 The frequency response of the meter was set to “A” and the time response was set to “Fast”.

4.5 Analysis

Background Sound Level

- 4.5.1 The background sound levels have been measured over a period of at least 48 hours to include the most sensitive period, when proposed operations could take place (i.e. when the restaurant is closed).
- 4.5.2 A modal, median and mean average analysis of the most background sound levels after 20:00 on the Sunday and between 11:00 and 23:00 on the Monday all indicate a level of 39dB $L_{A90,T}$ as the representative background sound level.

Residual Sound Level

- 4.5.3 The residual sound levels for the same periods have been logarithmically averaged and a value of 47dB $L_{Aeq,T}$ has been determined.

Table 4.4: Summary of Residual and Background Sound Levels

Parameter	Value
Background Sound Level	39dB $L_{A90,T}$
Residual Sound Level	47dB $L_{Aeq,T}$

*Values presented as whole numbers as is the convention within BS 4142

Ambient Sound Level

- 4.5.4 The installed plant when operational is subjectively the dominant sound source. The periods the extract system was operating are clearly identifiable and can be seen on Time Level History graph (Figure 04) where the elevated L_{A90} show similar values to the elevated L_{Aeq} values during the periods the unit operates. A modal analysis of the L_{A90} values when the source was in operation indicate a typical level of 54dB L_{A90} further supporting the assertion the installed plant is dominant.
- 4.5.5 A logarithmic average of the levels across both days indicates an ambient level of 56dB $L_{Aeq,T}$.

Specific Sound Level

- 4.5.6 The specific sound level has been initially determined by logarithmically subtracting the residual sound level of 47dB $L_{Aeq,T}$ from the ambient level of 56dB $L_{Aeq,T}$. This indicates a value of 55dB $L_{Aeq,T}$ as the specific level from all sources.
- 4.5.7 There is uncertainty when subtracting the residual from the ambient as fluctuating residual levels have the potential to influence the result, although this is less significant where the specific sound is the dominant source (and where the L_{A90} during operation and the L_{Aeq} values are similar). It is also noted the total specific sound level is within 2dB of the value put forward in the third-party report.
- 4.5.8 The specific sound level has also been calculated at the nearest receiver from source measurements made at site to further reduce uncertainty in the assessment. The calculations convert the measured sound pressure levels to sound power levels based on the measurement surface area of the air handling units and the extraction system and then onward to the receiver location (assuming point source propagation over hard ground) as detailed below in the table below.

Table 4.5 Calculation of Specific Sound from Measurements

Unit	Measured Level L_p dB(A)	Measurement Surface Area	Sound Power Level L_w dB(A)	Distance to Receiver	Receiver Level dB(A)
SRC35ZSP	48	22.2	61.5	7.5	36.0
FDC100VNA	60	28.2	74.5	5.5	47.7
FDC100VNA	60	28.2	74.5	6.2	46.1
Extract Fan	57	22.5	70.5	6.8	45.9
Total	54.9				

- 4.5.9 The calculations derived from source measurements indicate a specific sound level of 55dB $L_{Aeq,T}$ which is consistent with the observations made in Section 4.5.6 above and is within 2dB of the total specific sound level calculated in the 3rd party report.

Acoustic Character

- 4.5.10 BS 4142 allows corrections to be applied to the specific sound level to account for acoustic character that may increase the level subjectively perceived over and above that given by a simple numerical comparison.
- 4.5.11 Impulsive sound characteristics are not expected to be ordinarily present within the specific sound except in the case of malfunction. Tonal components were also not considered present within the specific sound and this was confirmed using the reference method from Annex D of BS 4142.
- 4.5.12 The sources operate continuously, and no correction is applicable for intermittency.
- 4.5.13 The specific sound features characteristics that are neither tonal nor impulsive, nor intermittent, but are readily distinctive against the residual acoustic environment, and a rating correction penalty of 3 dB is applicable.

5. ASSESSMENT

5.1 Assessment

5.1.1 A summary of the assessment is set out in the table below:

Table 5.1 Assessment

Results	Value	Relevant Clause	Commentary
Residual sound level	47 dB $L_{Aeq,1hr}$	7.3.2 8.1.2	Determined when the source was not present
Specific sound level	55 dB $L_{Aeq,1hr}$	7.3.3 7.3.4 7.3.5	Specific level calculated at receiver
Acoustic feature correction	+3 dB	9.2	+6dB for tonality +3dB for intermittency
Rating level	58 dB $L_{Ar,Tr}$	9.1 9.2	Specific sound level plus the Acoustic feature correction value
Background sound level	39 dB $L_{A90,1 hr}$	8	Determined at an alternative location together with the residual sound level.
Excess of rating level over background sound level	+19 dB	11	Background sound level subtracted from the Rating sound level
Assessment indication	Significant Adverse Impact	11	See Section 2.3 above and Section 5.2 below.
Uncertainty		10	The excess of the rating level over the background sound level is very large and in this instance the uncertainty of the measurement does not have any significance to the outcome of the assessment.

5.2 Context

5.2.1 The initial assessment indicates a significant adverse impact. BS4142:2014 requires that the conclusions of the assessment should take the context in which the sound occurs into account. BS4142 contains multiple instances of the term context which include: an understanding of the situation to be rated and assessed, the margin by which a sound exceeds the background sound level, its absolute level, time of day, and change in the acoustic environment, as well as local attitudes to the source of sound and the character of the neighbourhood.

5.2.2 The main contextual considerations are as follows:

- The initial assessment of the impact has been obtained by subtracting the background sound level from the rating level.
- Increased glazing i.e. windows that resemble insulating glass units (with one or more layer of glass) were not present at each of the closest and potentially most sensitive facades.
- Alternative ventilation is not present at all dwellings.
- Mechanical ventilation/air conditioning was not observed to be present at the residential premises, it is unknown if any mechanical ventilation/air conditioning or other form of alternative ventilation is present and none has been assumed.
- Multiple rooms may rely on openable windows for rapid ventilation.
- The properties are in use as residential dwellings and considered to be 'sensitive'.
- The presence of a comparatively low residual sound level (8dB below the specific sound level) indicates masking is not expected to occur.
- Similar sound sources were not observed present in the area.
- The initial assessment indicates a significant adverse impact.
- The specific sound level of 55dB $L_{Aeq,1hr}$ is 8dB above the residual level of 47dB $L_{Aeq,T}$ but is above the background level of 39dB $L_{A90,T}$ by 16dB.

5.2.3 It is concluded that the initial estimate of the impact does not need to be modified due to context and all pertinent factors have been taken into consideration.

5.3 Potential Impact of Uncertainty

5.3.1 BS 4142 requires that the potential impact of uncertainty⁶ upon the assessment be reported. The following steps have been taken to minimise uncertainty affecting the measurement values:

⁶ Uncertainty in the context of BS 4142 does not provide an indication of error but is a recognition of variable factors on the assessment.

- Class 1 Instrumentation was used for all measurements and a field calibration check was performed both before and after each measurement survey using a Reference Sound Calibrator that has been calibrated to UKAS standards within the last year.
- An outdoor microphone protection system was used to reduce sound attributable to wind at the microphone. Site measurements were also scheduled for a period when wind speeds were not expected to be high and this was confirmed by on site measurements both at the start and end of the survey.
- The measurements were undertaken across a range of times.
- Corrections for acoustic character were applied based on both the subjective and the objective methods from BS 4142.
- Best practice as indicated in the ANC Guidelines [4] has been followed when undertaking the measurements.
- A series of separate source term measurements were made at a distance of 1m from the units while these unit were operating.
- The field work for this assessment was undertaken by the author of this report who holds acoustic qualifications relevant to the application of the Standard and is experienced in undertaking work of this nature.

5.3.2 The following steps were taken to minimise uncertainty affecting the calculation values:

- Calculations for the specific sound level were based on measurement data and a simple calculation approach given the minimal separation distances.
- The assessment calculations have adopted a simplistic approach following the prescribed method in BS 4142 and are presented in Section 5 of this report.
- Values incorporated into the assessment method have been rounded to the nearest whole number of decibels with the value of 0.5 being rounded up.

5.3.3 It is considered that all reasonable steps to reduce uncertainty have been taken and while uncertainty maybe present, the level of uncertainty in the result is low.

5.4 Internal levels

5.4.1 An open window provides approximately 13dB of façade attenuation, and the external level of 55dB(A) would correspond to an internal level of 42dB(A). This is 7dB above the levels put forward by the WHO Guidelines [4] for interference with speech and moderate annoyance during the day and with acoustically distinguishing characteristics may not be acceptable for habitable rooms.

6. CONCLUSIONS

6.1 Summary of Conclusions

- 6.1.1 The results of the assessment indicate that continued operation of the units in the current format will result in a significant adverse impact when assessed using BS 4142.
- 6.1.2 The results of the measurements combined with calculations indicate the current level of mitigation is ineffective.
- 6.1.3 The results of the assessment indicate that the internal level will be above the guideline limits for the onset of interference with speech and moderate annoyance put forward by the WHO Organisation.
- 6.1.4 With reference to the 3rd party report the applicant now has evidence from two separate consultants who have independently come to the same conclusion: i.e. that the externally mounted plant generates a significant adverse impact and mitigation measures will be necessary.

6.2 Mitigation

- 6.2.1 Based on the measurements and calculations it is considered the current level of mitigation is ineffective and appropriate treatment should be applied to the relevant sources (arranged by order of magnitude) to reduce the levels generated as detailed in the table below:

Table 6.1 Mitigation Requirements:

Unit	Currently Calculated Level at Receiver	Mitigation Requirement	Mitigated Level at Receiver
FDC100VNA Twin Fan Unit	51.7	-16	35.7
FDC100VNA Twin Fan Unit	50.7	-16	34.7
Extract System Fan	45.9	-15	30.9
SRC35ZSP Single Fan Unit	36.0	-18	18.0
Total	39.0dB(A)		

- 6.2.2 The single fan unit will need to be reduced by at least 18dB. This can be achieved by installing a louvred system or combining a louvred system with relocating the unit further from habitable rooms.
- 6.2.3 Mitigation is most effective when applied to the loudest sources first. It is recommended the un-certified enclosure system currently around the twin fans be removed and replaced with a purpose built and certified acoustic enclosure capable of reducing the level of sound generated from these units by at least 16dB.
- 6.2.4 It is recommended a silencing system be applied to the extraction system to reduce the overall level by at least 15dB, in addition it is recommended a silencer be fitted to the cowl/exhaust point to prevent further sound transmission. Ideally the fan part of the system would be relocated inside the building possibly in combination with a compatible in-duct silencing system. However, it is unclear if this approach is

reasonably practicable having regard to: time, physical space restrictions and cost.

- 6.2.5 Mitigation requirements should be applied following consultation with the local planning authority (wherever possible) and maybe identified as part of the pre-application consultation stage. Caution is also advised when mitigating and minimising the adverse impact at one noise sensitive receiver location, that a significant adverse impact is not inadvertently created at another.

Mitigation Options

- 6.2.6 Options for sound control include:

- Removing and replacing the units so the total aggregate level reduces by at least 16dB so that the background sound level is not exceeded. A specific sound level that does not exceed a background sound level of 39dB_{LA90} is unlikely to be readily perceptible against a residual sound level of 47dB_{LAeq,T}.
- Relocating individual units - this may require further assessment once the scheme design has been finalised and may be subject to agreement from the local planning authority.
- Providing an acoustically certified silencing system (fan jacket) as proposed in the 3rd Party report in tandem with treating the other sound sources. The system will need to be capable of reducing the level from the extract by 15dB with the performance value to be checked and confirmed by the supplier prior to installation. An example product data sheet is attached in Appendix D. Where a fan jacket is not appropriate for maintenance or compatibility reasons any system of silencing must be agreed in advance with the system installer/supplier to ensure compatibility.
- Enclosing the FDC100VNA Twin Fan air handling units/internal components (i.e. increasing the insertion loss for the different items of plant by at least 16dB as outlined above) with the performance value to be checked and confirmed by the supplier prior to installation. This approach was also proposed in the 3rd Party report. Any enclosure will need to be certified and an example of an acoustic enclosure is presented in Appendix D. Manufacturers who provide acoustic enclosure solutions include⁷:
 - Classic Acoustics Ltd (classicacoustics.co.uk)
 - Environ Technologies Ltd (environ.co.uk)
 - Allaway Acoustics (allawayacoustics.co.uk).
- Providing an acoustically certified louvre system as proposed in the 3rd Party report in tandem with treating the other sound sources and possibly relocating the unit, so as to ultimately reduce the level of sound from the SRC35ZSP Single Fan Unit by at least 18dB with the performance value to be checked and confirmed by the supplier prior to installation. An example louvre system is attached in Appendix D and companies who supply such systems include:
 - Wakefield Acoustics (wakefieldacoustics.co.uk)
 - Environ Technologies Ltd (environ.co.uk)
 - Caice (caice.co.uk)

⁷ Able Acoustics Ltd makes no representations or guarantees in respect of 3rd party products or workmanship.

6.3 Statement of Competence

- 6.3.1 BS 4142:2014 requires a statement of the relevant qualifications, competency, professional memberships and experience directly relevant to the application of the standard of all those persons contributing to the assessment to be reported.
- 6.3.2 The assessment and field work were undertaken by Edward Crofton-Martin MSc, IEng⁸, MIOA⁹ MCIEH¹⁰. The author has 20 years of responsible experience in acoustics and his competence includes an MSc with distinction in Environmental and Architectural Acoustics, the Institute of Acoustics (IOA) Diploma in Acoustics and Noise Control, the IOA Certificate of Competence in Environmental Noise Measurement. The author is also an accredited expert witness (Practising Associate of the Academy of Experts) in the field of Acoustics and has prepared reports and given oral evidence for legal proceedings including in the High Court.
- 6.3.3 Beyond business he is a tutor and examiner for the IOA Diploma course and a doctoral researcher at London South Bank University in the field of human perception of acoustic stimuli.

⁸ Incorporated Engineer registered with the Engineering Council

⁹ Corporate Member of the Institute of Acoustics

¹⁰ Member of the Chartered Institute of Environmental Health



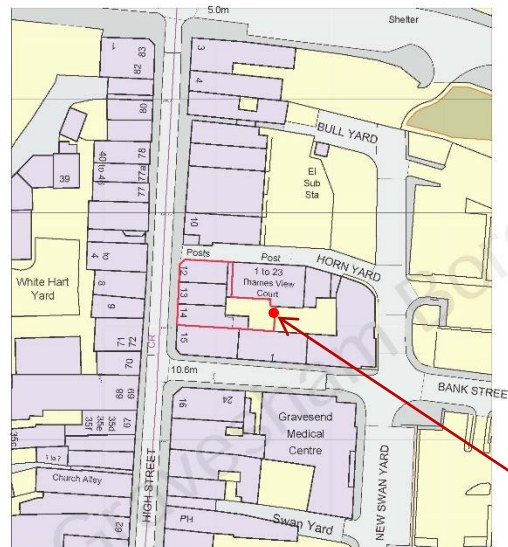
7. REFERENCES

1. British Standards Institution. British Standard 7445: Description and Measurement of Environmental Noise, Part 1. Guide to Quantities and Procedures, 1991.
2. The Planning Inspectorate, Appeal Decision, Appeal Ref: APP/K2230/W/22/3297812, 02nd December 2022.
3. British Standards Institution. British Standard 4142: Methods for rating and assessing industrial and commercial sound, 2014 +A1:2019.
4. The Association of Noise Consultants. ANC Guidelines, ANC Green Book: Environmental Sound Measurement Guide, 2nd Edition. 2021.
5. World Health Organisation. Guidelines for Community Noise. 2000.



FIGURES





Block Plan
1:500



SCALE BAR 1:500



Location Plan
1:1250



SCALE BAR 1:1250

Approximate Monitoring Location

rev. D Tied line corrected 09.03.19
rev. C Tied line extended to unit 14 14.12.18
rev. B Blue line removed 21.11.18
rev. A Red line Amended 28.06.18

Ms. Julia Santomauro

12 - 14 High Street,
Gravesend, Kent

Site/Location Plan

john finch partnership

chartered architects & town planning consultants

88 Inverfield Road
Chelmsford CM1 1ES
01246 354310/260780
admin@johnfinchpartnership.co.uk

www.johnfinchpartnership.co.uk

3358:01 D

Not To Scale Resized From Original Image

Project	No.	Drawing	No.	File	Date
12-14 High Street, Gravesend	P1547	Site Location	Figure 01	P1547/Figures.ppt	02/10/2023



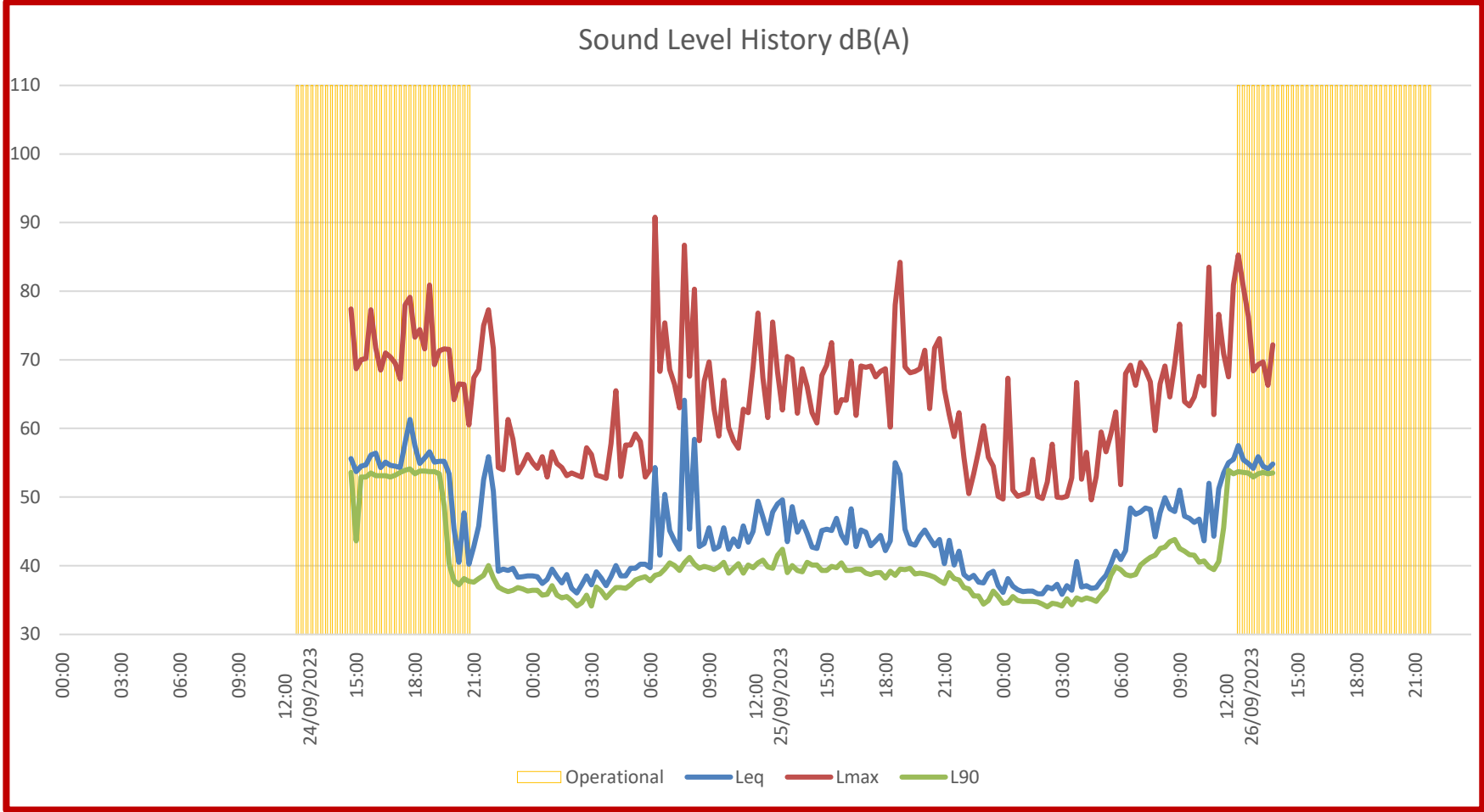
Not To Scale Resized From Original Image

Project	No.	Drawing	No.	File	Date
12-14 High Street, Gravesend	P1547	Extract System	Figure 02	P1547/Figures.ppt	02/10/2023



Not To Scale Resized From Original Image

Project	No.	Drawing	No.	File	Date
12-14 High Street, Gravesend	P1547	Enclosed Twin Air Handling Units	Figure 03	P1547/Figures.ppt	02/10/2023



Not To Scale Resized From Original Image

Project	No.	Drawing	No.	File	Date
12-14 High Street, Gravesend	P1547	Time Level History	Figure 04	P1547/Figures.ppt	02/10/2023

APPENDIX A
Calibration Certificates





CERTIFICATE OF CONFORMANCE

Date of Issue 06 October 2021
Customer Able Acoustics
Certificate Number CONF102101

	Manufacturer	Type	Serial Number
Sound Level Meter	Rion	NL-52	00710388
Preamplifier	Rion	NH-25	10931
Microphone	Rion	UC-59	19664

This is to certify that the instrument was tested and calibrated at the Manufacturer's factory according to their specification and that the product satisfied all the relevant requirements of the following Standards:

IEC 61672-1:2013 Class 1.

The instrument also received a functional check by ANV Measurement Systems prior to despatch in the UK, in accordance with our standard procedures.

Signed.....
B. Bogdan

Position. Calibration Technician Date. 06 October 2021

BEAUFORT COURT, 17 ROEBUCK WAY, MILTON KEYNES, MK5 8HL

☎ 01908 642846 📠 01908 642814

✉ info@noise-and-vibration.co.uk 🌐 www.noise-and-vibration.co.uk

ACOUSTICS NOISE AND VIBRATION LIMITED. REGISTERED IN ENGLAND NO. 3549028. REGISTERED OFFICE AS ABOVE.



CERTIFICATE OF CALIBRATION

Date of Issue: 01 June 2022

Certificate Number: TCRT22/1338

Issued by:
ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes MK5 8HL
Telephone 01908 642846 Fax 01908 642814
E-Mail: info@noise-and-vibration.co.uk
Web: www.noise-and-vibration.co.uk

Page 1 of 2 Pages
Approved Signatory

K. Mistry

A blue ink signature of K. Mistry, written in a cursive style.

Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Customer
Able Acoustics Ltd
Unit 20
Connect 10 Business Park
Ashford
TN24 0FE

Order No. P1000
Description Sound Level Meter / Pre-amp / Microphone / Associated Calibrator
Identification

Manufacturer	Instrument	Type	Serial No. / Version
Rion	Sound Level Meter	NL-52	00843175
Rion	Firmware		2.0
Rion	Pre Amplifier	NH-25	31989
Rion	Microphone	UC-59	06717
Rion	Calibrator	NC-74	34536109
	Calibrator adaptor type if applicable		NC-74-002

Performance Class 1

Test Procedure TP 2.SLM 61672-3 TPS-49

Procedures from IEC 61672-3:2006 were used to perform the periodic tests.

Type Approved to IEC 61672-1:2002 YES **Approval Number** 21.21 / 13.02

If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2003

Date Received 27 May 2022

ANV Job No. TRAC22/05189

Date Calibrated 01 June 2022

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2003, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2002.

Previous Certificate	Dated	Certificate No.	Laboratory
	29 May 2020	TCRT20/1254	ANV Measurement Systems

This certificate provides traceability of measurement to recognised national standards, and to units of measurement realised at the National Physical Laboratory or other recognised national standards laboratories. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.



CERTIFICATE OF CALIBRATION



0653

Date of Issue: 09 August 2023

Certificate Number: UCRT23/2056

Calibrated at & Certificate issued by:

ANV Measurement Systems

Beaufort Court

17 Roebuck Way

Milton Keynes MK5 8HL

Telephone 01908 642846 Fax 01908 642814

E-Mail: info@noise-and-vibration.co.uk

Web: www.noise-and-vibration.co.uk

Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

Page 1 of 2 Pages
Approved Signatory

K. Mistry

Customer Able Acoustics
Unit 20 Connect 10
Foster Road
Ashford
Kent
TN24 0FE

Order No. P1000

Test Procedure Procedure TP 1 Calibration of Sound Calibrators

Description Acoustic Calibrator

Identification	Manufacturer	Instrument	Model	Serial No.
	Rion	Calibrator	NC-74	34936366

The calibrator has been tested as specified in Annex B of IEC 60942:2003. As public evidence was available from a testing organisation (PTB) responsible for approving the results of pattern evaluation tests, to demonstrate that the model of sound calibrator fully conformed to the requirements for pattern evaluation described in Annex A of IEC 60942:2003, the sound calibrator tested is considered to conform to all the class 1 requirements of IEC 60942:2003.

ANV Job No. UKAS23/08550

Date Received 08 August 2023

Date Calibrated 09 August 2023

Previous Certificate	Dated	29 July 2021
	Certificate No.	UCRT21/1928
	Laboratory	0653

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

Appendix B

Unattended Measurements

Appendix B: Unattended Measurement Results

Project Number: P1547
Client: Mr V. Santomauro
Site Location: 12-14 High Street, Gravesend

Instrumentation	Serial No.
Rion NL-52 Sound Level Meter	00710388
Rion NH-25 Pre-amp	10931
Rion UC-59 Microphone	19664
Rion type NC-74 Calibrator	2263404

Calibration prior to survey:	94.0 dB (re 94.0)
Calibration after survey:	94.0 dB (re 94.0)

Start Time	L _{Aeq}	L _{AMax}	L _{A90}	1/3 Octave Centre Frequency Band Hz																											
				25 Hz	31.5 Hz	40 Hz	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz	1 kHz	1.25 kHz	1.6 kHz	2 kHz	2.5 kHz	3.15 kHz	4 kHz	5 kHz	6.3 kHz	8 kHz	10 kHz	
24/09/2023 15:33	55	70	53	49	52	46	47	45	45	49	48	55	45	47	50	46	46	47	45	44	45	43	42	41	41	38	35	34	33	31	
24/09/2023 15:48	56	77	54	48	50	53	49	46	48	51	49	55	46	47	50	46	47	48	46	45	46	44	43	42	43	40	38	44	37	35	
24/09/2023 16:03	56	72	53	48	49	53	59	47	50	51	49	55	47	48	51	48	50	50	48	46	45	44	43	43	42	39	36	35	35	33	
24/09/2023 16:18	54	69	53	48	52	53	52	45	49	50	48	55	45	46	49	44	44	46	45	44	46	44	42	41	40	35	33	32	32	29	
24/09/2023 16:33	55	71	53	49	51	51	49	46	48	50	48	55	45	46	50	46	47	48	47	45	47	44	42	41	41	36	34	32	32	30	
24/09/2023 16:48	55	70	53	50	50	52	48	45	47	49	47	55	45	46	50	46	46	47	46	44	45	43	42	41	41	38	35	35	33	31	
24/09/2023 17:03	55	70	53	47	47	49	46	44	47	50	51	55	45	46	50	45	45	48	45	44	45	43	42	41	41	36	33	30	30	27	
24/09/2023 17:18	54	67	54	60	51	49	48	44	48	49	48	55	46	46	50	43	44	48	44	42	47	42	41	41	39	34	31	28	28	27	
24/09/2023 17:33	58	78	54	58	52	49	50	46	46	51	49	56	48	49	52	49	50	52	50	48	49	46	43	42	42	38	36	35	34	32	
24/09/2023 17:48	61	79	54	46	51	50	47	43	43	50	49	56	49	51	53	52	55	57	53	53	52	50	46	44	43	40	35	33	32	30	
24/09/2023 18:03	58	73	53	47	52	51	48	44	45	50	48	55	46	48	52	49	49	52	49	47	48	46	43	42	42	39	37	35	35	31	
24/09/2023 18:18	55	74	54	49	52	52	48	45	44	49	48	55	45	47	51	46	45	50	45	43	45	43	41	42	40	36	34	33	32	30	
24/09/2023 18:33	56	72	54	45	51	51	47	45	44	49	47	55	45	47	51	46	46	50	46	44	46	44	42	43	41	39	38	36	35	35	
24/09/2023 18:48	57	81	54	48	58	51	47	45	44	49	47	55	46	47	52	49	48	51	48	47	46	44	44	44	41	37	35	33	32	29	
24/09/2023 19:03	55	69	54	44	51	48	46	44	48	49	48	55	45	47	52	46	46	50	46	45	43	42	41	43	41	36	34	32	30	28	
24/09/2023 19:18	55	71	53	42	50	45	45	43	45	50	48	55	45	47	52	46	46	48	47	46	43	43	41	42	42	38	36	34	33	31	
24/09/2023 19:33	55	72	49	43	48	46	48	45	41	48	46	53	44	46	52	46	47	48	47	45	44	43	41	41	41	37	35	33	32	30	
24/09/2023 19:48	53	72	40	47	50	47	47	43	41	44	41	42	43	44	46	46	47	48	46	43	42	41	40	38	37	34	33	31	28	26	
24/09/2023 20:03	45	64	38	36	43	44	44	41	47	42	43	40	40	39	40	39	39	38	38	36	35	33	29	27	29	20	18	16	15	14	
24/09/2023 20:18	41	67	37	37	40	46	44	40	39	40	38	37	36	34	33	31	32	32	33	31	31	28	25	25	29	21	19	18	16	15	
24/09/2023 20:33	48	66	38	39	44	53	45	43	44	45	44	45	43	43	43	43	42	41	39	38	36	34	33	30	31	26	22	20	18	17	
24/09/2023 20:48	40	61	38	35	39	40	44	41	39	40	38	38	37	35	35	32	31	31	32	31	28	27	25	25	30	21	18	17	16	15	
24/09/2023 21:03	43	67	38	37	41	42	45	40	40	40	42	46	40	37	38	35	36	33	32	32	30	28	27	27	32	27	28	24	20	21	
24/09/2023 21:18	46	69	38	40	41	42	44	40	40	42	41	41	41	41	41	40	40	39	37	35	33	31	29	29	32	28	29	25	22	22	
24/09/2023 21:33	53	75	39	45	43	46	47	40	39	40	39	42	41	41	41	43	47	48	46	44	42	40	37	35	35	30	26	24	23	22	
24/09/2023 21:48	56	77	40	37	40	42	44	40	39	42	41	42	45	47	47	49	50	51	48	46	46	45	42	39	38	35	32	32	29	27	
24/09/2023 22:03	51	72	38	40	44	44	45	43	42	43	44	43	42	42	43	44	46	46	43	40	39	37	35	34	35	32	31	30	28	26	
24/09/2023 22:18	39	54	37	36	39	41	43	40	45	40	41	39	37	36	35	31	30	29	30	29	26	25	23	23	30	18	16	16	15	16	
24/09/2023 22:33	40	54	37	38	41	41	44	41	42	42	40	40	39	37	36	33	31	29	31	28	25	24	22	22	29	16	13	14	13	13	
24/09/2023 22:48	39	61	36	37	39	41	43	40	40	39	37	37	36	34	34	30	29	30	33	31	27	24	23	23	29	17	14	15	14	15	
24/09/2023 23:03	40	58	36	41	39	40	46	39	38	39	39	41	37	36	36	31	32	31	31	29	26	25	23	23	29	18	15	16	15	14	
24/09/2023 23:18	38	54	37	37	38	41	44	39	39	40	38	37	37	35	34	30	29	29	30	28	25	24	23	22	29	16	13	14	13	13	
24/09/2023 23:33	38	55	37	34	37	40	42	40	42	40	39	38	37	34	34	30	29	29	30	28	25	24	22	22	29	16	14	14	14	13	
24/09/2023 23:48	39	56	36	35	37	41	43	40	43	40	39	38	37	35	34	30	30	29	30	28	25	24	23	22	29	17	14	14	13	13	

Start Time	L_{Aeq}	L_{Amax}	L_{A90}	1/3 Octave Centre Frequency Band Hz																										
				25 Hz	31.5 Hz	40 Hz	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz	1 kHz	1.25 kHz	1.6 kHz	2 kHz	2.5 kHz	3.15 kHz	4 kHz	5 kHz	6.3 kHz	8 kHz	10 kHz
25/09/2023 00:03	39	55	36	34	37	40	42	40	41	41	39	40	39	35	34	29	29	28	30	27	24	24	23	23	30	17	14	14	13	13
25/09/2023 00:18	38	54	36	33	37	40	42	39	41	39	38	38	37	35	34	29	29	29	30	28	25	24	23	22	29	17	14	14	13	13
25/09/2023 00:33	37	56	36	32	36	39	44	39	37	38	36	37	36	33	33	29	28	28	30	27	23	22	21	22	29	16	13	14	13	13
25/09/2023 00:48	38	53	36	33	36	40	47	39	38	39	37	38	38	35	33	29	29	28	29	26	24	23	22	22	29	17	14	14	13	13
25/09/2023 01:03	40	57	37	35	37	42	52	40	39	40	39	40	39	37	35	31	30	30	31	28	26	25	24	23	30	18	16	15	14	13
25/09/2023 01:18	38	55	36	35	37	41	54	41	42	40	40	39	37	35	33	29	29	28	29	27	24	24	22	22	29	17	14	14	13	13
25/09/2023 01:33	38	54	35	33	36	40	49	39	37	39	37	38	36	34	32	28	28	27	29	26	23	23	21	22	29	16	14	14	13	13
25/09/2023 01:48	39	53	36	36	39	46	63	45	39	46	39	40	36	34	32	28	27	26	29	25	22	23	22	22	29	16	13	14	13	13
25/09/2023 02:03	37	54	35	31	35	38	46	36	35	37	34	35	34	33	32	27	26	26	29	25	22	23	22	22	29	16	13	13	13	13
25/09/2023 02:18	36	53	34	29	34	36	40	36	34	37	34	35	34	32	31	26	25	25	28	24	21	22	21	21	29	15	13	13	13	13
25/09/2023 02:33	37	53	35	33	36	37	40	37	39	37	36	36	35	34	32	28	27	27	29	26	23	23	22	22	29	18	16	17	15	16
25/09/2023 02:48	39	57	36	34	38	41	41	40	45	39	39	39	39	36	34	30	29	28	30	27	25	24	23	22	29	18	15	15	14	14
25/09/2023 03:03	37	56	34	32	36	38	41	39	36	38	37	37	36	35	33	29	28	27	29	25	23	23	21	21	29	17	15	15	14	14
25/09/2023 03:18	39	53	37	35	38	42	42	40	38	40	40	40	39	37	35	31	30	29	31	27	25	25	23	23	29	18	16	15	14	14
25/09/2023 03:33	38	53	36	33	37	41	42	41	42	39	40	39	37	35	34	29	28	28	29	26	24	23	23	23	29	16	14	14	13	13
25/09/2023 03:48	37	53	35	33	37	39	41	40	36	38	37	37	36	34	32	28	27	27	29	25	23	23	22	22	29	16	13	14	13	13
25/09/2023 04:03	38	58	36	38	39	41	43	40	38	38	38	38	37	35	33	30	29	29	29	27	25	25	23	24	29	19	17	17	16	15
25/09/2023 04:18	40	66	37	36	38	39	43	40	38	39	38	38	37	36	35	31	30	29	30	29	30	28	27	26	29	20	18	16	14	13
25/09/2023 04:33	39	53	37	38	38	40	43	41	39	39	38	38	37	35	34	30	29	29	31	28	25	25	23	22	29	17	14	14	13	13
25/09/2023 04:48	39	58	37	34	38	40	43	41	40	40	39	38	37	35	34	30	29	29	31	28	24	24	22	23	29	17	15	16	14	14
25/09/2023 05:03	40	58	37	41	41	42	43	41	43	40	39	39	39	37	35	32	31	30	31	29	26	25	24	24	29	19	18	19	17	17
25/09/2023 05:18	40	59	38	37	42	43	44	41	41	41	39	39	38	37	35	32	30	30	31	29	26	26	24	24	29	19	17	17	16	15
25/09/2023 05:33	40	58	38	41	45	49	45	43	45	41	41	40	39	37	35	32	31	31	32	30	27	27	25	25	29	19	18	18	17	15
25/09/2023 05:48	40	53	38	42	44	47	45	42	41	43	42	41	41	37	35	32	31	31	32	30	27	26	23	22	29	17	15	15	14	15
25/09/2023 06:03	40	54	38	43	46	43	45	46	43	43	40	40	39	37	36	32	30	30	31	29	26	25	23	22	29	19	16	15	14	13
25/09/2023 06:18	54	91	39	42	45	44	50	48	48	56	58	56	53	51	52	42	41	44	44	42	42	41	37	36	37	43	39	41	36	28
25/09/2023 06:33	42	68	39	56	55	44	47	44	45	44	44	41	41	38	36	33	31	31	32	30	28	28	26	27	30	26	26	23	21	21
25/09/2023 06:48	50	75	40	43	47	44	47	45	45	45	40	40	40	38	37	34	33	34	36	40	44	41	44	39	32	27	30	32	29	27
25/09/2023 07:03	45	69	40	44	46	44	47	45	45	45	44	43	42	41	39	37	36	36	36	35	34	33	31	31	32	29	28	26	24	23
25/09/2023 07:18	44	66	40	44	46	45	48	46	47	44	42	41	41	40	38	36	34	33	33	33	31	30	29	28	30	25	27	34	26	19
25/09/2023 07:33	42	63	39	43	45	45	47	44	41	44	40	40	40	38	36	34	33	32	33	32	30	29	28	28	32	25	27	26	25	20
25/09/2023 07:48	64	87	40	57	61	59	59	62	65	64	62	62	62	62	60	58	58	56	55	54	52	51	49	48	46	44	42	40	38	35
25/09/2023 08:03	45	68	41	44	49	49	51	47	45	44	41	42	42	41	39	39	38	36	37	36	34	32	31	30	31	26	25	25	22	20
25/09/2023 08:18	58	80	40	50	57	61	57	60	58	52	51	50	50	51	49	49	49	49	51	48	47	49	47	43	43	41	42	42	41	40
25/09/2023 08:33	43	58	40	45	46	46	49	45	46	43	41	40	40	38	37	35	34	34	35	34	32	30	28	27	30	23	22	20	17	16
25/09/2023 08:48	43	67	40	45	46	45	49	45	46	45	42	41	40	39	38	35	34	34	34	33	31	30	29	29	31	27	27	23	21	20
25/09/2023 09:03	46	70	40	43	45	45	49	46	43	43	40	40	39	38	37	35	35	35	35	34	33	33	31	33	35	34	34	32	30	29
25/09/2023 09:18	42	63	39	41	45	48	48	45	45	43	43	40	40	38	37	34	33	33	34	33	31	30	28	27	31	24	23	20	19	15
25/09/2023 09:33	43	59	40	45	49	53	49	45	44	43	42	39	39	38	37	35	34	34	35	33	31	31	29	28	30	24	22	21	19	17
25/09/2023 09:48	46	67	41	46	48	46	51	46	45	44	41	41	40	39	39	39	37	39	37	36	34	33	32	31	32	28	26	24	21	19
25/09/2023 10:03	42	60	39	42	45	45	50	43	42	40	39	39	39	37	36	33	33	32	33	34	35	29	28	27	30	21	21	19	17	15
25/09/2023 10:18	44	58	40	46	48	51	49	47	49	44	42	43	41	41	40	37	36	35	36	34	31	30	29	26	30	22	20	19	17	15
25/09/2023 10:33	43	57	40	44	49	53	48	44	46	46	42	45	42	40	38	36	36	35	34	32	30	28	26	25	30	19	17	16	14	14
25/09/2023 10:48	46	63	39	43	45	47	49	43	46	44	45	45	40	44	40	41	41	38	37	35	33	31	29	27	30	21	18	17	15	14
25/09/2023 11:03	43	62	40	43	45	45	49	45	44	44	41	40	39	38	37	36	36	35	35	33	32	31	31	29	31	24	23	21	18	16
25/09/2023 11:18	45	69	40	43	48	52	49	46	49	44	41	43	40	40	39	37	36	36	36	35	33	33	31	30	33	30	30	27	23	21
25/09/2023 11:33	49	77	40	43	45	52	48	44	44	43	41	41	40	39	39	38	37	37	39	37	43	43	36	34	35	28	26	23	19	16
25/09/2023 11:48	47	67	41	42	44	51	46	43	42	42	40	40	40	41	41	39	39	40	40	38	37	36	34	31	32	25	23	21	16	14
25/09/2023 12:03	45	62	40	45	43	46	47	46	47	42	40	44	41	41	40	39	36	37	37	34	33	32	30	28	31	24	21	20	18	17
25/09/2023 12:18	48	76	40	43	46	45	47	44	45	44	46	44	42	43	43	42	42	40	40	38	37	35	33	30	32	28	27	24	21	20
2																														

Start Time	L_{Aeq}	L_{Amax}	L_{A90}	1/3 Octave Centre Frequency Band Hz																										
				25 Hz	31.5 Hz	40 Hz	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz	1 kHz	1.25 kHz	1.6 kHz	2 kHz	2.5 kHz	3.15 kHz	4 kHz	5 kHz	6.3 kHz	8 kHz	10 kHz
25/09/2023 13:18	49	70	40	44	44	45	49	43	41	42	41	41	39	39	39	37	39	43	44	42	33	32	33	30	31	26	24	21	20	19
25/09/2023 13:33	45	62	39	44	42	45	48	45	47	53	51	42	44	42	38	37	36	35	37	35	31	30	27	25	30	19	16	15	13	13
25/09/2023 13:48	46	69	39	47	48	48	47	42	44	43	43	42	40	40	39	38	37	36	37	38	39	37	31	28	31	26	24	22	21	21
25/09/2023 14:03	45	66	41	43	45	48	49	43	47	44	41	45	42	40	40	40	38	38	36	35	33	30	27	26	30	21	19	19	18	17
25/09/2023 14:18	43	62	40	43	44	52	49	43	44	43	40	41	39	38	37	37	36	36	34	33	31	29	27	25	30	20	18	19	16	15
25/09/2023 14:33	43	61	40	43	43	52	49	42	43	42	41	41	39	38	36	35	36	36	34	33	31	29	26	24	30	19	16	15	14	14
25/09/2023 14:48	45	68	39	44	44	50	48	44	46	46	43	41	40	40	37	36	37	38	35	34	37	33	31	29	32	27	27	23	21	20
25/09/2023 15:03	45	69	39	44	45	46	48	44	44	43	41	42	40	39	38	36	37	37	36	35	36	33	32	31	33	29	29	25	22	21
25/09/2023 15:18	45	73	40	41	44	47	48	42	45	42	43	43	41	40	40	39	38	37	36	35	33	32	30	30	31	28	25	23	22	20
25/09/2023 15:33	47	62	40	44	46	46	49	45	46	43	40	42	41	38	38	36	38	38	37	37	39	35	35	33	34	30	30	28	25	23
25/09/2023 15:48	45	64	40	42	49	45	49	43	42	42	42	42	41	40	40	38	38	38	36	35	32	31	29	27	30	22	20	18	15	14
25/09/2023 16:03	43	64	39	41	45	46	48	43	42	40	38	38	39	38	37	35	36	35	35	34	32	32	30	28	31	24	22	20	19	17
25/09/2023 16:18	48	70	39	43	49	52	47	43	43	44	42	42	43	44	46	44	42	41	40	39	37	34	30	27	30	21	19	19	16	16
25/09/2023 16:33	43	62	40	44	47	48	50	46	44	42	40	40	39	38	37	35	35	35	34	34	31	30	28	27	30	23	22	20	18	16
25/09/2023 16:48	45	69	40	45	49	48	51	45	43	41	40	41	39	39	38	36	36	36	35	34	34	33	32	32	35	33	33	28	26	26
25/09/2023 17:03	45	69	39	44	47	45	49	44	43	43	42	42	40	37	37	37	36	37	39	35	34	32	30	29	31	25	24	22	20	19
25/09/2023 17:18	43	69	39	43	49	47	49	44	45	46	48	44	41	38	37	35	35	33	32	31	30	29	27	28	31	26	27	22	20	19
25/09/2023 17:33	44	68	39	43	44	44	49	44	44	43	43	42	39	38	37	36	37	35	35	35	33	31	29	27	30	23	22	20	18	17
25/09/2023 17:48	44	68	39	42	46	47	50	44	42	41	38	38	39	38	37	35	37	36	36	35	34	34	31	29	31	24	26	21	19	17
25/09/2023 18:03	42	69	38	45	45	45	55	43	44	45	40	39	38	37	35	35	33	33	32	31	31	29	28	28	31	26	26	23	21	20
25/09/2023 18:18	44	60	39	57	53	49	63	46	46	46	43	41	40	38	36	33	32	34	37	34	32	32	30	27	30	20	18	18	17	15
25/09/2023 18:33	55	78	39	54	44	42	48	43	46	41	39	42	39	37	37	36	34	35	39	42	46	48	49	44	38	28	32	34	31	29
25/09/2023 18:48	53	84	40	45	47	47	49	46	45	43	46	48	44	44	44	45	45	45	44	45	45	42	40	39	38	37	36	33	31	29
25/09/2023 19:03	45	69	39	45	46	45	49	43	42	40	39	38	38	37	36	35	37	38	36	38	35	33	31	31	32	29	29	26	24	24
25/09/2023 19:18	43	68	40	44	46	45	48	46	47	45	43	42	41	37	37	34	35	34	35	32	32	30	28	29	31	27	27	24	22	20
25/09/2023 19:33	43	68	39	42	45	44	48	45	43	41	39	39	38	38	37	35	35	34	35	32	31	30	28	29	31	29	29	25	22	22
25/09/2023 19:48	44	69	39	38	41	42	45	40	39	40	37	38	38	37	36	34	35	35	36	34	33	32	31	31	33	30	32	28	24	24
25/09/2023 20:03	45	71	39	43	44	44	50	47	44	43	40	40	40	38	39	37	38	39	37	36	34	33	31	29	31	26	24	23	21	20
25/09/2023 20:18	44	63	39	38	41	41	43	40	40	40	38	38	38	37	36	33	33	37	38	37	33	33	29	27	29	20	17	15	14	14
25/09/2023 20:33	43	72	38	40	47	45	45	42	42	41	38	38	37	36	35	34	34	35	36	35	31	29	28	28	30	25	23	22	21	19
25/09/2023 20:48	44	73	38	44	41	44	46	41	40	40	38	37	38	39	36	34	34	34	39	36	30	29	29	27	30	23	22	21	20	19
25/09/2023 21:03	40	66	37	39	44	44	45	41	39	38	37	36	36	36	34	32	32	32	32	31	29	28	25	25	29	23	21	21	20	19
25/09/2023 21:18	44	62	39	40	45	41	44	41	40	39	38	39	40	38	36	35	37	38	35	35	33	31	28	27	30	24	23	21	20	18
25/09/2023 21:33	40	59	38	45	43	42	46	43	42	41	37	37	37	36	35	32	32	32	33	30	28	27	24	24	28	19	17	16	15	16
25/09/2023 21:48	42	62	38	50	44	45	50	48	45	43	41	39	39	37	35	32	33	34	34	34	31	31	26	26	29	19	17	16	15	15
25/09/2023 22:03	39	56	37	37	40	39	44	44	45	42	39	37	36	35	34	30	30	29	31	28	25	25	23	23	28	17	15	15	13	14
25/09/2023 22:18	38	51	37	35	41	41	43	42	40	41	36	37	36	35	34	30	29	29	31	28	25	24	22	22	28	16	13	14	13	13
25/09/2023 22:33	39	53	36	38	52	44	43	42	41	42	38	39	39	37	34	31	29	28	31	27	24	23	22	22	28	16	14	15	14	14
25/09/2023 22:48	38	57	36	38	41	41	43	40	40	39	35	35	35	34	33	29	28	28	31	27	24	23	23	23	28	17	16	15	14	14
25/09/2023 23:03	38	60	34	37	40	41	43	41	41	40	34	34	35	33	32	28	27	27	31	27	24	24	23	24	28	19	19	17	16	15
25/09/2023 23:18	39	56	35	39	48	54	48	41	47	44	42	39	37	35	34	31	30	29	30	27	24	24	22	22	27	17	16	16	15	15
25/09/2023 23:33	39	55	36	36	44	45	44	42	46	44	45	40	39	37	35	30	29	28	31	28	25	25	23	23	27	16	14	14	13	13
25/09/2023 23:48	37	50	36	33	37	41	43	40	39	40	37	36	35	34	32	28	27	27	30	26	23	23	22	22	27	15	13	13	12	13
26/09/2023 00:03	36	50	35	33	38	43	43	39	38	39	34	35	34	33	31	26	25	25	29	25	22	21	21	21	27	15	12	13	12	13
26/09/2023 00:18	38	67	35	33	37	40	41	40	42	41	36	35	35	33	31	27	26	26	30	26	24	24	25	25	29	25	26	20	18	18
26/09/2023 00:33	37	51	36	31	35	39	42	41	37	38	36	35	35	34	32	27	27	27	31	26	23	22	22	22	27	15	13	14	13	13
26/09/2023 00:48	37	50	35	33	37	40	42	40	38	40	35	36	34	33	32	27	26	26	30	25	22	21	21	22	27	15	12	13	12	13
26/09/2023 01:03	36	50	35	32	36	43	42	39	37	40	35	35	34	33	32	27	26	25	30	25	22	21	20	21	27	15	12	13	12	13
26/09/2023 01:18	36	51	35	33	36	39	41	40	37	38	35	35	34	33	31	26	25	24	31	25	22	21	20	21	27	15	12	13	12	13
26/09/2023 01:33	36	56	35	32	36	40	42	40	37	38	35	35	34	33	31	26	25	25	30	25	22	22	22	22	27	17	14	14	13</	

Start Time	L _{Aeq}	L _{AMax}	L _{A90}	1/3 Octave Centre Frequency Band Hz																										
				25 Hz	31.5 Hz	40 Hz	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz	1 kHz	1.25 kHz	1.6 kHz	2 kHz	2.5 kHz	3.15 kHz	4 kHz	5 kHz	6.3 kHz	8 kHz	10 kHz
26/09/2023 02:18	37	52	34	30	34	38	42	35	38	38	34	35	34	33	31	26	26	26	30	27	24	23	22	23	27	16	15	18	15	14
26/09/2023 02:33	37	58	35	33	38	41	41	36	36	39	33	34	34	33	31	26	25	26	31	25	23	22	23	27	17	15	15	15	14	
26/09/2023 02:48	37	50	34	43	50	43	44	38	39	43	36	39	36	34	32	28	27	26	32	24	21	21	20	21	27	15	12	13	12	13
26/09/2023 03:03	36	50	34	38	42	42	49	40	37	39	32	33	33	32	30	25	24	24	31	24	20	21	19	20	27	15	12	13	12	13
26/09/2023 03:18	37	50	35	44	53	46	49	43	42	44	38	37	35	33	31	27	27	26	31	25	22	22	21	21	27	15	13	13	12	13
26/09/2023 03:33	36	53	34	31	35	38	42	37	37	37	33	34	33	32	30	26	25	25	31	25	22	21	21	22	27	15	13	14	12	13
26/09/2023 03:48	41	67	35	38	44	48	63	46	43	48	43	42	38	35	34	33	29	31	33	27	25	25	23	24	28	19	18	17	15	15
26/09/2023 04:03	37	53	35	35	38	43	53	37	35	37	32	33	33	33	31	25	25	25	32	25	22	22	22	22	27	16	14	14	13	13
26/09/2023 04:18	37	57	35	34	36	38	39	36	35	36	32	34	34	33	32	27	27	27	31	26	22	23	22	23	28	17	15	15	14	14
26/09/2023 04:33	37	50	35	34	39	39	41	36	34	36	33	34	34	33	32	27	27	26	31	26	23	22	22	22	27	17	15	14	13	13
26/09/2023 04:48	37	53	35	36	37	38	40	37	35	38	34	35	34	33	31	26	26	25	32	26	23	22	22	22	27	17	15	17	15	15
26/09/2023 05:03	38	60	36	41	42	42	43	38	37	39	39	37	35	35	33	29	28	28	32	27	24	23	23	22	27	17	15	14	13	14
26/09/2023 05:18	39	57	37	38	42	43	43	40	40	40	37	38	37	35	34	30	29	29	32	28	25	24	23	23	27	18	16	15	14	14
26/09/2023 05:33	40	59	39	43	52	56	48	44	42	45	40	40	39	36	35	32	32	31	34	30	26	24	23	22	27	17	16	15	14	14
26/09/2023 05:48	42	62	40	45	53	56	49	45	44	45	41	42	41	39	37	34	33	32	35	31	28	27	27	27	29	25	23	22	20	19
26/09/2023 06:03	41	52	39	42	46	44	46	43	42	43	40	41	41	39	37	34	32	32	35	30	26	24	23	23	27	16	14	14	13	13
26/09/2023 06:18	42	68	39	56	45	44	49	45	42	43	41	40	40	38	36	34	35	34	34	30	29	28	28	28	30	27	27	23	20	19
26/09/2023 06:33	48	69	39	63	49	47	50	45	46	44	45	43	45	44	45	45	42	40	39	38	37	35	34	32	31	28	28	25	22	21
26/09/2023 06:48	48	66	39	43	45	46	48	45	43	44	43	42	42	41	41	40	39	40	41	41	37	32	30	28	29	21	19	18	16	15
26/09/2023 07:03	48	70	40	51	49	49	55	49	51	46	43	44	44	43	42	41	40	39	38	36	34	33	33	34	34	35	34	36	23	
26/09/2023 07:18	48	69	41	47	45	45	49	45	45	48	44	44	46	45	45	44	42	41	40	38	37	35	32	29	30	20	19	18	17	16
26/09/2023 07:33	48	67	41	41	44	46	48	46	48	51	48	45	46	45	44	43	42	41	40	38	36	34	31	28	30	22	21	20	18	17
26/09/2023 07:48	44	60	42	42	45	45	48	44	42	43	42	42	42	40	39	37	37	36	36	35	33	31	29	28	30	25	23	21	19	19
26/09/2023 08:03	48	67	43	45	49	48	50	45	44	43	43	43	45	44	43	42	41	41	40	37	36	35	32	30	32	28	27	26	21	19
26/09/2023 08:18	50	69	43	46	47	45	48	45	43	43	44	44	44	44	45	45	44	43	42	40	39	37	35	32	32	28	26	25	23	20
26/09/2023 08:33	48	65	44	43	46	45	48	44	43	44	44	45	45	43	42	42	42	42	40	37	36	36	34	31	32	28	27	27	22	20
26/09/2023 08:48	48	69	44	43	46	46	52	46	48	48	44	45	44	42	42	41	41	41	40	39	36	36	33	31	32	29	29	27	24	23
26/09/2023 09:03	51	75	43	43	50	51	50	47	45	46	46	44	45	46	46	46	44	43	43	41	39	38	35	35	37	35	36	34	32	30
26/09/2023 09:18	47	64	42	42	45	46	48	44	44	43	43	44	45	44	43	42	40	39	38	37	35	34	31	30	32	28	27	25	23	20
26/09/2023 09:33	47	63	42	42	45	45	47	43	43	42	43	43	43	42	42	43	40	39	39	37	35	33	31	28	31	26	25	24	21	18
26/09/2023 09:48	46	65	42	45	50	55	50	45	46	45	46	43	43	42	40	38	43	38	37	36	34	32	30	29	31	27	26	25	26	24
26/09/2023 10:03	47	68	41	45	47	46	48	45	44	43	42	42	42	42	41	40	39	37	37	35	34	34	35	35	34	32	33	29	29	23
26/09/2023 10:18	44	66	41	46	50	55	51	47	49	42	40	41	39	38	38	38	35	34	35	33	32	31	28	29	31	27	26	26	27	21
26/09/2023 10:33	52	84	40	52	49	53	49	46	46	43	44	43	42	42	42	44	43	45	43	43	43	41	39	37	37	36	34	31	30	27
26/09/2023 10:48	44	62	39	42	46	48	49	43	42	42	43	43	42	42	41	38	37	35	35	34	32	30	28	27	30	23	23	22	26	18
26/09/2023 11:03	51	77	41	45	51	49	48	48	45	44	44	45	45	45	44	44	46	45	42	39	39	39	37	36	35	34	34	32	30	26
26/09/2023 11:18	54	71	46	52	58	54	50	47	46	49	47	51	45	46	48	44	45	49	45	43	42	41	39	40	40	34	32	31	29	27
26/09/2023 11:33	55	68	54	51	53	52	50	46	45	50	46	52	45	46	49	47	47	51	47	44	44	42	41	41	41	35	32	31	30	27
26/09/2023 11:48	56	81	53	50	52	53	48	45	46	50	47	52	47	48	49	48	49	51	47	44	43	42	42	41	41	36	33	31	30	27
26/09/2023 12:03	58	85	54	51	53	54	49	47	47	55	56	54	51	50	51	50	49	52	48	45	46	44	45	45	45	42	40	37	34	30
26/09/2023 12:18	55	81	54	51	52	51	49	47	45	49	47	54	45	46	50	48	48	51	46	43	44	42	42	42	41	38	36	35	33	31
26/09/2023 12:33	55	76	54	51	50	56	48	45	49	49	47	54	45	47	49	47	47	50	45	43	45	44	42	41	40	35	32	30	29	26
26/09/2023 12:48	54	68	53	52	49	57	50	47	49	50	47	54	45	46	49	46	46	49	44	42	43	42	41	41	41	36	34	32	31	29
26/09/2023 13:03	56	69	53	52	50	57	49	46	48	50	48	54	46	47	50	48	49	51	47	45	46	43	42	42	41	37	34	32	31	28
26/09/2023 13:18	55	70	54	51	50	56	48	45	48	50	50	54	45	47	50	46	46	51	45	43	44	42	40	40	40	34	32	29	28	

Appendix C

Source Measurements



Appendix B: Unattended Measurement Results

Project Number:
Client:
Site Location:

P1547
Mr V. Santomauro
12-14 High Street, Gravesend

Instrumentation	Serial No.
Rion NL-52 Sound Level Meter	00843175
Rion NH-25 Pre-amp	31989
Rion UC-59 Microphone	06717
Rion type NC-74 Calibrator	34936366

Calibration prior to survey:	94.0 dB (re 94.0)
Calibration after survey:	94.0 dB (re 94.0)

Source	<i>L</i> _{Aeq}	25 Hz	31.5 Hz	40 Hz	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz	1 kHz	1.25 kHz	1.6 kHz	2 kHz	2.5 kHz	3.15 kHz	4 kHz	5 kHz	6.3 kHz	8 kHz	10 kHz
FDC100VNA Twin Fans at 1m	60	57	58	70	59	58	67	61	67	61	54	50	50	48	49	50	54	50	46	44	43	42	42	40	38	35	40	40
FDC100VNA Twin Fans at 1m	60	57	58	70	59	58	67	61	68	62	55	51	50	47	48	50	54	50	46	43	43	43	42	40	39	35	38	38
FDC100VNA Twin Fans at 1m	60	57	59	71	60	58	67	61	67	62	55	50	50	47	48	50	54	50	46	44	43	43	42	40	39	35	41	39
SRC35ZSP Fan at 1m	48	46	47	50	56	45	50	46	45	46	44	44	44	40	44	39	39	35	34	33	31	28	31	27	28	27	27	26
SRC35ZSP Fan at 1m	47	49	48	49	51	48	46	45	43	45	43	44	39	40	46	40	38	34	33	32	30	28	26	26	26	24	25	25
SRC35ZSP Fan at 1m	48	48	59	53	49	52	49	52	42	44	46	45	43	39	41	39	41	38	35	34	31	30	28	28	28	26	28	28
SRC35ZSP Fan at 1m	50	52	65	45	47	57	55	56	45	48	43	45	45	40	41	43	45	38	36	34	31	30	29	30	30	28	25	26
Extract at 1m	57	58	47	48	48	48	45	48	49	54	38	47	56	47	45	46	48	43	48	45	46	46	48	38	31	27	28	24
Extract at 1m	56	59	47	49	46	45	41	44	47	54	43	43	50	46	45	45	49	47	49	45	44	45	45	36	31	29	31	24
Extract at 1m	56	59	46	46	43	42	44	49	47	55	44	44	50	47	47	49	49	46	46	43	45	44	44	36	31	28	28	24
Extract at 1m	57	59	52	46	46	45	44	47	52	61	42	46	55	45	45	50	48	46	47	43	46	45	46	37	32	28	30	25
Extract at 1m	57	57	46	44	44	43	40	43	50	58	42	45	55	46	45	46	48	45	48	45	46	46	47	39	33	29	30	26

Appendix D
3rd Party Product Information

Acoustic Jackets

- *To reduce breakout noise from noisy plant and machinery, normally in contact with the surface noise is breaking-out off*
- *Simple wrap-around with Velcro flaps and fixing straps*

Isolated Systems Ltd acoustic jackets are manufactured from an inner and outer coated glass cloth completely enclosing a sound barrier mat with isolation layer behind to improve acoustic performance

Typical installed noise reductions

Standard acoustic performance:

Achieving a typical installed breakout noise reduction of up to 9dB with a 5 kg/m² barrier mat

High acoustic performance:

Achieving a typical installed breakout noise reduction of up to 15dB with a 10 kg/m² barrier mat

Acoustic Performance – Sound Transmission Losses

Please see separate laboratory sound transmission loss data sheets for 5 kg/m² & 10 kg/m² barrier mats



Isolated Systems Limited, Adams Close, Heanor Gate Industrial Park, Heanor, Derbyshire DE75 7SW

T +44 (0)1773 761 226 F +44 (0)1773 760 408 E sales@isolatedsystems.com

www.isolatedsystems.com

Registered in England Company No. 979107 VAT No. 1166424 83

JACKETS

Acoustic Fan Jackets



Acoustic Fan Jackets

ISL's Acoustic Fan jackets provides a flexible hard wearing wrap-around cover to reduce fan casing breakout noise from long or short cased axial fans in the HVAC, industrial and off-shore industries.

For indoor use the jackets are generally manufactured with an outer noise barrier material laminated to inner acoustic foam, terminal box cutout also included if required.

For outdoor use the jackets are generally manufactured with an outer sewn silicone coated glass fabric fully enclosing acoustic insulation with outer noise barrier material, terminal box cutout also included if required .

Fastening with Velcro flaps and additional fixing straps with 'D' rings if required.

The pre-shaped jackets are easy to install & remove, they reducing site installation working hours and costs over site installed acoustic insulation slabs with protection covers significantly.

Fire retardant or Class '0' fire rated construction available.

Acoustic performance, two options are available, either standard achieving a typical installed breakout noise reduction of up to 9dB, or high acoustic performance achieving a typical installed breakout noise reduction of up to 15dB.

Technical details; Full technical details are available upon request, please call or email.

**Environ Technologies Ltd**

Regus House, 1010 Cambourne Business Park
Cambourne, Cambridgeshire, UK, CB23 6DP
Tel: +44 (0)870 383 3344
Fax: +44 (0)1223 598001
www.environ.co.uk

environlite ELV1.1.25AC Acoustic Performance Data**Noise Measurement Information:**

Test: Environ Lite Acoustic Enclosure

Test Standard:

BS EN ISO 140-3 Acoustics - Measurement of Sound Insulation in Buildings and of Building Elements - Part 1:
Airborne Sound Insulation

Sound Level Measuring Equipment:

Norsonic 830 RTA Precision Sound Analyser Type 1
CEL 284/2 Acoustic Calibrator Type 1
JBL Loudspeaker driven by CEL Loudspeaker driven by 830 White Noise Source

Transmission Loss Data:

Transmission Loss — Environ ELV1.1.25AC Acoustic Enclosure							
Octave Frequency in Hertz (dB ref 2×10^{-5} Pascal's)							
63	125	250	500	1K	2K	4K	8K
14	16	23	30	37	39	38	39
Summary							
Transmission Loss Equates to an Overall Reduction of 26 dB(A)							

Support Information:

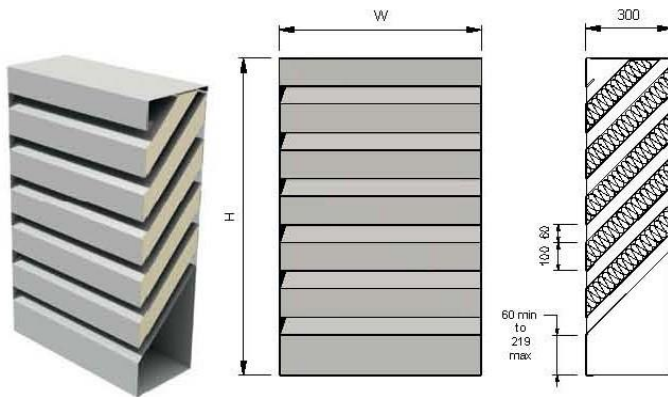
Monitoring was carried out using the BS3740 technique, insofar as measurements were taken in each quadrant and the results averaged. Internal Test Room: W 6m x D 16m x H 5m. Background noise in the semi-reverberant test room was such as not to interfere with the practical measurements

Environ acoustic enclosure designs are protected under patent

SH300 Acoustic Louvre Technical Data



Single Bank Acoustic Louvre, Higher Performance Profile, 300mm Deep



Typical weight 53kg/m²

Generally louvres above 50kg will be supplied in modules for assembly on site. Joining brackets and fixings will be provided for assembly.

Installation services, support steelwork, flashings, fixings to the structure and mastic will not be provided unless stated.

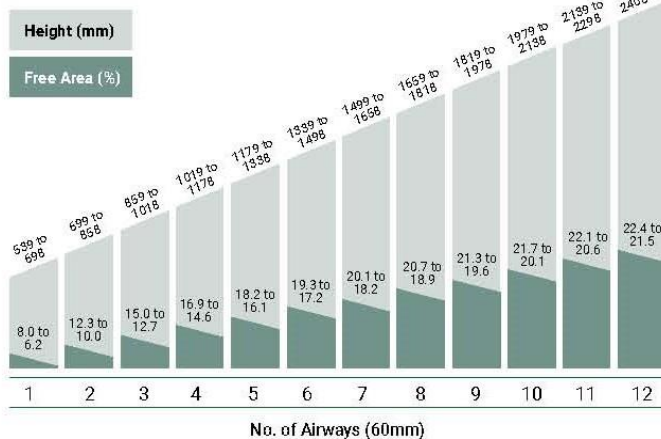
Refer to the Acoustic Louvre Schedule and Product Code Definitions for the size and specification of each Acoustic Louvre.

A minimum of 10mm clearance should be allowed between the structure and the Acoustic Louvre sizes shown.

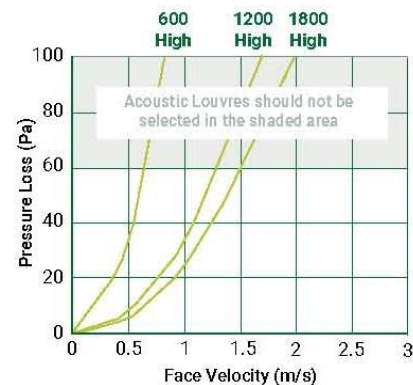
Performance

Acoustic Data	dB in each Octave Band Centre Frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k
Sound reduction index	7	7	10	17	29	30	27	21
Weighted sound reduction index (Rw)	21							
Static insertion loss	6	7	10	18	31	28	26	25
Regenerated sound power level at 1m/s face velocity	50	44	39	34	30	26	17	12
Regenerated sound power level at 2m/s face velocity	70	60	55	52	49	49	43	35

Free Area and Height range



Free area and pressure drop shown is based on a 1150mm wide single piece louvre fitted with bird mesh and will vary slightly for different widths and larger heights. Pressure losses for Class A rated louvres and/or Insect mesh are available upon request.



If you require further technical data please contact Caice: 0118 918 6470 | enquiries@caice.co.uk | caice.co.uk