

Able Acoustics

MR V. SANTOMAURO

12-14 HIGH STREET, GRAVESEND

ACOUSTIC ASSESSMENT

JULY 2025

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<i>P1547/03</i>	<i>July 2024</i>	<i>Position</i>	<i>Signature</i>
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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 contained the details of the mitigation measures.
- 1.1.3 Since the site visit in 2023 it was communicated that mitigation had been applied i.e. the fan units at ground level have been enclosed and this has been signed off by the Local Planning Authority and falls outside the scope of this instruction and that an attenuator and fan jackets have been fitted to the ducting of the extract system.
- 1.1.4 In April 2024 a repeat visit was made which determined mitigation was insufficient. Following those findings further work has been undertaken and Mr Santomauro has commissioned Able Acoustics Ltd to assess the impact of sound generated from the latest alterations.
- 1.1.5 The scope of this report is limited to sound from the extract unit.
- 1.1.6 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_{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.

iii) 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.

iv) 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.

v) 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 and 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".
- 2.3.2 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
- 2.3.3 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.
- 2.3.4 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."*
- 2.3.5 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.
- 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

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.

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 the table below:

Table 2.2 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 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 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 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.

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 7 days a week⁴ and the opening times are understood to be:

- Mondays to Thursdays 12:00-22:00hrs;
- Fridays to Saturdays 12:00-23:00hrs; and
- Sundays 12:00-20:00hrs.

- 3.2.2 To date no details have been provided for the extraction system, while the air handling units fall outside the scope of this report.

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 History

- 3.4.1 An assessment was carried out in February 2023 by a 3rd party whose contract has been determined.⁵ 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.

- 3.4.2 Since that time non-acoustically certified attempts were made to mitigate the level of sound generated and a further assessment was made in October 2023. That assessment concluded a similar outcome and recommended the following mitigation measures in Para 6.2.4

⁴ Details from <https://www.juliuscaesarrestaurant.co.uk/> accessed 03rd June 2025

⁵ This report does not provide any form of review of the 3rd party report other than to recognise its existence and findings.

"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."

3.4.3 Additional suggestions for sound control included:

- 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.*

3.4.4 Since October 2023 the blanket cover around the extract duct was removed and a jacket was supplied and installed by a third party. No data was provided to quantify the performance of the fan jacket, and it was unknown whether the performance value was checked and confirmed or if the system of silencing was agreed in advance with the system installer/supplier to ensure compatibility.

3.4.5 In April 2024 a repeat visit was made which determined mitigation was insufficient. The report dated 2024 found the following:

"6.2.1 Based on the measurements and calculations it is considered the current mitigation is ineffective and appropriate treatment should be applied to the relevant sources.

6.2.2 It is recommended an acoustically certified silencing system (fan jacket) be installed, as proposed in Section 6.2.4 and Section 6.2.6 bullet point 3 of the original report and also proposed in the 3rd party report. This should be done in tandem with treating the other sound sources. The system should 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. 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.

6.2.3 It is recommended a silencer be fitted to the cowl/exhaust point to prevent

further sound transmission as noted in Section 6.2.4 of the original report and in the 3rd party report.

6.2.4 *Ideally the fan part of the system would be relocated inside the building possibly in combination with a compatible in-duct silencing system, as noted in Section 6.2.4 of the original report. However, it is unclear if this approach is reasonably practicable having regard to: time, physical space restrictions and cost."*

- 3.4.6 It was observed the above points have not been addressed in their entirety as proposed by the 3rd party report and subsequently confirmed in our report (dated May 2024). The fan part of the system has not been relocated inside the building possibly in combination with a compatible in-duct silencing system, the acoustic jacket has been replaced with two fan jackets and further mitigation in the form of additional attenuation has been fitted as visible in Figure 02. The 3rd party report also proposed an ISL fan jacket that claimed an insertion loss of up to 15dB for a 10kg/m² barrier mat version. Fan jacket data for the unit(s) at site has been provided by the client and stated below:

Table 3.1 Manufacturer's Insertion Loss Data

Description	125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz
5kg/m ²	2	6	14	18	22	23
10kg/m ²	4	10	18	22	26	29

- 3.4.7 Images of the fan jackets were checked with ISL jacket who confirmed they supplied a single acoustic fan jacket and an attenuator. It is unclear what the second fan jacket is, or if this has been installed correctly.

"The attenuator was installed about 2 – 3 weeks ago; however, the scaffolding in place at the time would not allow my guys safe access to enable them to fit the jacket. We therefore agreed not to fit the jacket that we had provided, at this time, due to the scaffold issues. The guys did say that it would be easy enough to retro-fit our jacket from a ladder, once the scaffolding had been removed. Notwithstanding the above, based on comparing the photo you have sent with photos sent to me from the installation engineers, it appears that a jacket has been installed just below the attenuator. Without anything further to go on, it would stand to reason that this would be the jacket that we provided (unless they have sourced another one from elsewhere, which is unlikely given the amount of money they have spent to get the attenuator installed). However, we would need some more information to provide a definitive identification."

- 3.4.8 The circular silencer (attenuator) has been fitted below the cowl and the following insertion loss information has been relayed:

Table 3.2 Insertion Loss Data

63Hz	125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	8000Hz
8	10	20	24	17	11	9	11

- 3.4.9 The insertion loss of the silencer is lower than that required by the original 3rd party report (dated 24th February 2023) reproduced in the table below.

Table 3.3 Required Insertion Loss Values from 3rd Party Report

Source	125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz	8000Hz
Silencer	8	27	28	30	29	26	25

4. MEASUREMENTS

4.1 Source Measurements

- 4.1.1 Following the installation of further mitigation attended measurements were made between 12:00 and 13:33⁶ on Monday 02nd June 2025 with the system reported to be operating on typical duty.
- 4.1.2 The measurements were made at 0.75m from the source⁷ as overall A weighted values and across individual 1/3 Octave centre frequency bands. Subjective observations made at the assessment location indicated sound from the extract was not significant over and above the residual sound environment.
- 4.1.3 During the measurement exercise the meteorological conditions were noted to be dry with a temperature of 21.5° Celsius, 50% cloud and no measurable breeze.
- 4.1.4 Before the measurements 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 each set of measurements the meter was checked again using the acoustic calibrator to a reference level of 94.0dB and a meter reading of 93.9dB - 94.0dB was also recorded. This is within acceptable tolerance for calibration drift.
- 4.1.5 During the measurement exercise the residual acoustic environment was subjectively noted to be primarily influenced by sound from engine sound (possibly a nearby crane unit), construction related activity (including sound resembling the cutting of wood or metal), voices (including raised voices), music and aircraft.

4.2 Instrumentation

- 4.2.1 The following instrumentation was used for the measurements:
- Rion type NA-28 Sound Level Meter (Serial No. 30431903)
 - Rion type NH-23 Pre-amplifier (Serial No. 21966)
 - Rion type UC-59 Microphone (Serial No. 04966)
 - Rion type NC-75 Sound Level Calibrator (Serial No. 35146217)
- 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, a hand held weather monitor was used to measure the weather conditions.
- 4.2.4 The measurements were logarithmically averaged to provide a single figure at each frequency band and also the overall A weighted Value.
- 4.2.5 A summary of the measurements is provided in the table below while source term measurements are provided at Appendix B:

⁶ Due to internal battery exhaustion the clock on the meter had initialised and a precise time was not recorded, this has no bearing on the measured values.

⁷ Due to obstacles present and for safety working at height it was necessary to take measurements at a closer location than previously.

Table 4.3 Sound Pressure Levels – Extract System (Measured June 2025)

Frequency (Hz)	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500
Level	47	58	47	49	47	46	50	48	42	42	48	40	40	42
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	43	41	42	41	43	39	40	41	36	29	24	29	18	52

Values are presented as a whole number as is the convention in BS 4142

4.3 Analysis

Specific Sound Level

- 4.3.1 The specific sound level could not be determined by subtracting the residual level from the ambient level due to the influence of the fluctuating residual sound and a series of source term measurements has been relied on.
- 4.3.2 The specific sound level was initially calculated at the nearest receiver from source measurements made during the site visit to address uncertainty in the assessment and identify if further calculations were needed. The calculations assume line source propagation using the formula: $L_2 = L_1 - 10 \times \log(D_2/D_1)$ and are summarised in the table below.

Table 4.4 Calculation of Specific Sound from Measurements

Unit	Measured Level L_p dB(A)	Distance to Receiver (m)	Receiver Level dB(A)
Extraction Unit	52	6.8	42

- 4.3.3 Following the initial calculations and to further reduce uncertainty a simple model was run using the software SoundPlan® with a receiver placed at the closest façade. The sound power level was calculated using the formula $L_w = L_p + 10 \times \log(S)$. As the measurements were not made in the free field, but close to reflective surfaces 3dB has been deducted to account for this. The model has included three reflections and assumes hard ground.
- 4.3.4 The model predicts a specific sound value at the receptor of 39dB $L_{Aeq,Tr}$.

Acoustic Character

- 4.3.5 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.
- 4.3.6 Impulsive sound characteristics are not expected to be ordinarily present within the specific sound except in the case of malfunction.
- 4.3.7 Tonal components were not confirmed present within the specific sound and this was checked using the reference method from Annex D of BS 4142.
- 4.3.8 The source operates continuously, and no correction is applicable for intermittency.
- 4.3.9 The specific sound level of 39dB $L_{Aeq,Tr}$ is not readily audible against the residual sound level of 47dB $L_{Aeq,T}$ or a background sound level of 39dB $L_{A90,T}$. This was confirmed on

site through subjective observations and measurements noting the residual level was similar to the ambient level. For the purpose of an absolute worst case scenario a correction of +3dB for "*Other sound characteristics*" has been applied, building further protection in to the report.

5. ASSESSMENT

5.1 Assessment

5.1.1 The assessment is summarised 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	39 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	+3dB for other characteristics
Rating level	42 dB $L_{Ar,Tr}$	9.1 9.2	Specific sound level plus the Acoustic feature correction value
Background sound level	39 dB $L_{A90,1hr}$	8	Determined at an alternative location together with the residual sound level.
Excess of rating level over background sound level	3 dB	11	Background sound level subtracted from the Rating sound level
Assessment indication	Low Impact-Adverse Impact	11	Context has been addressed in detail in the previous report and is summarised in Section 5.2 below.
Uncertainty		10	The excess of the rating level over the background sound level is not very large. There is some uncertainty where it is not possible determine the specific sound level by subtracting the residual sound level from the ambient level due to fluctuating levels and a series of source measurements were made in conjunction with simple calculations and a software model. Given the similarity of specific and background sound levels this is not a significant level of uncertainty and the uncertainty in the result is considered to be low.

5.2 Context

5.2.1 The initial assessment indicates an outcome that's sits between a low impact and an adverse impact. This is primarily attributable to the application of acoustic character corrections to build additional protection in to the report.

5.2.2 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.

5.2.3 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 high residual sound level 8dB above the specific sound level) indicates masking is expected to occur.
- Similar sound sources were not observed present in the area.
- The initial assessment indicates a low-adverse impact following the application of acoustic character corrections..
- The specific sound level from the extract system of $39L_{Aeq,1hr}$ is 8dB below the residual level of 47dB $L_{Aeq,T}$ and does not exceed the background level of 39dB $L_{A90,T}$.

5.2.4 It is concluded that the initial estimate of the impact may be modified from siting between two outcomes to that of a low impact due to context and once pertinent factors have been taken into consideration.

5.3 Potential Impact of Uncertainty

5.3.1 BS 4142 requires that the potential impact of uncertainty⁸ upon the assessment be reported. The following steps have been taken to minimise uncertainty affecting the measurement values:

- 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.
- A 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

⁸ Uncertainty in the context of BS 4142 does not provide an indication of error but is a recognition of variable factors on the assessment.

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.
- The assessment is limited only to the operation of the extract system and other mitigation is reported to have been signed off by the local planning authority and falls outside the scope of this exercise.
- 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.
- The specific level could not be calculated by subtracting the residual sound level from the ambient level due to the fluctuating residual sound level and a series of separate source term measurements were made at a distance of 0.75m from the system while operating.
- There is some uncertainty due to the installation not being entirely by the contractor. However, the reduction in the specific sound level no longer exceed the background sound level and the mitigation maybe considered to be effective.
- 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.
- A series of simple calculations were made to determine the need for additional scrutiny and a model was then run using source data measured on site.
- 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 15dB of façade attenuation, and the external level of 39dB(A) would correspond to an internal level of 24dB(A). This is 11dB below the levels put forward by the WHO Guidelines [5] for interference with speech and moderate annoyance during the day.

6. CONCLUSIONS

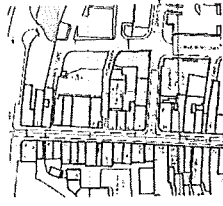
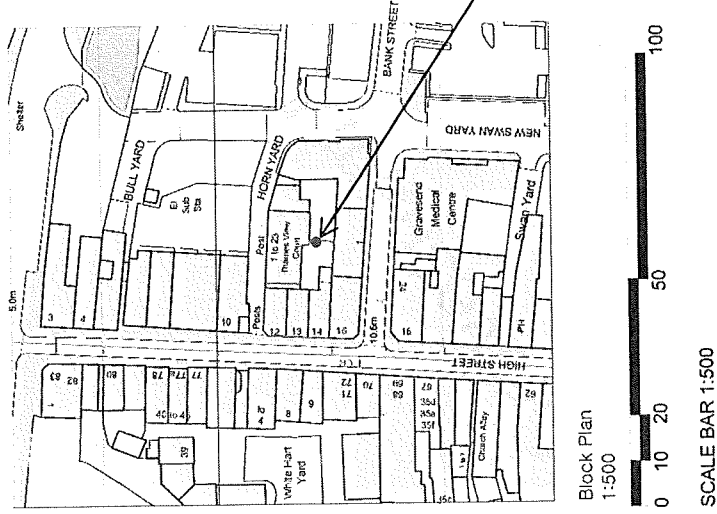
6.1 Summary of Conclusions

- 6.1.1 The results of the assessment indicate that continued operation of the system in its current format achieves a low impact when assessed using BS 4142.
- 6.1.2 The results of the assessment also indicate that the absolute internal level will be below the guideline limits for the onset of interference with speech and moderate annoyance put forward by the WHO Organisation.
- 6.1.3 The assessment concludes that operation of the newly mitigated system achieves a low impact. It is recommended the system be periodically maintained to ensure operating characteristics do not vary from those assessed.
- 6.1.4 The assessment reflects the operating hours reported in section 3.2 above. In the event operating hours were to vary, further assessment would be required.
- 6.1.5 This assessment concludes there are no further reasons on noise grounds why the relevant planning condition should not be discharged.

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

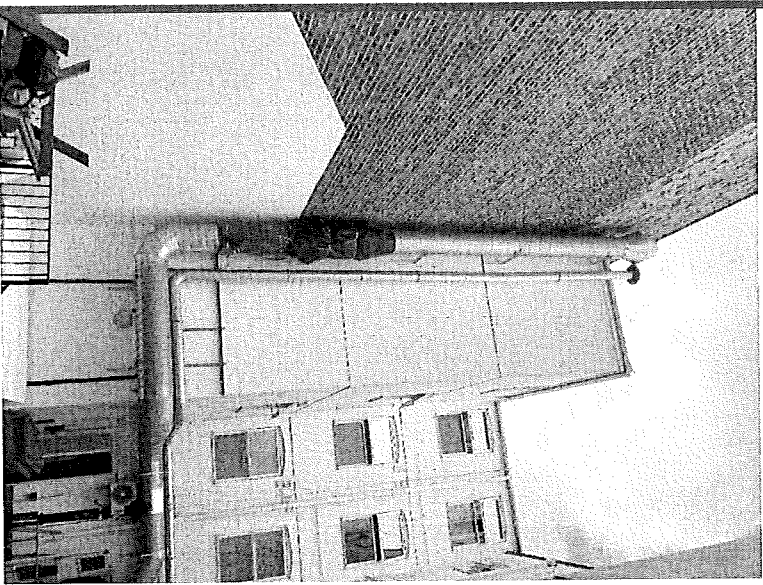


Ms. Julia Santomaro
12 - 14 High Street
Gravesend, Kent
Site/Location Plan
John Finch Partnership
architects, urbanists & landscape consultants
all proposed and
existing buildings are
shown in black and
existing roads are
shown in grey.
www.johnfinchpartnership.co.uk
01474 811111
335501
D

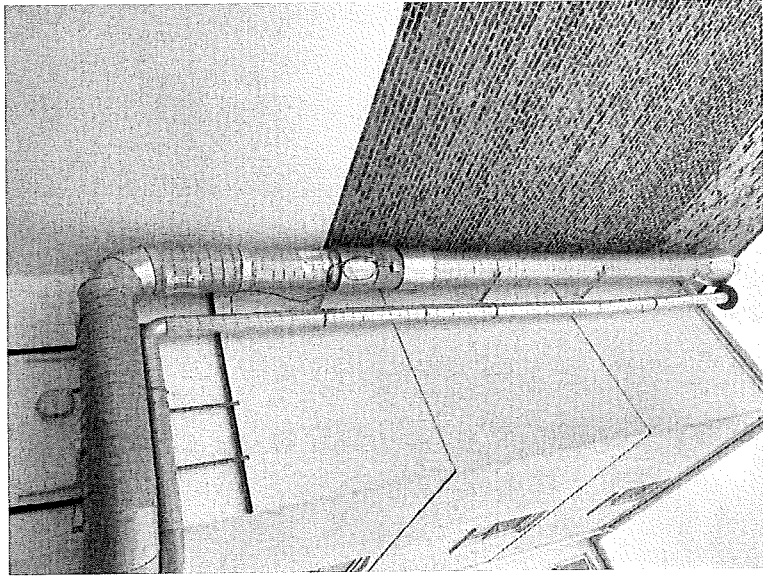
Approximate Monitoring Location

Not To Scale Resized From Original Image

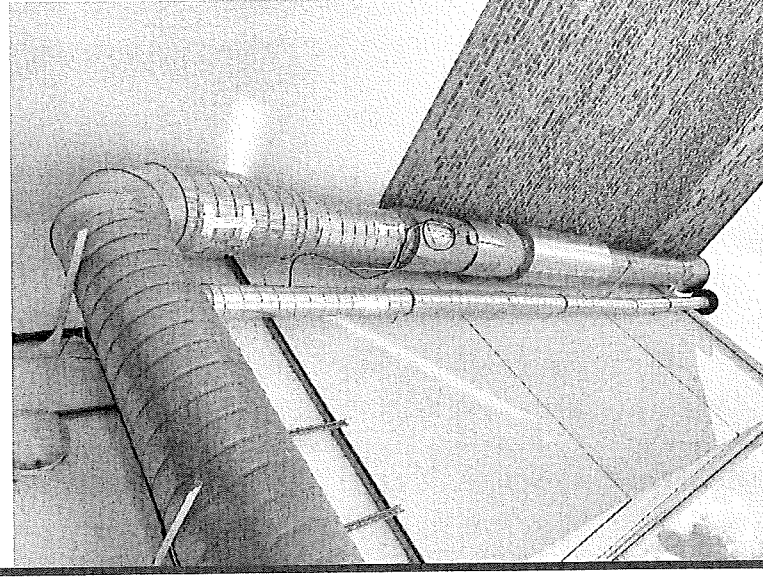
Project	No.	Drawing	No.	File	Date
12-14 High Street, Gravesend	P1547	Site Location	Figure 01	P1547/Figures.ppt	03/06/2025



October 2023



April 2024



June 2025

Not To Scale Resized From Original Image

Project	No.	Drawing	No.	File	Date
12-14 High Street, Gravesend	P1547	Extract System Mitigation	Figure 02	P1547/Figures.ppt	03/06/2025

APPENDIX A
Calibration Certificates



CERTIFICATE OF CALIBRATION

Date of Issue: 18 June 2024

Certificate Number: TCRT24/1448

Issued by:

ANV Measurement Systems

Beaufort Court

17 Roebuck Way

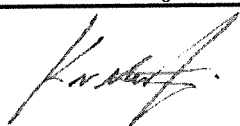
Milton Keynes MK5 8HL

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 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	NA-28	30431903
	Rion	Firmware		2.0
	Rion	Pre Amplifier	NH-23	21966
	Rion	Microphone	UC-59	04966
	Brüel & Kjær	Calibrator	4231	2263404
		Calibrator adaptor type if applicable		UC 0210

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 21.21/07.01

If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2002

Date Received 17 June 2024 ANV Job No. TRAC24/06252

Date Calibrated 18 June 2024

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 61672-2:2002, 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
	14 June 2022	TCRT22/1373	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: 08 January 2025

Certificate Number: UCRT25/1052

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 Ltd
Kent House
81 Station Road
Ashford
Kent House
TN23 1PP

Order No. P1000

Test Procedure Procedure TP 14 Calibration of Sound Calibrators (60942:2017)

Description Acoustic Calibrator

Identification	Manufacturer	Instrument	Model	Serial No.
	Rion	Calibrator	NC-75	35146217
Public evidence of Type Approval	Yes	Approved by	PTB	

The calibrator has been tested as specified in Annex B of IEC 60942:2017. As public evidence was available, from a testing organisation 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 60942:2017, the sound calibrator tested is considered to conform to all the class 1 requirements of IEC 60942:2017.

ANV Job No. UKAS25/01016

Date Received 08 January 2025

Date Calibrated 08 January 2025

Previous Certificate *Dated* Initial Calibration
Certificate No.
Laboratory

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
Source Measurements

Appendix E: Measurement Results (2nd June 2025)

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

Instrumentation	Serial No.
Blom N/A-28 Sound Level Meter	30431003
Blom N/A-28 In-situ	23466
Blom UC-59 Microphone	06466
Blom UC-77 Calibrator	35148217

Calibration prior to survey:	94.0 dB (re 94.0)
Calibration after survey:	93.5 dB (re 94.0)

Start Time	L _{eq}	1/3 Octave Centre Frequency Band [Hz]																Overall											
		25	31.5	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1k	1.25k	1.6k	2k	2.5k	3.15k	4k	5k	6.3k	8k	10k	
00:08	53	49	60	51	53	49	46	50	47	43	42	46	42	42	44	44	43	43	42	44	40	36	42	37	36	35	30	15	
00:08	52	49	60	50	50	48	45	50	49	42	42	49	40	40	40	40	41	41	43	43	39	39	40	37	39	25	30	15	
00:08	52	47	59	50	49	48	47	49	49	41	42	49	39	39	41	41	42	43	42	44	40	40	40	38	29	24	31	18	
00:08	52	44	56	49	48	47	48	48	48	41	42	51	39	39	41	41	42	43	42	44	40	41	41	37	31	26	30	18	
00:08	52	49	61	49	53	50	46	53	48	43	42	49	40	40	41	41	41	42	42	42	40	40	41	37	30	25	32	21	
00:12	52	49	60	52	54	50	48	52	50	45	43	48	41	41	43	43	43	43	45	43	41	42	44	37	30	28	32	22	
00:12	54	52	63	52	54	50	48	52	50	45	43	48	41	41	43	43	43	43	45	43	41	42	44	37	30	28	32	22	
00:12	53	48	58	46	50	49	47	50	48	41	43	48	40	41	41	45	43	45	45	44	40	40	41	38	29	22	28	16	
00:12	52	46	55	46	48	47	48	49	49	41	43	50	39	40	40	42	42	44	40	44	40	40	41	38	29	22	28	16	
00:12	53	44	51	44	46	45	47	52	50	45	43	50	41	39	42	45	41	41	41	41	39	42	38	39	33	26	22	24	14
00:12	51	43	47	41	43	42	45	51	49	43	41	49	40	39	41	42	39	40	40	42	38	39	39	33	26	22	24	14	
00:13	51	44	51	43	43	42	45	51	49	43	41	49	40	39	41	42	39	40	40	42	38	39	38	37	30	26	25	16	
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00:14	50	42	46	38	42	42	43	46	47	41	42	48	39	38	38	40	40	39	40	43	37	38	38	34	26	21	29	15	
00:14	51	43	45	40	41	41	41	42	46	41	41	47	40	40	40	42	42	39	38	40	40	37	38	34	25	20	23	13	
00:14	51	44	45	41	40	38	44	42	45	41	42	46	40	41	41	45	41	41	40	40	39	40	40	34	29	27	26	18	

Due to internal battery exhaustion the system clock had re-initialised, this line has no bearing on the measured values.