

## Acoustic and Odour Assessment at



**2 Milton Road**

**Gravesend**

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### Executive Summary

Ned Johnson Acoustic Consultants Limited has been appointed to undertake an acoustic and odour assessment of the proposed extraction system at 2 Milton Road, Gravesend.

The acoustic assessment takes account of the existing noise environment, which has been quantified using direct measurement to take account of the effect of the plant referred to above.

The odour risk assessment has been undertaken in line with the risk assessment procedure contained in the Emaq+ document 'Control of odour and noise from commercial kitchen exhaust systems'.

Noise control recommendations have been made to meet the likely planning requirements of Gravesham Borough Council. The predictions show that the system will be at least 5dB below the typical background noise level at the nearest residential window with a silencer in place.



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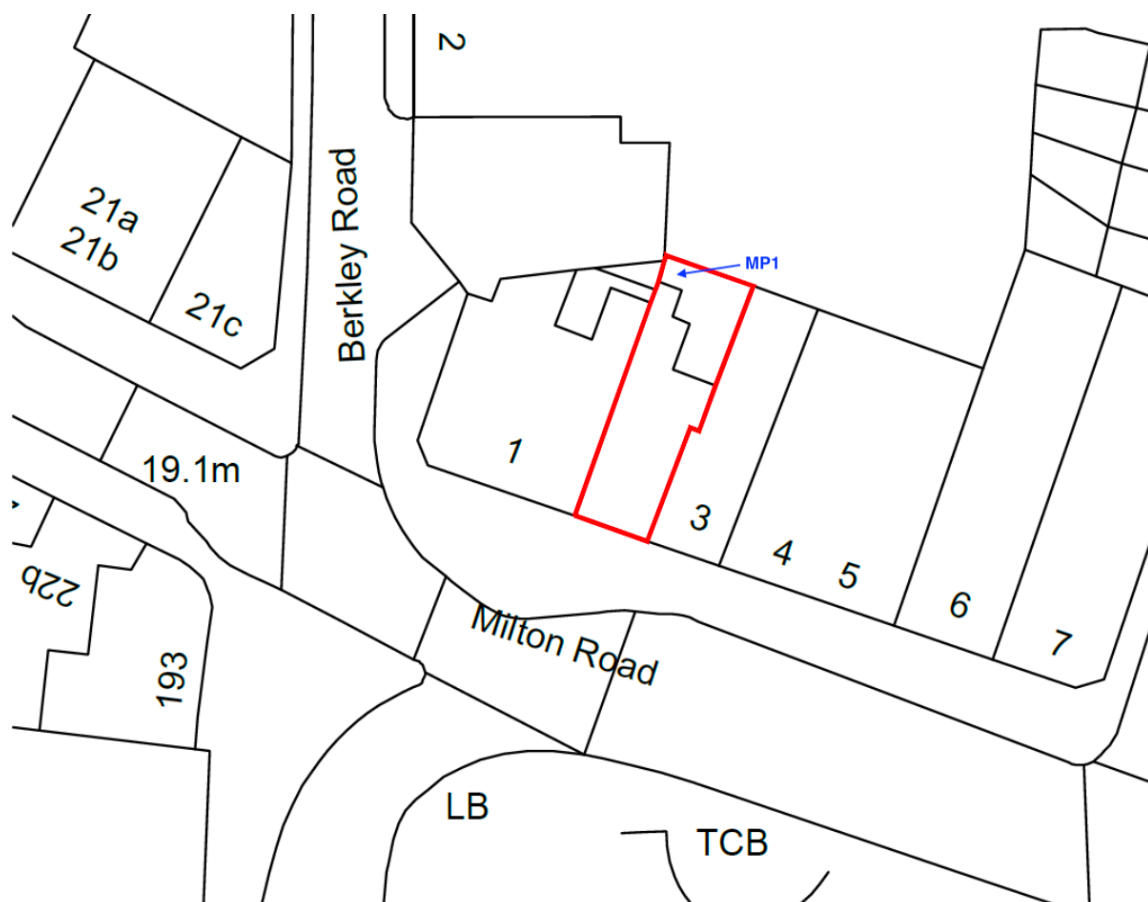
### 1. Introduction

- 1.1 Ned Johnson Acoustic Consultants Limited has been appointed to undertake an acoustic assessment of the extraction system at 2 Milton Road, Graversham.
- 1.2 The development is for the installation of a kitchen extraction system, which will be located on the rear elevation of the premises. The equipment operates only when the premises are open. The proposed opening times for the takeaway are Monday – Wednesday, 16:00 – 22:00, Friday and Saturdays, 12:00 – 22:45 and Sundays 12:00 – 22:00.
- 1.3 The extraction system fan is located internally with ducting on the external elevation. The fan to be installed will be a Flakt Woods Powerbox 500.
- 1.4 The noise levels from the system at the nearest noise-affected property has been predicted and compared to the likely requirements of Graversham Borough Council using the methodology set-out in BS4142:2014+A1 2019. The requirement is that noise from the external equipment shall be at least 5dB below the background noise level 1 metre from the nearest or most noise affected residential window.
- 1.5 The odour risk assessment follows the method set out in the Emaq+ document 'Control of odour and noise from commercial kitchen exhaust systems'.

## 2. Site Description

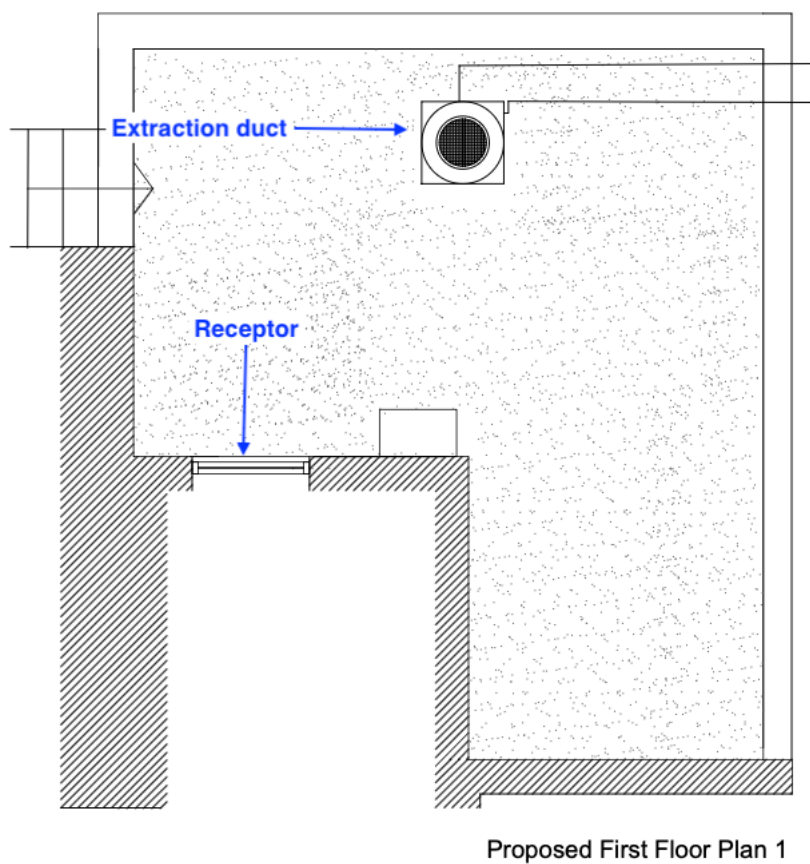
- 2.1 The development is for the installation of a kitchen extraction system at the rear of 2 Milton Road, Gravesend. The nearest noise sensitive window is 2 metres from the extraction duct termination. The main source of noise at the rear of this location was due to the other mechanical plant and road traffic noise.
- 2.2 Figure 1 below shows the location of the development; the measurement location is shown below. MP1 is the measurement point.

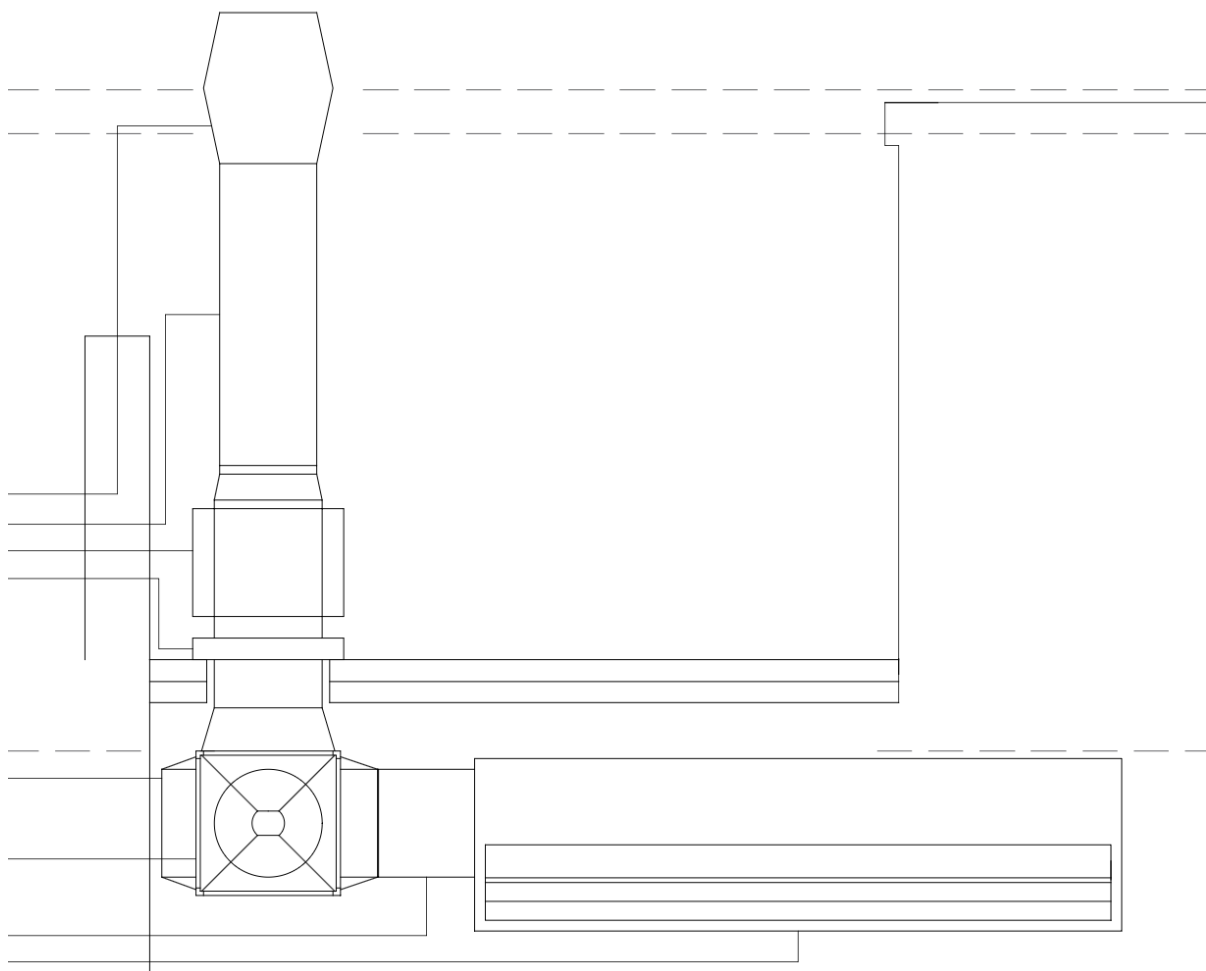
Figure 1.



2.3 Figure 2 below shows the plant layout. The fan will be located inside the building.

Figure 2.





- 2.4 The context of the site is that there are already various items of mechanical plant in close proximity to the proposed location. This appears to be a busy location due to the commercial properties on Milton Road and road traffic.
- 2.5 In terms of the sensitivity of the receptor, the flat is located in a busy location, which does mean that the acoustic environment can be expected to be noisier than would a suburban location. The receptors in



this location are not more sensitive due to the period of time when the mechanical plant operates.

- 2.6 With noise control measures the impact of the extraction system will be reduced to a point where the BS4142 rating will be at least 5dB below the typical background sound levels (see Section 6). It is considered that a rating level below background is a low impact.



### 3. Reference Documents

#### National Planning Policy Framework

3.1 The Department of Housing, Communities and Local Government published the National Planning Policy Framework (NPPF) in December 2024.

3.2 Paragraphs 187 (e) 198(a), (b) and 200 refer to noise in terms of policy approach:

187. Planning policies and decisions should contribute to and enhance the natural and local environment by:

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and

198. Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life.

b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason

200. Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed.

### Noise Policy Statement for England

- 3.3 The Department for Environment, Food and Rural Affairs published the *Noise Policy Statement for England* (NPSE) in March 2010. The explanatory note of NPSE defines the terms used in the NPPF:

*"2.20 There are two established concepts from toxicology that are currently being applied to noise impacts, for example, by the World Health Organisation. They are:*

*NOEL – No Observed Effect Level. This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.*

*LOAEL – Lowest Observed Adverse Effect Level. This is the level above which adverse effects on health and quality of life can be detected.*

*2.21 Extending these concepts for the purpose of this NPSE leads to the concept of a significant observed adverse effect level.*

*SOAEL – Significant Observed Adverse Effect Level. This is the level above which significant adverse effects on health and quality of life occur.”*

- 3.4 The NPSE does not define the SOAEL numerically, stating at paragraph 2.22:

*“2.22 It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available.”*

- 3.5 There is no local or national guidance on how the three terms should be defined numerically.
- 3.6 There are three aims in the NPSE, which match, and expand upon, the first two bullet points in paragraph 123 of the NPPF and add a third aim that relates to a wider improvement in health and quality of life (the bold text is in the NPSE):
- 3.7 The first aim of the NPSE states that significant adverse effects on health and quality of life should be avoided while also taking into account the guiding principles of sustainable development.
- 3.8 The second aim of the NPSE refers to the situation where the impact lies somewhere between LOAEL and SOAEL. It requires that all reasonable



steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development. This does not mean that such adverse effects cannot occur.

- 3.9 This aim seeks, where possible, positively to improve health and quality of life through the pro-active management of noise while also taking into account the guiding principles of sustainable development, recognising that there will be opportunities for such measures to be taken and that they will deliver potential benefits to society. The protection of quiet places and quiet times as well as the enhancement of the acoustic environment will assist with delivering this aim.

### **British Standard 8233**

- 3.10 The scope of British Standard 8233: 2014 *Sound insulation and noise reduction for buildings – Code of practice* is the provision of recommendations for the control of noise in and around buildings. It suggests appropriate criteria and limits for different situations, which are primarily intended to guide the design of new or refurbished buildings undergoing a change of use.
- 3.11 The standard suggests suitable internal noise levels for residential dwellings, as shown in Table 1. Below.

Table 1.

| Activity | Location     | 07:00 - 23:00              | 23:00 - 07:00             |
|----------|--------------|----------------------------|---------------------------|
|          |              | $L_{Aeq, 16 \text{ hour}}$ | $L_{Aeq, 8 \text{ hour}}$ |
| Resting  | Living Rooms | 35                         | -                         |
| Dining   | Dining Area  | 40                         | -                         |
| Sleeping | Bedrooms     | 35                         | 30                        |

3.12 In terms of this development the internal noise levels have been compared to the internal noise levels in Table 1. It is suggested in this report that by meeting these noise levels the development would be classed as NOAEL.

### **British Standard 4142:2014+A1 2019**

3.13 The scope of British Standard 4142: *Method for rating industrial noise affecting mixed residential and industrial areas* describes methods for determining, at the outside of a building:

a) noise levels from factories, or industrial premises, or fixed installations, or sources of an industrial nature in commercial premises; and

b) background noise level.

3.14 In particular BS4142 describes the “*use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.*” It sets out a methodology for assessing a noise Rating level which is a combination of absolute or ‘specific’ noise level (in terms of

$L_{Aeq}$  average noise level over different durations; 1 hour for daytime and 15 minute at night); and then including penalties to account for character of a noise (i.e. tonality, impulsivity, intermittency and 'other').

- 3.15 BS4142 applies to new noise sensitive developments that are proposed near existing industrial sources, the following paragraph relates to such developments: [SEP]

*"Where a new noise-sensitive receptor is introduced and there is extant industrial and/or commercial sound, it ought to be recognized that the industrial and/or commercial sound forms a component of the acoustic environment. In such circumstances other guidance and criteria in addition to or alternative to this standard can also inform the appropriateness of both introducing a new noise-sensitive receptor and the extent of required noise mitigation."* [SEP]

Further to this BS4142:2014 also notes that other standards may be relevant; in this development this would include BS8233:2014.

- 3.16 The rating levels in BS4142 are as follows:

*"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.”*

- 3.17 BS4142:2014 also states *‘where the initial estimate of the impact needs to be modified due to the context, take all pertinent factors into consideration’*. In terms of those factors the document states the following: *‘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, facade insulation ii) ventilation and/or cooling that will reduce the need to have windows open so as to provide rapid or purge ventilation; and acoustic screening.’*
- 3.18 Where there is an adverse impact in terms of the BS4142 rating mitigation can be proposed to reduce the impact or achieve desirable internal noise levels.



### 4. Survey Methodology

- 4.1 The survey was conducted on April 11<sup>th</sup> – April 12<sup>th</sup> 2026 over a 24-hour period. The monitoring point can be seen in Figure 1.
- 4.2 The instrument used for the survey was a Svantek 971A precision grade sound level meter.
- 4.3 The sound level meter was calibrated immediately before and after the survey with a Brüel & Kjær 4231 Acoustic Calibrator producing 94dB<sub>A</sub> at 1KHz and no drift was noted in calibration readings. Both calibration results were 93.9dB<sub>A</sub>.
- 4.4 During the survey there were no unusual noise events. The sound level meter was set to log every 15 minutes. The metrics measured were L<sub>Aeq</sub> and L<sub>A90</sub>.
- 4.5 The measurement procedure in BS4142:2014 was followed. The sound level meter microphone at MP1 was mounted on a tripod at ground first floor level at the rear of 2 Milton Street. MP1 was representative of the nearest residential premises to the new extraction system.
- 4.6 During the background survey the temperature was 14°C with a wind speed of 0.1 metres per second and no precipitation. Cloud cover was approximately 60% with no precipitation.



### 5. Noise Survey Results

- 5.1 The typical  $L_{A90}$  during operational hours, was 47dB and the typical ambient was 51dB  $L_{Aeq}$ .
- 5.2 No penalties in the BS4142 assessment have been added as the extraction system runs continuously during restaurant opening hours. Using the subjective method in BS4142 the fan does not show tonality and no penalty has been added.
- 5.3 The following table presents the BS4142 assessments for the extraction system noise. The system calculations can be found in Appendix 4 and the result below include a silencer.

Table 2. BS4142 assessment for the extraction system at Receptor

| Results                                                                             | Measurement             | Clause | Commentary                                                                                                                                                                                                                            |
|-------------------------------------------------------------------------------------|-------------------------|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Typical ambient sound level                                                         | $L_{Aeq} = 51\text{dB}$ | 7.3.1  |                                                                                                                                                                                                                                       |
| Typical background sound level                                                      | $L_{A90} = 47\text{dB}$ | 8.3    |                                                                                                                                                                                                                                       |
| Specific sound level of the extraction system at residential window                 | $41\text{dB}_A$         |        |                                                                                                                                                                                                                                       |
| Acoustic feature                                                                    | $0\text{dB}$            | 9.2    | No penalty as the fan will not be intermittent and there is no tonality                                                                                                                                                               |
| Rating level                                                                        | $41\text{dB}_A$         | 11     | Sound source                                                                                                                                                                                                                          |
| Typical background sound level                                                      | $L_{A90} = 47\text{dB}$ | 8.3    |                                                                                                                                                                                                                                       |
| Rating level at receptor point                                                      | $-6\text{dB}$           | 11     |                                                                                                                                                                                                                                       |
| The assessment shows that there is likely to be no adverse impact at receptor point |                         |        |                                                                                                                                                                                                                                       |
| Uncertainty of the assessment                                                       |                         |        | The rating level is $-6\text{ dB}$ and in this instance the uncertainty of the measurement does not have any significance to the outcome of the assessment. The measurement conditions were repeatable so overall uncertainty is low. |

## 6. Odour Risk Assessment

- 6.1 The Emaq+ document 'Control of odour and noise from commercial kitchen exhaust systems has an odour risk assessment in Appendix 3.
- 6.2 The following table sets-out the risk assessment score for the extraction system to be installed at the proposed development.

Table 3. Odour risk assessment

| Criteria               | Score       | Score     | Details                                                         |
|------------------------|-------------|-----------|-----------------------------------------------------------------|
| Dispersion             | Moderate    | 10        | Above eaves                                                     |
| Proximity of receptors | Close       | 10        | Closest sensitive receptor less than 20m from kitchen discharge |
| Size of kitchen        | Medium      | 3         | Medium size                                                     |
| Cooking Type           | High        | 7         | Indian                                                          |
| <b>Total</b>           | <b>High</b> | <b>30</b> |                                                                 |

- 6.3 The minimum performance standards for odour control have been taken from the Emaq+ document and will be set-out in the next section.



## 7 Evaluation of results

- 7.1 The impact of the proposed plant at 2 Milton Road, has been determined by comparing the measured noise levels with the criteria set out in Section 3 of this report.
- 7.2 The BS4142 assessment shows that the noise from the extraction system duct termination, at the most noise affected residential window, is predicted to be 6dB below the typical background noise level during operational hours.
- 7.3 The above results demonstrate that the noise from the extraction system duct termination would have a low impact. The predicted sound pressure level of the plant at the nearest noise sensitive receptors would meet with the likely requirements of Graversham Borough Council for plant noise.
- 7.4 In terms of penalties the extraction system will run continuously during operating hours and therefore no penalty for intermittency is required. The  $\frac{1}{3}$  octave data is not available for the fan and as it has not been installed it cannot be measured, so an objective assessment for tonality is not possible. Experience of this type of plant at other sites allows a subjective assessment, which shows that this type of fan is not tonal and no penalty is required. None of the plant items have impulsivity characteristics and no penalty is required.
- 7.5 The noise level due to the extraction system at the nearest receptor is a result of the attenuation with distance and the insertion of a silencer after the fan in the ductwork (see Appendix 4 for calculations). The silencer minimum performance can be seen in the table below.

Table 4. Minimum silencer performance

|                                    | Octave band centre frequency, Hz |     |     |     |      |      |      |      |
|------------------------------------|----------------------------------|-----|-----|-----|------|------|------|------|
|                                    | 63                               | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |
| <b>Minimum Insertion Loss (dB)</b> | -1                               | -12 | -20 | -31 | -28  | -28  | -25  | -15  |

- 7.6 The above insertion loss can be achieved with, for example, a R02-2-600 attenuator from Acoustica on the atmospheric side. This could fitted to the ducting with a rectangular/round transformation section. The attenuator, if fitted inside the building, should be situated as close to the exit point on the external wall to prevent sound breaking back into the ducting.
- 7.7 The ducting for the extraction system must be mounted on anti-vibration mounts. The fan must also be on anti-vibration mounts and connected to the ducting with flexible connectors.
- 7.8 All anti-vibration mountings shall provide static deflection, under the equipment weight. Mounting selection should allow for any eccentric load distribution or torque reaction, so that the design deflection is achieved on all mountings under the equipment, under operating conditions. It is the supplier's responsibility to ensure that all mountings offered are suitable for the loads, operating and environmental conditions which will prevail. Particular attention should be paid to mountings which will be exposed to atmospheric conditions to prevent corrosion.



- 7.9 A suitable antivibration hanger for the fan will be an AMC Mecanocaucho ST + Sylomer ST-30 (code 23303) with a static deflection of 11.9mm and a maximum natural frequency of 4.7Hz.
- 7.10 As the system has duct externally it is proposed that the duct is fitted with acoustic lagging which has a minimum mass of 5Kg/m<sup>2</sup> and has a minimum performance of 27dB sound reduction index.
- 7.11 The odour risk assessment total score was in the 'high' category. The Emaq+ document states that for such scores the extraction system may have a minimum specification of one of the following:
1. *'Fine filtration or ESP followed by carbon filtration (carbon filters rated with a 0.2- 0.4 second residence time).*
  2. *Fine filtration or ESP followed by UV ozone system to achieve the same level of control as 1.'*
- 7.12 Filters are to be cleaned/replaced in accordance with manufacturer's recommendations and the carbon filters are to be replaced every 6 months and grease filters to be washed every week. The extract ductwork should be cleaned every 3-6 months, in line with the recommendation in Emaq+ document.
- 7.13 The filtration proposed meets the requirements for a 'high' category odour risk assessment as set-out in the Emaq+ document. The cleaning strategy must also be followed to ensure optimal operation of the system.



## Appendix 1: Glossary of Terms

Daytime Defined in BS8233 and BS4142 as the period 07:00-23:00 hours.

Night-time Defined in BS8233 and BS4142 as the period 23:00-07:00 hours.

Decibel (dB): A unit of level derived from the logarithm of the ratio between the value of a quantity and a reference value. It is used to describe the level of many different quantities. For sound pressure levels the reference quantity is 20 uPa. The threshold of normal hearing is in the region of 0 dB and 140 dB is the threshold of pain. A change of 1 dB is only perceptible under controlled conditions.

$dB_A$ : Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in  $dB_A$  broadly agree with people's assessment of loudness. A change of 3 dB is the minimum perceptible under normal conditions, and a change of 10 dB corresponds roughly to halving or doubling the loudness of a sound. The background noise in a living room may be about 30  $dB_A$ ; normal conversation about 60  $dB_A$  at 1 metre; heavy road traffic about 80  $dB_A$  at 10 metres; the level near a pneumatic drill about 100  $dB_A$ .

$L_{A10,T}$ : The A weighted noise level exceeded for 10% of the measurement period, T. It gives an indication of the upper limit of fluctuating noise such as that from road traffic.

$L_{A90,T}$ : The A weighted noise level exceeded for 90% of the measurement period, T. This is defined in BS 4142 as the background noise level.

$L_{AE}$ : The sound exposure level – the level of a sound with a period of 1 second that has the same sound energy as the event considered.



$L_{Aeq,T}$ : The equivalent continuous sound level – the sound level of a notionally steady sound having the same energy as a fluctuating sound over a specified measurement period (T).

$L_{A\ Max}$ : The highest A weighted noise level recorded during a noise event. The time weighting (slow or fast) should be stated.

## Appendix 2: Calibration Certificates

| <div>  <div> <b>CALIBRATION CERTIFICATE</b><br/>           Issued By AcSoft Limited Calibration Laboratory<br/> <b>Date Of Issue:</b> 02-01-2025      <b>Certificate No:</b> 1510886-1<br/> <b>Calibrated By:</b> W. Jay<br/> <b>Approved By:</b> W. Jay         </div> <div>  </div> </div> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                      |     |         |               |      |       |                    |       |        |                     |            |              |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-----|---------|---------------|------|-------|--------------------|-------|--------|---------------------|------------|--------------|
| <b>CUSTOMER</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Ned Johnson Acoustics<br>London<br>Ng gHS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                      |     |         |               |      |       |                    |       |        |                     |            |              |
| <b>INSTRUMENT DETAILS</b>                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>Manufacturer:</b> SVANTEK<br><b>Model:</b> SV971A<br><b>Serial No.:</b> 154237<br><b>Firmware Version:</b> 1.09.4<br><b>Description:</b> Sound Level Meter<br><b>Performance Class:</b> 1<br><b>Type Approved to IEC 61672-1:2013:</b> No<br>(If Yes, there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2013)                                                                                                                                                                                                                                                                                                                                                                                                                                               |                      |     |         |               |      |       |                    |       |        |                     |            |              |
| <b>SENSOR DETAILS</b>                                                                                                                                                                                                                                                                                                                                                                                                                                           | <table border="0"> <tr> <td><b>Manufacturer:</b></td> <td>ACO</td> <td>SVANTEK</td> </tr> <tr> <td><b>Model:</b></td> <td>7152</td> <td>SV18A</td> </tr> <tr> <td><b>Serial No.:</b></td> <td>92768</td> <td>155350</td> </tr> <tr> <td><b>Description:</b></td> <td>Microphone</td> <td>Preamplifier</td> </tr> </table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>Manufacturer:</b> | ACO | SVANTEK | <b>Model:</b> | 7152 | SV18A | <b>Serial No.:</b> | 92768 | 155350 | <b>Description:</b> | Microphone | Preamplifier |
| <b>Manufacturer:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                            | ACO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | SVANTEK              |     |         |               |      |       |                    |       |        |                     |            |              |
| <b>Model:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 7152                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | SV18A                |     |         |               |      |       |                    |       |        |                     |            |              |
| <b>Serial No.:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                              | 92768                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 155350               |     |         |               |      |       |                    |       |        |                     |            |              |
| <b>Description:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                             | Microphone                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Preamplifier         |     |         |               |      |       |                    |       |        |                     |            |              |
| <b>P/O NUMBER</b>                                                                                                                                                                                                                                                                                                                                                                                                                                               | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                      |     |         |               |      |       |                    |       |        |                     |            |              |
| <b>DATE RECEIVED</b>                                                                                                                                                                                                                                                                                                                                                                                                                                            | 02-01-2025                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                      |     |         |               |      |       |                    |       |        |                     |            |              |
| <b>DATE CALIBRATED</b>                                                                                                                                                                                                                                                                                                                                                                                                                                          | 02-01-2025                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                      |     |         |               |      |       |                    |       |        |                     |            |              |
| <b>CALIBRATION RESULTS</b>                                                                                                                                                                                                                                                                                                                                                                                                                                      | <p>The sound level meter submitted for testing successfully completed the periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed. However, no general statement or conclusion can be made about conformance of the sound level meter to the full specifications of IEC 61672-1:2013 because (a) evidence was not publicly available, from an independent testing organization responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the class Y specifications in IEC 61672-1:2013 or correction data for acoustical test of frequency weighting were not provided in the Instruction Manual and (b) because the periodic tests of IEC 61672-3:2013 cover only a limited subset of the specifications in IEC 61672-1:2013.</p> |                      |     |         |               |      |       |                    |       |        |                     |            |              |
| <b>REPORTED RESULTS</b>                                                                                                                                                                                                                                                                                                                                                                                                                                         | <p>The results contained in this Certificate refer only to the measurements made at the time of test for the instrument detailed above. These results do not reflect the instrument's ability to maintain calibration.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                      |     |         |               |      |       |                    |       |        |                     |            |              |

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This calibration was performed by AcSoft Ltd, 11 Abbey Court, Fraser Road,  
 Priory Business Park, Bedford, MK44 3WH  
 T: 01234 639550 W: www.acsoft.co.uk E: sales@acsoft.co.uk

(AP 17/05/2024 Issue No. 5)

### CALIBRATION CERTIFICATE

Issued By AcSoft Limited Calibration Laboratory

Date Of Issue: 02-01-2025      Certificate No: 1510886-1



|                                 |                   |
|---------------------------------|-------------------|
| <b>ENVIRONMENTAL CONDITIONS</b> | Start - End       |
| Temperature:                    | 22.3 – 22.7 °C    |
| Humidity:                       | 36 – 38 %rh       |
| Pressure:                       | 101.6 – 101.6 kPa |

|                                   |                                                                                                                                                                                                                                                                                    |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>INSTRUCTION MANUAL DETAILS</b> | <b>Title:</b> SV971A User Manual<br><b>Version No.:</b> Rev. 1.00<br><b>Publication Date:</b> 23/09/2021<br><b>Date Provided or Downloaded:</b> 28/11/2022<br><b>Uncertainties Provided:</b> Case Corrections<br>Wind Shield Corrections<br>Mic Pressure to Free Field Corrections |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                           |                                                                                                                                                                                                                                                                                                                   |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CALIBRATOR DETAILS</b> | <b>Manufacturer:</b> SVANTEK<br><b>Model:</b> SV30A<br><b>Serial No.:</b> 83782<br><b>Customer or Lab Calibrator:</b> Lab Calibrator<br><b>Specified or Equivalent:</b> Equivalent<br><b>Sound Pressure Level:</b> 114.00 dB Calibration Reference SPL<br><b>Frequency:</b> 999.97 Hz Calibration Check Frequency |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**CALIBRATION METHOD** Periodic tests were performed in accordance with procedures from IEC 61672-3: 2013.

**UNCERTAINTY OF MEASUREMENTS** Uncertainty of measurement has been evaluated in compliance with EA-4/02:2013. The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a coverage probability of approximately 95%.

**MEASUREMENT TRACEABILITY** The instrument under test was calibrated using the following equipment:  
Svantek SV401 Signal Generator, ACS022, Certificate No. 1148625  
Svantek SV30A Acoustical Calibrator, ACS023, Certificate No. 6397/1  
LAB-EL LB-706B Thermo-Barometer, ACS029, Certificate No. 1148624

**NOTES**

- The information appearing on this certificate has been compiled specifically for this instrument. This calibration certificate is produced with traceable and advanced equipment which permit comprehensive quality assurance verification of all data supplied herein.
- The measurements in this document are traceable to GUM (Central Office of Measures), Poland
- This calibration certificate shall not be reproduced except in full, without written permission from AcSoft Ltd.

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This calibration was performed by AcSoft Ltd, 11 Abbey Court, Fraser Road,  
Priory Business Park, Bedford, MK44 3WH  
T: 01234 639550 W: www.acsoft.co.uk E: sales@acsoft.co.uk

(AP-17/05/2024 Issue No. 5)



Laboratory Location

**Campbell Associates Ltd**

5b Chelmsford Road Industrial Estate  
GREAT DUNMOW, Essex, GB-CM6 1HD  
Phone 01371 871030

**Certificate of Calibration and Conformance**Certificate number: **55014**Test Object: **Sound Calibrator**Producer: **Brüel & Kjær**Type: **4231**Serial number: **2706088**Customer: **Ned Johnson Acoustic Consultants Ltd**Address: **378 Church Street,  
London. N9 9HS.**Contact Person: **Ned Johnson.**

Order No:

| Measurement Results      | Level<br>dB  | Level Stability<br>dB | Frequency<br>Hz | Distortion<br>% |
|--------------------------|--------------|-----------------------|-----------------|-----------------|
| Measurement 1            | 94.09        | 0.02                  | 999.97          | 0.45            |
| Measurement 2            | 94.09        | 0.02                  | 999.98          | 0.55            |
| Measurement 3            | 94.09        | 0.03                  | 999.98          | 0.61            |
| <b>Result (Average):</b> | <b>94.09</b> | <b>0.02</b>           | <b>999.97</b>   | <b>0.54</b>     |
| Expanded Uncertainty:    | 0.1          | 0.02                  | 1               | 0.16            |
| Degree of Freedom:       | >100         | >100                  | >100            | 9               |
| Coverage Factor:         | 2            | 2                     | 2               | 2.37            |

The stated level is relative to 20 $\mu$ Pa. The level is traceable to National Standards. The stated level is valid at reference conditions. The following correction factors have been applied during the measurement

Pres:0.0008 dB/kPa Temp:0.0015 dB/°C Humi:0.001 dB/%rh Load volume: 0.0003 dB/mm<sup>3</sup>

| Conditions             | Pressure kPa       | Temperature °C | Humidity %RH   |
|------------------------|--------------------|----------------|----------------|
| Reference conditions   | 101.325            | 23             | 50             |
| Measurement conditions | 99.298 $\pm$ 0.042 | 23.1 $\pm$ 0.1 | 54.1 $\pm$ 2.1 |

The reported expanded uncertainty of measurements is based on a standard uncertainty multiplied by the coverage factor of k=2, providing a level of confidence of approximately 95%. Where the degrees of freedom are insufficient to maintain this confidence level, the coverage factor is increased to maintain this confidence level. The uncertainty has been determined in accordance with UKAS requirements.

Records: K:\C A\Calibration\Nor-1504\Nor-1018 CalCal\Current Year\BNK4231\_2706088\_M1.nmf

**Preconditioning**

The equipment was preconditioned for more than 4 hours in the specified calibration environment.

**Method**

Calibration has been performed as set out in the current version of CA Technical procedure TP01

**Calibration Dates:**

|                   |             |                |             |
|-------------------|-------------|----------------|-------------|
| Received date:    | 20-May-2026 | Reviewed date: | 04-Jun-2026 |
| Calibration date: | 03-Jun-2026 | Issued date:   | 04-Jun-2026 |

**Technicians: (Electronic certificate)**

Calibrated by: *Palanivel Marappan B.Eng(Hons), M.Sc*

Reviewed by: *Robyn Pezara*

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.

Doc ref: Calb-V6-Cert-Master-V4-02



### Appendix 3: Uncertainty

The measurement method used was to measure the existing background noise levels.

As part of the BS4142 assessment the headings from the 2014 standard have been used to consider where uncertainty in the measurements may have occurred.

#### **The complexity of the sound source and the level of variability in sound emission from the source**

The extraction system will run continuously while the restaurant is open. In terms of the complexity the manufacturer's data does not show a great variation between the octave band centre frequencies.

#### **The complexity and level of variability of the residual acoustic environment**

The extraction system has not yet been installed but the predictions show there will be no effect on the residual environment.

The ambient environment overall provided consistent, reproducible results and therefore uncertainty for this aspect is low.

#### **The level of residual sound in the presence of the specific sound at the measurement location**

The plant has not yet been installed and therefore no comment can be made.



### **The location(s) selected for taking the measurements**

The location for measurements followed the guidance in BS4142:2014 and was representative of the noise sources in the area.

### **The distance between sources of sound and the measurement location and intervening ground conditions**

The extraction system is 2 metres from the window of the most noise affected residential property.

### **The number of measurements taken**

24 hours of data was collected in 15-minute periods. It covers worst-case scenario background levels. Overall there is a reliable dataset from which to derive the typical background noise levels and uncertainty is low.

### **The measurement time intervals**

The time intervals for logged data were 15-minute periods, which is an appropriate period for this type of survey and uncertainty is low.

### **The range of times when the measurements have been taken**

The measurement times were representative of the background and ambient sound levels at both measurement locations.

### **The range of suitable weather conditions during which measurements have been taken**

During the surveys the wind conditions were suitable as they did not exceed 5m/s at any time; there was also no precipitation and the temperature was a 14°C. All conditions were recorded, including cloud cover and all were in line



with the requirements of BS4142 and therefore uncertainty due to weather is low.

### **The measurement method and variability between different practitioners in the way the method is applied**

The method for taking measurements followed that required in BS4142. The measurement procedure is reproducible and therefore uncertainty is low.

### **The level of rounding of each measurement recorded**

Where necessary results have been rounded to the nearest whole decibel; any results at 0.5 have been rounded up.

### **The instrumentation used**

The instrument used is a class 1 sound level meter and calibrator and have all been calibrated to a traceable standard at a UKAS accredited laboratory in the last 24 months. Uncertainty due to instrumentation is low.

### **Uncertainty in calculations:**

#### **Uncertainty in any measured sound levels used in calculations**

It was not possible to measure any of the sound pressure levels for the system as the ducting has not yet been installed. For this reason manufacturer's data was used for all calculations and uncertainty is low.



### **Uncertainty in the operation or sound emission characteristics of the specific sound source and any assumed sound power levels**

The fan and ducting has not yet been installed and manufacturer's data was used. As this data was measured under laboratory conditions uncertainty is low.

### **Uncertainty in the calculation method**

Standard calculation for attenuation with distance was used in the calculations and all calculations followed normal acoustic methods. The insertion losses provided in the calculations (see Appendix 4) for the silencer for the extraction system were taken from manufacturer's datasheets, so this is a measured performance and not a predicted performance. The minimum specification for the silencers will be met and exceeded by silencers available on the market.

The silencer insertion losses were selected on the basis that they had the measured acoustic attenuation performance required to sufficiently attenuate sound emissions. The uncertainty of the performance is that real-life installations do not always provide the same attenuation performance as laboratory measurements and are dependent on the standard of workmanship in installation. It is not possible to put a figure on possible losses in attenuation due to installation and therefore it is logical to use the measured data. For this reason, uncertainty is low.

### **Simplifying the real situation to 'fit' the model (user influence on modelling)**

The performance of the plant and emissions was not modelled. All calculations were based on the site characteristics.



### **Error in the calculation process**

All calculations were checked by a colleague in an independent consultancy and uncertainty is low.

## Appendix 4: Calculations

Calculation of impact to the residential property nearest due to extraction system stack vent.

Table 5.

| Procedure                     | Overall |       |      |      |      |      |      |      |    |
|-------------------------------|---------|-------|------|------|------|------|------|------|----|
|                               | 63      | 125   | 250  | 500  | 1000 | 2000 | 4000 | 8000 |    |
| Sound power level of fan (dB) | 71      | 79    | 82   | 77   | 73   | 69   | 63   | 59   |    |
| Conversion to A-weighting     | -26.2   | -16.1 | -8.6 | -3.2 | 0    | 1.2  | 1    | -1.1 |    |
| Conversion to $L_{PA}$ at 1m  | -8      | -8    | -8   | -8   | -8   | -8   | -8   | -8   |    |
| Attenuation to 2m             | -6      | -6    | -6   | -6   | -6   | -6   | -6   | -6   |    |
| End reflection                | -5      | -2    | 0    | 0    | 0    | 0    | 0    | 0    |    |
| Bend reflection               | 0       | 0     | -1   | -2   | -3   | -3   | -3   | -3   |    |
| Silencer performance          | -1      | -12   | -20  | -31  | -28  | -28  | -25  | -15  |    |
| Total (dB <sub>A</sub> )      | 24.8    | 34.9  | 38.4 | 26.8 | 28   | 25.2 | 22   | 25.9 | 41 |



Appendix 5: Data

