

---

Our Ref: NA/1069/22/083/v1.0/460 Cheetham Hill Road

30<sup>th</sup> May 2022

Mr Belal Rashid  
Belal Rashid Technical Architecture  
Office 12  
Falcon Business Centre  
Victoria Street  
Oldham  
OL9 0HB



Sent by email only [belal.brta@outlook.com](mailto:belal.brta@outlook.com)

Dear Belal,

**NOISE ASSESSMENT FOR THE PROPOSED INSTALLATION OF A FUME EXTRACTION FLUE TO THE REAR OF 460 CHEETHAM HILL ROAD, MANCHESTER, M8 9JW**

**MANCHESTER CITY COUNCIL PLANNING APPLICATION 133168/FO/2022**

**1.00 INTRODUCTION**

- 1.01 RP Acoustics Limited has been commissioned by Mr Arslan Younis to carry out a noise assessment for the proposed installation of a fume extraction flue to the rear of 460 Cheetham Hill Road, Manchester, M8 9JW (hereafter referred to as the application site).
- 1.02 The noise assessment has been undertaken to accompany planning application 133168/FO/2022 which has been submitted to Manchester City Council.
- 1.03 The objectives of the noise assessment were to:
- Determine the noise levels associated with the proposed fume extraction flue at the nearest residential dwellings
  - Assess the suitability of the proposed fume extraction flue with cognisance to current planning and noise-related policies and guidelines
  - Provide recommendations for mitigation measures (if necessary) to protect residential amenity with cognisance to current planning and noise-related policies and guidelines
- 1.04 This report sets out the methodology and findings of the noise assessment. It has been prepared on behalf of Mr Arslan Younis for the sole purpose described above and no extended duty of care to any third party is implied or offered. Third parties making reference to the report should consult Mr Arslan Younis (the applicant), Belal Rashid Technical Architecture (the applicant's agent) and RP Acoustics Limited as to the extent to which the findings may be appropriate for their use.
- 1.05 A glossary of acoustic terms is contained in Appendix 1 for reference.

**2.00 APPLICATION SITE SETTING AND HOURS OF OPERATION**

- 2.01 The application site is set in predominantly commercial setting (see Appendix 2). The nearest residential dwellings are located on Woodlands Street, circa 80 metres to the east of the proposed fume extraction flue (see Appendix 3), whilst the North Manchester Jame Masjid Mosque (the main hall rather than the ancillary toilet block) is circa 25 metres to the east.
- 2.02 The hours of operation of the restaurant / flue are understood to be circa 4 pm to midnight.

### 3.00 PRE-ASSESSMENT CONSULTATION

3.01 In December 2015, Manchester City Council published a document entitled 'Planning and Noise: Technical Guidance'. This document was prepared in response to changes in the planning system and requests from practitioners for additional technical guidance on the management of noise. The guidance aims to provide help and advice in relation to noise in a planning context to encourage good acoustic design. It outlines what is expected in relation to current guidance and policy with the aspiration that new developments achieve the highest possible standards without compromising the health and well-being of people that live and work within the City of Manchester.

3.02 The main reasons for requiring a noise assessment would be if:

- There is a planning application for a noise sensitive development, such as a residential development, next to or near an existing noise source, such as busy transport route, or an industrial, commercial or recreational land use, or
- There is a planning application for a development that has the potential to cause noise disturbance to existing residential or other noise sensitive properties.

3.03 The following information MUST be included in all acoustic reports:

- A statement of the reason for and scope of the report
- Details of the proposed development to which the report relates.
- A location and development plan
- A description of the area and environment surrounding the development site
- The methodology used to carry out the noise survey including the location of any noise monitoring locations, the equipment used and details of its last accredited calibration, and the weather conditions at the time the survey was carried out
- Full table of results
- Assessment of the results in accordance to the relevant standards and policies
- Recommendations for noise control measures if needed
- Full calculations of the noise reductions expected to support any suggested noise control measures

3.04 BS 4142 should be used to assess the likely impact of noise from industrial and commercial sources at noise sensitive premises. One of the indications of the impact of a BS 4142 assessment is 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.

3.05 The Council consider that new developments should contribute and enhance the area in which they are located and where possible, contribute to the improvement of people's health and quality of life as per the NPSE. With this in mind, the design objective should be that:

**'The development should be designed so as to achieve a rating level of 5 dB (LAeq) below the typical background (LA90) level at the nearest noise sensitive location'**

#### 4.00 BASELINE NOISE SURVEY

- 4.01 A baseline noise survey was undertaken at the application site from Sunday 22<sup>nd</sup> May 2022 through to the early hours of Monday 23<sup>rd</sup> May 2022.
- 4.02 For the purpose of the baseline noise survey, the following noise monitoring positions were adopted (reproduced in Appendix 4 for reference):
- NMP1 was located outside residential dwellings on Woodlands Street
  - NMP2 was located in the ginnel to the rear of 460 Cheetham Hill Road
- 4.03 Baseline noise measurements were undertaken using NTi Audio XL2 Type 1 integrating sound level meters. The calibration was verified immediately before and after measurement sessions and no drift in calibration level was noted (calibration certificates reproduced in Appendix 5 for reference).
- 4.04 Baseline noise measurements consisted of A-weighted broadband parameters, together with linear one-third octave band  $L_{eq}$  levels, with a logging interval of 1 second (and full audio recording).
- 4.05 The free field baseline noise measurement data is summarised in the following table (note: although 24-hour baseline noise measurements were collected, only those relevant to the hours of operation are presented below).

**Table 4.1 – Baseline Noise Measurement Data**

| NMP                                                                                                                                                                    | Date            | Time      | LAeq (dB) | LA90 (dB) | Comments                                                                                                     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-----------|-----------|-----------|--------------------------------------------------------------------------------------------------------------|
| 1                                                                                                                                                                      | Sunday 22/05/22 | 1600–1700 | 55        | 48        | LAeq is Woodlands Street traffic                                                                             |
|                                                                                                                                                                        | Sunday 22/05/22 | 1700–1800 | 55        | 48        |                                                                                                              |
|                                                                                                                                                                        | Sunday 22/05/22 | 1800–1900 | 54        | 47        |                                                                                                              |
|                                                                                                                                                                        | Sunday 22/05/22 | 1900–2000 | 54        | 47        | LA90 is distant traffic                                                                                      |
|                                                                                                                                                                        | Sunday 22/05/22 | 2000–2100 | 53        | 46        |                                                                                                              |
|                                                                                                                                                                        | Sunday 22/05/22 | 2100–2200 | 53        | 46        | Air intake and fume extraction flue at Lahori Chaska (hot food takeaway at 458 Cheetham Hill Road) inaudible |
|                                                                                                                                                                        | Sunday 22/05/22 | 2200–2300 | 51        | 44        |                                                                                                              |
|                                                                                                                                                                        | Sunday 22/05/22 | 2300–0000 | 49        | 40        |                                                                                                              |
|                                                                                                                                                                        | Monday 23/05/23 | 0000–0100 | 46        | 40        |                                                                                                              |
| <b>Ambient noise level 54 dB LAeq (1600–2300) and 47 dB LAeq (2300–0200)</b><br><b>BS4142 background noise level 47 dB LA90 (1600–2300) and 40 dB LA90 (2300–0200)</b> |                 |           |           |           |                                                                                                              |
| 2                                                                                                                                                                      | Sunday 22/05/22 | 1540–1555 | 51        | 49        | Air intake Lahori Chaska; distant traffic                                                                    |
| <b>Background noise level comparable to NMP1 (long-term monitoring position)</b>                                                                                       |                 |           |           |           |                                                                                                              |

- 4.07 The baseline noise measurements are considered commensurate with the urban site setting. The principal noise source was screened / distant traffic from the A665 Cheetham Hill Road.

## 5.00 NOISE LEVELS ASSOCIATED WITH THE PROPOSED FUME EXTRACTION SYSTEM

5.01 The proposed fume extraction system incorporates:

- Flakt Woods JM Maxfan Compac extraction fan (see Appendix 6)
- Flakt Woods 40JM/16/4/5/1PH long cased axial flow intake fan for make-up air (see Appendix 6); note: the intake fan is significantly quieter than the extraction fan
- 2D straight through silencers on the inlet and outlet side of both fans (see Appendix 6)
- The fans will be accompanied with anti-vibration housing, anti-vibration mounts and flexible connections to prevent vibration transfer and minimise noise transfer through fixings or structures; furthermore, the fans will be lagged

5.02 The noise level associated with the fume extraction system is calculated in accordance with the following equation:

$$\text{SPL} = \text{SWL} - \text{DA} - \text{DL} - \text{DI} - \text{IL} - 11 \text{ where}$$

|      |   |                                                                        |
|------|---|------------------------------------------------------------------------|
| SPL  | = | Sound Pressure Level                                                   |
| SWL  | = | Sound Power Level of Extraction Fan                                    |
| D    | = | Distance Attenuation ( $20 \times \log(\text{distance to receptor})$ ) |
| DL   | = | Duct Loss (typically 0.15 dB per linear metre)                         |
| DI   | = | Directivity Index (see Appendix 7)                                     |
| IL   | = | Insertion Loss due to in-line silencer on outlet side                  |
| - 11 | = | Conversion factor from SWL to SPL                                      |

5.03 For reference, the sound power level of the Flakt Woods JM Maxfan Compac extraction fan on the outlet side outlet is 104 dB (note: this is not A-weighted), whilst the sound power level of the Flakt Woods 40JM/16/4/5/1PH long cased axial flow intake fan on the outlet side is 80 dB (note: this is not A-weighted). Both fans are broadband in character (not tonal).

5.04 Due to the difference in sound power levels being 24 dB (and furthermore an additional louvre is to be provided to the intake system), it is only necessary to consider the noise associated with the extraction fan system. There will be no cumulative impact.

5.05 The noise level associated at the nearest residential dwelling (and also the mosque, though this is considered significantly less of a noise sensitive receptor than residential dwellings) with the fume extraction fan system is calculated in the following tables.

**Table 5.1 – Noise Associated with Fume Extraction System at Residential Dwellings**

| Item | Octave band (Hz)                                      | 63  | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | Broadband |
|------|-------------------------------------------------------|-----|-----|-----|-----|------|------|------|------|-----------|
| A    | Outlet SWL(dB)                                        | 93  | 89  | 98  | 99  | 95   | 94   | 90   | 87   | 104       |
| B    | A-Weighting Correction Outlet SWL (dBA)               | -26 | -16 | -9  | -3  | 0    | 1    | 1    | -1   |           |
| C    | Distance Attenuation at 80 metres                     | 38  | 38  | 38  | 38  | 38   | 38   | 38   | 38   |           |
| D    | Duct losses due to duct length                        | 1   | 1   | 1   | 1   | 1    | 1    | 1    | 1    |           |
| E    | Directivity Index (receptors perpendicular to outlet) | 2   | 3   | 7   | 12  | 16   | 22   | 27   | 31   |           |
| F    | 2D Silencer Attenuation                               | 4   | 8   | 12  | 17  | 23   | 17   | 12   | 10   |           |
| G    | Correction SWL to SPL                                 | 11  | 11  | 11  | 11  | 11   | 11   | 11   | 11   |           |
|      | Resultant SPL dB(A) at receptor (A+B-C-D-E-F-G)       | 11  | 12  | 20  | 17  | 6    | 6    | 2    | -5   | <b>23</b> |

**Table 5.2 – Noise Associated with Fume Extraction System at Mosque**

| Item | Octave band (Hz)                                      | 63  | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | Broadband |
|------|-------------------------------------------------------|-----|-----|-----|-----|------|------|------|------|-----------|
| A    | Outlet SWL(dB)                                        | 93  | 89  | 98  | 99  | 95   | 94   | 90   | 87   | 104       |
| B    | A-Weighting Correction Outlet SWL (dBA)               | -26 | -16 | -9  | -3  | 0    | 1    | 1    | -1   |           |
| C    | Distance Attenuation at 25 metres                     | 28  | 28  | 28  | 28  | 28   | 28   | 28   | 28   |           |
| D    | Duct losses due to duct length                        | 1   | 1   | 1   | 1   | 1    | 1    | 1    | 1    |           |
| E    | Directivity Index (receptors perpendicular to outlet) | 2   | 3   | 7   | 12  | 16   | 22   | 27   | 31   |           |
| F    | 2D Silencer Attenuation                               | 4   | 8   | 12  | 17  | 23   | 17   | 12   | 10   |           |
| G    | Correction SWL to SPL                                 | 11  | 11  | 11  | 11  | 11   | 11   | 11   | 11   |           |
|      | Resultant SPL dB(A) at receptor (A+B-C-D-E-F-G)       | 21  | 22  | 30  | 27  | 16   | 16   | 12   | 5    | <b>33</b> |

## 6.00 BS4142 ASSESSMENT AND CONCLUSIONS

- 6.01 The rating level of the fume extraction system at the nearest residential dwellings (Woodlands Street) is 23 dB(A). The daytime and night time background noise levels are 47 dB LA90 (1600–2300) and 40 dB LA90 (2300–0100), respectively. It is evident that the fume extraction system is 24 and 17 dB below the daytime and night time background noise levels, respectively. This represents no adverse impact.
- 6.02 The rating level of the fume extraction system at the mosque is 33 dB(A). The daytime and night time background noise levels are 47 dB LA90 (1600–2300) and 40 dB LA90 (2300–0100), respectively. It is evident that the fume extraction system is at 14 and 7 dB below the daytime and night time background noise levels, respectively. This represents no adverse impact.
- 6.03 In conclusion, noise should not pose a constraint to the granting of planning permission for the proposed fume extraction flue at the rear of 460 Cheetham Hill Road, Manchester, M8 9JW.

If we can be of any further assistance, please do not hesitate to contact us.

Yours sincerely

Richard Pennell, BEng (Hons), MSc (Hons), MIOA  
For RP Acoustics Limited

---

## Appendix 1

### Glossary of Acoustic Terms

#### Sound Pressure Level ( $L_p$ )

The basic unit of sound measurement is the sound pressure level. As the pressures to which the human ear responds can range from 20  $\mu$ Pa to 200 Pa, a linear measurement of sound levels would involve many orders of magnitude. Consequently, the pressures are converted to a logarithmic scale and expressed in decibels (dB) as follows:

$$L_p = 20 \log_{10}(p/p_0)$$

Where  $L_p$  = sound pressure level in dB;  $p$  = rms sound pressure in Pa; and  $p_0$  = reference sound pressure (20  $\mu$ Pa).

#### A-weighting Network

A frequency filtering system in a sound level meter, which approximates under defined conditions the frequency response of the human ear. The A-weighted sound pressure level, expressed in dB(A), has been shown to correlate well with subjective response to noise.

#### Equivalent continuous A-weighted sound pressure level, $L_{Aeq, T}$

The value of the A-weighted sound pressure level in decibels of continuous steady sound that within a specified time interval,  $T$ , has the same mean-square sound pressure as a sound that varies with time.  $L_{Aeq, 16h}$  (07:00 to 23:00 hours) and  $L_{Aeq, 8h}$  (23:00 to 07:00 hours) are used to qualify daytime and night time noise levels.

#### $L_{A10, T}$

The A-weighted sound pressure level in decibels exceeded for 10% of the measurement period,  $T$ .  $L_{A10, 18h}$  is the arithmetic mean of the 18 hourly values from 06:00 to 24:00 hours.

#### $L_{A90, T}$

The A-weighted sound pressure level of the residual noise in decibels exceeded 90% of a given time interval,  $T$ .  $L_{A90}$  is typically taken as representative of background noise.

#### $L_{AF \max}$

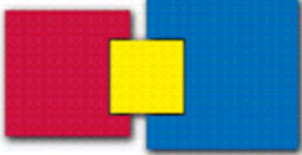
The maximum A-weighted noise level recorded during the measurement period. The subscript 'F' denotes fast time weighting, slow time weighting 'S' is also used.

#### Sound Exposure Level (SEL or $L_{AE}$ )

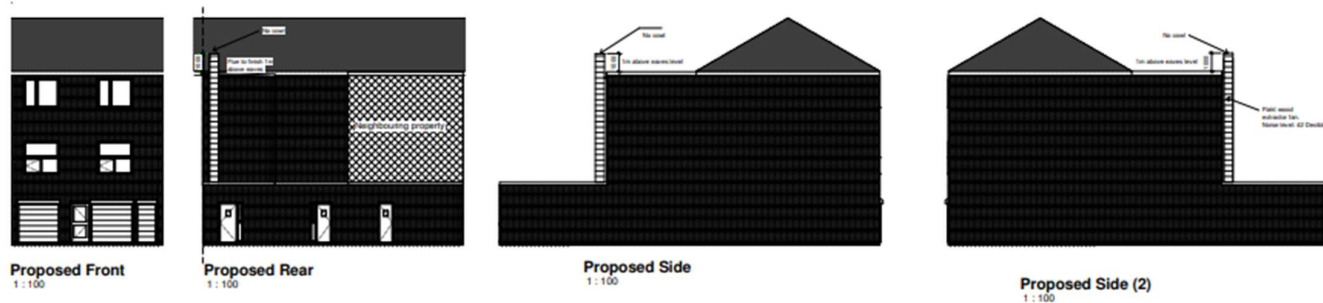
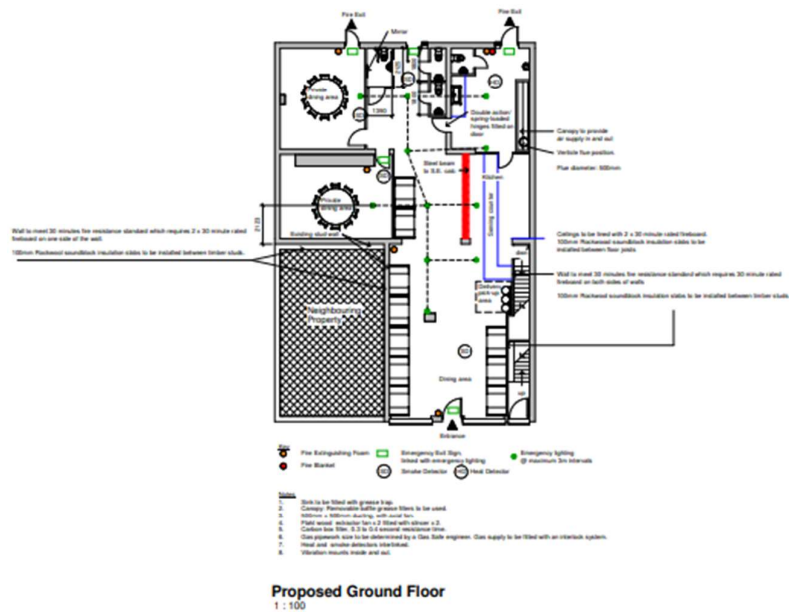
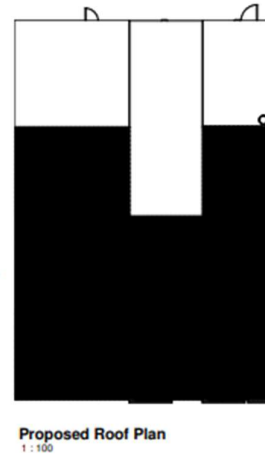
The energy produced by a discrete noise event averaged over one second, no matter how long the event actually took. This allows for comparison between different noise events that occur over different lengths of time.

## Appendix 2 Application Site Location Plan



|                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                  |  |                                          |                                                       |                                               |                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|--|------------------------------------------|-------------------------------------------------------|-----------------------------------------------|---------------------------------------|
| <br><b>S C H E M E</b><br>D E S I G N S<br>Suite 15, Business Development Centre,<br>Eanam Wharf, Blackburn, BB1 5BL<br>T 01254 503200 M 07989 177834<br>E mail@schemedesigns.co.uk<br>W www.schemedesigns.co.uk                                                                                                                                                              | <b>Client</b> Mr A YOUNIS                                                                                        |  |                                          |                                                       |                                               |                                       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>Project</b> 460 Cheetham Hill Road, Manchester<br>Change of Use & Installation of Extract<br>Flue & Shopfront |  |                                          |                                                       |                                               |                                       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>Drawing Title</b> Location Plan                                                                               |  |                                          |                                                       |                                               |                                       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>Drawing No.</b> 0664/001/A4/Rev - <b>Scale</b> See DWG                                                        |  |                                          |                                                       |                                               |                                       |
| <b>Issued Date</b> 25 / 05 / 2021 <b>Revision Date</b> -- / -- / --                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                  |  |                                          |                                                       |                                               |                                       |
| <b>Drawn By</b> E.K. <b>Checked By</b> E.K.                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                  |  |                                          |                                                       |                                               |                                       |
| <b>Drawing Issue:</b><br><table style="width: 100%;"> <tr> <td><input type="checkbox"/> Draft Proposals</td> <td><input checked="" type="checkbox"/> Planning Approval</td> </tr> <tr> <td><input type="checkbox"/> Building Regulations</td> <td><input type="checkbox"/> Construction</td> </tr> </table>                                                                                                                                                      |                                                                                                                  |  | <input type="checkbox"/> Draft Proposals | <input checked="" type="checkbox"/> Planning Approval | <input type="checkbox"/> Building Regulations | <input type="checkbox"/> Construction |
| <input type="checkbox"/> Draft Proposals                                                                                                                                                                                                                                                                                                                                                                                                                         | <input checked="" type="checkbox"/> Planning Approval                                                            |  |                                          |                                                       |                                               |                                       |
| <input type="checkbox"/> Building Regulations                                                                                                                                                                                                                                                                                                                                                                                                                    | <input type="checkbox"/> Construction                                                                            |  |                                          |                                                       |                                               |                                       |
| <small>This drawing is the copyright of Scheme Designs Limited and no reproduction is allowed without prior permission. All Drawings must be checked and verified prior to commencement of work on site. All dimensions are in millimeters, unless otherwise stated. Anyone using this drawing e.g. Contractor, Client, Supplier is to check all dimensions on site prior to carrying out work or ordering of materials. DO NOT SCALE FROM THIS DRAWING.</small> |                                                                                                                  |  |                                          |                                                       |                                               |                                       |

### Appendix 3 Proposed Fume Extraction Flue



|                  |                                             |
|------------------|---------------------------------------------|
| Client:          | Arslan Younis                               |
| Project:         | Project Name                                |
| Project Address: | 460 Cheetham Hill Road<br>Manchester M8 9JW |
| Drawing Name:    | Proposed                                    |
| Drawing Number:  | A102                                        |
| Drawing Date:    | 03/12/21                                    |
| Author:          | N.Shah, B.Rashid                            |

Belal Rashid Technical Architecture  
Office 12  
Falcon Business Centre  
Victoria Street  
Oldham  
OL9 0HB

Email: belal.brta@outlook.com  
Mobile: 07794529361



---

## Appendix 4 Noise Monitoring Positions



## Appendix 5 Calibration Certificates

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: **U39995**

**Test Object:** Sound Level Meter, BS EN IEC 61672-1:2013 Class 1  
Associated Frequency Analyser to BS EN IEC 61260:1996 Class 1  
**Producer:** NTi Audio  
**Type:** XL2-TA  
**Serial number:** A2A-17283-E0  
**Customer:** RP Acoustics Ltd  
**Address:** 1 Dobcroft Close,  
Sheffield, South Yorkshire. S11 9LL.  
**Contact Person:** Richard Pennell  
**Order No:**

#### Introduction:

Calibration has been performed as set out in CA Technical Procedures which are based on the procedures for periodic verification of sound level meters as per the **Test Object** listed above. Results and conformance statement are overleaf and detailed results, where appropriate, are provided in the attached Measurement Report.

| Tested:      | Producer     | Type   | Serial No | Certificate No |
|--------------|--------------|--------|-----------|----------------|
| Microphone   | NTi Audio    | MC230A | A18352    | 39994          |
| Calibrator*  | Larson Davis | CAL200 | 17115     | U39993         |
| Preamplifier | NTi Audio    | MA220  | 8854      | Included       |

\* The calibrator was complete with any required coupler for the microphone specified.

Additional items that have also been submitted for verification:

Wind shield - -  
Attenuator - -  
Extension cable - -

These items have been taken into account wherever appropriate.

Instruction Manual: NTi-Audio XL2 Operating Manual v3,11,02 August 2016 Firmware Version: v4,21 The test object is a single channel instrument.

| Conditions             | Pressure kPa | Temperature °C | Humidity %RH |
|------------------------|--------------|----------------|--------------|
| Reference conditions   | 101.325      | 23             | 50           |
| Measurement conditions | 102.80 ±0.04 | 22.65 ±0.15    | 31.35 ±0.25  |

#### Calibration Dates:

Received date: 17/01/2022 Reviewed date: 25/01/2022  
Calibration date: 25/01/2022 Issued date: 25/01/2022

#### Technicians: (Electronic certificate)

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

Reviewed by: *Darren Batten*

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 5 Calibration Certificates

### Certificate of Calibration and Conformance

Continuation of Certificate number: U39995

The statements of conformance and observation notes detailed in this certificate are made with reference to the following standards in respect of the calibration of the test object.

Manufactured: BS EN IEC 61672-1:2013  
Periodic Tests: BS EN IEC 61672-3:2013  
Pattern Evaluation: BS EN IEC 61672-2:2013  
Filter Evaluation: BS EN IEC 61260:1996 Class 1

#### Conformance:

From markings on the sound level meter or by reference to the manufacturer's published literature it has been determined that the instrument submitted for verification was originally manufactured to the listed standard and similarly that the associated sound calibrator conforms to the BS EN IEC 60942 standard.

#### Measurement Summary:

|                                                                            |        |
|----------------------------------------------------------------------------|--------|
| Indication at the calibration check frequency - IEC 61672-3 Ed.2 #10       | Passed |
| Self-generated noise - IEC 61672-3 Ed.2.0 #11,2                            | Passed |
| Acoustical signal tests of a frequency weighting - IEC 61672-3 Ed.2.0 #12  | Passed |
| Electrical signal tests of frequency weightings - IEC 61672-3 Ed.2.0 #13   | Passed |
| Frequency weightings: A Network - IEC 61672-3 Ed.2.0 #13.3                 | Passed |
| Frequency weightings: C Network - IEC 61672-3 Ed.2.0 #13.3                 | Passed |
| Frequency weightings: Z Network - IEC 61672-3 Ed.2.0 #13.3                 | Passed |
| Frequency and time weightings at 1 kHz IEC 61672-3 Ed.2.0 #14              | Passed |
| Level linearity on the reference level range - IEC 61672-3 Ed.2.0 #16      | Passed |
| Level linearity including the level range control - IEC 61672-3 Ed.2.0 #17 | Passed |
| Toneburst response - IEC 61672-3 Ed.2.0 #18                                | Passed |
| Peak C sound level - IEC 61672-3 Ed.2.0 #19                                | Passed |
| Overload indication - IEC 61672-3 Ed.2.0 #20                               | Passed |
| High level stability test - IEC 61672-3 Ed.2.0 #21                         | Passed |
| Long term stability test - IEC 61672-3 Ed.2.0 #15                          | Passed |
| 1/1octave: Relative attenuation - IEC 61260, #4,4 & #5,3                   | Passed |
| 1/3octave: Relative attenuation - IEC 61260, #4,4 & #5,3                   | Passed |

#### Comments

Correct level with associated calibrator is 114.0dB(A).

#### Statement of Conformance

The sound level meter submitted has successfully completed the periodic tests of the standard listed for the environmental conditions under which the tests were performed. As public evidence(1) was available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with the manufacturer's standard to demonstrate that the model of sound level meter fully conformed to the requirements of the said standard, the sound level meter submitted for testing conforms to the relevant class of the said standard.

(1 - evidence is held on file at the calibration laboratory)

#### Filter Calibration

The filter functions have been found to conform, by electrical testing, to the relative attenuation requirement of the standard noted over the range of frequencies shown in the attached test report.

#### Observations

No information on the uncertainty of measurement, required by the listed standard, for the correction data was made available in the instruction manual / data sheets from the equipment manufacturer / supplier for the test object. The uncertainty of measurement of the correction data was therefore assumed to be the maximum-permitted uncertainty given in IEC 62585 for the corresponding free-field correction data and for a coverage probability of 95 %.

---

## Appendix 5 Calibration Certificates

### Certificate of Calibration and Conformance

Continuation of Certificate number: U39995

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor  $k = 2$ , providing a coverage probability of approximately 95 %. The uncertainty evaluation has been carried out in accordance with UKAS requirements. Details of the uncertainty for each measurement are available from the Calibration Laboratory upon request. Details of the sources of corrections and their associated uncertainties that relate to this verification are contained within the test report accompanying this certificate.

#### Decision Rule

The decision rules will be applied in accordance with the procedure as described in BS EN 61672-3:2013.

A PASS or PASSED statement indicates that the instrument conforms with the relevant accuracy requirements of the testing standard AND the expanded measurement uncertainty ( $k = 2$  for approximately 95 % coverage probability) is no greater in magnitude than the accuracy requirements defined in BS EN IEC 61260:1996 standard.

This certificate relates only to the items tested above.

\*\* End of Certificate \*\*

## Appendix 5 Calibration Certificates

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: **U39993**

Test Object: **Sound Calibrator**

Producer: **Larson Davis**  
Type: **CAL200**  
Serial number: **17115**  
Customer: **RP Acoustics Ltd**  
Address: **1 Dobcroft Close,  
Sheffield, South Yorkshire. S11 9LL.**  
Contact Person: **Richard Pennell**  
Order No:

| Measurement Results      | Level<br>dB   | Level Stability<br>dB | Frequency<br>Hz | Distortion<br>% |
|--------------------------|---------------|-----------------------|-----------------|-----------------|
| Measurement 1            | 114.11        | 0.01                  | 1000.30         | 0.48            |
| Measurement 2            | 114.11        | 0.01                  | 1000.31         | 0.48            |
| Measurement 3            | 114.11        | 0.01                  | 1000.31         | 0.50            |
| <b>Result (Average):</b> | <b>114.11</b> | <b>0.01</b>           | <b>1000.31</b>  | <b>0.49</b>     |
| Expanded Uncertainty:    | 0.1           | 0.02                  | 1               | 0.1             |
| Degree of Freedom:       | >100          | >100                  | >100            | >100            |
| Coverage Factor:         | 2             | 2                     | 2               | 2               |

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

Pressure: 0 dB/kPa Temperature: 0 dB/°C Humidity: 0 dB/%RH Load volume: 0 dB/mm<sup>3</sup>

| Conditions             | Pressure kPa        | Temperature °C | Humidity %RH   |
|------------------------|---------------------|----------------|----------------|
| Reference conditions   | 101.325             | 23             | 50             |
| Measurement conditions | 102.833 $\pm$ 0.042 | 22.3 $\pm$ 0.2 | 31.6 $\pm$ 0.9 |

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 CalCal2022\LDL200\_17115\_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:    | 17/01/2022 | Reviewed date: | 25/01/2022 |
| Calibration date: | 25/01/2022 | Issued date:   | 25/01/2022 |

#### Technicians: (Electronic certificate)

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

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 5 Calibration Certificates

### Certificate of Calibration and Conformance

Continuation of Certificate number: U39993

Reference Microphone: WSM8 - GRAS-40AG.147852

#### Measurements

The calibrator has been tested as described in the following annexes to BS EN IEC60942:2003 Sound Calibrators; B3.4 for sound pressure level, B3.5 for frequency, B3.6 for total distortion and A4.4 for short term stability of the pressure level.

#### Instruments and Program

A complete list of instruments, hardware and software that have been used for this calibration is available from the calibration laboratory

#### Comments

94dB spot check = 94,11dB. Note this is not UKAS data.

#### Statement of Conformance and Calibration

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 BS EN IEC 60942:2003, the sound calibrator tested is considered to conform to all the class 1 requirements of that BS EN IEC 60942:2003.

\*This evidence is held on file at the calibration laboratory.

#### Notes:

The sound pressure level generated by the calibrator in its ½ inch configuration was measured five times and averaged by a WS2P working standard microphone for class 1 or 2 devices or a LS2P reference microphone for class 0 or LS devices as specified in the International Standard BS EN 61094-4. The results of three replications and the mean of the measurements obtained are given in the measurement results table of this certificate. The frequency and distortion were measured in a similar manner. The figures in BOLD are the final results; a small correction factor may need to be added to the sound pressure level quoted here if the device is used to calibrate a sound level meter that is fitted with a free field response microphone. See manufacturer's handbooks for full details of this and other corrections that may be applicable.

#### Observations:

#### Decision Rule:

The decision rules have been applied in accordance with the procedure as described in BS EN 60942:2003

This certificate relates only to the items tested above.

\*\* End of Certificate \*\*

|                                     |                                  |
|-------------------------------------|----------------------------------|
| Fan Code                            | 45 MaxFan Compac                 |
| Fan Diameter / Size                 | 450 Size / mm                    |
| Fan Speed                           | 2910 rpm                         |
| Velocity                            | 7.5 m/s                          |
| Blade Angle                         | 16°                              |
| Installation Type / Form of Running | D / AB                           |
| Fan Casing                          | Long                             |
| Requested Duty                      | 1.19m³/s @ 622 Pa (static)       |
| Outlet Dynamic Pressure             | 34 Pa                            |
| Duty Shaft Power                    | 1.32 kW                          |
| Max Shaft Power                     | 1.43 kW                          |
| Total Efficiency                    | 60.3 %                           |
| Motor Frame                         | 80 [ Class F ]                   |
| Motor Rating                        | 1.32 kW [ IE2 ]                  |
| Full Load Current                   | 4.71 A                           |
| Starting Current                    | 25.5 A                           |
| Motor Mounting                      | Pad                              |
| Electrical Supply                   | 220-240 Volts 50 Hz 1 Phase      |
| Start Type                          | DOL                              |
| Motor Winding                       | Standard                         |
| Enclosure                           | Standard All                     |
| Erp [FMEG] Rating                   | N 60 (ErP Compliant 2015)        |
| Erp [FMEG] Target                   | N 58                             |
| FMEG Blade Angle [Range]            | 0° [ 0° - 0° ]                   |
| Measurement Category                | D (Total)                        |
| VSD                                 | N                                |
| Fan + Motor Efficiency              | 55.4% (1.67 m³/s @ 515 Pa)       |
| Motor Input Power (ErP)             | 1.55 kW                          |
| SFP value                           | 1.36 W/(l/s) @ Requested Duty    |
| Power from mains                    | 1.63 kW                          |
| Energy Consumption                  | 4904 kWh [3000 h/year]           |
| Running Cost / Year                 | £589                             |
| Air Density                         | 1.2 kg/m³ / 20 °C / 0 m / 50% RH |
| Smoke Venting                       | Non Smoke Venting                |
| Product Number                      | EJ463266                         |

Performance data has been derived from tests carried out in a Flakt Woods laboratory, in accordance with ISO 5801 and is specifically applicable for Ducted installations. When an electronic controller is incorporated, enhanced motor noise can occur - particularly when the operating speed is well below maximum. FWL therefore recommend using an auto transformer speed controller for noise sensitive applications. Bifurcateds are Erp exempt when used continuously at >100C. They are not for use in the EEA at lower temperatures.

The MaXfan Compac includes a preprogrammed inverter drive to operate via 1 phase supply, offering full speed control and optimised performance.

Acoustic data has been derived from tests carried out in a Flakt Woods laboratory, in accordance with BS 848 Pt 2, 1985 / BS EN ISO 5136 under Ducted conditions. The single figure provided is the overall inlet sound pressure level at the specified distance, under spherical, free field conditions.

Acoustic figures for adjusted running speeds have been interpolated and are for reference only.

**Terms and Conditions:** This offer is made subject to the terms and conditions detailed on the accompanying letter.

|           | Sound Spectrum (Hz) |     |     |     |    |    |    |    | Overall |             |
|-----------|---------------------|-----|-----|-----|----|----|----|----|---------|-------------|
|           | 63                  | 125 | 250 | 500 | 1k | 2k | 4k | 8k | Lw*     | Lpa @ 3 m** |
| Inlet*    | 91                  | 89  | 96  | 98  | 95 | 94 | 90 | 87 | 103     | 81          |
| Outlet*   | 93                  | 89  | 98  | 99  | 95 | 94 | 90 | 87 | 104     | 81          |
| Breakout* | 83                  | 71  | 76  | 76  | 70 | 66 | 68 | 63 | 85      | 57          |

\* Lw dB re 10<sup>-12</sup> W  
 \*\* dBA re 2x10<sup>-5</sup> Pa  
 Sound data at ducted duty.

|                                     |                                     |
|-------------------------------------|-------------------------------------|
| Fan Code                            | 40JM/16/4/5/40                      |
| Fan Diameter / Size                 | 400 Size / mm                       |
| Blades                              | 5                                   |
| Fan Speed                           | 1420 rpm                            |
| Velocity                            | 8.0 m/s                             |
| Blade Angle                         | 40°                                 |
| Installation Type / Form of Running | D / B                               |
| Fan Casing                          | Long                                |
| Requested Duty                      | 1m³/s @ 110 Pa (static)             |
| Outlet Dynamic Pressure             | 38 Pa                               |
| Duty Shaft Power                    | 0.265 kW                            |
| Max Shaft Power                     | 0.271 kW                            |
| Total Efficiency                    | 56.3 %                              |
| Pitch Angle Range                   | 34° - 40°                           |
| Motor Frame                         | BT9 (Sized at 1.2kg/m3 Air Density) |
| Motor Grade                         | IE1                                 |
| Motor Rating                        | 0.250 kW                            |
| Full Load Current                   | 1.56 A                              |
| Starting Current                    | 3.45 A                              |
| Motor Mounting                      | Pad                                 |
| Electrical Supply                   | 220-240 Volts 50 Hz 1 Phase         |
| Start Type                          | DOL                                 |
| Motor Winding                       | Standard                            |
| Enclosure                           | Standard All                        |
| ErP [FMEG] Rating                   | N 51 (ErP Compliant 2013)           |
| ErP [FMEG] Target                   | N 50                                |
| Measurement Category                | D                                   |
| Efficiency Category                 | Total                               |
| Fan + Motor Efficiency              | 42.3% (1.28 m³/s @ 121 Pa)          |
| Motor Input Power (ErP)             | 0.365 kW                            |
| SFP value                           | 0.38 W/(l/s)                        |
| Energy Consumption                  | 758 kWh (2000 h/year)               |
| Running Cost / Year                 | £68                                 |
| Air Density                         | 1.2 kg/m³ / 20 °C / 0 m / 50% RH    |
| Smoke Venting                       | Non Smoke Venting                   |
| Product Number                      | EJ411452                            |

|                                | <b>Sound Spectrum (Hz)</b> |     |     |     |    |                                 |    |    | <b>Overall</b> |           |
|--------------------------------|----------------------------|-----|-----|-----|----|---------------------------------|----|----|----------------|-----------|
|                                | 63                         | 125 | 250 | 500 | 1k | 2k                              | 4k | 8k | Lw*            | LpA @ 3 m |
| Inlet*                         | 75                         | 73  | 71  | 70  | 65 | 62                              | 58 | 53 | 79             | 51        |
| Outlet*                        | 76                         | 75  | 71  | 70  | 66 | 64                              | 60 | 55 | 80             | 52        |
| Breakout*                      | 66                         | 60  | 51  | 49  | 40 | 35                              | 35 | 32 | 67             | 30        |
| * Lw dB re 10 <sup>-12</sup> W |                            |     |     |     |    | ** dBA re 2x10 <sup>-5</sup> Pa |    |    |                |           |

Acoustic data has been derived from tests carried out in a Flakt Woods laboratory, in accordance with BS 848 Pt 2, 1985 / BS EN ISO 5136 under Ducted conditions. The single figure provided is the overall Inlet sound pressure level at the specified distance, under spherical, free field conditions. Breakout levels stated are estimated from induct sound power levels and are provided for guidance.

1 Dobcroft Close, Sheffield, S11 9LL. Tel: 07786 735282 e-mail: info@rpacoustics.co.uk. Registered No.: 11312952

## Appendix 6 Fume Extraction System Details 2D Silencer



### silencers

Elta offer 2 types of cylindrical silencers as standard;  
Type ENP (without pod) and EP (with pod).

#### construction

Both types are rigidly constructed in galvanised sheet steel, with a highly absorbent sound attenuating lining between the outer casing and the inner perforated steel lining. The end faces of the silencer have a series of threaded holes for direct mounting to the LC/SC fan fixing flange/flexible collar. The EP (podded versions) will provide an improved level of attenuation. The inner acoustic pod is constructed from perforated steel sheet with a sound absorbent in-fill.

Melinex lined silencers available on request.

3 options of each type can be provided with differing lengths – 1D = 1 times fan diameter, 1.5D = 1.5 times fan diameter or 2D = 2 times fan diameter.

#### silencer attenuation

To determine the sound level of a fan fitted with a silencer, the dynamic insertion loss should be subtracted from the sound power level spectrum (dBW) of the LC and SC fan. This should be carried out for the entire octave band mid-frequency spectrum as published in the Elta fans characteristic data (obtainable on request).

The fan dBW ratings and silencer attenuation apply equally to in duct applications, with a silencer connected between the fan and the duct system.

#### important note!

In highly noise sensitive areas, where circular silencers cannot achieve the necessary attenuation levels, Elta can design and build splitter silencers for greater effect.

The velocity through EP silencers should not exceed 15m/s.

| Silencer Type | Approx dBa reduction |
|---------------|----------------------|
| 1DENP         | 7-10                 |
| 2DENP         | 10-13                |
| 1DEP          | 12-15                |
| 2DEP          | 15-18                |

#### dynamic insertion loss

The silencer attenuation is defined as the "dynamic insertion loss". The values quoted in the table below represent the difference between the sound power level of a fan and silencer combination (dBW) and that of the fan alone (dBW).

The dynamic insertion losses shown are the attenuations recorded under ideal working conditions. The achieved attenuation will vary according to the air velocity and flow pattern in the airways. Noise regeneration can occur at higher velocities, especially in EP silencers.

| Fan Sizes | Silencer Length | Silencer Type | Insertion Loss @ Octave Band (Hz) |     |     |     |     |     |     |     |
|-----------|-----------------|---------------|-----------------------------------|-----|-----|-----|-----|-----|-----|-----|
|           |                 |               | 63                                | 125 | 250 | 500 | 1k  | 2k  | 4k  | 8k  |
| 315-560   | 1D              | ENP           | -2                                | -5  | -6  | -9  | -13 | -11 | -6  | -6  |
|           |                 | EP            | -4                                | -6  | -8  | -11 | -18 | -19 | -17 | -14 |
|           | 1.5D            | ENP           | -3                                | -6  | -9  | -13 | -18 | -14 | -9  | -8  |
|           |                 | EP            | -5                                | -8  | -10 | -16 | -22 | -22 | -20 | -18 |
|           | 2D              | ENP           | -4                                | -6  | -12 | -17 | -23 | -17 | -12 | -10 |
|           |                 | EP            | -7                                | -10 | -12 | -21 | -26 | -26 | -24 | -22 |
| 630-800   | 1D              | ENP           | -3                                | -4  | -9  | -15 | -15 | -8  | -7  | -6  |
|           |                 | EP            | -4                                | -6  | -8  | -17 | -23 | -20 | -18 | -10 |
|           | 1.5D            | ENP           | -4                                | -6  | -11 | -18 | -18 | -10 | -9  | -7  |
|           |                 | EP            | -6                                | -8  | -12 | -22 | -27 | -25 | -23 | -14 |
|           | 2D              | ENP           | -6                                | -8  | -13 | -22 | -22 | -13 | -12 | -9  |
|           |                 | EP            | -8                                | -11 | -16 | -27 | -32 | -31 | -29 | -19 |
| 900-1400  | 1D              | ENP           | -3                                | -4  | -9  | -14 | -13 | -7  | -7  | -6  |
|           |                 | EP            | -4                                | -6  | -11 | -20 | -18 | -15 | -13 | -11 |
|           | 1.5D            | ENP           | -4                                | -6  | -11 | -17 | -15 | -9  | -9  | -7  |
|           |                 | EP            | -6                                | -8  | -14 | -23 | -22 | -20 | -17 | -13 |
|           | 2D              | ENP           | -6                                | -8  | -13 | -21 | -18 | -12 | -11 | -9  |
|           |                 | EP            | -8                                | -11 | -18 | -26 | -27 | -26 | -22 | -16 |
| 1600-2000 | 1D              | ENP           | -4                                | -5  | -10 | -14 | -11 | -6  | -6  | -5  |
|           |                 | EP            | -8                                | -9  | -14 | -19 | -17 | -11 | -10 | -9  |
|           | 1.5D            | ENP           | -4                                | -6  | -11 | -16 | -14 | -9  | -8  | -7  |
|           |                 | EP            | -9                                | -11 | -17 | -22 | -22 | -18 | -13 | -11 |
|           | 2D              | ENP           | -5                                | -7  | -12 | -19 | -18 | -13 | -11 | -9  |
|           |                 | EP            | -10                               | -14 | -21 | -25 | -27 | -25 | -16 | -14 |

## Appendix 7 Directivity Index

