
Our Reference: NIA&ORA/1275/24/350/v1.0/108 Bradford Road, Huddersfield

2nd August 2024

Mr Rashid Moghul
363 Architecture
985 Leeds Road
Bradford
BD3 7ND



Dear Sirs

**NOISE IMPACT AND ODOUR RISK ASSESSMENT FOR A PROPOSED RESTAURANT AT
108 BRADFORD ROAD, HILLHOUSE, HUDDERSFIELD, HD1 6LJ**

1.00 SCOPE OF CONSULTANCY SERVICES

- 1.01 RP Acoustics Limited has been commissioned by 363 Architecture to carry out a noise impact and odour risk assessment for a proposed restaurant at ground floor level at 108 Bradford Road, Hillhouse, Bradford, HD1 6LJ (hereafter referred to as the application site).
- 1.02 The noise impact and odour risk assessment has been undertaken to accompany a Planning Application to be submitted to Kirklees Council.
- 1.03 The scope of the noise impact and odour risk assessment is as follows:
- Determine ambient and background noise levels at the application site
 - Assess the noise impact of the kitchen extraction system
 - Assess the noise impact of restaurant patrons
 - Determine the odour potential associated with the restaurant
 - Determine the odour risk assessment
 - Provide recommendations for odour control requirements
- 1.04 This report sets out the methodology and findings of the assessments. It has been prepared on behalf of 363 Architecture 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 363 Architecture 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 PROPOSED DEVELOPMENT

- 2.01 The application site is located in a mixed commercial and residential use setting approximately 1.5 kilometres to the north of Huddersfield town centre (the application site location plan is reproduced in Appendix 2). It is located in a busy suburb with the A641 Bradford Road being heavily trafficked during the daytime, evening and night time periods. There are a number of late opening hot food takeaways in the locality, such as Rajas Fartown (268 Bradford Road) which is open 1100 to 0100 hours, 7 days a week.
- 2.02 The existing ground floor retail unit is to be converted into a restaurant / takeaway serving predominantly fried chicken (note: no alcohol to be served). The proposed opening hours are to 2 am. The dining area is relatively modest with circa 32 covers. The kitchen extraction flue is to extend through the roof of the single storey part of the building at the rear and extend up the rear façade to at least 1 metres above the eaves. The extraction fan is to be housed internally within the kitchen area of the proposed restaurant / takeaway. The upper floor use is to remain as dwelling flats (for reference within the same blue line land holding ownership). The proposed floor plans and elevations are reproduced in Appendix 3.

3.00 BASELINE NOISE SURVEY

3.01 A baseline noise survey was undertaken at the application site on the late evening of Sunday 28th July 2024. For the purpose of the baseline noise survey, the following noise monitoring positions were adopted (see Appendix 4):

- NMP1 was located at 1st floor level on Bradford Road façade (reflective field environment)
- NMP2 was located at 1st floor level in the rear courtyard (free field environment)

3.02 Noise measurements were undertaken using an NTi Audio XL2 Type 1 integrating sound level meters. A 90 mm windshield was fitted for all measurements. The measurement system calibration was verified immediately before and after measurement sessions with no drift in calibration level noted (calibration certificates reproduced in Appendix 5 for reference).

3.03 Measurements consisted of A-weighted broadband parameters, together with linear third octave band L_{eq} levels, with a logging interval of 1 second. The following table contains a summary of the relevant measurement data, rounded to the nearest decibel (note: a – 3 dB façade enhancement correction has been applied to NMP1).

Table 3.1 – Baseline Noise Measurement Data

Position	Time	LAeq (dB)	LA90 (dB)	LA10 (dB)	LA1 (dB)	LAFMax (dB)	Comments
NMP1	2200–2300	65	49	69	77	80	A641 Bradford Road traffic dominant; pedestrians due to night time economy of area
	2300–0000	63	47	67	77	81	
	0000–0100	61	44	65	76	80	
	0100–0200	60	42	63	75	78	
60 dB LAeq and 42 dB LA90 (0100–0200)							
NMP2	2200–2300	49	46	53	65	68	A641 Bradford Road traffic dominant (but fully screened from road)
	2300–0000	46	43	50	65	68	
	0000–0100	44	43	48	64	67	
	0100–0200	44	41	47	62	65	
44 dB LAeq and 41 dB LA90 (0100–0200)							

3.04 The ambient and background noise levels are considered wholly commensurate with the application site setting.

4.00 GOVERNMENT POLICY, ACOUSTIC STANDARDS AND GUIDANCE

National Planning Policy Framework

4.01 The National Planning Policy Framework (NPPF), which was revised in July 2021, states in Paragraph 174 that '*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.*'

National Planning Policy Framework: Planning Practice Guidance on Noise

4.02 The National Planning Policy Framework Planning Practice Guidance on Noise (NPPF-PPGN) states that the subjective nature of noise means that there is not a simple relationship between noise levels and the impact on those affected. This will depend on how various factors combine in any particular situation. These factors include: The source and the absolute level of noise; the content of the noise; and the general character of the noise. The NPPF-PPGN presents a table of noise exposure hierarchy, which relates the NOAEL, LOAEL and SOAEL to the subjective perception of noise and examples of outcomes (reproduced in the table overleaf).

Table 4.1 – Summary of Noise Exposure Hierarchy

Perception	Examples of Outcomes	Increasing Effect Level	Action
No Observed Adverse Effect Level (NOAEL)			
Not Noticeable	No Effect	No Observed Effect	No specific measures required
Noticeable and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level (LOAEL)			
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level (SOAEL)			
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

BS 4142:2014 Methods for Rating and Assessing Industrial and Commercial Sound

- 4.03 The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs. An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context.
- 4.04 Typically, the greater this difference, the greater the magnitude of the impact. A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context. A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context. 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.
- 4.05 It is also important to consider the absolute level of sound. For a given difference between the rating level and the background sound level, the magnitude of the overall impact might be greater for an acoustic environment where the residual sound level is high than for an acoustic environment where the residual sound level is low. Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night.

5.00 NOISE ASSOCIATED WITH PROPOSED RESTAURANT / TAKEAWAY

Control of Noise Associated with the Kitchen Extraction System

- 5.01 The kitchen extraction system is to incorporate a Solar & Palau (S&P) CVAT/4-900/500 ND1.1 centrifugal acoustic cabinet fan (also known as a box fan). The acoustic cabinet fan is manufactured from aluminium profiles and double thickness panels internally lined with 25 mm thickness of fireproof fibreglass acoustic insulation (see Appendix 6). The sound power level at the **maximum working point** at the outlet exhaust is 83 dB (without a silencer); the casing breakout is 68 dB L_{WA} (less than 60 dB(A) inside the kitchen itself). Such levels are not loud. The acoustic cabinet fans are relatively quiet compared to a typical standard uncased axial fan used for extraction. Furthermore, the acoustic cabinet fan is to be located inside the kitchen itself (and can be mounted vertically or horizontally and is to include anti-vibration mountings)
- 5.02 The S&P acoustic cabinet fan (which is broadband in nature and does not warrant an acoustic feature correction) is also to include a 2D cylindrical silencer on the exhaust side (see Appendix 7) and a 1D cylindrical silencer on the inlet side.
- 5.03 The noise level from the extract flue at the windows of the surrounding first floor dwelling flat(s) is (frequency) dependent upon the fan sound power level, silencer insertion loss, directivity correction as the exhaust is set at circa 165 degrees and 1.5 metres from the nearest first floor window (see Appendix 8 for the directivity corrections), and distance correction. The exhaust noise level at the nearest window of the overlying dwelling flat is calculated in the following table.

Table 5.1 – Calculated Noise Levels Outside 2nd Floor Bedroom Window

Item	Octave band (Hz)	63	125	250	500	1000	2000	4000	8000	A
A	Outlet SWL(dB)	58	73	74	76	77	75	67	57	83
B	A-Weighting Correction Outlet SWL (dBA)	-26	-16	-9	-3	0	1	1	-1	
C	Distance Attenuation at 1.5 metres ($=20 \cdot \log(1.5)$)	4	4	4	4	4	4	4	4	
D	Directivity Index (receptors above outlet, 165°)	5	4	10	15	20	28	34	39	
E	2D Silencer Attenuation	4	8	12	17	23	17	12	10	
F	Correction SWL to SPL	11	11	11	11	11	11	11	11	
	Resultant SPL dB(A) at receptor (A+B-C-D-E-F)	8	30	28	26	19	16	7	-8	33

- 5.04 The extraction flue noise level outside the 1st floor residential dwelling flat window at the rear façade is calculated at 33 dB(A). This is 8 decibels below the weekend night time background noise level of 41 dB L_{A90} (0100–0200). In accordance with BS 4142, this represents a negligible impact. Furthermore, good internal ambient noise levels will be achieved with windows open.
- 5.05 In accordance with the National Planning Policy Framework Planning Practice Guidance on Noise (NPPF-PPGN), the noise of the extraction flue is categorised as being at a No Observed Adverse Effect Level (NOAEL) as '*Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.*'

Noise Impact of Patrons

- 5.06 The A641 Bradford Road is trafficked throughout the daytime, evening and night time and passing vehicles regularly generate maxima around 75 dB L_{AFMax} and higher.
- 5.07 The application site is also located in an area with a vibrant night time economy with regular vehicles and pedestrians into the early hours frequenting the existing hot food takeaways in the locality.

- 5.08 Considering that the noise level of human voice is circa 65 dB L_{AFMax} at 1 metre, the resultant level at a first floor dwelling flat bedroom window on the A641 Bradford Road façade is calculated at 51 dB L_{AFMax} (65 dB – 20*log(5 metres up to bedroom window)). Such a level is negligible. Furthermore, good internal maximum noise levels will be achieved with windows open (it should be noted that bedroom windows likely to remain closed due to road traffic noise although it is understood that the dwelling flats on the A641 Bradford Road façade have been fitted with enhanced acoustic glazing and ventilation).
- 5.09 In accordance with the National Planning Policy Framework Planning Practice Guidance on Noise (NPPF-PPGN), the noise of the extraction flue is categorised as being at a No Observed Adverse Effect Level (NOAEL) as '*Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.*'

Separating Floor

- 5.10 It is understood that the separating floor between the first and ground floor is of a basic timber construction (floorboards over timber joists with insulation between joists and a plasterboard ceiling).
- 5.11 In order to validate this, an airborne sound insulation test was undertaken of the existing separating floor and the result was 39 dB $D_{nT,w}+C_{tr}$ (which is indicative of a basic timber floor).
- 5.12 The existing separating floor is to be upgraded as follows (note: existing floor to ceiling height is 2510 mm):
- 15 mm fire line plasterboard to existing ceiling
 - 38 mm timber battens at 400 mm centres perpendicular to timber floor joists with 25 mm dense mineral wool insulation between battens (20 to 60 kg/m³)
 - 30 mm deep metal resilient bar at 400 mm centres perpendicular to timber battens
 - 2 x 12.5 mm sound bloc plasterboard
 - New floor to ceiling height circa 2402 mm
- 5.13 This construction has previously been tested by RP Acoustics Limited and achieved 53 dB $D_{nT,w}+C_{tr}$ (see Appendix 9).
- 5.14 This represents a very high standard of airborne sound insulation and is 10 decibels above the minimum standard set out in Approved Document E 'Resistance to the Passage of Sound' (ADE) for conversions.
- 5.15 Following previous discussions with Mohammed Nasim, Environmental Health, Kirklees Council, it is understood that a 10 dB betterment of ADE is acceptable for dwelling flats above restaurants / takeaways.

6.00 ODOUR RISK ASSESSMENT

- 6.01 The following 'Risk Assessment for Odour' has been derived from criteria outlined by DEFRA 2005, Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems Appendix C. The assessment is carried to accurately score the site according to DEFRA standards. Odour control must be designed to prevent odour nuisance in a given situation. The following score methodology is suggested as a means of determining odour control requirements using a simple risk assessment approach.

Table 6.1 – Risk Assessment for Odour for Proposed Restaurant

Criteria	Rating	Score	Details
Dispersion	Very Poor	20	Low level discharge, discharge into courtyard or restriction on stack
	Poor	15	Not low level but below eaves, or discharge at below 10 m/s
	Moderate	10	Discharging 1m above eaves at 10 to 15 m/s
	Good	5	Discharging 1m above ridge at 15 m/s
Proximity of Receptors	Close	10	Closest sensitive receptor less than 20m from kitchen discharge
	Medium	5	Closest sensitive receptor between 20 and 100m from kitchen discharge
	Far	1	Closest sensitive receptor over 100m from kitchen discharge
Size of Kitchen	Large	5	More than 100 covers or large sized take away
	Medium	3	Between 30 and 100 covers or medium sized take away
	Small	1	Less than 30 covers or small sized take away
Cooking Type (Odour / Grease Loading)	Very High	10	Pub (high level of fried food), fried chicken, burgers or fish and chips
	High	7	Vietnamese, Thai or Indian
	Medium	4	Cantonese, Japanese or Chinese
	Low	1	Most Pubs, Italian, French, Pizza or Steakhouse
Overall Score = 33 = High Level of Odour Control			

Impact Risk	Odour Control Level Requirement	Significance Score
Low / Medium	Low Level Odour Control	Less than 20
High	High Level Odour Control	20 to 35
Very High	Very High Level Odour Control	More than 35

6.02 High level odour control requires:

- a) a canopy to cater for medium loading (0.35 m/s), and
- b) Prefiltration and carbon filtration or Electro Static Precipitation (ESP) with UV Ozone to achieve a 0.2 to 0.4 second residence time.

6.03 A high velocity jet cowl should also be provided as illustrated below.

High Velocity Jet Cowl



7.00 CONCLUSION

- 7.01 A noise impact and odour risk assessment has been undertaken for a proposed restaurant at ground floor level at 108 Bradford Road, Hillhouse, Bradford, HD1 6LJ.
- 7.02 In accordance with the National Planning Policy Framework Planning Practice Guidance on Noise (NPPF-PPGN), the noise of the extraction flue and patrons entering and exiting the proposed restaurant is categorised as being at a No Observed Adverse Effect Level (NOAEL) as *'Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.'*
- 7.03 The separating floor between the first floor dwelling flats and the ground floor restaurant is to be upgraded to provide airborne sound insulation at least 10 decibels better than the minimum requirement of Approved Document E 'Resistance to the Passage of Sound' (ADE). This standard is acceptable to Environmental Health at Kirklees Council in order to safeguard residential amenity.
- 7.04 A scheme of odour abatement has been specified in accordance with good practice in order to safeguard residential amenity.
- 7.05 In conclusion, noise and odour do not pose a constraint to the granting of planning permission.

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

Yours sincerely

Jonathan Rigg
MEng(Hons), AMIOA, Diploma in Acoustics and Noise Control
For RP Acoustics Ltd

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 μPa 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:

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

L_p = sound pressure level in dB; p = rms sound pressure in Pa; and p_0 = reference sound pressure (20 μPa).

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.

$L_{AF \text{ max}}$

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.

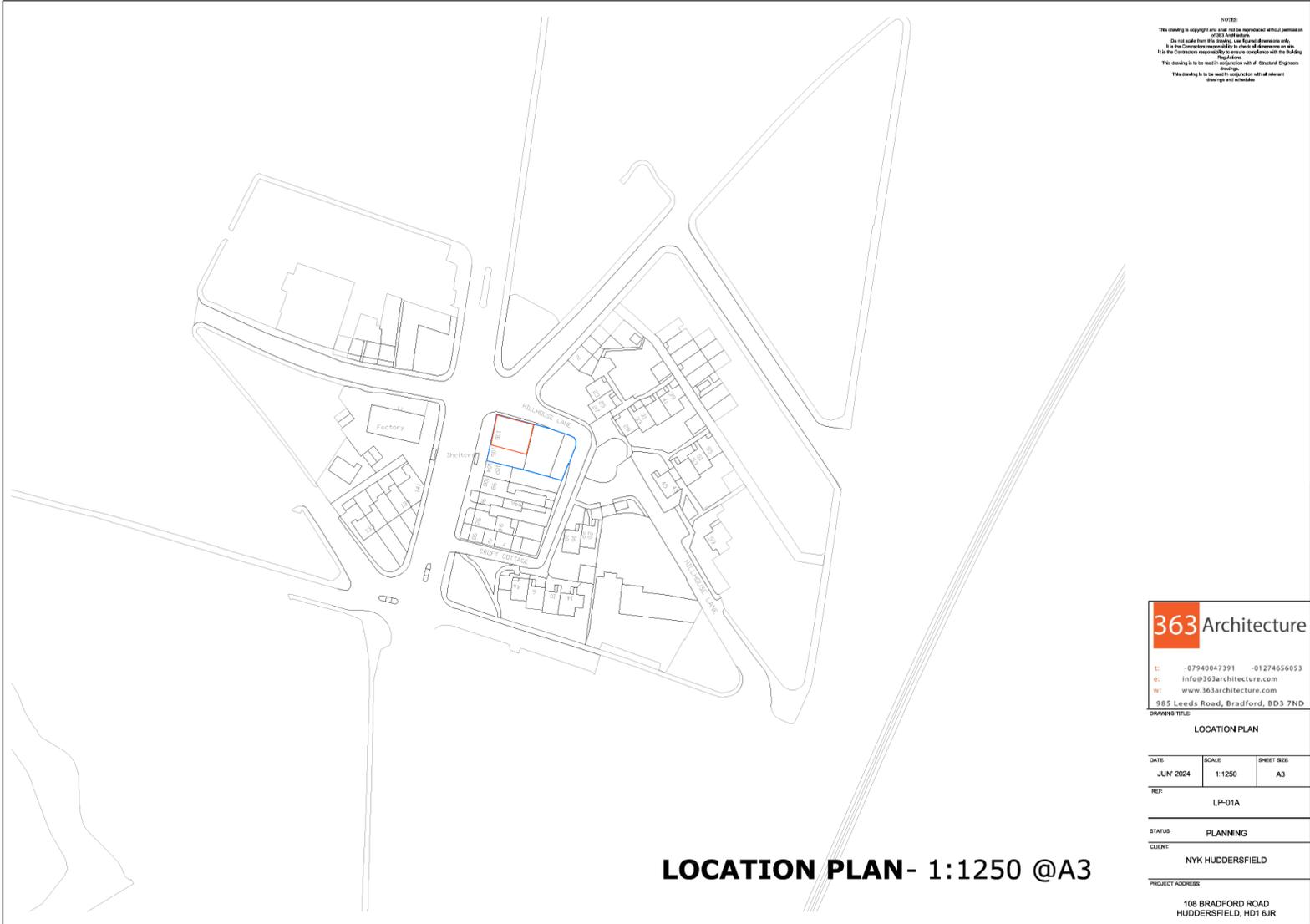
Sound Exposure Level (SEL or L_{AE})

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.

Building Regulations ADE 2003 Standard ($D_{nT,w} + C_{tr}$)

A single-number quantity which characterises the airborne sound insulation between rooms using noise spectrum No. 2 as defined in BS EN ISO 717-1:1997.

APPENDIX 2 APPLICATION SITE LOCATION PLAN



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LOCATION PLAN- 1:1250 @A3

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DRAWING TITLE:
 LOCATION PLAN

DATE	SCALE	SHEET SIZE
JUN 2024	1:1250	A3

REF:
 LP-01A

STATUS: PLANNING

CLIENT: NYK HUDDERSFIELD

PROJECT ADDRESS:
 108 BRADFORD ROAD
 HUDDERSFIELD, HD1 6JR

APPENDIX 3 PROPOSED FLOOR PLANS



4 PROPOSED GF PLAN
1 : 100



2 PROPOSED FF PLAN
1 : 100

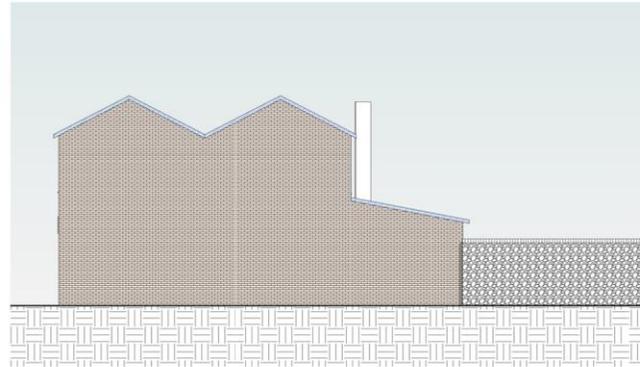


No.	Description	Date					PROJECT			CLIENT		
			363 Architecture				108 BRADFORD ROAD HD1 6JR			Date: 29/08/2024		
			CODE	STATUS	SUITABILITY DESCRIPTION	PURPOSE OF ISSUE	PROPOSED FLOOR PLANS			Project number: PROJ30		Scale (@ A2): 1:100
						PLANNING				Drawn by: MSA	DRAWING NUMBER: PROJ30-XX-XX-ZZ-DR-A-102	REV:
										Checked by: RM		

APPENDIX 3 PROPOSED ELEVATIONS



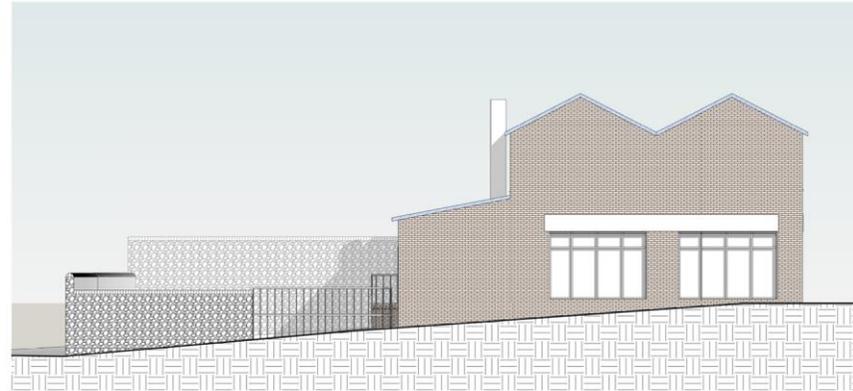
3 PROPOSED SOUTH
1 : 100



1 PROPOSED EAST
1 : 100



2 PROPOSED NORTH
1 : 100

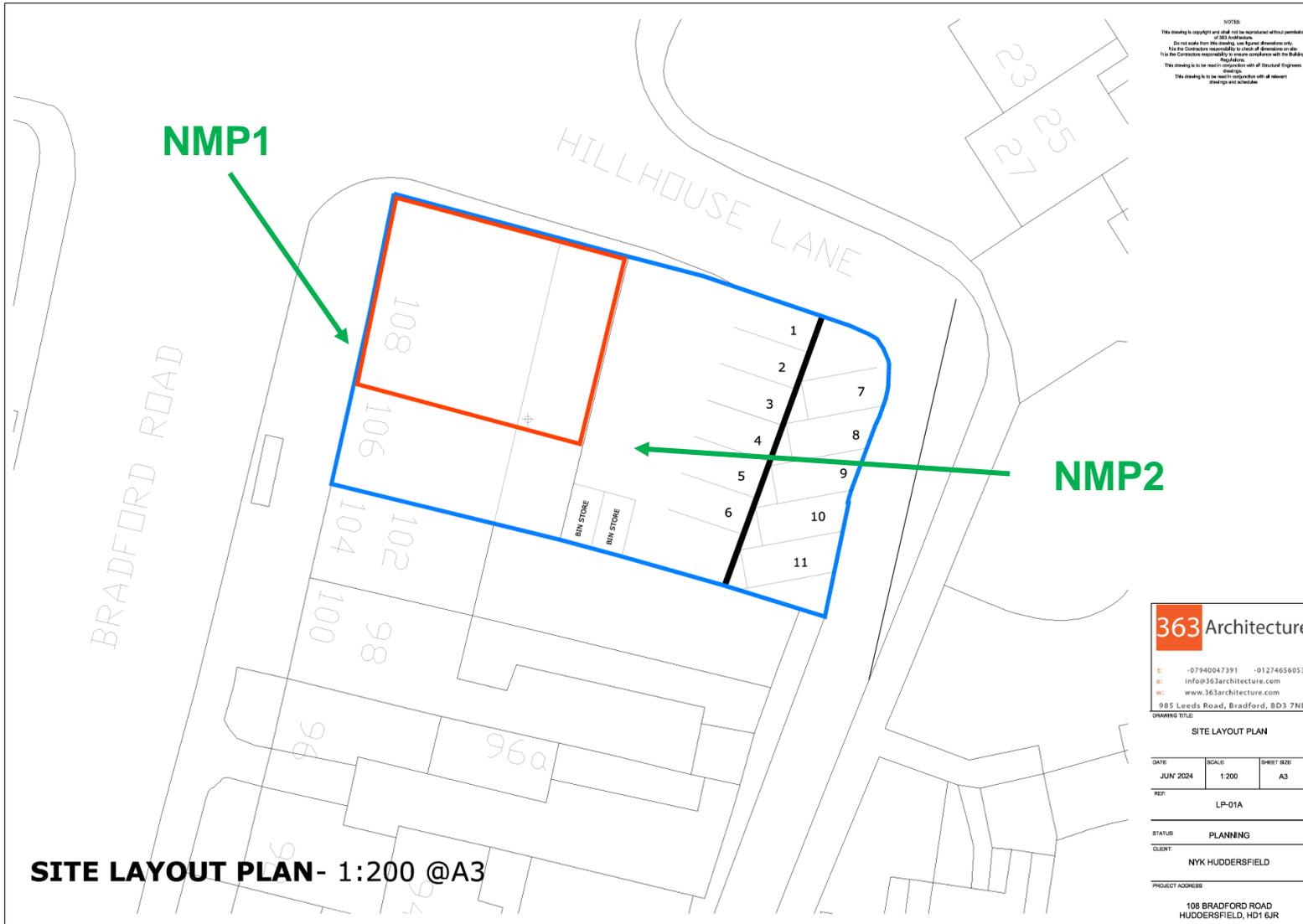


4 PROPOSED WEST
1 : 100

No.	Description	Date			PROJECT	CLIENT		
					108 BRADFORD ROAD HD1 6JR	Date	Project number	Scale (@ A2)
						28/06/2024	PROJ00	1 : 100
					SHEET	Drawn by	DRAWING NUMBER	REV
					PROPOSED ELEVATIONS	MSA		
						Checked by	PROJ30-XX-XX-ZZ-DR-A-202	
						RM		

363 Architecture
CODE STATUS SUITABILITY DESCRIPTION PURPOSE OF ISSUE
 PLANNING

APPENDIX 5 NOISE MONITORING POSITIONS



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DRAWING TITLE:
SITE LAYOUT PLAN

DATE: JUN 2024	SCALE: 1:200	SHEET SIZE: A3
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REF:
LP-01A

STATUS: **PLANNING**

CLIENT:
NYK HUDDERSFIELD

PROJECT ADDRESS:
**108 BRADFORD ROAD
 HUDDERSFIELD, HD1 6JR**

APPENDIX 5
CALIBRATION CERTIFICATE FOR SOUND LEVEL METER (CALIBRATION EVERY 2 YEARS)

Laboratory Location

Campbell Associates Ltd
5b Chelmsford Road Industrial Estate
GREAT DUNMOW, Essex, GB-CM8 1HD
Phone 01371 871030



Certificate of Calibration and Conformance

Certificate number: **U46717**

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. S11 9LL.**

Contact Person: **Richard Pennell**
Order No: **RPA/24/CAL/01**

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	A23855	46716
Calibrator*	Larson Davis	CAL200	17115	U46700
Preamplifier	NTi Audio	MA220	11174	Included

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

Additional items that have also been submitted for verification:

Wind shield N/A
Attenuator N/A
Extension cable N/A

These items have been taken into account wherever appropriate.

Instruction Manual: NTi-Audio XL2 Operating Manual v3.11.02 August 2016 Firmware Version: V4.71 The test object is a single channel instrument.

Conditions	Pressure kPa	Temperature °C	Humidity %RH
Reference conditions	101.325	23	50
Measurement conditions	97.15 ±0.02	22.30 ±0.4	43.48 ±0.65

Calibration Dates:

Received date: 23/01/2024 Reviewed date: 09/02/2024
Calibration date: 09/02/2024 Issued date: 09/02/2024

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 CERTIFICATE FOR SOUND CALIBRATOR (CALIBRATION EVERY YEAR)

Laboratory Location

Campbell Associates Ltd

5b Chelmsford Road Industrial Estate
GREAT DUNMOW, Essex, GB-CM8 1HD
Phone 01371 871030



Certificate of Calibration and Conformance

Certificate number: U46700

Test Object: Sound Calibrator

Producer: Larson Davis
Type: CAL200
Serial number: 17115
Customer: RP Acoustics Ltd
Address: 1 Dobcroft Close,
Sheffield. S11 9LL.

Contact Person: Richard Pennell
Order No:

Measurement Results	Level dB	Frequency Hz	Distortion %
Measurement 1	114.11	1000.36	0.37
Measurement 2	114.11	1000.36	0.37
Measurement 3	114.12	1000.37	0.37
Result (Average):	114.11	1000.36	0.37
Expanded Uncertainty:	0.1	1	0.3
Degree of Freedom:	>100	>100	>100
Coverage Factor:	2	2	2

The stated level is relative to 20 μ Pa. The level is traceable to National Standards.
The stated level is valid at measurement conditions

Conditions	Pressure kPa	Temperature °C	Humidity %RH
Reference conditions	101.325	23	50
Measurement conditions	98.28 \pm 0.01	21.63 \pm 0.35	45.58 \pm 1.8

Calibration Statement

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.

Multi Level Multi Frequency

Refer to page 3 for details of additional levels and frequencies calibrated.

Calibration Dates:

Received date: 23/01/2024 Reviewed date: 09/02/2024
Calibration date: 08/02/2024 Issued date: 09/02/2024

Technicians: (Electronic certificate)

Calibrated by: *Kathryn Brown*

Reviewed by: *Darren Batten*

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APPENDIX 6 S&P ACOUSTIC CABINET FAN

ACOUSTIC CABINET FANS CVAB-N / CVAT-N Series



Range of direct drive backward curved centrifugal cabinet fans designed for ventilation of commercial kitchens and industrial applications. Cabinet fan manufactured from aluminium profiles and double thickness side panels internally lined with 25 mm thickness of fireproof fiberglass acoustic insulation. Circular duct connection flange on the inlet and outlet. CVAB-N/CVAT-N incorporates direct drive backward curved centrifugal impeller, manufactured from aluminium (CVAB-N) or steel (CVAT-N) sheet, with motor fitted inside the air stream.

Motors

CVAB-N
Single-phase external rotor motors 230V 50Hz, IP55, class F, with thermal protection, speed controllable by tension. Working temperature from -40°C to 60°C.

CVAT-N
Three-phase 4 and 6 pole motors 230/400V 50Hz, IP55, class F, with thermal protection (PTC), speed controllable by inverter. Working temperature from -20°C to 40°C.

ATEX versions

On request, explosion proof versions in accordance to ATEX Directive, for three phase models. Working temperature from -20°C to +40°C.

- ATEX Flameproof - Gas
In standard ATEX version flameproof motors are without thermal protection. If used with frequency inverter, flameproof motors with a PTC-type thermal protection must be specified at order.
 - ⊕ II 2G Exd IIB T4
 - ⊕ II 2G Exd IIB+H2 T4 [with motor Exd IIC T4]
- ATEX Increased safety - Gas
⊕ II 2G Exe IIC T3

To select CVAT-N ATEX refer to performance curves, or Easyvent. Note electrical data may vary for ATEX motors.

Specific applications



Versions



Backward curved centrifugal impellers

To prevent accumulation of dirtiness. Dynamically balanced.



Low noise level

Double thickness side panels lined with 25 mm thickness of fireproof fiberglass acoustic insulation.



Robustness

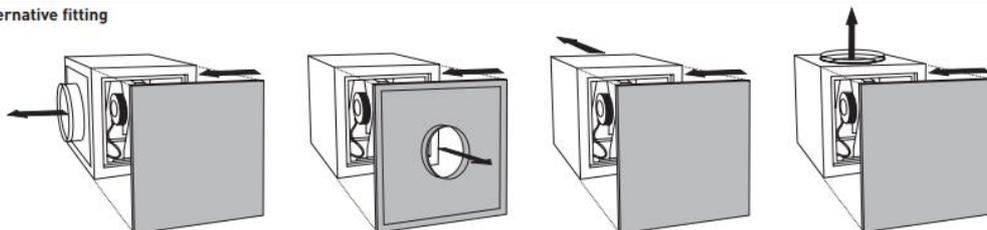
Quality finished aluminium profiles and plastic corners providing a great robustness.



IP55 external terminal box

To ease electrical connection. Only available for CVAB single-phase models. For three-phase models, connection to the motor terminal box.

Alternative fitting



APPENDIX 6 S&P ACOUSTIC CABINET FAN

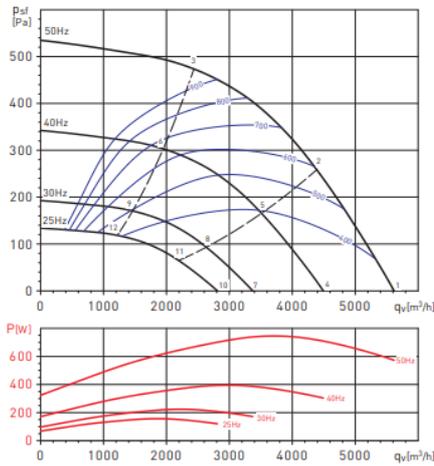
ACOUSTIC CABINET FANS CVAB-N / CVAT-N Series



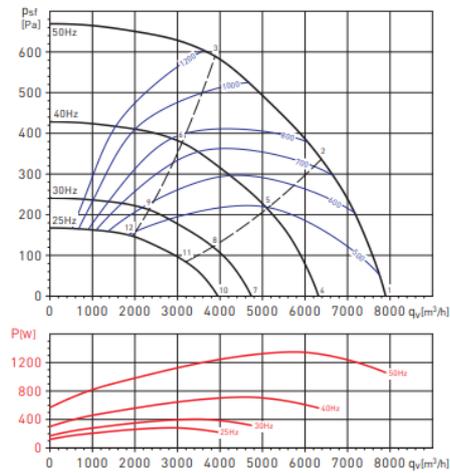
PERFORMANCE CURVES - ACOUSTIC CHARACTERISTICS

- q_v : Airflow in m^3/h .
- p_{st} : Static pressure in Pa.
- P: Input power in W.
- SFP: Specific fan power in $W/m^3/s$ (blue curves).
- Performance data in accordance with ISO 5801 and AMCA 210-99 Standards.

CVAT/4-6000/450N D 0,75kW



CVAT/4-9000/500N D 1,1kW



Working point	63	125	250	500	1000	2000	4000	8000	LwA
1 Inlet	48	71	73	74	71	74	67	62	80
1 Outlet	55	70	72	74	75	72	64	55	80
1 Break-Out	43	59	61	59	58	58	49	41	66
2 Inlet	46	69	72	72	70	69	64	59	78
2 Outlet	52	68	72	70	75	67	60	53	78
2 Break-Out	41	58	60	58	57	53	46	38	65
3 Inlet	49	68	69	70	68	66	61	57	75
3 Outlet	52	65	67	70	67	64	59	52	75
3 Break-Out	44	57	58	56	55	51	44	37	63
4 Inlet	43	66	69	69	67	69	62	57	75
4 Outlet	50	65	67	69	70	68	59	51	75
4 Break-Out	38	54	56	55	54	54	44	37	62
5 Inlet	41	64	67	67	65	64	59	54	73
5 Outlet	47	63	67	65	70	62	56	48	74
5 Break-Out	36	53	55	53	52	48	41	33	60
6 Inlet	44	63	65	65	63	61	57	52	71
6 Outlet	48	61	62	66	62	60	54	47	70
6 Break-Out	40	52	53	51	51	46	39	32	58
7 Inlet	37	60	62	63	60	63	56	51	69
7 Outlet	44	59	61	62	64	61	53	44	69
7 Break-Out	32	48	50	48	47	47	38	30	55
8 Inlet	35	58	61	61	59	57	52	47	67
8 Outlet	41	57	61	59	64	56	49	42	67
8 Break-Out	30	46	49	47	46	42	35	27	53
9 Inlet	38	57	58	58	57	54	50	46	64
9 Outlet	41	54	56	59	56	53	47	41	64
9 Break-Out	33	46	47	45	44	40	33	26	52
10 Inlet	33	56	58	59	56	59	52	47	65
10 Outlet	40	55	57	58	60	57	49	40	65
10 Break-Out	28	44	46	44	43	43	34	26	51
11 Inlet	31	54	57	57	55	54	48	43	63
11 Outlet	37	53	57	55	60	52	45	38	63
11 Break-Out	26	43	45	43	42	38	31	23	50
12 Inlet	34	53	54	54	53	50	46	42	60
12 Outlet	37	50	52	55	52	49	43	37	60
12 Break-Out	29	42	43	41	40	36	29	22	48

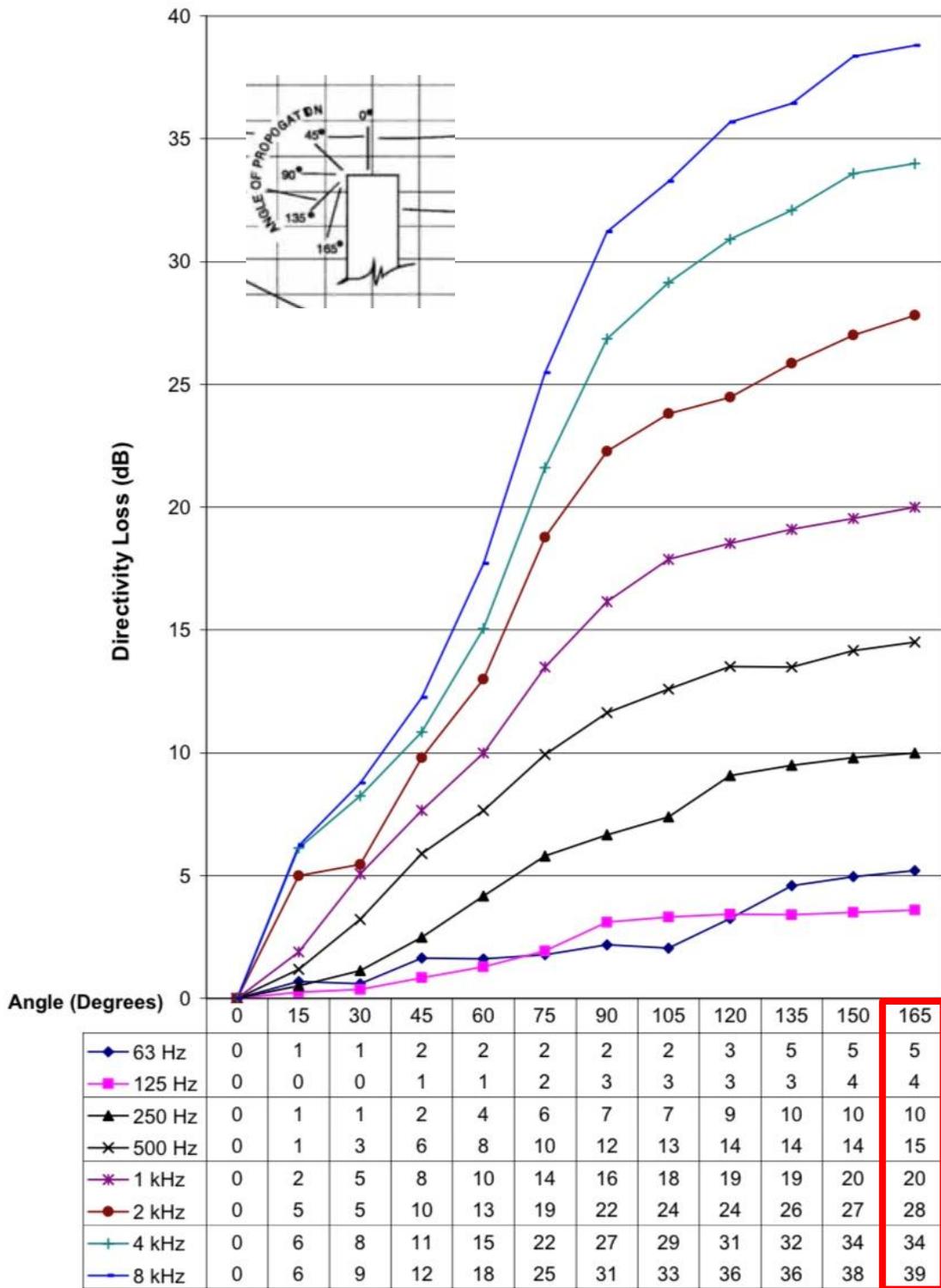
Working point	63	125	250	500	1000	2000	4000	8000	LwA
1 Inlet	51	73	75	75	73	77	68	63	82
1 Outlet	58	73	74	76	77	75	67	57	83
1 Break-Out	46	61	63	61	60	60	50	43	68
2 Inlet	48	73	75	75	73	72	66	61	81
2 Outlet	56	72	77	74	78	71	64	57	82
2 Break-out	43	61	64	61	59	56	49	41	68
3 Inlet	54	73	74	73	72	70	65	61	80
3 Outlet	58	71	72	75	72	69	62	56	79
3 Break-out	49	62	63	59	58	54	48	41	67
4 Inlet	46	68	71	70	68	72	64	58	77
4 Outlet	53	68	70	71	72	70	62	52	78
4 Break-out	41	56	59	56	55	55	45	38	63
5 Inlet	44	68	71	70	68	67	61	56	76
5 Outlet	52	67	72	69	74	66	59	52	77
5 Break-out	39	56	59	56	55	51	44	36	63
6 Inlet	49	68	69	68	67	65	60	56	75
6 Outlet	53	66	67	70	67	64	58	51	74
6 Break-out	44	57	58	54	54	49	43	36	62
7 Inlet	40	62	64	64	62	66	57	52	71
7 Outlet	47	62	63	65	66	64	56	46	71
7 Break-out	35	50	52	50	49	49	39	32	57
8 Inlet	37	62	64	64	62	61	55	50	70
8 Outlet	45	61	65	63	67	60	53	46	71
8 Break-out	32	50	53	50	48	44	37	30	57
9 Inlet	42	61	63	62	60	59	54	50	68
9 Outlet	46	60	61	64	61	57	51	45	68
9 Break-out	38	50	52	48	47	43	37	30	56
10 Inlet	36	58	60	60	58	62	53	48	67
10 Outlet	43	58	59	61	62	60	52	42	68
10 Break-out	31	46	48	46	45	45	35	28	53
11 Inlet	33	58	60	60	58	57	51	46	66
11 Outlet	41	57	62	59	63	56	49	42	67
11 Break-out	28	46	49	46	44	40	33	26	53
12 Inlet	39	57	59	58	56	55	50	46	64
12 Outlet	42	56	57	60	57	53	47	41	64
12 Break-out	34	47	48	44	43	39	33	26	52

APPENDIX 7 CYLINDRICAL SILENCER

Dynamic Insertion Loss

Fan Size	Silencer Length	Silencer Type	Insertion Loss @ Octave Band (Hz)							
			63	125	250	500	1k	2k	4k	8k
0250	1D	ENP	-2	-5	-6	-9	-13	-11	-6	-6
		EP	-4	-6	-8	-11	-14	-16	-11	-10
	2D	ENP	-4	-7	-10	-15	-19	-16	-12	-9
		EP	-7	-10	-15	-16	-15	-17	-13	-13
0315-0560	1D	ENP	-2	-5	-6	-9	-13	-11	-6	-6
		EP	-4	-6	-8	-11	-18	-19	-17	-14
	2D	ENP	-4	-8	-12	-17	-23	-17	-12	-10
		EP	-7	-10	-12	-21	-26	-26	-24	-22
0630-0800	1D	ENP	-3	-4	-9	-15	-15	-8	-7	-6
		EP	-4	-6	-8	-17	-23	-20	-18	-10
	2D	ENP	-6	-8	-13	-22	-22	-13	-12	-9
		EP	-8	-11	-16	-27	-32	-31	-29	-19
900-1000	1D	ENP	-3	-4	-9	-14	-13	-7	-7	-6
		EP	-4	-6	-11	-20	-18	-15	-13	-11
	2D	ENP	-6	-8	-13	-21	-18	-12	-11	-9
		EP	-8	-11	-18	-26	-27	-26	-22	-16

APPENDIX 8 DIRECTIVITY INDEX FOR FLUE



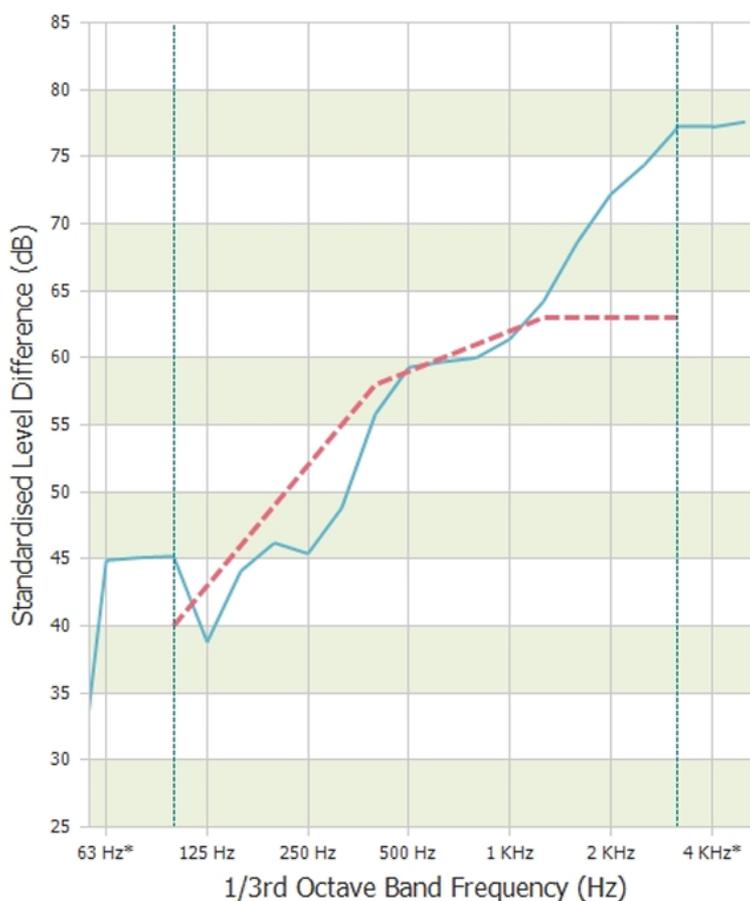
APPENDIX 9 AIRBORNE SOUND INSULATION OF PROPOSED SEPARATING FLOOR UPGRADE

Registered Sound Insulation Test Certificate



Test No: 49607	Test Job Ref: 13895	Testing Org. Name: RP Acoustics Ltd	SITMA Membership No: 9063
Customer Address	Job Address 28 Terminus Road Sheffield England Postcode S7 2LH	Test Type Airborne (Floor) Test Date 09/04/2021 Tester Richard Pennell	Site Type Material Change of Use Site Build Dwelling-House/Flat
Source Room:	Partition:	Receiver Room:	
Description Flat 28B Bedroom 1	FT0001**	Flat 28A Bedroom 2	
Volume / Area 33.0 m3	9.9 m2	25.0 m3	

Frequency (Hz)	DnT 1/3 Octave (dB)	High B Gnd
50 Hz*	23.5	
63 Hz*	44.9	X
80 Hz*	45.1	
100 Hz	45.2	
125 Hz	38.8	
160 Hz	44.1	
200 Hz	46.2	
250 Hz	45.4	
315 Hz	48.8	
400 Hz	55.8	X
500 Hz	59.3	
630 Hz	59.7	
800 Hz	60.0	X
1 KHz	61.4	X
1.25 KHz	64.2	X
1.6 KHz	68.6	X
2 KHz	72.2	X
2.5 KHz	74.4	X
3.15 KHz	77.2	X
4 KHz*	77.2	X
5 KHz*	77.6	X



Evaluation based on field measurement using results obtained by an engineering method

*Outside scope of accreditation

Above graph shows frequency range according to the curve of reference values within ISO 717-1

$D_{nT,w}(C; C_{tr})$ [dB]: 59 (-2; -6) dB
 $D_{nT,w} + C_{tr}$ [dB]: 53 dB
 Minimum Pass Level [dB]: 43 dB

PASS

Adverse Aggregated Deviations [dB]: 25.8 dB

Partition Detail: Existing timber floor, new 15 mm fireboard, 38 mm timber batten + insulation, 30 mm resilient bar, 2 x 12.5 mm sound board

Test Exceptions (if any):