NOISE IMPACT ASSESSMENT

BS 4142:2014+A1:2019

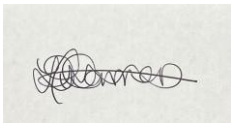
Commercial Noise:
Proposed Restaurant/Cafe



REPORT DETAILS

Site Address	57 Wood St, Earl Shilton, Leicester, LE9 7NE
Report Title	Noise Assessment: Proposed Restaurant/Cafe
Project No.	NALPRO101125.1b
Consultant Contact	jonathan@noiseassessments.co.uk

QUALITY ASSURANCE

Issue No.	Status	Issue Date	Comments	Author	Approved
1	FINAL	15/03/26	-		
2	FINAL	15/04/26	Updated based on council comments	J Mape BSc (Hons) PgDip IOA Cert. Environ. Noise **Noise Consultant**	D Warren **Director**

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1. Proposal

1.1 A ground and first floor commercial property applying to operate as a pizza/burger style restaurant/cafe seeks planning permission for its extraction system for the change of use of an existing premises (formerly a barber shop, to a Class E(b) restaurant/café to confirm that its external flue meets noise control guidelines. The client has completed a noise assessment at 57 Wood St, Earl Shilton, Leicester LE9 7NE.

1.2 No music or TV is proposed as part of the operation.

1.3 A noise assessment is required to assess the likely noise impact from noise generated from the extractor fan unit at the rear of the site with the air vented at ground floor level to terminate 2m above the eaves during the daytime.

1.4 The extract fan inside the kitchen and the discharge flue are insulated to stop further noise breakout. The extract ducting is rigid in construction and installed with anti-vibration mountings. Large section ducts may include bracing or stiffeners to prevent drumming. Lined or lagged ducts, including bends, elbows or spigots, may be required if additional noise reduction is necessary.

1.5 The primary internal noise source from the ground and first floor is customers/staff voices, chopping of food within the restaurant.

1.6 Breakout noise to the adjoining residents has also been assessed.

Consultant

1.7 Jonathan has experience in environmental, noise and vibration monitoring, acoustic consultancy and impact assessment gained over a period of 21 years in the industry, across the UK, Australia, Brunei, Turkey and the Middle East. He has a Degree in Environmental Science, Postgraduate Diploma in Environmental Monitoring. He has also completed the IOA Certificate in Environmental Noise, from the University of Liverpool.

1.8 Jonathan specialises in the measurement and assessment of noise and vibration for a wide range of planning applications, including those requiring EIA, across the industrial, commercial, residential, and mineral extraction sectors. Jonathan is also involved in undertaking various aspects of indoor occupational monitoring and reporting for projects relating to worker health.

2. Existing Context

2.1 The site (ground and first floor level) is set within a commercial row of 2-storey attached buildings. The site is surrounded by residential apartments and commercial unit, adjacent to a main road.

2.2 The environmental health department of the local planning authority is likely to raise concerns of noise emissions from the use of the fan extraction unit venting on sensitive residential properties during the daytime.

3. Criteria

3.1 The following targets have been selected in accordance with 'BS 4142:2014+A1:2019 – Methods for rating and assessing industrial and commercial sound.' This will be achieved when the Rating Level is below the representative background sound level.

3.2 The local council require that operational noise from the restaurant space on the ground and first floor should not exceed NR15 Leq,T, within the existing residential apartments through the walls.

3.3 The NR15 criterion are spectrum-based criterion, which require that the maximum noise level at a range of frequencies should not be exceeded as indicated in the tables below.

Table 1: NR15

	Octave Centre-Frequency Band, Hz						
	63	**125**	**250**	**500**	**1k**	**2k**	**4k**
NR15	47.0	35.0	26.0	19.0	15.0	12.0	9.0

3.4 Whilst there are no prescribed standards for the assessment of noise impact where human voice is the primary source, reference can be made to 'BS8233:2014 – Guidance on sound insulation and noise reduction for buildings' [British Standards Institution] which gives guideline criteria for internal ambient noise levels in residential dwellings.

4. Noise Policy and Guidance

Noise Policy Statement for England (NPSE)

4.1 The NPSE sets out the Government's policy on noise and includes the long-term vision of promoting good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.

4.2 This long-term vision is supported by the following aims:

4.3 Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- avoid significant adverse impacts on health and quality of life;
- mitigate and minimise adverse impacts on health and quality of life; and
- where possible, contribute to the improvement of health and quality of life.

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

- NOEL (No Observed Effect Level) – this is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise;
- LOAEL (Lowest Observed Adverse Effect Level) – this is the level above which adverse effects on health and quality of life can be detected.

4.5 Extending these concepts further, NPSE leads to the concept of a significant observed adverse effect level:

- SOAEL (Significant Observed Adverse Effect Level) – this is the level above which significant adverse effects on health and quality of life occur.

4.6 NPSE acknowledges that it is not possible to have a single objective noise-based measure that defines NOEL, LOAEL and SOAEL that is applicable to all sources of noise in all situations. It is therefore suggested that more specific advice from other applicable noise standards and guidance could be employed to determine suitable noise level criteria within the overall principles of the NPSE.

National Planning Policy Framework (NPPF)

4.7 The revised NPPF was updated in December 2024 and sets out the government's planning policies for England and how these are expected to be applied. This document replaces the first NPPF published in March 2012 and includes minor clarifications to the revised version published in July 2018, February 2019, July 2021, and 2023.

4.8 Where issues of noise impact are concerned the NPPF provides brief guidance in Chapter 15 '*Conserving and enhancing the natural environment*' as follows:

Paragraph 170:

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

Paragraph 180:

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

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

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

c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.

Paragraph 182:

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

Planning Practice Guidance (PPG)

4.9 PPG is written in support of the NPPF and provides an increased level of specific planning guidance.

4.10 It suggests that noise needs to be considered when new developments may create additional noise and when new developments would be sensitive to the prevailing acoustic environment. It is also suggested that noise should not be considered in isolation and separately from issues such as the economic, social and other environmental dimensions of proposed development.

4.11 Local planning authorities' plan-making and decision taking should take account of the acoustic environment and in doing so consider:

- whether or not a significant adverse effect is occurring or likely to occur;
- whether or not an adverse effect is occurring or likely to occur; and
- whether or not a good standard of amenity can be achieved.

Technical Guidance

BS 4142:2014+A1:2019 – Methods for rating and assessing industrial and commercial sound'

BS4142 Is a recognised standard for assessing the noise impact of fixed plant machinery via relation of noise emissions to current background noise levels.

5. Nearest Sensitive Receptor Locations

5.1 The nearest noise sensitive receptors (NSRs) have been identified as residential apartments at the rear and side of the site.

6. Subjective Impressions

6.1 The noise climate at the rear of the site is dominated road traffic throughout the day and evening including cars and HGVs / LGVs where tyre / road interaction noise. Secondary noise sources have been identified as bird song and people chatting.

7. Measurement Locations

7.1 Unattended background noise measurements were undertaken outside the rear of the nearest sensitive receptor. The data collected during this period has been used to characterise the existing acoustic environment around the site.

7.2 Measurement and NSR locations are shown in figure 1 below:

Figure 1: Site & Measurement Location



Background measurement location M1

Site location

NSR1 (6m)

8. Measurement Procedure

8.1 Noise levels were measured on 26th February 2026. Full measurement times and durations can be found in **Appendix B**.

9. Measurement Equipment

9.1 Measurements were undertaken using a calibrated, Pulsar N45 class 1 sound level meters. Full equipment details can be found in **Appendix C.**

9.2 Measurements at the monitoring locations were 'free field' (no vertical reflective surfaces within 3.5 metres of the microphone) and at a height of between 1.2 – 1.5 metres above ground level. During all measurements the microphone was protected with an outdoor windshield.

9.3 The calibration level of the meters was checked before and after the survey with a sound calibrator with no variation in the levels observed.

9.4 The sound level meter was set to measure various noise parameters including LAeq and LAmax values using a 'fast' time weighting.

9.5 Full calibration details can be provided.

10. Weather Conditions

10.1 Weather conditions were deemed acceptable for background noise measurement. Full meteorological conditions are detailed in **Appendix E**.

11. Noise Source Levels

11.1 The noise level of the extraction unit has been provided by the manufacturer.

11.2 The outlet noise level is tabulated below:

Table 2: Manufacturer Noise Level

Equipment	LAeq (dB)	r, m
Extractor fan outlet	62	3.0

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12. Specific Sound Levels

12.1 The specific sound level is denoted LAs and is the A-weighted, equivalent noise level at the NSR locations over the reference time period.

12.2 The NSRs are located adjacent to and directly above the site, however the location of the extractor flue exit will be above the receptor with no direct line of sight for the apartments above. See Figure 1 for the location of sensitive receptors. Full calculations are shown in **Appendix F**:

12.3 The Specific Sound Level of the air vented from the internal extractor fan unit at the nearest NSR locations at the rear of the site are summarised below:

Table 3: Specific Sound Levels

NSR	Specific Sound Level, Db L_{As}
1 (6m)	51

13. Background Sound Level

13.1 Environmental noise levels were measured on site 26th February 2026.

13.2 The lowest daytime background sound level was measured between 19:00-19:15 as 42 dB LA90,15min.

14. Rating Level

14.1 The specific sound level may be corrected for certain characteristics that make a sound more noticeable at the NSR locations. Corrections for tonality, impulsivity and intermittency may be applied.

14.2 The associated rating penalties and resultant sound rating levels, dB LAr, are tabulated below:

Table 4: Rating Penalties, dB, and Sound Rating Levels

NSR	dB L_{As}	Tonality	Impulsivity	Intermittency	dB L_{Ar}
1	51	3	0	3	57

15. Rating Level Vs Background

15.1 The rating level is to be compared to the background sound level to determine the resultant noise impact in accordance with BS4142:

> A Sound Rating Level at or below the background noise level is indicative of *Low Impact;*
>
> A Sound Rating Level that exceeds the background noise level by around + 5dB is likely an indication of *Adverse Impact*, depending on the context;
>
> A Sound Rating Level that exceeds the background noise level by around + 10dB is likely an indication of *Significant Adverse Impact*, depending on the context.

15.2 The noise impact during the daytime is tabulated below:

Table 5: Noise Impact

NSR	Rating Level, dB L_{Ar}	Difference, dBA	Impact
1	57	+15	**Significant Adverse Impact**

15.3 Significant Adverse Impact has been identified at the NSR therefore mitigation in the form of a silencer is required (see appendix A for the type of silencer/s required) to reduce noise by **20dBA** to be low impact noise at the NSRs.

16. Internal Noise Level

From Voices and Background Music and Chopping of Food

16.1 Whilst there are no prescribed standards for the assessment of noise impact where human voice is the primary source, reference can be made to 'BS8233:2014 – Guidance on sound insulation and noise reduction for buildings' [British Standards Institution] which gives guideline criteria for internal ambient noise levels in residential dwellings.

16.2 The primary noise source within the proposed restaurant will be customer's/employee voices, background music and chopping of food, breakout. Spectral noise data from *American Standard ANSI 3.5 1997* (Appendix A) has been utilised within the calculations.

16.3 The Octave Band noise levels from the source data have been normalised. This figure is assumed as a worst-case scenario for internal noise levels. The Octave Band noise levels from the source data have been normalised to an overall A-Weighted internal noise level of 77 dB(A).

Table 6: Internal Noise Within Ground Floor Area

	Octave Centre-Frequency Band, Hz							**Equivalent A-Weighted Sum, dB L_{Aeq}**
	63	**125**	**250**	**500**	**1k**	**2k**	**4k**	
Noise Level (Normalised), dB L_{eq}	63	65	68	70	74	69	63	77

17. Current Building Insulation

17.1 The adjoining walls on the ground and first floor from the residential dwellings and commercial units has been determined as shown below.

Current Building Wall Insulation

17.2 The wall is plasterboard, and single brick.

18. Internal Noise Transfer

Wall Breakout

18.1 Wall specifications have been observed and modelled in InsulTM (Marshall Day Acoustics) as shown below.

Wall Breakout

18.2 The initial model of the current wall showed a performance of around Rw 38 this will be adequate in attenuating internal noise transfer to within the target criteria to reduce the noise levels within the receiving room.

18.3 Based on an addition of an acoustic wall, the result of the noise in the commercial unit is shown below.

Table 8: Via the wall and acoustic insulation

Frequency, Hz	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**
Source Noise Level, dB Lz	63.0	65.0	68.0	70.0	74.0	69.0	63.0
Wall plus accoustic ceiling	29.0	50.0	62.0	54.0	60.0	67.0	73.0
Break-in, dBz	34.0	15.0	6.0	16.0	14.0	2.0	-10.0
A-Weighting	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0
Break-in, dBA	7.8	-1.1	-2.6	12.8	14.0	3.2	-9.0
NR15	**47.0**	**35.0**	**26.0**	**19.0**	**15.0**	**12.0**	**9.0**
Difference NR15	-39.2	-36.1	-28.6	-6.2	-1.0	-8.8	-18.0
Receiver Room Level, dB LA	17.3						

18.4 Overall Airborne Performance: 63dB (DnT,w+Ctr) Includes correction for low frequency performance.

19. Summary

19.1 A ground and first floor commercial property applying to operate as a pizza/burger style restaurant/cafe seeks planning permission for its extraction system for the change of use of an existing premises (formerly a barber shop, to a Class E(b) restaurant/café to confirm that its external flue meets noise control guidelines. The client has completed a noise assessment at 57 Wood St, Earl Shilton, Leicester LE9 7NE.

19.2 No music or TV is proposed as part of the operation.

19.3 The extract fan inside the kitchen and the discharge flue are insulated to stop further noise breakout. The extract ducting is rigid in construction and installed with anti-vibration mountings. Large section ducts may include bracing or stiffeners to prevent drumming. Lined or lagged ducts, including bends, elbows or spigots, may be required if additional noise reduction is necessary.

19.4 The associated rating penalties and resultant sound rating levels, dB LAr, are tabulated below:

Rating Penalties, dB, and Sound Rating Levels

NSR	dB L_{As}	Tonality	Impulsivity	Intermittency	dB L_{Ar}
1	51	3	0	3	57

19.5 The lowest daytime background sound level was measured between 20:00-20:15 as 42 dB LA90,15min.

19.6 The noise impact during the daytime is tabulated below:

Noise Impact

NSR	Rating Level, dB L_{Ar}	Difference, dBA	Impact
1	57	+15	**Significant Adverse Impact**

19.7 Significant Adverse Impact has been identified at the NSRs therefore mitigation in the form of a silencer is required (see appendix A for the type of silencer required) to reduce noise by **20dBA** to be low impact noise at the NSRs.

Internal and external noise

19.8 The noise impact through the walls is deemed to comply with a minimum NR15 requirement.

20. Uncertainties

20.1 Uncertainty can arise when a calculation method, such as distance correction, is used to determine an overall noise level at an NSR location; however, it is an accepted method when the noise sources are yet to be introduced to the site.

20.2 The monitoring equipment is subject to a 1dB error margin, however calibration before and after measurements allows the drift within the margin to be monitored and thus demonstrates that minimal drift occurred throughout the measurements.

Appendices

APPENDIX A – Extraction and Wall Details

Represented by:
ELTA FANS LTD (BUILDING SERVICES)
Tel: +44 (0)1384 275800 Fax: +44 (0)1384 275810 email: sales@eltafans.co.uk
46 Third Avenue, Pensnett Trading Estate, Kingswinford, West Midlands DY6 7US, UK

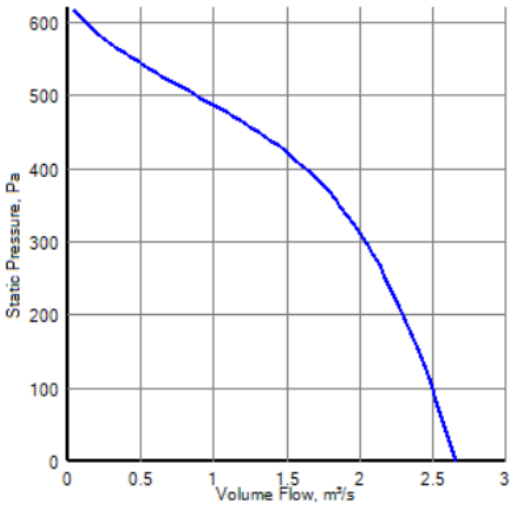
Version 5.25.3 Copyright © 2010-23 Elta Group

Technical Data - Fan Model CF500/4-3AC

Location: **Designation:**

Please Note: Data shown is nominal - enter more criteria for accurate detail.

Performance - Required		**Actual**	
Air Flow :	0.00 m³/s	Air Flow:	0.00 m³/s
Static Pressure :	0 Pa	Static Pressure:	0 Pa
Selection Pressure:	0 Pa	Total Pressure:	0 Pa
Installation Type:	n/a		
Air Density:	1.204 kg/m³		
- Atmos. Temp:	20 °C		
- Altitude:	0 m		
- Humidity:	0.0 %		

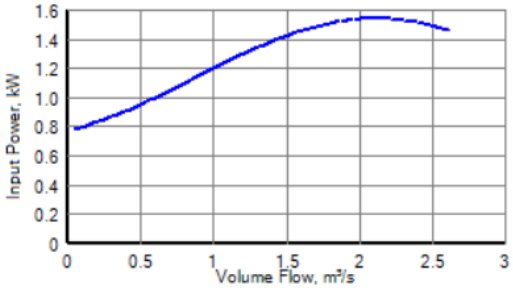


Fan Data

Catalogue Code:	CF500/4-3AC		
Description:	Centrifugal Vertical Roof		
Diameter:	500 mm		
Impeller Type:	Centrifugal		
Blade Material:	-		
Speed:	1315 r/min @50 Hz		
Power, Abs:	-		
Input Power:	0.78 kW	Peak:	-
Efficiency Total:	-		
SFP:	-	Static:	-
Fan Weight:	67.0 kg		

Motor Data (at STP)

Motor Type:	
Electrical Supply:	400V 3ph 50Hz
Motor Frame:	
Motor Power:	1.45kW
FLC/Start:	2.80A / 9.50A
Motor Speed:	4 pole
Motor Efficiency:	-



Sound Data

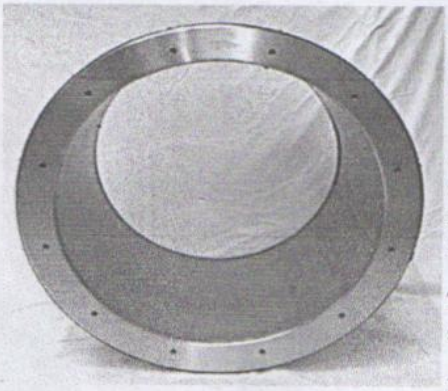
Spectrum (Hz):	63	125	250	500	1K	2K	4K	8K	dBW	dB(A) @ 3m
Inlet (dB):	72	84	77	74	72	71	69	67	86	58
Outlet (dB):	74	82	79	78	78	75	70	67	86	62

Sound levels are quoted as in-duct values. dB(A) values are average spherical free-field for comparative use only.

As part of our continuous improvement processes, Elta reserves the right to make changes in design or specification to products without notice.

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Fan Mounted Silencers



No need to telephone for a price if you have a requirement for an intermediate size in length. See price list for price banding

A Comprehensive range of cylindrical attenuators, matched to fit directly to all types of metric axial fan flanges or to ducting via optional matching flanges. Two alternative sets of threaded inserts are offered for each silencer to match most fan mounting requirements.

The 'F' Series range is available as standard in two lengths, one x diameter and two x diameter.

Excellent attenuation properties are achieved using sound absorbing acoustic infill, which is glass tissue faced as standard to minimize fibre migration and retained within the silencer casing by a perforated liner.

- Standard sizes 250mm to 1250mm diameter
- Special sizes on request (maximum spun diameter 1850mm)
- Supplied fully packaged to suit transport method and destination
- Maximum temperature 200°C
- Maximum pressure 1500 Pa
- Hexagon mounted drillings giving a higher torque to turn ratio as well as significant thermal expansion and contraction properties reducing the risk of free rotation of the fixings

Material and Finish.. *Casing;* galvanized mild steel (BS2989), seams are sealed lockformed type with spun galvanized steel end rings. *Inner lining;* perforated galvanized mild steel (BS2989). *Sound absorbing material;* mineral fibre slabs, faced with glass tissue. Manufactured to HVCA specification DW144 class B and M&E 100 for sheet steel thickness and stiffening.

SIZE ONLY	CENTRE BAND FREQUENCY							
	63	125	250	500	1000	2000	4000	8000
F1000-2	5	10	16	23	23	16	13	11

FUSIONHOT LTD

Stainless Steel Fabrication

Commercial Kitchen Design and Installation

Anti Vibration Mounts (A.V. Mounts)



Load range per mount 5Kg -28Kg

Anti Vibration Mounts (A.V. Mounts) attach to the bottom of Mounting Feet.

A.V. Mounts are used to isolate the fan from the system to prevent vibration transfer through fixings or structures.

A.V. Mounts can be used to isolate any products from the main system to prevent vibration transfer

The main uses A.V. Mounts for are, Axial flow fans, Box fans, Centrifugal fans, in fact A.V. Mounts can be used with anything that causes vibration.

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Stainless Steel Fabrication
Commercial Kitchen Design and Installation

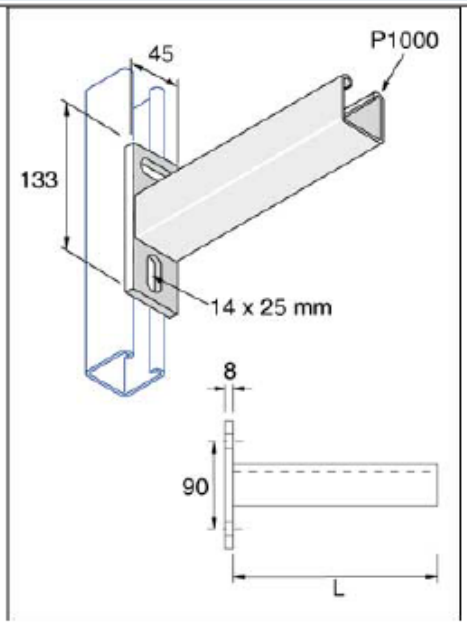
Unit5 Firefly Square Plantation Road Burscough Industrial Estate L40 8JT

VAT No. 245073616

Tel: 01704-893945 **Fax:** 0844-4122296

Email: fusionhot1@gmail.com **Web:** wwwFusionHot.co.uk

UNISTRUT P2663



Load Data (All Loads are kN)					
Part Number	L	F1 1/2 L 1/2 L	F1	F2 1/3L F2 1/3L F2 1/3L	F3 1/4L F3 1/4L F3 1/4L F3 1/4L
P2663/150	150	6.2	3.1	3.1	2.06
P2663/300	300	3.2	1.6	1.6	1.06
P2663/450	450	2.15	1.07	1.07	0.71
P2663/600	600	1.62	0.81	0.81	0.54
P2663/750	750	1.3	0.65	0.65	0.43

Part No.	Finish	Size	Length	Weight
P2663/150	HG	41mm	150mm	0.80
P2663/300	HG	41mm	300mm	1.17
P2663/450	HG	41mm	450	1.59
P2663/600	HG	41mm	600	2.03
P2663/750	HG	41mm	750	2.53
P2663/150	SS	41mm	150mm	0.81
P2663/300	SS	41mm	300mm	1.20
P2663/450	SS	41mm	450	1.62
P2663/600	SS	41mm	600	2.08
P2663/750	SS	41mm	750	2.62

Project: A

Architect / Engineer: B

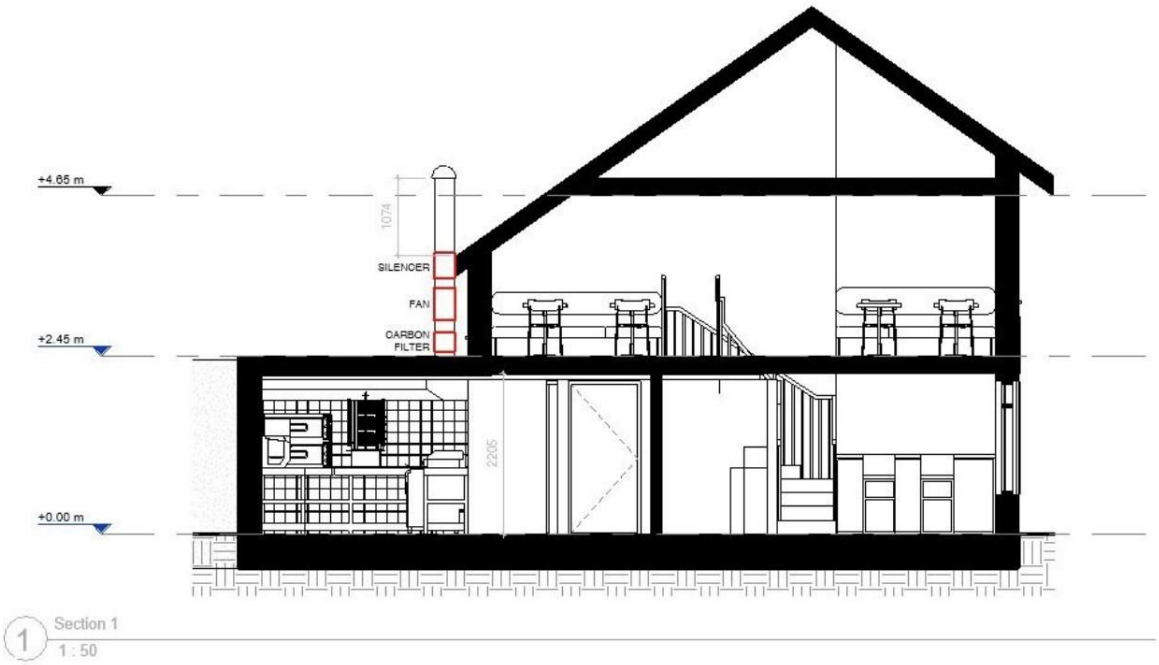
Date: C **Phone:** D

Contractor: E

Address: F

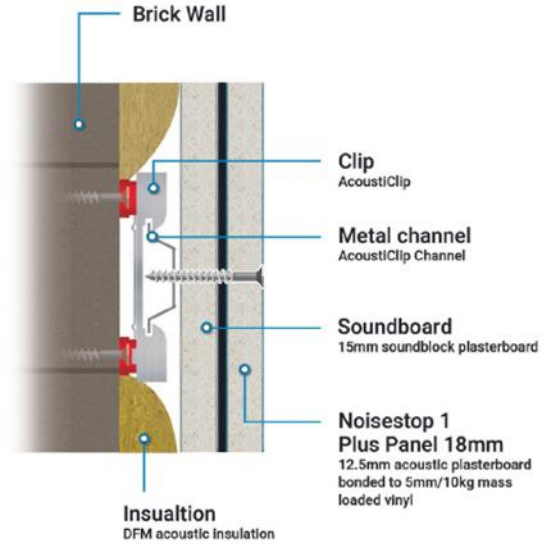
Notes 1: G

Approval Stamp:


+4.65 m
+2.45 m
+0.00 m
1074
SILENCER
FAN
CARBON FILTER
2205
1
Section 1
1 : 50

Sound Insulation Test

AcoustiClip Direct to Wall System



NOISESTOP SYSTEMS

www.noisestopsystems.co.uk
info@noisestopsystems.co.uk
01234 339163



Mass air resonant frequency = 42Hz
Panel size = 2.7m x 4.0m
Partition surface area mass = 152kg/m2

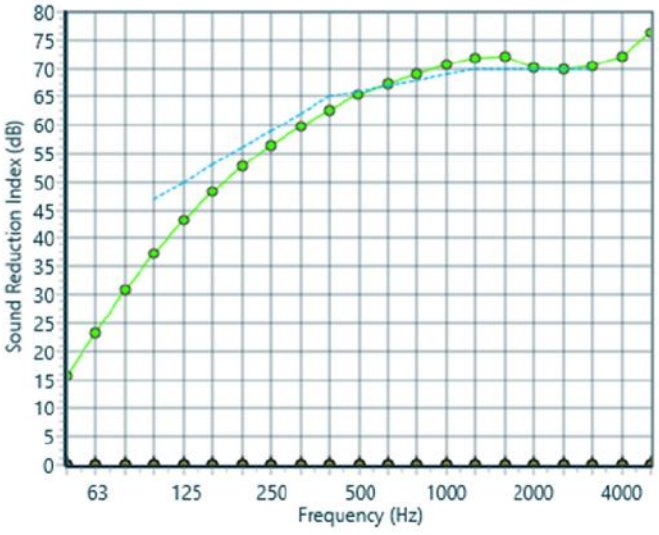
System Description

- The system is applied to a 100mm single-skin brick wall
- AcoustiClip and AcoustiChannel
- 25mm/60kg Acoustic insulation
- 15mm Acoustic plasterboard
- 18mm Noisestop 1Plus Panel (incorporated 12.5 acoustic p/b and 10kg mass-loaded vinyl)
- Acoustic sealant to the edges and perimeter of the boards

Sound Insulation

Untreated 100mm single skin brick wall	**DnT,w 38dB**
AcoustiClip Direct System applied	**DnT,w 63dB**
Improvement when solution is applied	**DnT,w 25dB**

freq.(Hz)	R(dB)	R(dB)
50	24	
63	33	29
80	41	
100	47	
125	52	50
160	57	
200	60	
250	63	62
315	63	
400	54	
500	53	54
630	56	
800	58	
1000	61	60
1250	63	
1600	65	
2000	67	67
2500	68	
3150	69	
4000	87	73
5000	91	



APPENDIX B - Measurement Details

Measurement	Start Date	Start Time	End Date	End Time
M1	26/02/26	10:30	27/02/26	08:30

APPENDIX C - Equipment Details

Equipment	Make	Model	Class	Serial Number
Sound Meter	Pulsar	N45	1	1365
Calibrator	Pulsar	PM1	1	011121C

APPENDIX D - Calibration Details

Measurement	Calibrator Ref Level (dB)	Level Before (dB)	Deviation Before (dB)	Level After (dB)	Deviation After (dB)
M1	94.0	94.0	0	94.0	0

APPENDIX E - Meteorology Details

Date	Temp C	Wind Speed m/s*	Wind Direction	Humidity %	Precipitation mm	Cloud Cover (Oktas)
26/02/26	11	1.9	w	82	0.0	4/8

*Windspeeds measured on site using a Skywatch Xplorer 2 Anemo-Thermometer.

APPENDIX F - Noise Attenuation

Utilising Manufacturer Levels

Equipment	Manufacturer Data, dB LpA	r_1 , m	r_2 , m	Barrier	Level at NSR_2
Extractor	62	6	3.0	- 5	51 (NSR1)

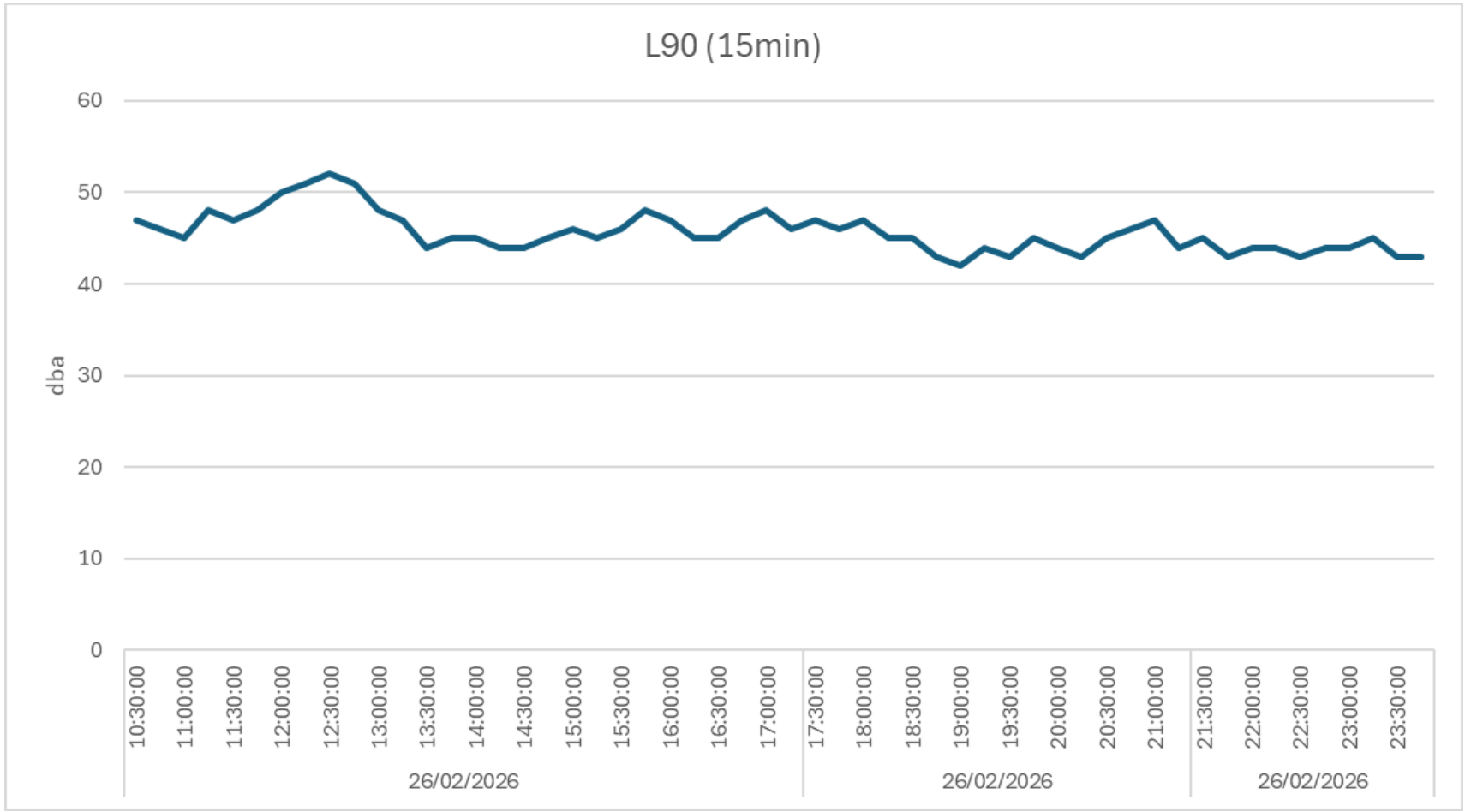
Barrier attenuation assumed as 5 dB and 10 dB for the partial and complete blockage of the line of sight respectively between source and receiver as per 'BS5228-1:2009 – Noise and vibration control on construction and open sites' pg. 130.

Point source distance attenuation

$$L_y = 20 \times \log \frac{r_1}{r_2}$$

Where L_y is the distance attenuation factor and $r_{1,2}$ are the source -> measurement distance and source -> NSR distance in metres respectively

APPENDIX G – Background Noise



APPENDIX H – Terminology and Definitions

Noise
Sound only becomes noise (often defined as 'unwanted sound' or sound that is considered undesirable or disruptive) when it causes or contributes to some harmful or otherwise unwanted effect, like annoyance or sleep disturbance.

Acoustic Environment
Sound from all sound sources as modified by the environment.

Equivalent continuous A-weighted sound pressure level LAeq,T
Value of the A-weighted sound pressure level of a continuous, steady sound that, within a specified time interval T, has the same mean square sound pressure as a sound under consideration whose level varies with time.

A-weighting
The human ear is most sensitive to frequencies in the range 1 kHz to 5 kHz. On each side of this range the sensitivity falls off. A-weighting is used in sound level meters to replicate this sensitivity and respond in the same way as the human ear.

Octave Band
Band of frequencies in which the upper limit of the band is twice the frequency of the lower limit.

Maximum Sound Pressure Level LAmax,T
Highest value of the A-weighted sound pressure level with a specified time weighting that occurs during a given event or measuring period.

The LA10,T Sound Level
The A-weighted sound pressure that is exceeded for 10% of a given time interval, T. It is often used to evaluate road traffic noise.

The LA90,T Sound Level
The A-weighted sound pressure that is exceeded for 90% of a given time interval, T, measured using time weighting F. It is often referred to as the background noise level and which might in part be an indication of relative quietness at a given location

Free-field Level
The sound pressure level away from reflecting surfaces.
NOTE Measurements made 1.2 m to 1.5 m above the ground and at least 3.5 m away from other reflecting surfaces are usually regarded as free-field. To minimize the effect of reflections the

measuring position has to be at least 3.5 m to the side of the reflecting surface (i.e. not 3.5 m from the reflecting surface in the direction of the source).

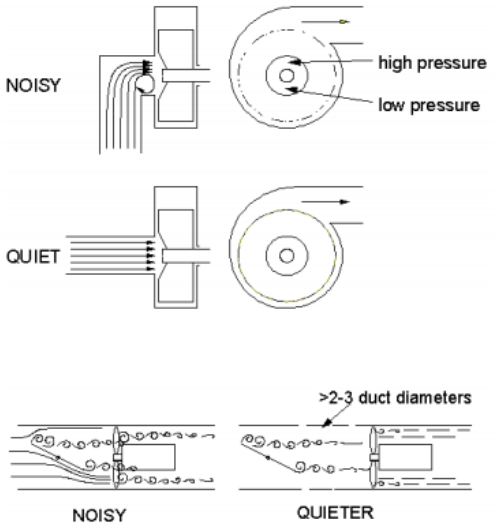
Façade Level
The sound pressure level 1 m in front of the façade.
NOTE Facade level measurements of LpA are typically 1 dB to 2 dB higher than corresponding free-field measurements because of the reflection from the facade.

Indoor Ambient Noise
Noise in a given situation at a given time, usually composed of noise from many sources, inside and outside the building, but excluding noise from activities of the occupants.

APPENDIX I – Noise Control Technique Examples

FAN INSTALLATIONS

Typical applications Axial flow or centrifugal fans. Technique Maximum fan efficiency coincides precisely with minimum noise. Any fan installation feature that tends to reduce fan efficiency is therefore likely to increase noise. Two of the most common examples are bends close to the fan (intake side in particular) and dampers (close to the fan intake or exhaust).



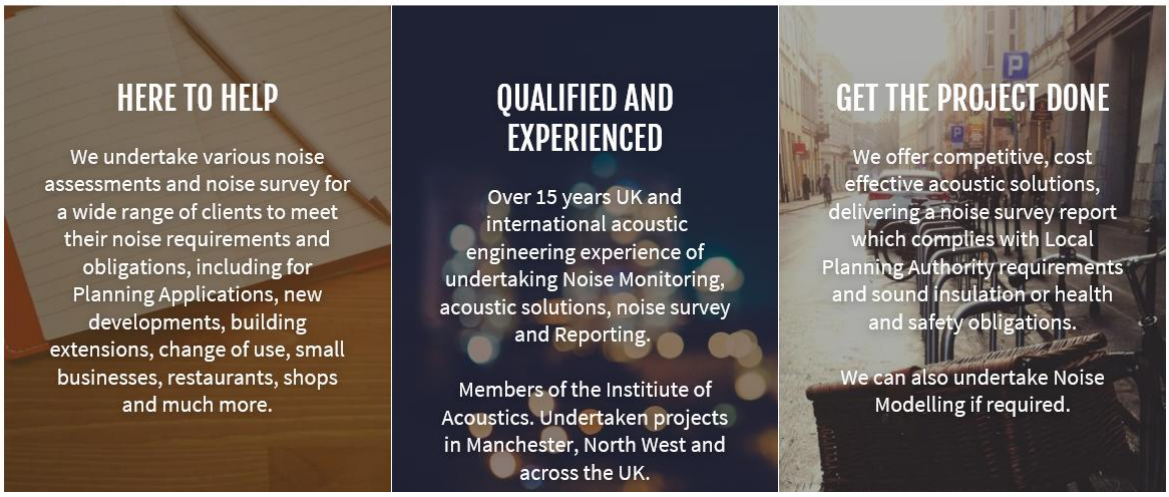
Ideally, for maximum fan efficiency and minimum noise, make sure there is at least 2 - 3 duct diameters of straight duct between any feature that may disturb the flow and the fan itself. Noise reductions of 3 - 12 dB are often possible.

DUCTWORK

Typical applications Extraction, ventilation, cooling, openings in walls and enclosures. Technique Instead of fitting silencers, it is often possible to achieve a 10 - 20 dB reduction in airborne noise from a duct or opening by lining the last bend in the ductwork with acoustic absorbent (foam or rockwool / fibreglass). Alternatively, construct a simple absorbent lined right-angled bend to fit on the opening. Ideally, either side of the bend should be lined along a length equivalent to twice the duct diameter. Where flow velocities are high (> 3m/s), consider using cloth faced absorbent.

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