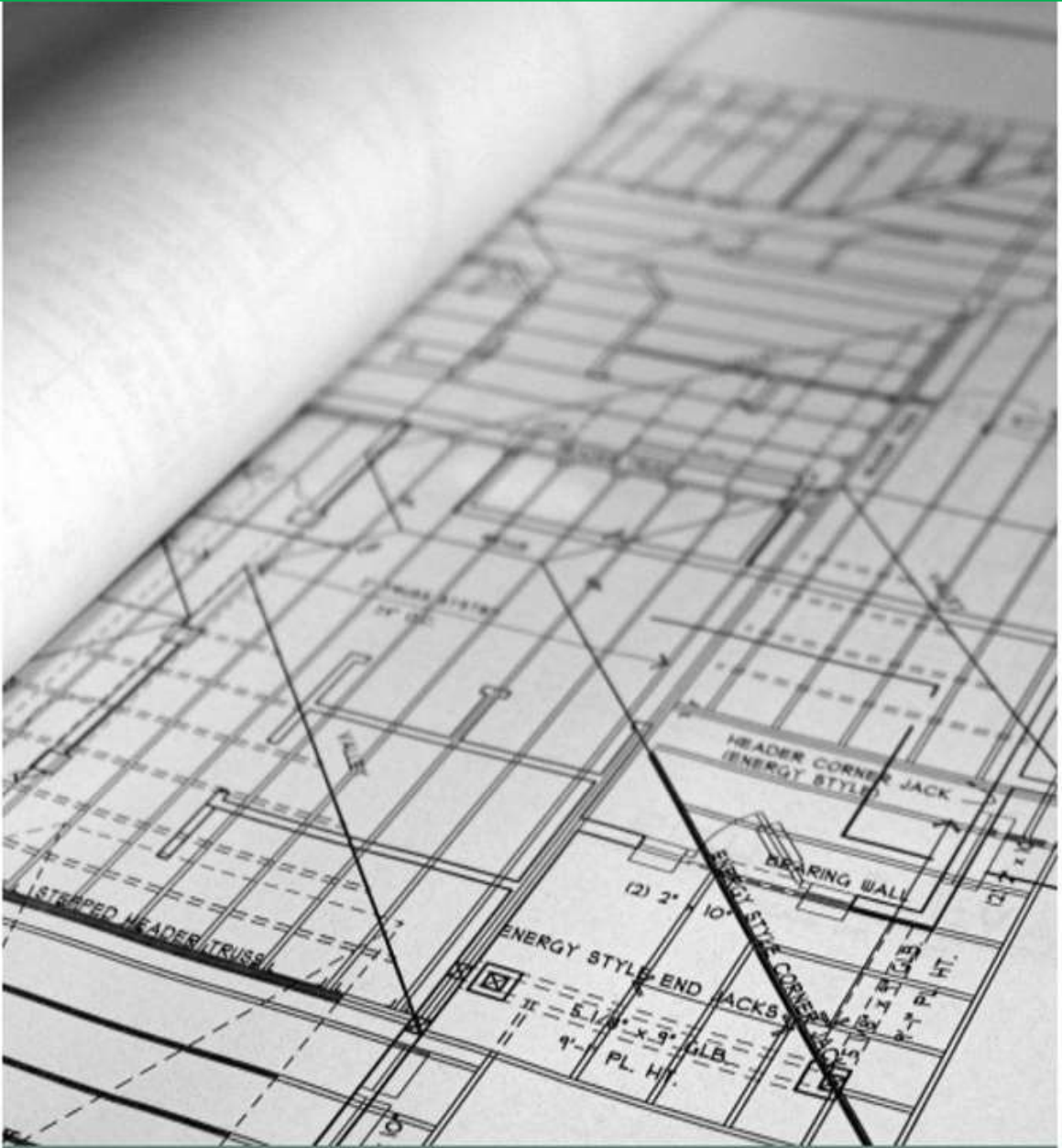




Central Air and Sound Testing

ENVIRONMENTAL NOISE ASSESSMENT

5 Meldon Road

Manchester

M13 0TZ

CLIENT:

Tayyab Akhlaq

DATE:

23rd October 2023

Acoustic Survey undertaken by:

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1. INTRODUCTION

Central Air and Sound Testing have been appointed by the new owners of an established takeaway business to undertake an Acoustic Noise Assessment, to assess the noise impact of proposed Installation of new fixed plant extraction system, in relation to a planning application for a proposed single storey extension to the rear of the business at 5 Meldon Road , Manchester.

Ref - Planning Application 23/37106/FUL

The assessment is required to provide evidence that noise emissions from the proposed takeaway extraction system, will not be detrimental to the amenity of the nearby noise sensitive receptors and advise on any required mitigation.

In accordance with the request made by the LPA Environmental Health Officer.

“A full acoustic survey/report is required. An acoustician to measure noise levels to determine the LA90. Based on the equipment chosen, calculations then need to be done to ensure this is 5db or less, however based on BS 4142 there are additional penalties added to the noise levels that need to be accounted for.”

This assessment is taken in accordance with the National Policy Planning Framework (NPPF) The Noise Policy Statement for England (NPSE) THE National Policy planning guidance (NPPG) including British Standard BS 4142. 2014.

2. LEGISLATION & GUIDENCE

In order to provide a suitable assessment a number of national planning polices and guidance have been considered, including:

- The National Policy Planning Framework (NPPF),
- The Noise Policy statement for England (NPSE).
- The National Policy Planning Guidance (NPPG).
- British Standards BS 8233: 2014 Guidance on sound insulation for buildings.
- BS4142: Methods for rating and assessing industrial and commercial sound.
- The world health authority (W.H.O) Guidelines for community noise.

The National Policy Planning Framework states the following with respects to noise.

- Avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of development.
- Mitigate and reduce to a minimum other adverse impact on health and quality of life arising from noise from new development, including through the use of conditions.
- Recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established; and
- Identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

Noise Policy Aims

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

: The NPPF noise aims widely reflect those in NPSE. The NPSE does however include some context within the explanatory note to assessing noise impact and uses established concepts from toxicology currently being applied to noise impacts, these include:

1) 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.

2) SOAEL– Significant Observed Adverse Effect Level.

This is the level above which significant adverse effects on health and quality of life occur.

3) LOAEL– Lowest Observed Adverse Effect Level.

This is the level above which adverse effects on health and quality of life can be detected.

Noise Policy statement for England and National Planning Guidance

The NPSE has stated that the impact of noise be classified according to an “effect level” Shown in the previous table (Table A).

The National Policy Planning Guidance (NPPG) has clarified what this effect level above means in terms of its perception by people at receptors and what action should be taken.

(*Table A*).

(Table A) **The National Policy Guidance Noise Exposure Hierarchy**

Perception	Examples of Outcome	Increasing Effect Level	Action
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	
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 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 Adverse Effect Level	
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

World Health Authority (W.H.O) Guidelines for Community Noise.

These guidelines entitled “Guidance for Community Noise”; were approved by the World Health Organisation and consider guideline values for annoyance in the community. These have been set at 50 or 55 dBA, representing daytime levels below which a majority of the adult population will be protected from becoming moderately or seriously annoyed, respectively.

See below an extract of Table 4.1 from Section 4.4 Guideline values for community noise in specific environments.

Specific Environment	Critical Health effect (s)	LAeq (dB)	Time base (hours)	LA max fast (dB)
Outdoor Living Area	Serious annoyance, daytime and evening	55	16	-
	Moderate annoyance, daytime and evening	50	16	-
Dwelling, indoors Inside bedrooms	Speech intelligibility and moderate annoyance daytime and evening.	35	16	45
	Sleep disturbance, night-time	30	8	
Outside bedrooms	Sleep disturbance, window open (outdoor values)	45	8	60

The guidelines also suggest that; “At night, sound pressure levels at the outside façades of the living spaces should not exceed 45 dB LAeq and 60 dB LMax, so that people may sleep with bedroom windows open. These values have been obtained by assuming that the noise reduction from outside to inside with the window partly open is 15 dB.” LAeq for daytime is for 16 h and for night-time 8h. It is also noted that the WHO suggest “where a development is deemed necessary or desirable despite external noise levels above recommended guidelines, the internal LAeq target levels may be relaxed by up to 5dB and reasonable internal conditions still achieved.

British Standards BS 4142:2014

The BS 4142 is a standard which describes a method for assessing whether a specific noise from an industrial or commercial source i.e., Extract fans, Air conditioning units is likely to give rise to complaint from residents of the adjacent dwellings the specific noise levels are determined outside dwellings.

The specific noise level is determined for a reference time period of 1hour daytime (7am-11pm) and 15mins night-time (11pm-7am).

Tonal or impulsive characteristics of a noise are likely to increase the scope for complaints and this is taken into account by adding a value to a specific noise source level to obtain a rating level. The value may be between 0 and 15dB depending on objective and subjective measures detailed in the standard.

BS 4142 Requires that the rating level of a noise source is compared with the existing difference between the rating level and the background noise.

- A difference of 0dB is indicative of a “minor impact”.
- A difference of +5dB is indicative of an “adverse impact”.
- A difference of +10dB is indicative of a significant “adverse impact”.

BS4142:2014 states, -

“Response to sound can be subjective and is affected.

by many factors, both acoustic and non-acoustic. The significance of its impact, for example, can depend on such factors as the margin by which a sound exceeds the background sound level, its absolute level, time of day and change in the acoustic environment, as well as local attitudes to the source of the sound and the character of the neighbourhood.”

The lower the rating level is 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 level ,this is an indication of a specific sound source having a low impact , depending on context.

The British Standard 4142 describes methods for rating and assessing sound of an industrial or commercial nature.

3. SITE DETAILS

The site is situated a urban location in close proximity to Birchfields Road and the busy A34 Leading to the city centre., (Fig 1) The area contains is a busy mix of commercial and residential properties , shops, fast food takeaway businesses, offices and restaurant's all located within the immediate vicinity .

The proposed single storey rear extension is to enable the existing takeaway business to utilise more space to the rear of the property.

Mechanical extraction fan system is to be installed internally , at ground level above new griddle hob plates to extract fumes through the outer side wall and into an existing 500m exhaust duct which terminates at roof height some 5.5m above.

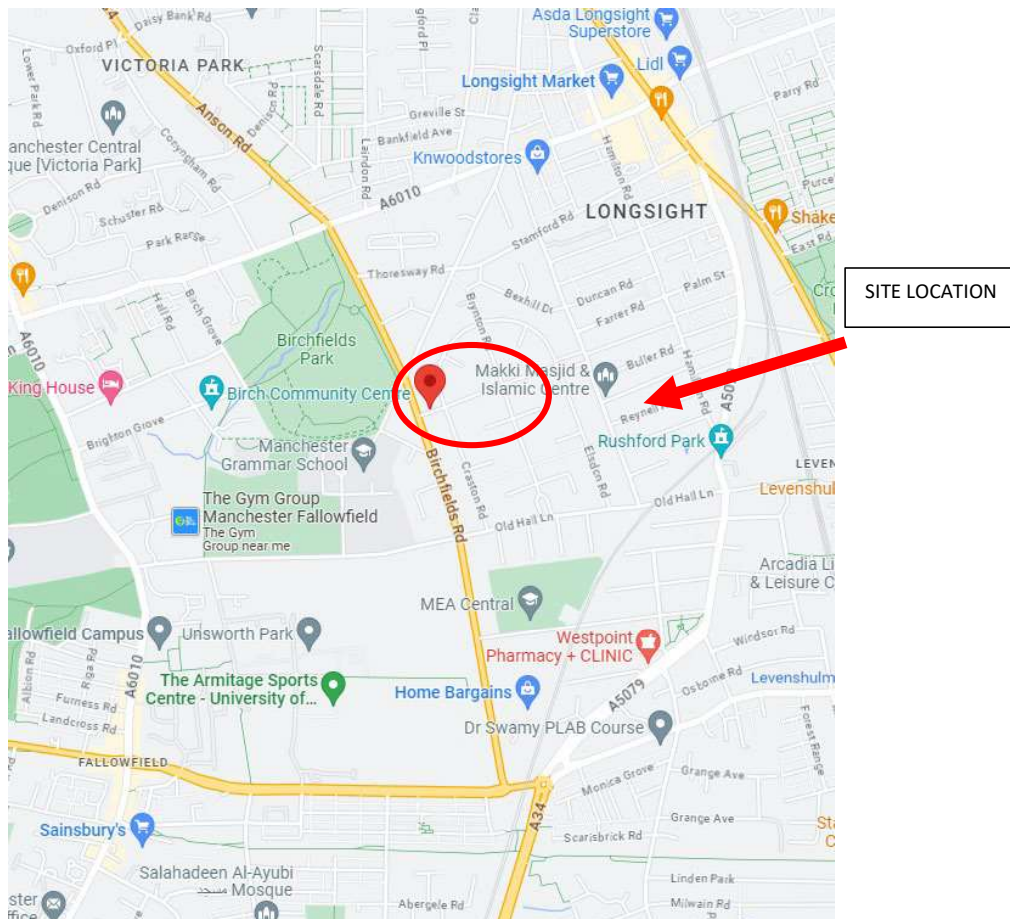


Figure 1

4.Environmental Noise Impact Survey

British Standard BS 4142: 2014 + A1:2019

Noise Survey Criteria

The site was visited on 18th October 2023 to assess sound levels for proposed new mechanical Plant equipment, it is necessary to record the existing LAeq noise climate to establish the background sound levels(LA90). at the location

In accordance with BS 4142:2014 the prevailing background level is not necessarily to be taken at the lowest recorded value, but rather the level that best represents the typical background sound level in the area over a defined time period.

It is our understanding that the takeaway premises may be open from midday to 11.30pm some evenings , It was therefore decided to include these times, within this assessment.

Acoustic noise data was recorded over a 24 hour period from Wednesday 18th to Thursday 19th which included Day time 16 hour 07.00-23.00 and Night-Time 8 hour 23.00-07.00.

A calibrated Class 1 sound level meter was used to record noise data over a given time period , taking into consideration the location of the nearest noise sensitive receptors (NSR 1 & 2 Fig2) , the position of the fan extraction system on the western side of the proposed site , and road traffic noise from Birchfield Road contributing to the existing noise climate .

Noise Levels were recorded in 15-minute samples to determine equivalent continuous A weighted sound level in dB of the Leq and LA90 and Lmax.

Measurements were recorded for a 24-hour period to assess the average continuous noise levels, the sound meter was installed in a secure weatherproof acoustic outdoor case. and the microphone fitted with an appropriate weather shield. The microphone was positioned away from any sound reflective façade (Fig 2)

Metrological Conditions

Weather during the survey were mild and dry ,with relatively low/ medium wind speed, and is not considered to have adversely impacted the outcome of the survey.

Temp 9-16 degrees Celsius The Sound meter has been fully laboratory calibrated within the past 12 months and field calibrated before and after the survey. No significant drift was noted for this report (Not more than +- 0.1dB)

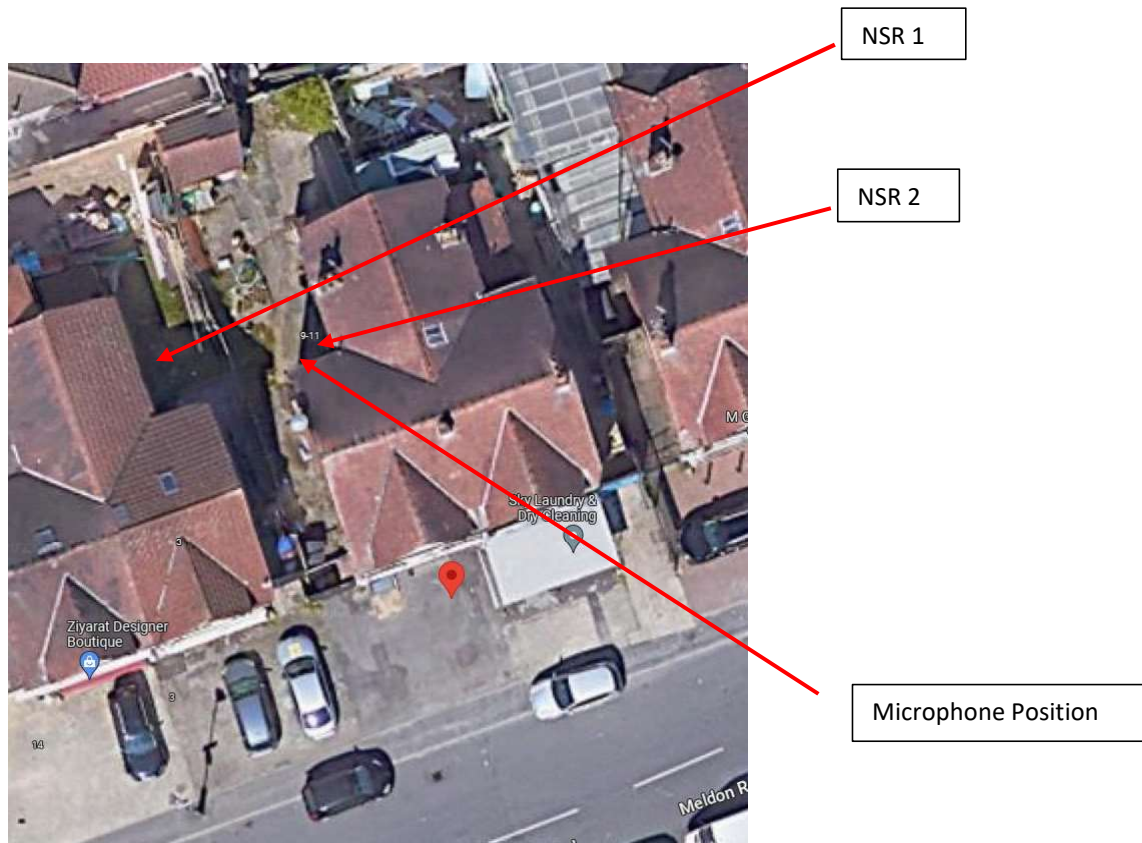
Equipment .

NTI XL2 Sound Meter Class 1 complete with weatherproof outdoor environmental kit

NTI Class 1 Microphone

NTI Larson Davis Sound Calibrator Class 1 with UKAS Calibration

Figure 2



Results

Below is a summary of the results time averaged. (dB)

Position 1	Daytime (07.00-23.00 hrs)		Night-time (23.00-7.00 hrs)		
	LA eq 16hr	LA90	LAeq 8hr	LA90	LAmx
1	59	52	52	49	85

In accordance with guidance from BS 4142:2014, background noise levels are recorded to best represent the typical noise environment, of the average background sound levels over a defined period .

Proposed Fixed Plant & Equipment

A noise impact assessment has been undertaken to assess noise levels from the proposed fixed plant extraction system , based on guidance from BS4142:2014 Assessment of Noise from Fixed plant and machinery.

We understand that the takeaway business wish to install a new **RadiCal EC R3G 450** centrifugal fan with acoustic attenuator to extract fumes and vapour into the existing 500mm exhaust duct positioned on the western side of the premises, the Fan exhaust will terminate 5.8m above at roof ridge height **(Figure 3 & 4)**

Sound emissions from the proposed mechanical plant equipment has been determined using manufactures published data. Acoustic on-site noise data was assessed at the nearest noise sensitive receptors, being the bedroom windows of no 5 & 7 Meldon Road, although both in close proximity, both windows were fully or partially shielded from direct line to the extract exhaust, due the building and roof blocking direct line of sight this has been considered within the calculations and adjustments for tonality have also been applied.

Acoustic Calculations and Corrections allowing for distance and barrier attenuation, are made in accordance with **British Standard BS4142 and ISO 9613 2. Attenuation of sound propagation outdoors.**

Figure 3

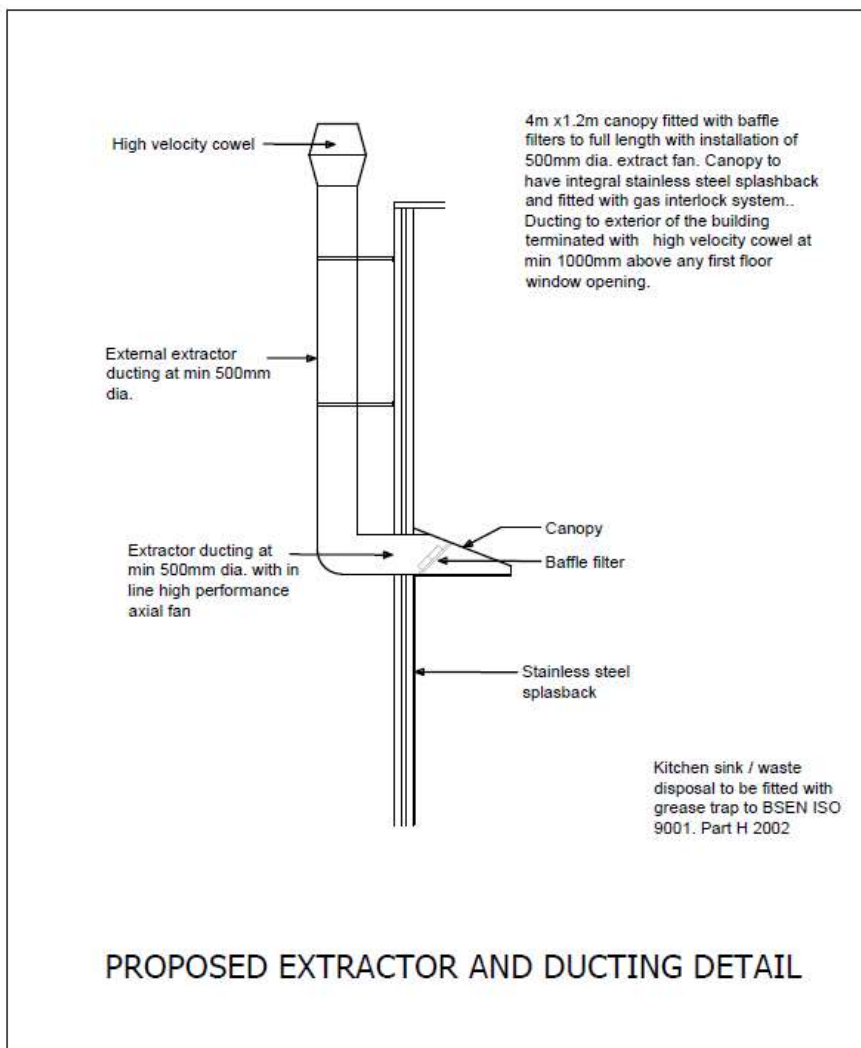


Fig 3



Fig 4 Existing Exhaust Flue

Proposed Extraction Fan Equipment

Fan Manufacturer / Model	Sound Power Level (dB)
RadiCal EC R3G 450	78.0 dB

EC RadiCal Centrifugal Coaxial Fan R3G 450

Sound Pressure Level at each Octave Band Centre Frequency (Hz)								
UNIT	125	250	500	1000	2000	4000	8000	dBA
R3G 450	84.0	79.0	77.0	73.0	76.0	59.0	53.0.	78.0

Sound Pressure Level at each Octave Band Frequency (Hz) EC Centrifugal Fan R3G450								
Frequency (Hz)	125	250	500	1000	2000	4000	8000	dBA
Sound Pressure level	84.0	79.0	77.0	73.0	76.0	59.0	53.0	
'A' Weight	68.0	70.0	74.0	73.0	77.0	60.0	52.0	
Calculated Distance Correction	-25	-25	-25	-25	-25	-25	-25	
Barrier Correction	-10	-12	-15	-18	-20	-23	-25	
Feature Correction BS:4142	+3	+3	+3	+3	+3	+3	+3	
	36.0	36.0	37.0	33.0	35.0	15.0	5.0	
<u>Calculated Sound Pressure at NSR</u>	Total							42.6db

Survey Results:

Rating Level at Nearest Receptor **42.6dB**

Lowest Background Sound level **49.0dB**

Excess of Rating over Background Sound level BS4142 **-6.4dB**

BS: 4142 - 2014 LOW IMPACT

In accordance with BS 4142;2014 Guidance ,

The rating level is an indication of a specific sound source having Low Impact in relation to noise, the lower the rating level is relative to the measured LA90 Background noise, the less likely the specific sound source will have an adverse impact.

BS 4142 Requires that the rating level of a noise source is compared with difference between the rating level and the background noise.

- **A difference of 0dB is indicative of a “minor impact”.**
- **A difference of +5dB is indicative of an “adverse impact”.**
- **A difference of +10dB is indicative of a significant “adverse impact”.**

6. Results Summary

- Results from this Noise impact Assessment, undertaken with guidance from BS 4142:2014 , indicate that calculated noise levels expected to emit from the terminus of the proposed extraction system to be **42.6 dB LA90** at the nearest noise sensitive receptor(NSR) , which are the residential bedroom windows nearest to the proposed plant equipment, this is **6.4 dB below** the lowest measured typical background noise level of 49dB LA90) which was used for this assessment .
- At the time of the report no acoustic data was available for any additionally planned noise attenuators or baffles, which may be installed within the fan extraction system, these would further contribute to lowering the calculated noise level from the proposed plant machinery, in relation to any noise sensitive receptors.
- The proposed scheme intends to extract fumes from the takeaway business into the exiting chimney flue, It is believed this Chimney has been used commercially by the previous owners for some years without complaint.
- In accordance with BS 4142:2014 Guidance ,

‘The rating level is an indication of the specific sound source having a low impact’
indicating no detectable effect on health and quality of life due to noise.

- Uncertainty. The measurements and calculations undertaken for this assessment, were taken under repeatable conditions. Manufacturers data and specification is likely to be robust and the uncertainty in these results will be considered low.

7. CONCLUSION

Central Air and Sound Testing have been commissioned to assess the acoustic impact of a proposed extraction fan system, in relation to a planning application for proposed single storey extension to the rear of a takeaway business at 5 Meldon Road Manchester .

A detailed environmental noise assessment has been conducted to establish the representative sound levels at the nearest residential noise sensitive receptors.

Based on the measured noise levels obtained, and calculations using manufactures sound data for the proposed new plant equipment , sound levels at the nearest receptor will be more 5dB **below** the existing background noise level, and defined as **Low impact** in accordance with BS 4142: 2014.

Therefore, it is our conclusion this noise assessment has established that noise from the installation of any new proposed extraction fan system , will not be disturbing or detrimental to the amenity of nearby residents and no further mitigation measures would be necessary.

Disclaimer

This report has been prepared with all reasonable skill and care in accordance with accepted acoustic consultancy principles for the client only, and solely for the purposes expressly defined herein. We owe no duty of care to any third parties in respect of its content. Statements and conclusion made within this report are based on reasonable assumptions and good industry practice, Therefore, unless expressly agreed by us in signed writing, we hereby exclude all liability to third parties, including liability for negligence.

The consequences of climate change and the effects of future changes in climatic conditions cannot be accurately predicted. This report has been based solely on the specific design assumptions and criteria stated herein.

8. EQUIPMENT

NTI XL2 Class 1 SOUND METER	456778	UKAS Calibration Dec 2023
NTI Class 1 MICROPHONE		
NTI Class 1 calibrator	69678	UKAS Calibration Dec 2023

9. Glossary of Terms

Term	Definition
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s_1 and s_2 is given by $20 \log_{10} (s_1/s_2)$. The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is $20 \mu\text{Pa}$.
A-weighting, dB(A)	The unit of sound level, weighted according to the A-scale, which takes into account the increased sensitivity of the human ear at some frequencies.
Noise Level Indices	Noise levels usually fluctuate over time, so it is often necessary to consider an average or statistical noise level. This can be done in several ways, so a number of different noise indices have been defined, according to how the averaging or statistics are carried out.
$L_{eq,T}$	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
$L_{max,F}$	A noise level index defined as the maximum noise level during the period T. L_{max} is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
$L_{90,T}$	A noise level index. The noise level exceeded for 90% of the time over the period T. L_{90} can be considered to be the 'average minimum' noise level and is often used to describe the background noise.
Free-Field	Far from the presence of sound reflecting objects (except the ground), usually taken to mean at least 3.5m
Ambient Noise Level	The totally encompassing sound in a given situation at a given time, usually composed of a sound from many sources both distant and near ($L_{Aeq,T}$).
Residual Noise Level	The ambient noise remaining at a given position in a given situation when specified sources are suppressed to a degree such that they do not contribute to the ambient noise level ($L_{Aeq,T}$)
Specific Noise Level	The equivalent continuous A-weighted sound pressure level at the assessment position produced by the specific noise source (the noise source under investigation) over a given time interval ($L_{Aeq,T}$)
Rating Noise Level	The specific noise level plus any adjustment for the characteristic features of the noise ($L_{Ar,Tr}$).

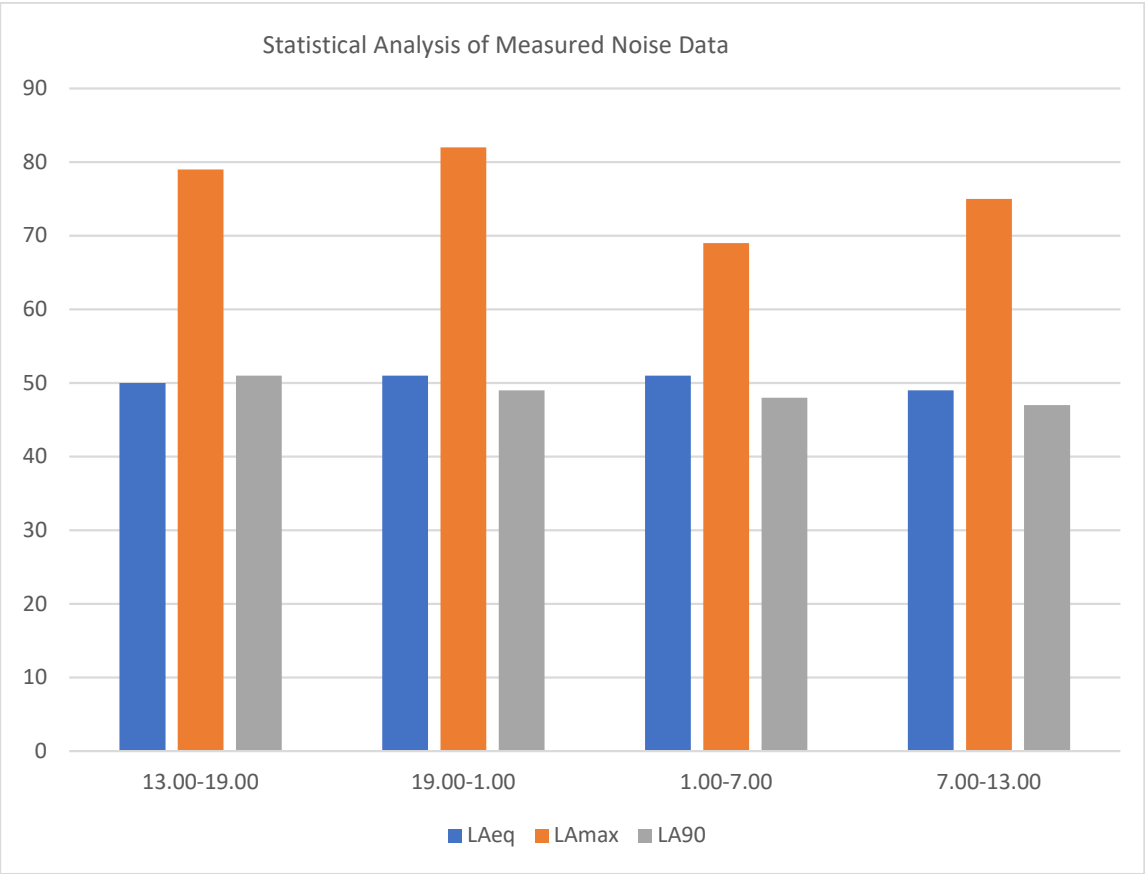
Measured Noise Data

The period LAeq T is obtained from the logarithmic average of measured sound levels.

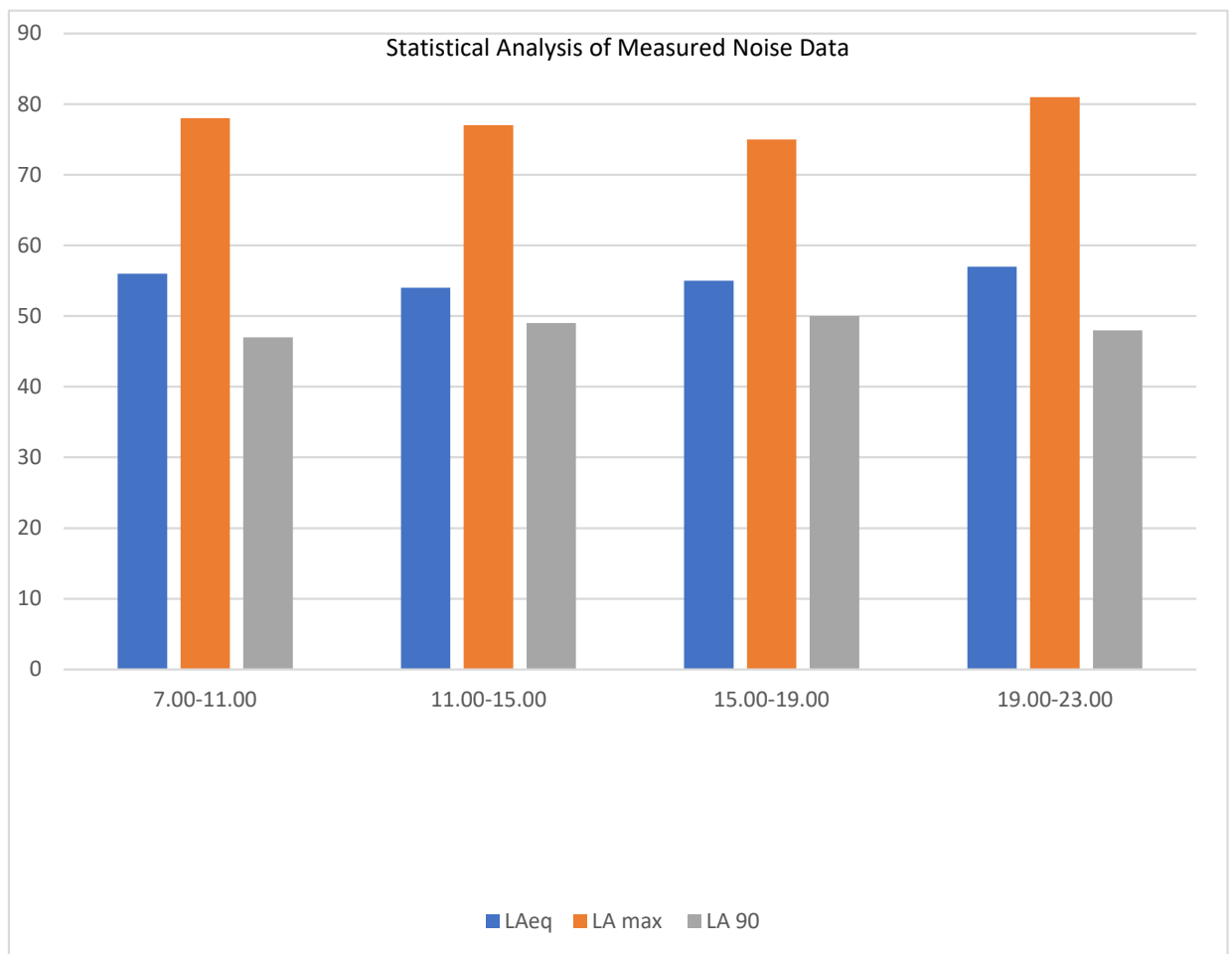
The period LA90 T is obtained from the average of sound levels measured.

The Maximum sound levels LAmax represent the highest sound levels measured during the period.

3 Highest peaks LA max were from emergency vehicle sirens and omitted from the data analysis.



Position 1 Measured Sound Pressure Level Night-Time 8hr (23.00-07.00)



Position 1 - Measured Sound Pressure Level Daytime 16hr (07.00- 23.00)

Position 1

LAeq ■ LA90 ■ LAmax ■

Recorded Spectral Noise Data

