



PEAK acoustics

Noise Assessment Report

Email: sales@acousticsurveys.co.uk | **Office:** 0330 043 1764

Web: www.acousticsurveys.co.uk

Peak Acoustics Ltd, Fernbank House, Springwood Way, Macclesfield, SK10 2XA

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Noise Impact Assessment

Report Reference Number: NM0403212NR

Client: Adnan Malik

Site: Land at Johnsons Square, Manchester, M40 7GL

Project Consultant

N. Mitchell BSc (Hons)
Acoustic Consultant
nick@acousticsurveys.co.uk

Proofing Consultant

K. Donald BSc (Hons) AMIOA
Acoustic Consultant
kyle@acousticsurveys.co.uk



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Assessment Summary

A Noise Impact Assessment has been undertaken for a change of use from existing workshops to form 4 no. units with proposed kitchen delivery businesses at Land at Johnsons Square, Manchester, M40 7GL.

Communications with the client detailed potential for businesses to run until 01:00. Therefore, the assessment will consider baseline noise levels during the last hours of trading.

A measurement of the prevailing background noise climate was undertaken from Tuesday 09th – Wednesday 10th March 2021 at site, in a location representative of the identified Noise Sensitive Receptors (NSRs).

The nearest or most-affected NSRs were identified as residential apartments located near the proposal on first and second floors. The windows of these apartments overlook areas of the proposed site and are classed as noise sensitive receptors.

Current drawings show roof extraction to each individual unit. Due to proposals being in the early design stages, specific extraction products have not yet been selected for the units. Subsequently, a detailed assessment of the chosen noise source(s) could not be undertaken at the time of writing, and therefore a noise limiting level has been provided to ensure nearby residents do not suffer loss of amenity in accordance with BS4142 and MCC criteria; no external plant is proposed.

Noise breakout from all internal operations with regard to each unit, and as a whole, is predicted to be well below the background baseline level and MCC criteria, so long as external access doors remained closed throughout operations. Access in and out of the site should be minimised throughout the life of the development.

1. Introduction

- 1.1 A Noise Impact Assessment has been undertaken at Land at Johnsons Square, Manchester, M40 7GL.
- 1.2 The noise assessment report has been requested from Manchester City Council with the following comment: *“please provide a noise report including consideration of noise outbreak and plant”*.
- 1.3 4 no. units are proposed, each with individual kitchen extraction, with current drawings detailing roof cowl on the rear side. Internal noise sources are likely to include noise from cooking/cleaning, noise from spoken voice, and potential noise from radio/low level music.
- 1.4 Residential apartments are located adjacent to site at first and second floor level.

2. Assessment Criteria

- 2.1 The assessment of the proposed development is to be undertaken in accordance with BS4142:2014 and relevant MCC criteria.

BS4142:2014 – Methods for rating and assessing industrial and commercial sound - is a recognised standard for determining the noise impact of fixed plant machinery via relation of emissions to the measured background noise levels on site.

Manchester City Council, Section 3.6.1.5 Industrial/Commercial developments – The development should be designed so as to achieve a rating levels of 5 dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location.

Manchester City Council, Section 3.6.1.5.1 Noise and Vibration from Fixed Plant/Equipment – Externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5 dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location.

3. Noise Sensitive Receptors

- 3.1 The nearest or most-affected Noise Sensitive Receptors (NSRs) have been identified as first-floor and second-floor windows of apartments located adjacent to the proposed site. The nearest residential window will be represented as NSR1.

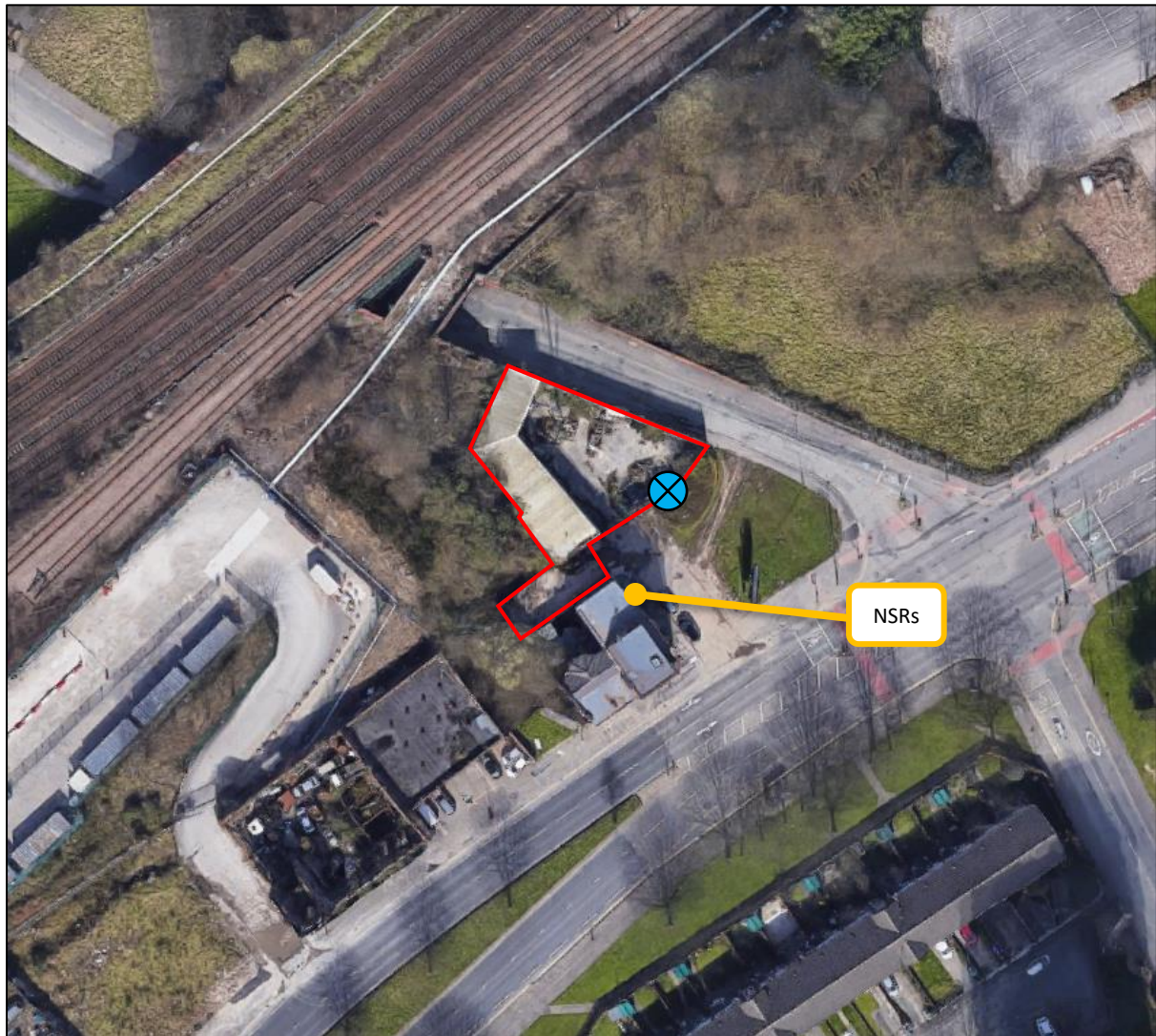
4. Site Description

- 4.1 The development site is located at Johnsons Square, Manchester; adjacent to Collyhurst Street and Oldham Road. Oldham Road stretches from Ancoats through to Oldham and is heavily used by a variety of vehicles including HGVs. Immediately to the north lies the Manchester Victoria to Ashton under Lyme stretch of railway line, a heavily used transport link. The noise climate is dominated by road and rail traffic. Residential apartments are located immediately south west from site.

5. Site, Source & NSR Locations

5.1 The Site, NSR and noise source's location are shown in Figure 1 below:

Figure 1: Site, Source & NSR Locations – google.com/maps



-  Site Boundary (Approx.)
-  Noise Sensitive Receptors (NSRs)
-  Background Monitoring Location M1

- 5.2 Figure 2 shows an elevated image of the existing site, with additional detailing to show the noise source locations in relation to the NSRs:

Figure 2: google.com



Noise Sensitive Receptors (NSRs)



Site Boundary (Approx.)



Proposed Kitchen Extract Openings

6. Measurement Procedure

- 6.1 An attended background noise survey was conducted at position M1 between the hours of 10:35 on Tuesday 09th – 09:20 on Wednesday 10th March 2021. Measurements of $L_{Aeq,T}$ and $L_{A90,T}$ were logged in 5-min intervals at 1/1 octave resolution.
- 6.2 At position M1, the microphone was placed above the existing boundary wall as to not interfere with typical conditions and best represent the residential apartments adjacent. The microphone was approximately 2.5m from ground level. The noise climate at this location was deemed representative of the NSR locations.

7. Measurement Equipment

- 7.1 Measurements were obtained using Class 1 instrumentation. Full equipment details are given in **Appendix B**.
- 7.2 Equipment was calibrated before and after use and no significant drift occurred during measurements. Full calibration details are provided in **Appendix D**.

8. Weather Conditions

- 8.1 Precipitation occurred on the 10th with daytime temperatures ranging between 5°C – 7°C and wind speeds of 2 – 6 m/s over the measurement period. Noise levels between 23:00 – 03:00 have been considered as to nullify the impact of precipitation and best represent noise levels during trading hours. Environmental conditions are therefore deemed suitable for conducting environmental noise measurements. Detailed meteorological information can be found in **Appendix C**.

9. Background Sound Level

- 9.1 The prevailing background noise climate at site consisted of road and rail traffic. Other less frequent sources were spoken voice, distant construction and birdsong.
- 9.2 Communications with the client informed that operations could run until 01:00/02:00. Typically, kitchen extraction systems operate throughout opening hours as a continuous noise source. In the interest of a robust assessment, the typical background sound levels measured at position M1, from 23:00 – 03:00 have been extracted from measurement data to represent the most sensitive time period in which the system(s) may operate. The measured levels are summarised below.

Table 1: Background Sound Levels

Period	Typical $L_{Aeq,T=15min}$	Typical $L_{A90,T=15min}$
Daytime (23:00 – 03:00)	57	47

- 9.3 The full measured background sound levels are shown graphically in **Appendix E**.

10. Noise Limiting Level to Plant Services

- 10.1 For the assessment of plant noise emissions, the measured background sound level of **47 dB L_{A90}** has been adjusted to meet MCC criteria. As stated,

“Externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5 dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location.”

- 10.2 A plant limit criterion of **42 dB L_{Aeq,T}** is therefore considered the operational limit criterion for both industrial activity and extraction, at the Noise Sensitive Receptor location.
- 10.3 As it is still unknown what type of kitchen extraction will be installed, and a detailed assessment of the noise impact could not be undertaken at the time of writing. Therefore, there noise rating level of **42 dB L_{Aeq}** as detailed in Section 10, has been provided. Any installation of kitchen extraction and/or externally mounted plant noise would need to be controlled to at or below the target figure, at the receptor window.

Noise Breakout Assessment – All 4 no. Units

11. Source Noise Levels

- 11.1 Noise sources within the development area are anticipated to be spoken voice from patrons. Considerations are to be made for normal spoken voice and shouting; deemed to represent the intended proposal. Representative noise data has been sourced from 'ANSI 3.5-1997' - *American National Standard – Methods for Calculation of the Speech Intelligibility Index (1997)* and is summarised in the table below.

Table 2: Noise Source Spectra

Noise Source	63	125	250	500	1K	2K	4K	8K	dB(A)
Kitchen – Internal Noise Data*	59	59	59	64	69	74	74	74	79
Radio**	67	69	72	69	69	68	62	53	74
ANSI 3.5-1997' Raised Speech	37	48	62	57	62	57	51	43	65
Cumulative Noise Source	67	69	72	70	72	75	74	74	81

*Noise data taken from SoundPLAN library: Steel Pipe manufacturer, adjusted noise level to represent typical internal noise levels for operational kitchens.

**Noise data taken from Peak Acoustics Noise Library

- 11.2 Noise levels at the NSR are calculated considering internally generated noise from operation. It is recommended that a minimum double-glazed specification (4mm / 16mm air gap / 4mm) be used as part of the proposal, with a minimum sound reduction Index = 30R_w. Dimensions of breakout area have been measured from plans provided by the client, at 3.4m². The noise breakout from all units is calculated to the nearest NSR window, providing an overall cumulative impact at the NSR, and is summarised in the table below.

Table 3: Noise Impact – Residual Sound Levels

Unit	Internal Source Noise Level, dBA	Distance to NSR, m	Breakout Noise Level at NSR, dBA
Unit 1	81	13	17
Unit 2		21	13
Unit 3		27	11
Unit 4		31	10

Cumulative Noise Level	
All units	20

- 11.3 Table 4 indicates that if front doors to each unit were closed during operation, the noise breakout at the NSR location would be well under the typical background sound level, informing a *Low Impact* is achievable. No mitigation against the breakout of noise is deemed applicable, so long as front doors to each unit are closed during operation, with minimised opening for access.

12. Conclusion

- 12.1 A noise impact assessment has been undertaken at Land at Johnsons Square, Manchester, M40 7GL for a proposed redevelopment of existing buildings to form 4 no. kitchen units with delivery business.
- 12.2 A measurement of the prevailing background noise climate was undertaken from Tuesday 09th – Wednesday 10th March 2021 at site, in a location representative of the identified Noise Sensitive Receptors, detailed in Figure 1 & 2, page 6 & 7.
- 12.3 A BS4142:2014 assessment of the kitchen extraction system at the nearest sensitive receptors could not be undertaken at the time of writing. Therefore, a noise Rating Level limit has been provided in which any installation of kitchen extraction, and/or externally mounted plant, would need to be controlled to 'at or below' the criterion design figure.
- 12.4 Noise breakout of individual units, and as a whole, have been assessed with predicted calculations to be well under the typical background level and MCC criteria. Calculations have been made with front access doors closed. Efforts should be made to minimise opening of front doors as much as possible and reduce breakout of noise.

APPENDIX A – Measurement Details

Measurement	Kit	Start Date	Start Time	End Date	End Time
M1	A1	09/03/2021	15:50	10/03/2021	11:30

APPENDIX B - Equipment Details

Kit	Equipment	Make	Model	Class	Serial Number
A1	Sound Meter	Svantek	958	1	34525
A1	Pre-Amp	Svantek	SV12L	1	32484
A1	Microphone	Microtech Gefell	MK255	1	11561
A1	Calibrator	Svantek	SV33B	1	83715

APPENDIX C - Meteorology Details

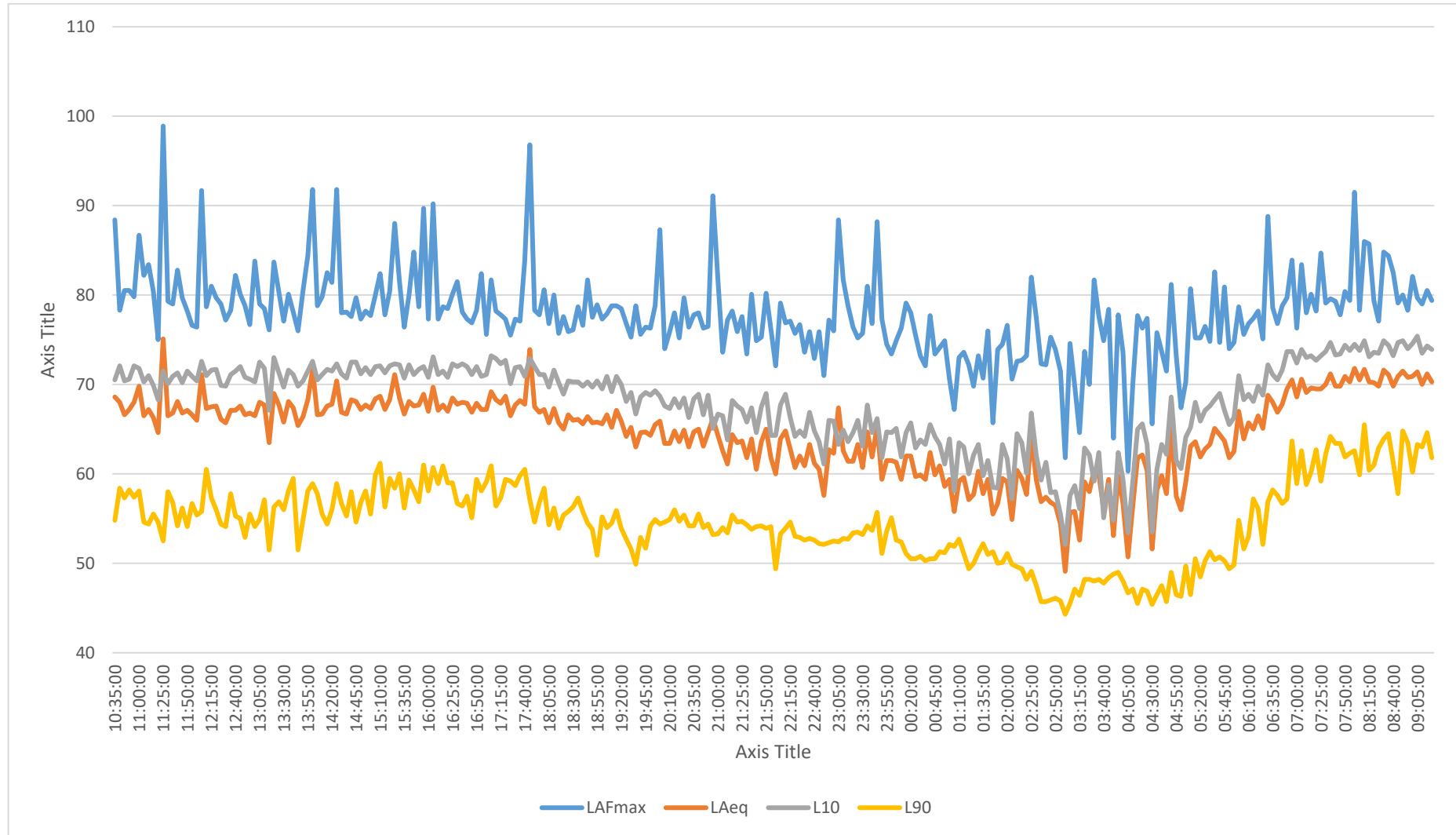
Date	Temp C°	Wind Speed m/s	Wind Direction	Humidity %	Precipitation mm	Cloud Cover (Oktas)
09/03/2021	5	2 – 3	SW	86	0	8/8
10/03/2021	7	5 – 6	S	93	10	8/8

APPENDIX D - Calibration Details

Measurement	Calibrator Ref Level (dB)	Deviation Before (dB)	Deviation After (dB)
M1	114.0	0.2	0.8

APPENDIX E – Noise Survey Results

Measured Background Sound Levels (M1): 09th – 10th March 2021



APPENDIX F – Calculations

Unit 1 – Noise Breakout

Noise Breakout Calculation									
Description:									
Calculation of noise breakout from UNIT 1 to receiver location									
1/1 Octave Centre-Freq. Band	Hz	63	125	250	500	1k	2k	4k	dBA
Source Noise Level, dB	dB	67.4	69.4	72.4	70.1	72.3	74.9	74.3	80.0
R1, 4 / 16 / 4mm glazing	R, dB	21.0	24.0	20.0	25.0	35.0	38.0	35.0	
R2	R, dB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
R3	R, dB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Comp R	Rcomp, dB	-21.0	-24.0	-20.0	-25.0	-35.0	-38.0	-35.0	
Distance Correction	dB	-22.3	-22.3	-22.3	-22.3	-22.3	-22.3	-22.3	
Receiver Level (Unweighted)	dBZ	15.4	14.5	21.4	14.1	6.4	6.0	8.3	
A-Weighting	dB	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	
Receiver Level	dBA	-10.8	-1.6	12.8	10.9	6.4	7.2	9.3	17.0
Formula:									
$L_2 = L_1 - SRI + 10\log[S] + 20\log[r] - 14, dB$									

Partition(s) & Receiver Details		
R1, 4 / 16 / 4mm glazing	m2	3.4
R2	m2	0.0
R3	m2	0.0
S Total	m2	3.4
S Facing Receiver	m2	3.4
Source > Receiver Distance	m	13.0
Lw Ground Atten. Factor	dB	-14.0

Unit 2 – Noise Breakout

Noise Breakout Calculation									
Description:									
Calculation of noise breakout from UNIT 2 to receiver location									
1/1 Octave Centre-Freq. Band	Hz	63	125	250	500	1k	2k	4k	dBA
Source Noise Level, dB	dB	67.4	69.4	72.4	70.1	72.3	74.9	74.3	80.0
R1, 4 / 16 / 4mm glazing	R, dB	21.0	24.0	20.0	25.0	35.0	38.0	35.0	
R2	R, dB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
R3	R, dB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Comp R	Rcomp, dB	-21.0	-24.0	-20.0	-25.0	-35.0	-38.0	-35.0	
Distance Correction	dB	-26.4	-26.4	-26.4	-26.4	-26.4	-26.4	-26.4	
Receiver Level (Unweighted)	dBZ	11.3	10.3	17.3	10.0	2.2	1.8	4.2	
A-Weighting	dB	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	
Receiver Level	dBA	-14.9	-5.8	8.7	6.8	2.2	3.0	5.2	12.9
Formula:									
$L_2 = L_1 - SRI + 10\log[S] + 20\log[r] - 14, dB$									

Partition(s) & Receiver Details		
R1, 4 / 16 / 4mm glazing	m2	3.4
R2	m2	0.0
R3	m2	0.0
S Total	m2	3.4
S Facing Receiver	m2	3.4
Source > Receiver Distance	m	21.0
Lw Ground Atten. Factor	dB	-14.0

Unit 3 – Noise Breakout

Noise Breakout Calculation									
Description:									
Calculation of noise breakout from UNIT 3 to receiver location									
1/1 Octave Centre-Freq. Band	Hz	63	125	250	500	1k	2k	4k	dBA
Source Noise Level, dB	dB	67.4	69.4	72.4	70.1	72.3	74.9	74.3	80.0
R1, 4 / 16 / 4mm glazing	R, dB	21.0	24.0	20.0	25.0	35.0	38.0	35.0	
R2	R, dB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
R3	R, dB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Comp R	Rcomp, dB	-21.0	-24.0	-20.0	-25.0	-35.0	-38.0	-35.0	
Distance Correction	dB	-28.6	-28.6	-28.6	-28.6	-28.6	-28.6	-28.6	
Receiver Level (Unweighted)	dBZ	9.1	8.1	15.1	7.8	0.0	-0.4	2.0	
A-Weighting	dB	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	
Receiver Level	dBA	-17.1	-8.0	6.5	4.6	0.0	0.8	3.0	10.7
Formula:									
$L_2 = L_1 - SRI + 10\log[S] + 20\log[r] - 14, dB$									

Partition(s) & Receiver Details		
R1, 4 / 16 / 4mm glazing	m2	3.4
R2	m2	0.0
R3	m2	0.0
S Total	m2	3.4
S Facing Receiver	m2	3.4
Source > Receiver Distance	m	27.0
Lw Ground Atten. Factor	dB	-14.0

Unit 4 – Noise Breakout

Noise Breakout Calculation									
Description:									
Calculation of noise breakout from UNIT 4 to receiver location									
1/1 Octave Centre-Freq. Band	Hz	63	125	250	500	1k	2k	4k	dBA
Source Noise Level, dB	dB	67.4	69.4	72.4	70.1	72.3	74.9	74.3	80.0
R1, 4 / 16 / 4mm glazing	R, dB	21.0	24.0	20.0	25.0	35.0	38.0	35.0	
R2	R, dB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
R3	R, dB	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Comp R	Rcomp, dB	-21.0	-24.0	-20.0	-25.0	-35.0	-38.0	-35.0	
Distance Correction	dB	-29.8	-29.8	-29.8	-29.8	-29.8	-29.8	-29.8	
Receiver Level (Unweighted)	dBZ	7.9	6.9	13.9	6.6	-1.2	-1.6	0.8	
A-Weighting	dB	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	
Receiver Level	dBA	-18.3	-9.2	5.3	3.4	-1.2	-0.4	1.8	9.5
Formula:									
$L_2 = L_1 - SRI + 10\log[S] + 20\log[r] - 14, dB$									

Partition(s) & Receiver Details		
R1, 4 / 16 / 4mm glazing	m2	3.4
R2	m2	0.0
R3	m2	0.0
S Total	m2	3.4
S Facing Receiver	m2	3.4
Source > Receiver Distance	m	31.0
Lw Ground Atten. Factor	dB	-14.0

APPENDIX G – Acoustic Terminology

To aid the understanding of acoustic terminology and the relative difference between noise levels the following background information is provided.

We perceive sound when the ear detects fluctuations in air pressure (sound waves), which are then processed by the brain and perceived as sound. Humans can hear an incredibly wide range of sound intensities ranging from jet engines to fingertips lightly brushing against each other. This range is quantified using a logarithmic scale called the decibel scale (dB). The comfortable range of the decibel scale typically ranges from 0dB (the threshold of hearing) to around 140dB. Here are some examples common environments and their typical noise levels.

Noise Level	Environment
0 dB(A)	Threshold of hearing
20 to 30 dB(A)	Quiet bedroom at night
30 to 40 dB(A)	Living room during the day
40 to 50 dB(A)	Typical office
50 to 60 dB(A)	Inside a moving car
60 to 70 dB(A)	Typical high street
100 to 110 dB(A)	Fire alarm at 1 metre away
140 dB(A)	Threshold of pain

Terminology

dB (decibel) – A unit used to quantify the pressure level of sound. Defined as 20 times the logarithm of the ratio between the root-mean-square pressure of a given sound field and a reference pressure level (2×10^{-5} Pa – threshold of hearing).

$L_{Aeq, T}$ – The equivalent continuous sound pressure level over a stated period. It quantifies a fluctuating sound level over a given period as the equivalent continuous sound level in which the same amount of acoustic energy is contained over. This is A-weighted in order to assess human perception.

L_{A90} – The sound level exceeded 90% of the time. Typically used to describe background noise the L_{90} is regarded as the ‘average minimum level’ and quantifies the common sound level of a fluctuation sound field i.e. the sound level that occurs 90% of the time. Alternatively, L_{10} describes the sound level exceeded 10% of the time and therefore quantifies the ‘average maximum level’ of sound which is often used during the calculation of road traffic noise.

A-Weighting – A standard weighting of the audible frequencies designed to reflect the response of the human ear to noise.

R_w – The Weighted Sound Reduction Index (R_w) is a number used to rate the effectiveness of a soundproofing system or material.



Let us introduce ourselves

Peak Acoustics formed in 2011, we are a fully accredited specialist consultancy and testing organisation.

We are a diverse team of Acoustic Consultants, Specialist Engineers and Building Compliance Technicians, with a network spanning the UK. We are proud to offer our services nationally, with no job too big or small.

We provide Acoustic Consultancy, Building Compliance Testing and Energy Services.

Additional Services

We offer an extensive range of services in the sectors of Acoustic Consultancy, Building Compliance & Energy Efficiency. We are able to put together custom packages combining multiple services which saves both time and money for you.

Building Compliance

- Sound Insulation Testing
- Air Tightness Testing
- Ventilation Testing
- Water Efficiency Calculations
- Sound Insulation Specification

Energy Efficiency

- SAP Calculations
- EPC's
- SBEM Calculations
- Energy Statements
- Sustainability Statements
- MEES Regulations
- Commercial EPC's

Acoustic Consultancy

- Noise Assessment for planning conditions
- Construction site noise monitoring
- Noise at work assessments
- Noise & Vibration Impact Assessments

Peace of mind

We are accredited and registered by all the relevant major UK authorities to provide the services we offer. Peak Acoustics is UKAS accredited for sound insulation testing, ATTMA registered for Air Leakage Testing. and our Energy team are all Domestic On-Completion Energy Assessors.

Our Added Value

We combine our detailed knowledge of building regulations with our technical understanding of building physics, acoustics and environmental sciences to maximise development quality. Our work ensures appropriate strategies and studies are prepared to demonstrate to local authorities how proposed developments will be of high quality and generate acceptable impact on the surrounding environment.

Contact Us

Head Office:

Peak Acoustics
Fernbank House
Springwood Way, Macclesfield, SK10 2XA

Tel: 0330 043 1764

Email: sales@acousticsurveys.co.uk

Website: acousticsurveys.co.uk

Opening hours

Mon - Fri: 8:30 - 17:00