



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

Rev. 0

27/07/2020



Noise Impact Assessment

Report Reference Number: NM3006203NR

Assessment Standards: BS4142:2014; BS8233:2014

Client: Ikhlaq Ahmed

Site: 824 Stockport Road, Levenshulme, Manchester, M19 3AW

Project Consultant

N. Mitchell BSc (Hons)

Acoustic Consultant

nick@acousticsurveys.co.uk

Proofing Consultant

K. Donald BSc (Hons) TechIOA

Acoustic Consultant

kyle@acousticsurveys.co.uk



Contents

Project Information.....	4
Assessment Summary	5
1. Proposed Noise Sources.....	6
2. Noise Sensitive Receptors (NSRs).....	6
3. Site Description, NSR and Measurement Locations	7
4. Measurement Procedure	8
5. Measurement Equipment	8
6. Weather Conditions	8
7. Background Sound Levels	9
8. Specific Sound Levels - Plant	9
9. Rating Level - Plant.....	10
10. Rating Level Vs Background - Plant	10
11. Sound Insulation Review – Noise Break Out	11
12. Noise Break Out – Internal Restaurant Noise.....	11
13. Predicted Noise Break Out	12
14. Internal Sound Transmission.....	13
15. Conclusion.....	14
APPENDIX A – Measurement Details	15
APPENDIX B - Equipment Details	15
APPENDIX C - Meteorology Details	15
APPENDIX D - Calibration Details	15
APPENDIX E – Noise Survey Results	16
APPENDIX F – Calculations	17
APPENDIX G – Technical Data Sheets.....	20
APPENDIX H – Acoustic Modelling	21

Project Information

Peak Acoustics has been commissioned to undertake the assessment detailed within this report. Below is a summary of pre-commencement requirements and comments as communicated to Peak Acoustics by involved parties. This information forms the basis of the assessment and report.

Client Contact	Ikhlaq Ahmed
Client Requirement	A noise assessment has been requested by the local authority regarding a change of use from first floor storage to allow use as a restaurant of 60 no. covers.
Site details as communicated by client.	The site currently operates as a Class A3 and Class A5 premises at ground floor with first-floor storage space. Two external plant condenser units are situated on the side of the building.
Planning Conditions & Criteria	The following conditions have been identified and provided by the local authority: <i>"5) Before use of the first floor commences, the party wall with the adjoining property, no. 822 Stockport Road, shall be acoustically insulated and treated to limit the break out of noise in accordance with a noise study of the premises and a scheme of acoustic treatment that has been submitted to and approved in writing by the City Council as local planning authority. The scheme shall be implemented in full before use of the first floor commences.</i> <i>6) Any externally mounted ancillary equipment shall be acoustically insulated in accordance with a scheme submitted to and approved in writing by the City Council as local planning authority in order to secure a reduction in the level of noise emanating from the site/property. Externally mounted ancillary plant, equipment and servicing shall be acoustically treated in accordance with a scheme designed so as to achieve a noise level of 5dB below the existing background (LA90) in each octave band at the nearest noise sensitive location."</i>
Assessment Standards & Justification	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 noise emissions to the measured background noise level on site. Noise-Breakout – The noise impact will also be determined via comparison of predicted noise-breakout from the proposed development against the pre-existing background noise level at the NSR location. IOA Good Practice Guide for Entertainment Noise (2003) – Guidance on the assessment of entertainment noise via the comparison of noise emissions to internal noise level standards set out in BS8233. BS8233:2014 – internal noise levels within the neighbouring property will be within the desirable limits of BS8233:2014 'Noise Rating Curve – ISO 1973' give graphs of acceptable sound pressure levels plotted against frequency and are determined based on hearing preservation, speech and annoyance. Referencing noise break-in to NR curves allows for a more comprehensive assessment of internal noise levels due to the frequency dependency of the acceptable noise levels, as opposed to a single, summative decibel target.

Assessment Summary

A Noise Impact Assessment has been conducted at 824 Stockport Road in relation to the proposal of a new first-floor restaurant space inclusive of 60 covers and which adjoins a neighbouring property with two externally mounted condenser units.

A background noise survey was undertaken on Wednesday 15th July 2020 to obtain measurements of the existing noise climate representative of nearby Noise Sensitive Receptors (NSRs). Residential receptors were identified and are detailed within Sections 2 & 3.

A BS4142:2014 assessment of externally mounted condenser units, with a precautionary + 3 dB intermittent BS4142 penalty, identified a *Low Impact* at the worst affected receptor (NSR2). Rating Levels were calculated as 18 dB below the prevailing background sound level. No mitigation is deemed applicable.

An assessment of noise breakout is predicted to be 42.5 dBA below the lowest measured background sound level (M1) at 1 meter from the worst affected receptor façade. Noise levels fall well within the desirable limits in regard to BS8233 daytime threshold of <35 dB $L_{Aeq,16hr}$.

An internal sound transmission assessment of the separating partition predicted that internal levels can be controlled within desirable limits of daytime noise levels set out in BS8233, and within NR25 curve for each individual octave bands.

Operation of the proposal will be unlikely to give rise to adverse noise impacts upon the surrounding residential community.

1. Proposed Noise Sources

- 1.1 The individual noise sources, together with their proposed operational times, are detailed below:

Condenser Units – Air Conditioning:

- 2x No. Mitsubishi MXZ-5E102VA
- Operation 12:00 – 23:00

Internal Sound Transmission (Adjoining property)

- A mix of internal background music and human voice
- Operation 12:00 – 23:00

Noise Breakout (Nearest Receptor)

- A mix of internal background music and human voice
- Operation 12:00 – 23:00

2. Noise Sensitive Receptors (NSRs)

- 2.1 The nearest Noise Sensitive Receptors (NSRs) have been identified based on the noise source in which they will be primarily exposed to:
- 2.2 For consideration of the externally mounted plant equipment, the nearest Noise Sensitive Receptor has been identified as nearest first-floor window on the opposite side of Stockport Road, NSR 2.
- 2.3 The breakout of noise will consider both NSR 1 and NSR 2 due to proximity and line of sight toward the restaurant.
- 2.4 In considering the internal sound transmission and noise break out, the nearest Noise Sensitive Receptor has been identified as the neighbouring dwelling that shares a separating wall partition with the restaurant, NSR 1.

3. Site Description, NSR and Measurement Locations

- 3.1 The building is located halfway along the main Manchester to Stockport Road (A6) near Matthews Lane junction and adjacent to Levenshulme Methodist Church. At the rear of the property is an enclosed yard area used for customer / staff parking as well as bin storage. A neighbouring dwelling which has been vacant for over 15 years shares a separating wall partition with the restaurant.
- 3.2 The site, NSRs, noise monitoring location and noise source locations are shown in **Figure 1** below.

Figure 1: Measurement and NSR Locations



-  Site Boundary (Approx.)
-  Background Sound Monitoring Location (M1)
-  AC units (Approx.)
-  NSR 1 (internal sound transmission and noise breakout)
-  NSR 2 (external plant)

4. Measurement Procedure

- 4.1 Attended measurements of the condenser units was undertaken on 3rd July 2020. Due to high environmental noise levels present in the area, measurements were deemed unsuitable as primary noise sources masked the plant noise; ambient readings did not match manufacturers data for the Mitsubishi MXZ-5E102VA units. Therefore, manufacturer data sheets and library data have been utilised in order to provide a robust assessment.
- 4.2 An attended background noise measurement was conducted at position M1 over a period of 30 minutes just after the proposed closing hours of 23:00 on 15th July 2020. The noise climate at this position was deemed representative of that at the NSR locations adjacent and opposite.
- 4.3 Measurements of $L_{Aeq,T}$ and $L_{A90,T}$ were logged in 1-min intervals at 1/1 octave resolution.
- 4.4 At position M1 the microphone was placed approximately 1.7m from ground level and away from reflective surfaces.

5. Measurement Equipment

- 5.1 Measurements were obtained using Class 1 instrumentation. Full equipment details are given in **Appendix B**.
- 5.2 Equipment was calibrated before and after use and no significant drift occurred during measurements. Detailed equipment listings can be located in **Appendix A** with full calibration details are provided in **Appendix D**.

6. Weather Conditions

- 6.1 Weather conditions were dry with temperatures of around 14°C and wind speeds of 3 m/s; deemed suitable for conducting environmental noise measurements. Detailed meteorological information can be found in **Appendix C**.

7. Background Sound Levels

- 7.1 The AC/condenser plant units are expected to run intermittently due to cooling demands during the hour's operation (12:00 – 23:00).
- 7.2 For the assessment of the AC condenser, as requested by the local authority, 5 dB below the lowest background 15-minute period measured during the 30-minute attended noise survey has been considered.
- 7.3 For the assessment of noise breakout, the lowest 15-minute period during the measurement, and just after the restaurant closes, has been considered to account for overflow of when customers are leaving and representative of the most time-sensitive period in which the nearest receptor could be impacted.
- 7.4 A summary of the background sound level and target criterion considered for the assessment are provided in **Table 1** below.

Table 1: Measured Background Sound Levels

Location	Period	Lowest Background, dB $L_{A90,15min}$	Plant Criterion, dBA
M1	Night-time (23:15 – 23:30)	54	< 49

8. Specific Sound Levels - Plant

- 8.1 The Specific Sound Level is denoted L_{As} and is the A-weighted, equivalent noise level at the NSR location.
- 8.2 The Specific Sound Levels have been calculated to the NSR locations while accounting for distance attenuation, shielding, directivity and reflections.
- 8.3 Full calculations are shown in **Appendix F** and the derived Specific Sound Levels are tabulated below:

Table 2: Specific Sound Levels

NSR	Noise Source(s)	Day/Night	Specific Sound Level, dB L_{As}
1	External AC Plant	Night (23:00 – 07:00)	21
2	External AC Plant	Night (23:00 – 07:00)	28

9. Rating Level - Plant

- 9.1 In accordance with BS4142:2014, the Specific Sound Levels may be corrected for characteristics that make the sound more noticeable at the NSR location such as tonality, impulsivity, and intermittency.
- 9.2 Air handling units such as these are typically broadband in nature with no impulsive characteristics; therefore, no penalty for tonality or impulsivity has been applied.
- 9.3 The condenser units will operate in response to cooling demands, ambient temperatures, and seasonal changes; a 3 dB penalty for intermittency is therefore deemed applicable.
- 9.4 The Rating Levels following application of character corrections are summarised in **Table 3**.

Table 3: Rating Level Calculations

NSR	Specific Sound Level, dB L_{As}	Total BS4142 Corrections	Sound Rating Level, dB L_{Ar}
1	27	+ 3.0	24
2	28	+ 3.0	31

10. Rating Level Vs Background - Plant

- 10.1 The noise impact of the proposed noise sources is to be determined in accordance with BS4142:2014. The rating levels are to be compared to the background sound level to determine noise impact in accordance with BS4142:2014:

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;

- 10.2 The noise impact at the NSR locations is tabulated below:

Table 4: Noise Impact

NSR	Rating Level, dB L_{Ar}	Background Criterion, dBA	Difference, dB	Impact
1	24	< 49	-25	Low
2	31	< 49	-18	Low

- 10.3 The Rating Levels for the external condenser units is predicted to have a '*low impact*', in accordance with BS4142; no further assessment is required in regard to plant.

11. Sound Insulation Review – Noise Break Out

- 11.1 Existing construction details for the front façade were discussed and reviewed by the consultant on site during the noise survey measurement (M1). The existing construction is made of brick and block. A standard construction of 100mm brick / 75mm cavity / 100mm block has been considered for the purpose of a robust assessment.
- 11.2 The glazing was noted as double-glazed units. For robustness, a standard configuration of 4mm / 16mm / 4mm has been assumed as the exact glazing could not be examined on site.
- 11.3 To ensure the predicted noise breakout can be calculated, acoustic modelling through computer software (Marshall Day Acoustics Ltd – INSUL) has been utilised to derive sound insulation reduction indices, detailed below:

Table 5: Acoustically Modelled Sound Reduction Index

Material	63	125	250	500	1K	2K	4K
Glazing	22*	24	18	26	40	45	39
External Wall	41	48	47	51	60	70	80

*Acoustic data was unavailable at 63 Hz; therefore, a reasonably uniform value has been assumed.

12. Noise Break Out – Internal Restaurant Noise

- 12.1 Plans provided by the client give information regarding dimensions for both external and internal façades. Glazed areas and dimensions have been measured from the most current plans drawn by 'NA Design' and dated 'Nov 2013'.
- 12.2 New variations of the existing application sought after an increase in covers from 30 no. people to 60 no. people. A low level of background music is anticipated as not to exceed the level of comfortable speech. As a worst-case scenario, an overall level of 80 dBA has been considered.
- 12.3 Internal noise sources are to comprise primarily of music and spoken voice. Internal spectra for the proposal have been obtained using previously measured library data as well as data from the human speech index 'ANSI 3.5, 1997'. An internal noise level of 80 dBA has been derived and is considered a robust representation of internal noise levels for a restaurant, tabulated below:

Table 6: Assumed Internal Noise Levels

Noise Source	63	125	250	500	1K	2K	4K	dB(A)
Music & Speech	75	75	75	78	76	72	65	80

13. Predicted Noise Break Out

- 13.1 Noise breakout via the front façade of the proposal has been calculated to the closest residing receptors, taking into account distance attenuation as well as the façade construction.
- 13.2 In the purpose of a robust assessment, noise breakout has only been assessed from the front façade due to the surface area of glazing and line of sight direction toward the NSR locations.
- 13.3 Dimensions and surface areas of the front façade construction have been approximated from plans supplied by the applicant, on site-observations and measurements of the archway opening. These approximations are as follows: 2.0m² glazing and 18.3m² existing brick.
- 13.4 The calculated noise breakout is shown below in **Table 7**.

Table 7: Noise Breakout

NSR Location	Internal Noise Level, dB	Noise Breakout at NSR, dB L _{Aeq}
NSR 1	80	11.5
NSR 2		8.8

- 13.5 The predicted noise breakout level is calculated to be 12 dB below the criteria set out in Section 4.3.1, indicating a Low Impact in accordance with the IOA guidance. This is summarised in **Table 8** below:

Table 8: Entertainment Noise Breakout

NSR Location	Noise Breakout, dB L _{Aeq}	Lowest Background Level, dB L _{A90}	Difference, dB	Impact
NSR 1	11.5	54	- 42.5	Low Impact
NSR 2	8.8		- 45.2	Low Impact

- 13.6 Calculations are based on windows being fully closed and ventilation provided by internal AC units associated with external condenser units. The business should make efforts to ensure that external windows are kept closed to ensure minimisation of noise egress.
- 13.7 Full calculations are provided in **Appendix F**.

14. Internal Sound Transmission

- 14.1 Through the use of information provided by the client, along with notes taken during the site survey, existing materials communicated by the client which form the adjoining partition could be modelled using industry standard acoustic insulation modelling software, *INSUL, Marshall Day Acoustics Ltd.*
- 14.2 A reasonable 'worst-case' scenario for noise levels within the restaurant would be 80 dB(A), with the frequency spectrum comprised primarily of human voice.
- 14.3 The following assumed internal noise levels for the 'Restaurant' have been used for the assessment:

Table 9: Internal Noise Sources

Source	Parameter	Octave Centre-Frequency Band, Hz (Unweighted)							Sum (dBA)
		63	125	250	500	1k	2k	4k	
Human speech [1]	dB L _{eq,T}	54.7	63.7	72.2	76.3	73.0	67.5	62.0	77.2
Music [2]	dB L _{eq,T}	74.8	75.1	71.7	71.2	73.4	70.4	61.9	76.8
Total	dB L _{eq,T}	74.8	75.4	75.0	77.5	76.2	72.2	65.0	80.0
[1]	American Standard ANSI 3.5 1997 – Human Voice Spectra (Independent of Sex) – Normalized								
[2]	Peak Acoustics measurement of a PA System in operation in an unoccupied bar (August 2016)								

- 14.4 The proposed separating wall partition has been modelled and internal noise transmission has been calculated using a room-to-room sound transmission calculation (full calculation – **Appendix F**, separating wall acoustic modelling detailed within **Appendix H**).
- 14.5 The predicted sound transmission levels with would be 20.4 dB L_{Aeq} and therefore the BS8233:2014 target of 35 dB(A) for living conditions have been met.
- 14.6 Due to the separating partition siding with a first floor (bedroom) area, the individual octave bands of internal sound transmission have been compared to NR25 in the interest of a robust assessment. The outcome is tabulated below Table 10 below.

Table 10: Internal Sound Transmission – NR25

	Octave Centre-Frequency Band, Hz						
	63	125	250	500	1K	2K	4K
Restaurant Noise Levels, dB L _{eq}	75	75	75	77	76	72	65
Receiver Noise Levels, dB L _{eq}	34	23	25	18	13	7	-8
Criteria, NR25	55	44	35	29	25	22	20
Difference	-21	-21	-10	-11	-12	-15	-28

- 14.7 The individual octave bands of internal sound transmission are within the spectra of NR25. No mitigation is deemed necessary.

15. Conclusion

- 15.1 A Noise Impact Assessment has been conducted at 824 Stockport Road in relation to the proposal of a new first-floor restaurant space.
- 15.2 A background noise survey was undertaken to derive representative background sound levels during the relevant time periods.
- 15.3 Noise Sensitive Receptors were identified as nearby residential dwellings, detailed in **Figure 1**.
- 15.4 A BS4142:2014 assessment indicated that the external condenser units result in a *Low Impact* at all identified NSR locations.
- 15.5 A noise breakout assessment determined that internal to external noise egress will not negatively impact surrounding receptors and noise levels fall well under the lowest measured background sound levels (M1).
- 15.6 The neighbouring property, NSR1, shares an internal partition with the first-floor restaurant. An assessment of internal sound transmission determined that internal sound transmission would be within the desirable limits of BS8233 with individual octave bands well within NR25 Curves.
- 15.7 Operation of the proposal will be unlikely to give rise to adverse noise impacts upon the surrounding residential community.

APPENDIX A – Measurement Details

Measurement	Kit	Start Date	Start Time	End Date	End Time
M1	A4	15/07/20	23:00	15/07/20	23:30
Source Measurement	STK 3	03/07/20	14:40	03/07/20	14:45

APPENDIX B - Equipment Details

Kit	Equipment	Make	Model	Class	Serial Number
A4	Sound Meter	Svantek	971	1	60688
A4	Pre-Amp	Svantek	SV18	1	62781
A4	Microphone	ACO	7052E	1	66703
STK 3	Sound Meter	Svantek	977	1	36815
STK 3	Pre-Amp	Svantek	SV12L	1	47589
SKT 3	Microphone	ACO	7052E	1	63891
Cal	Calibrator	Svantek	SV33A	1	90273

APPENDIX C - Meteorology Details

Date	Temp C°	Wind Speed m/s	Wind Direction	Humidity %	Precipitation mm	Cloud Cover (Oktas)
15/07/20	14	3	W	94	0.0	7/8

APPENDIX D - Calibration Details

Measurement	Calibrator Ref Level (dB)	Level Before (dB)	Deviation Before (dB)	Level After (dB)	Deviation After (dB)
M1	113.9	114.8	-0.9	114.8	-0.9

APPENDIX E – Noise Survey Results

Measured Background Sound Levels [M1] 15th July 2020

Date & time	LAFmax, [dB]	LAeq, [dB]	L10, [dB]	L90, [dB]
15/07/2020 23:00	78.3	69.2	73.4	59.6
15/07/2020 23:01	81.4	73.8	77.3	57.9
15/07/2020 23:02	78.7	74.8	77.3	70.5
15/07/2020 23:03	79.6	74.7	76.7	71.3
15/07/2020 23:04	81.4	73.7	75.9	67.6
15/07/2020 23:05	86.8	72.8	76.0	55.5
15/07/2020 23:06	77.6	71.0	74.9	58.3
15/07/2020 23:07	78.7	66.8	70.6	49.1
15/07/2020 23:08	82.5	72.6	76.2	61.3
15/07/2020 23:09	75.1	67.8	71.9	57.6
15/07/2020 23:10	80.0	68.6	72.6	59.0
15/07/2020 23:11	78.9	71.2	75.3	57.1
15/07/2020 23:12	81.2	72.5	78.1	49.3
15/07/2020 23:13	81.2	71.0	75.6	55.4
15/07/2020 23:14	77.9	69.8	74.4	58.1
15/07/2020 23:15	78.7	68.9	72.1	57.5
15/07/2020 23:16	77.1	70.1	73.8	58.3
15/07/2020 23:17	78.5	70.0	73.6	56.8
15/07/2020 23:18	77.2	67.6	71.7	53.2
15/07/2020 23:19	79.7	68.8	73.8	51.9
15/07/2020 23:20	80.4	71.4	75.6	54.3
15/07/2020 23:21	76.3	68.0	72.5	52.4
15/07/2020 23:22	82.6	65.3	69.2	53.8
15/07/2020 23:23	74.4	61.1	63.8	45.0
15/07/2020 23:24	78.4	68.0	72.5	52.1
15/07/2020 23:25	78.0	70.6	74.3	58.3
15/07/2020 23:26	79.8	70.4	74.6	60.6
15/07/2020 23:27	79.7	69.3	73.8	59.0
15/07/2020 23:28	76.1	68.7	73.1	60.2
15/07/2020 23:29	79.4	72.0	76.0	62.6
15/07/2020 23:30	81.0	69.9	74.0	53.6

APPENDIX F – Calculations

BS4142 - Condenser Unit Calculations

Condenser Units											
		Hz	63	125	250	500	1k	2k	4k	8k	dB (A)
Mitsubishi MXZ-5E102VA manufacturer referenced data	<i>Lp</i>		54	54	54	53	50	46	41	34	55
Mitsubishi MXZ-5E102VA outdoor unit	<i>Lp</i>		51	51	51	50	47	43	38	31	52
2no. Mitsubishi MXZ-5E102VA outdoor units			54	54	54	53	50	46	41	34	55
NSR 1 (N) - Impact											
2no. Mitsubishi MXZ-5E102VA outdoor units	<i>Lp</i>		54	54	54	53	50	46	41	34	55
Reflection (Wall)			3	3	3	3	3	3	3	3	
Line of sight			-10	-10	-10	-10	-10	-10	-10	-10	
Distance correction			-27	-27	-27	-27	-27	-27	-27	-27	
Level at NSR	<i>Lp</i>		20	20	20	19	16	12	7	0	21
NSR 2 (E) - Impact											
2no. Mitsubishi MXZ-5E102VA outdoor units			54	54	54	53	50	46	41	34	
Reflection (Wall)			3	3	3	3	3	3	3	3	
Line of Sight			0	0	0	0	0	0	0	0	
Distance correction			-30	-30	-30	-30	-30	-30	-30	-30	
Level at NSR			27	27	27	26	23	19	14	7	28

Noise Breakout Calculation - NSR 1								
Description:								
Calculation of noise breakout from internal space to external receiver location								
1/1 Octave Centre-Freq. Band	Hz	63	125	250	500	1k	2k	4k
Source Noise Level, dB	dB	74.8	75.4	75.0	77.5	76.2	72.2	65.0
R1 External Wall	R, dB	41.0	48.0	47.0	51.0	60.0	70.0	80.0
R2 Glazing	R, dB	22.0	24.0	28.0	26.0	40.0	45.0	39.0
R3	R, dB	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Comp R	Rcomp, dB	-31.6	-33.9	-37.6	-36.0	-49.7	-55.0	-49.1
Receiver Level	dBZ	18.4	16.7	12.6	16.7	1.7	-7.6	-8.9
A-Weighting	dB	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0
Receiver Level	dBA	-7.8	0.6	4.0	13.5	1.7	-6.4	-7.9
Partition & Receiver Details								
S1 External Wall	m2	18.3						
S2 Glazing	m2	2.0						
S3	m2	0.0						
S Total	m2	20.3						
S Facing Receiver	m2	20.3						
Source > Receiver Distance	m	22.0						
Lw Ground Atten. Factor	dB	-11.0						-11 Hard Grnd, -14 Soft Grnd
Source Room Level	dBA	80.0						
Receiver Level	dBA	14.5						
Formula:								
$L_2 = L_1 - SRI + 10\log[S] + 20\log[r] - 14, \text{ dB}$								

Noise Breakout Calculation - NSR 2								
Description:								
Calculation of noise breakout from internal space to external receiver location								
1/1 Octave Centre-Freq. Band	Hz	63	125	250	500	1k	2k	4k
Source Noise Level, dB	dB	74.8	75.4	75.0	77.5	76.2	72.2	65.0
R1 External Wall	R, dB	41.0	48.0	47.0	51.0	60.0	70.0	80.0
R2 Glazing	R, dB	22.0	24.0	28.0	26.0	40.0	45.0	39.0
R3	R, dB	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Comp R	Rcomp, dB	-31.6	-33.9	-37.6	-35.9	-49.7	-54.9	-49.1
Receiver Level	dBZ	15.8	14.0	9.9	14.1	-0.9	-10.2	-11.6
A-Weighting	dB	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0
Receiver Level	dBA	-10.4	-2.1	1.3	10.9	-0.9	-9.0	-10.6
Partition & Receiver Details								
S1 External Wall	m2	18.3						
S2 Glazing	m2	2.0						
S3	m2	0.0						
S Total	m2	20.3						
S Facing Receiver	m2	20.3						
Source > Receiver Distance	m	30.0						
Lw Ground Atten. Factor	dB	-11.0						-11 Hard Grnd, -14 Soft Grnd
Source Room Level	dBA	80.0						
Receiver Level	dBA	11.8						
Formula:								
$L_2 = L_1 - SRI + 10\log[S] + 20\log[r] - 14, \text{ dB}$								

Room to Room Sound Transmission Calculation**Description:**

Calculation of sound transmission from Room A to Room B

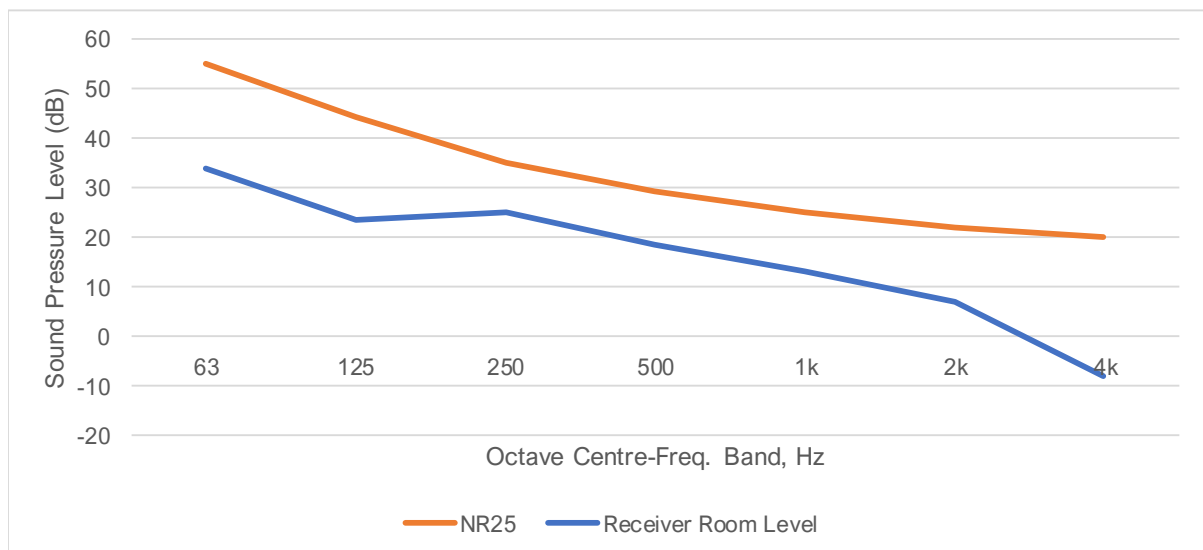
1/1 Octave Centre-Freq. Band	Hz	63	125	250	500	1k	2k	4k
Source Noise Level, dB	dB	75	75	75	77	76	72	65
R1 Separating Wall	R, dB	46.0	57.0	55.0	64.0	68.0	70.0	78.0
R2	R, dB	0.0	0.0	0.0	0.0	0.0	0.0	0.0
R3	R, dB	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Comp R	Rcomp, dB	-46.0	-57.0	-55.0	-64.0	-68.0	-70.0	-78.0
Receiver Room Level	dBZ	34	23	25	18	13	7	-8
A-Weighting	dB	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0
Receiver Room Level	dB(A)	7.4	7.1	16.2	15.1	13.0	8.2	-7.3

Partition & Receiver Room Details

S1 Wall Partition	m2	26.2
S2	m2	0.0
S3	m2	0.0
S Total	m2	26.2
S Shared Area	m2	26.2
Receiver Room Volume	m3	27.0
RT60	s	0.5
Absorptive Area	A, m2	8.7
Source Room Level	dB(A)	80.0
Receiver Room Level	dB(A)	20.4

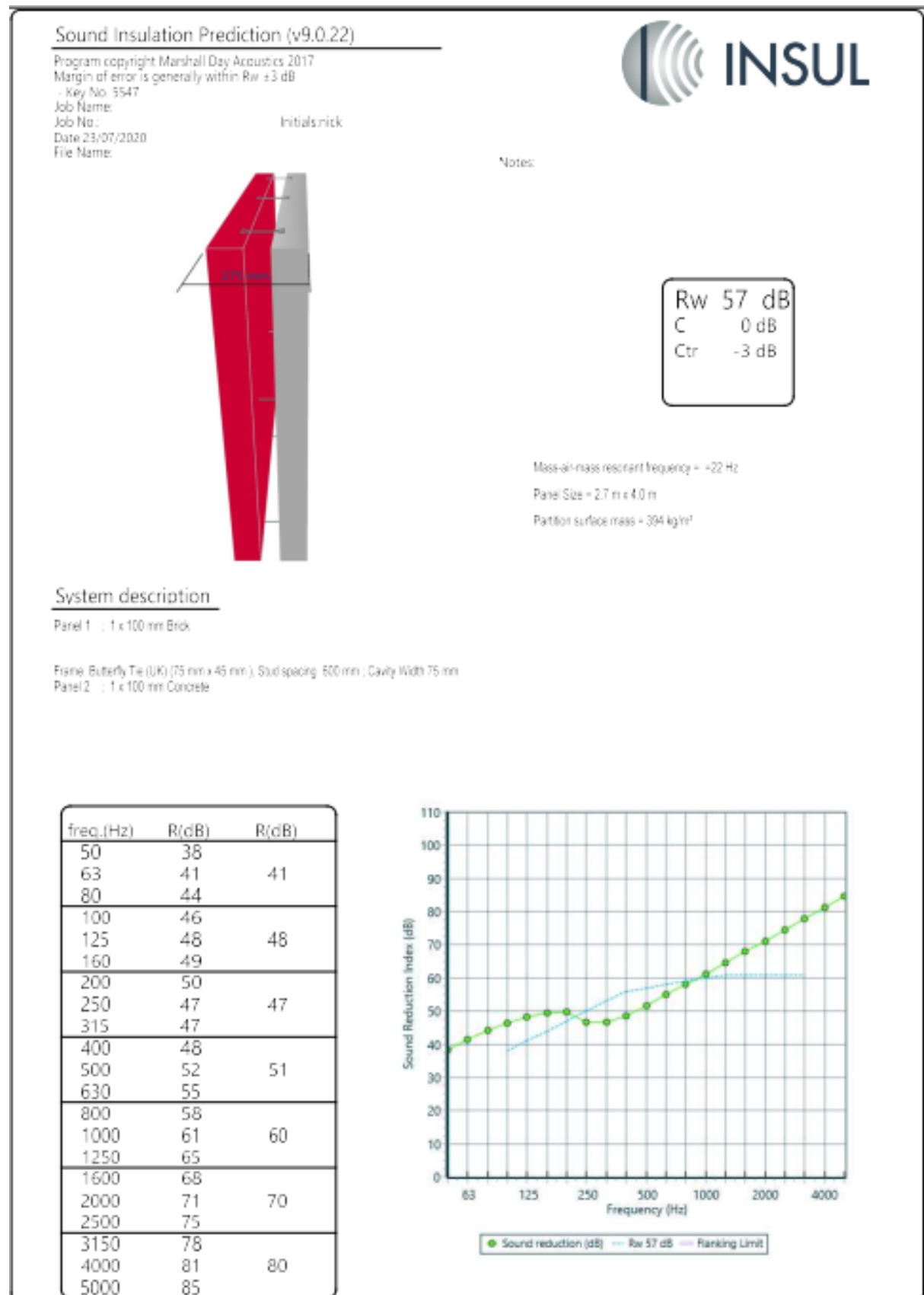
Formula:

$$L_2 = L_1 - SRI + 10 \log \left[\frac{S}{A} \right], \text{dB}$$



APPENDIX H – Acoustic Modelling

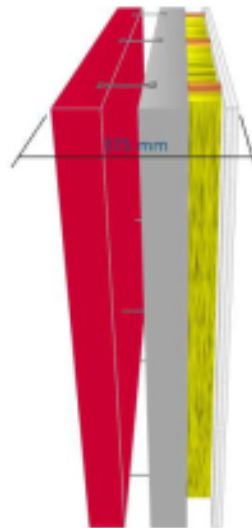
External Wall Construction



Sound Insulation Prediction (v9.0.22)

Program copyright Marshall Day Acoustics 2017
 Margin of error is generally within $R_w \pm 3$ dB
 - Key No. 5547
 Job Name:
 Job No.:
 Date 23/07/2020
 File Name:

Initials/nick



Notes:



R_w 67 dB
 C -1 dB
 Ctr -4 dB

Mass-air-mass resonant frequency = 426 Hz, 50 Hz

Panel Size = 2.7 m x 4.0 m

Partition surface mass = 420 kg/m²

System description

Panel 1 : 1 x 100 mm Brick

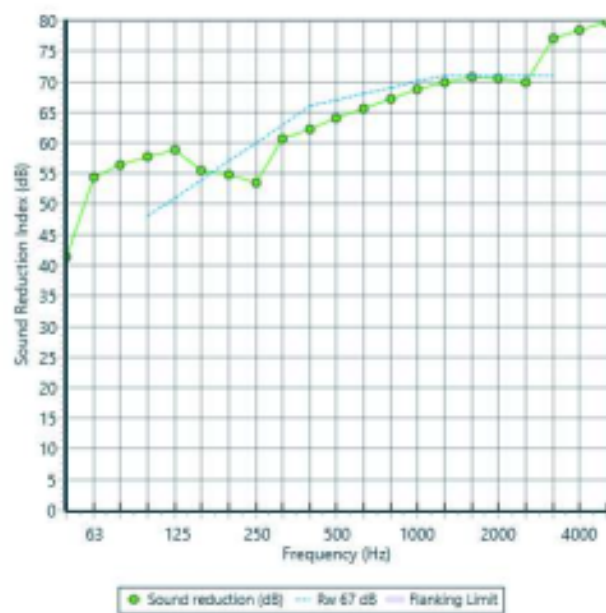
Frame: Butterfly Tie (UK) (75 mm x 45 mm), Stud spacing: 600 mm, Cavity Width 75 mm

Panel 2 : 1 x 100 mm Concrete

Frame: Timber stud (75 mm x 50 mm), Stud spacing: 600 mm, Cavity Width 75 mm, 1 x Mineral wool (3.8 lbf/ft³) Thickness: 75 mm

Panel 3 : 2 x 12.5 mm Gyproc SoundBloc 12.5mm

freq.(Hz)	R(dB)	R(dB)
50	41	
63	54	46
80	56	
100	58	
125	59	57
160	55	
200	55	
250	53	55
315	61	
400	62	
500	64	64
630	66	
800	67	
1000	69	68
1250	70	
1600	71	
2000	70	70
2500	70	
3150	77	
4000	78	78
5000	80	





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