

Report VA5623.241115.NIA

**Longacre House, Winchester Road,
Botley**

Noise Impact Assessment

25 November 2024

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Report Version	Author	Approved	Changes	Date
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The interpretations and conclusions summarised in this report represent Venta Acoustics' best technical interpretation of the data available to us at the time of assessment. Any information provided by third parties and referred to in this report has not been checked or verified by Venta Acoustics, unless otherwise expressly stated in the document. Venta Acoustics cannot accept any liability for the correctness or validity of the information provided. Due to a degree of uncertainty inherent in the prediction of all parameters, we cannot, and do not guarantee the accuracy or correctness of any interpretation and we shall not, except in the case of gross or wilful negligence on our part, be liable for any loss, cost, damages or expenses incurred or sustained by anyone resulting from any interpretations, predictions of conclusions made by the company or employees. The findings and conclusions are relevant to the period of the site survey works, and should not be relied upon to represent site conditions at later dates. Where additional information becomes available which may affect the findings of our assessment, the author reserves the right to review the information, reassess the findings and modify the conclusions accordingly.

1. Introduction

A change of use of one of the units at Longacre House, Winchester Road, Botley from storage and warehousing (Class B8) to a dance and fitness studio (Class E) is being applied for.

Venta Acoustics has been commissioned by Synergy Elite to undertake an assessment the potential noise impact of the proposed changes on the nearby residential dwellings to support the planning applications.

An environmental noise survey was undertaken to determine the background noise levels at the site as well as the sound levels generated by the surrounding premises. These levels were then used to undertake an assessment of the likely impact on nearby noise sensitive receivers.

2. Site Description

As illustrated on attached site plan VA5623/SP1, the site building is located to the east of Winchester Road in a small industrial estate behind Longacre House. The estate already houses Love it Lawns, and another lawn and landscaping company.

The site is bordered by Braxells House and Gainsborough Cottages to the west, which are expected to be the most affected receivers.

The building is constructed from a profiled metal cladding. Internally, the walls and ceiling appear to have been spray foamed with thermal rigid insulation, with some timber boarding applied to the walls. To the front of the building is a large double door on rollers, with a smaller roller shutter door on the side, facing into the industrial estate.

The proposed use of the space is for dance lessons which would take place between 16:30 and 21:30 Monday – Sundays. Lessons are expected to be accompanied by music moderate levels. Outside of these hours, it may be used for mother, baby and toddler groups, and occasional one to one personal training.

3. Design Criterion and Assessment Methodology

There is no specific guidance for the assessment of music noise, with BS4142: 2014 *Methods for rating and assessing industrial and commercial sound* specifically excluding the assessment of music and people in its methodology.

BS8233 and the WHO Guidelines provide recommendations as to suitable internal and external noise levels, although this relates to ‘anonymous’ noise, such as distant traffic. However, the levels in the documents can be a useful starting point against which to assess other noise sources, which will be discussed further in the report.

The DEFRA Noise from Pubs and Clubs, as the title would indicate, was focussed upon larger venues. However, the guidance does provide a balanced approach for the assessment of music noise

sources, and so this element will be utilised for the assessment of music noise breakout from the building to the nearby receivers.

3.1 BS8233:2014

BS8233 *Guidance on sound insulation and noise reduction for buildings* provides guidance as to suitable internal noise levels for different areas within residential buildings.

The relevant section of the standard is shown below in Table 3.1.

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living Room	35 dB L_{Aeq} , 16 hour	-
Dining	Dining Room	40 dB L_{Aeq} , 16 hour	-
Sleeping (daytime resting)	Bedroom	35 dB L_{Aeq} , 16 hour	30 dB L_{Aeq} , 8 hour

Table 3.1 - Excerpt from BS8233: 2014

[dB ref. 20 μ Pa]

3.2 Noise from Pubs and Clubs

Little guidance relating specifically to the assessment of noise from existing premises, particularly involving music, is available.

The DEFRA Noise from Pubs and Clubs (2005) document reviews the current guidance and criteria used in the industry. It relates noise to subjective audibly as well as a number of objective metrics.

An IOA working group established to produce guidance on the control of noise from pubs and clubs, produced a set of criteria which, although not formally published as a Code of Practice, has been adopted by several councils / licensors in the absence of alternative criteria.

The following table expresses the numerical limits it suggested outside of residential windows:

Venue Where...	Suggested Regulations	Outcome if Criteria Met
Entertainment < 30 times/year*	$L_{Aeq,15mins}$ (EN) should not exceed L_{A90} (WEN) by more than 5dB.	EN will generally be audible but not overly obtrusive inside the noise sensitive property
Entertainment > 30 times/year*	L_{Aeq} (EN) should not exceed L_{A90} (WEN) by more than 5dB And the L_{10} (EN) should not exceed L_{90} (WEN) by more than 5dB in any 1/3 octave band between 40 and 160Hz.	EN will generally be audible but not overly obtrusive inside the noise sensitive property
Entertainment > once/week or continues beyond 2300hrs	L_{Aeq} (EN) should not exceed L_{A90} (WEN) And L_{10} (EN) should not exceed L_{90} (WEN) in any 1/3 octave band between 40 and 160Hz.	EN will be virtually inaudible inside noise sensitive property.

EN = Entertainment noise level, WEN = Representative background noise level without the entertainment noise, both measured 1m from the façade of the noise-sensitive premises.

* Not more than once a week and ends by 2300hrs

Table 3.2 Limits Suggested in the IOA Annex

4. Environmental Noise Survey

4.1 Survey Procedure & Equipment

In order to establish the existing background noise levels at the site, a noise survey was carried out between Wednesday 6th and Sunday 10th November 20204 at the location shown in site plan VA5623/SP1. This location was chosen to be representative of the background noise level at the most affected noise sensitive receivers.

Continuous 5-minute samples of the L_{Aeq} , L_{Amax} , L_{A10} and L_{A90} sound pressure levels were undertaken at the measurement location.

The weather during the survey period was generally dry with light winds. The background noise data is not considered to have been compromised by these conditions.

The measurement period did span fireworks night, but the times when fireworks were being let off, namely the weekend evenings, would not overlap with the majority of the proposed operational hours for the studio (weekday evenings), and so the background noise data is not considered to have been compromised by these events.

Measurements were made generally in accordance with ISO 1996 2:2017 *Acoustics - Description, measurement and assessment of environmental noise – Part 2: Determination of sound pressure levels*.

The following equipment was used in the course of the survey:

Manufacturer	Model Type	Serial No	Calibration	
			Certificate No.	Date
NTi Class 1 Integrating SLM	XL2	A2A-11586-E0	1509201-2	19/7/24
Larson Davis calibrator	CAL200	19816	1509201-5	19/7/24

Table 4.1 – Equipment used for the survey

The calibration of the sound level meter was verified before and after use with no significant calibration drift observed.

4.2 Noise Breakout Test

Whist on site, investigative sound breakout tests were undertaken from inside the building to the site boundary.

High volume 'pink' noise was generated from a loudspeaker in the building, positioned so as to obtain a diffuse sound field within the spaces. A spatial average of the resulting one-third octave band noise levels was obtained within both building source and at the site boundary to the residential dwelling.

Background noise levels were measured in the receive rooms in order to correct the received noise measurements for the influence of the prevailing noise climate as in accordance with BS EN 140 part 4.

The prevailing background noise in the building was due to traffic on the nearby roads.

Manufacturer	Model Type	Serial No	Calibration	
			Certificate No.	Date
NTi Class 1 Integrating SLM	XL2	A2A-11586-E0	1509201-2	19/7/24
Larson Davis calibrator	CAL200	19816	1509201-5	19/7/24
Electro Voice	ZLX-12P-EX	095208361761760076	-	-
Unbranded WAV player	-	-	-	-

Table 4.2 – Equipment used for the tests

5. Results

5.1 Noise Survey

The measured sound levels are shown as time-history plots on the attached charts VA5623/TH1-4.

The typical background noise levels measured were:

Monitoring Period	$L_{Aeq, T}$	Typical ¹ $L_{A90, 5min}$
07:00 – 23:00 hours	50 dB	37 dB
23:00 – 07:00 hours	43 dB	38 dB
Dance lesson hours 16:30 – 21:30	51 dB	39 dB

Table 5.1 – Typical background noise levels [dB ref. 20 μ Pa]

¹The typical L_{A90} value is taken as the 10th percentile of all L_{A90} values measured during the relevant period.

5.2 Noise Breakout Tests

The sound reduction from the existing building was, as would be expected, relatively poor, providing an overall sound reduction of 22dB from inside the building to the site boundary, 4m away from the main doors.

The dominant transmission path is through the roller doors, which are not sealed in any manner, and have gaps at the meeting junction and with the main building. A picture of the doors is shown below in Figure 5.1.



Figure 5.1 – Main doors to building

6. Discussion and Proposed Mitigation Measures

It is proposed for the premises to be used as a dance studio in the afternoon/early evening, although it may be used during the day for a range of uses including mother, baby and toddler groups and occasional one to one personal training. The noise from the proposed dance studio would be the loudest of the potential uses, and hence this has been focused on, as control of noise from this use would reduce all other uses to much lower noise levels, and hence would be at acceptable levels at the noise sensitive receivers.

The sound tests have shown that the building currently provides a poor degree of sound reduction. However, as part of the fit out and conversion process into the new use, there is the opportunity to improve the sound insulation performance and hence reduce potential noise impact on the nearby residences.

The fitout currently involves the replacement of the side roller door on the eastern façade of the building to create a new entrance to the building, with modern, thermally insulated doors. The current main doors are not to be used for access to the building.

It is recommended that the main doors are sealed shut and overboarded internally with 18mm timber sheeting that is sealed with non-hardening mastic at the junction with the walls.

Internally, and also over the newly overboarded main door area, a new independent studwork wall should be constructed, with the cavity between the existing wall/linings and the inner faces of the new lining being at least 100mm, with 100mm mineral wool (minimum density 22kg/m³) in the void and finished in two layers of 15mm plasterboard (minimum mass 9kg/m² per board), joints staggered and taped. A similar solution should be applied across the ceiling.

With the above in place, the sound insulation of the building would be expected to be significantly improved to music noise breakout.

7. Entertainment Noise Assessment

The notes to Table 3.2 suggest that, for premises the generate music more than once a week, the entertainment noise L_{Aeq} (EN) should not exceed the representative background noise level L_{A90} (WEN), and the L₁₀ EN should not exceed L₉₀ WEN in any 1/3 octave band between 40Hz and 160Hz outside any nearby receptor. Where so limited, music would be approaching inaudibility.

The following internal source noise level has been used have been used as the basis for the internal noise level, based upon measurements undertaken in other dance studios with loud, bass heavy music being played. The table below shows the levels between 40Hz-160Hz and the overall noise levels. The full spectral calculations between 40Hz and 5kHz are attached in Appendix B.

	L ₁₀							L _{Aeq}
	40 Hz	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	
Source Music Levels	53	69	74	76	81	82	81	79

Table 7.1 – Limited source spectrum for music (full spectrum in Appendix B)

The sound insulation of the external panel with the proposed uprated elements has been modelled in INSUL software, with the output attached in Appendix C. The abbreviated spectral loss is shown below in Table 7.2 for the frequencies highlighted by the guidance.

	40 Hz*	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz
Building loss	16	18	18	16	18	24	30

Table 7.2 – Limited spectral building envelope loss

* INSUL limits the performance to 50Hz. This value has been 'rolled off' by 2dB as would be expected at this lower frequency

The predicted noise levels at the most affected received are summarised below in Table 7.3 and Table 7.4.

Description	Sound Level
Music level at receiver - EN L _{eq}	15 dB(A)
Background – WEN L ₉₀	39 dB(A)
EN difference from WEN	-24 dB

Table 7.3 – L_{Aeq} levels at receiver

	40 Hz	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz
Music level at receiver - EN L ₁₀	8	22	27	31	34	29	22
Background – WEN L ₉₀	38	42	35	32	40	29	37
EN difference from WEN	-30	-20	-8	-1	-6	0	-15

Table 7.4 — L₁₀ levels at receiver

Full spectral calculations are attached in Appendix B.

This predicted level would be effectively inaudible, in accordance with the most stringent requirements of the guidance, and overall noise levels (L_{eq}) being significantly below the background noise levels.

The predicted noise levels are all external. Internal noise levels within the surrounding houses would be expected to be at least 15dB lower with open windows, and would be considerably below the recommended noise levels for ‘anonymous’ noise in BS8233.

8. Noise Management Strategy

Although the predictions show low noise levels at the receiver, it is recommended that the premises adopts a noise management strategy to use as a framework to follow should neighbours have concerns in the future.

The following noise management strategy includes many measures that would be recommended for adoption by management of the premises. This strategy address both music noise and noise from guests. These measures are intended to minimise the noise impact on the neighbours.

8.1 Potential Noise Sources

The management understand that the identification and recognition of potential causes of disturbance assists greatly in planning to avoid disturbances to the surroundings.

The following noise sources have been identified in relation to the proposed operation of the premises:

- Music noise from indoor areas (there is to be no amplified music played outdoors);

8.2 Management Controls

The responsibility for the management controls will be assumed by the manager/owner. Other members of staff may assume the role in the future following suitable training. Where the venue is hired out, this responsibility will be shared with the event organisers as will be included in the contract for the hire of the premises.

To minimise noise break-out from the premises, the external doors to the premises will be kept closed during the classes, except when being used for immediate access and egress. Closer

mechanisms will be used on all non-emergency exit doors to ensure these are kept closed when not in immediate use.

Guests are expected to access and leave the premises by car via the access road, which is entirely commensurate with the existing usage, and would generate a low number of vehicle movements.

8.3 Neighbour Relations

The management will endeavour to maintain a friendly, open and informative relationship with the nearby residents to allow concerns to be raised and addressed without hostility.

8.3.1 Complaints Procedure

A phone number and email address will be provided to nearby residents to allow efficient notification of the premises if noise or other activities are causing a disturbance. Clear instructions would be given to those likely to answer on these procedures for handling complaints.

A complaint action procedure will be produced and made available to staff who will be instructed to follow it on receiving a complaint. This procedure would include checking and adjusting the music volume and ensuring all doors are closed, if required.

A timed and dated log will be kept in the office of all complaints, including actions taken and responses given. Other information recorded in the complaints log will include the approximate number of guests and staff present at the time of the complaint, and any specific activities or conditions which were noteworthy at the time. Other notes or email communications should be copied and a record kept in the complaint log folder.

All complaints will be addressed promptly, with a response/explanation as well as any future actions or improvements that can be implemented.

9. Conclusion

A baseline noise survey has been undertaken by Venta Acoustics to establish the background noise climate in the locality of Longacre House, Winchester Road, Botley.

The measured noise levels have been assessed using the DEFRA Noise from Pubs and Clubs (2005) guidance, as well as comment made regarding noise levels in relation to BS8233: 2014 *Guidance on sound insulation and noise reduction for buildings* to assess potential impacts on the nearby noise sensitive receivers.

The predictions show noise levels would be at acceptable levels at the nearby receiver, and would likely be inaudible.

Although noise is not expected to be an issue, to ensure a full approach, a noise management strategy has also been provided to help address the potential for other impacts associated with the development through operational / management means.

With the recommended mitigation measures implemented, the proposed scheme is not expected to cause an adverse noise impact on the neighbours and the site is considered acceptable for the proposed use.

Jamie Duncan MIOA

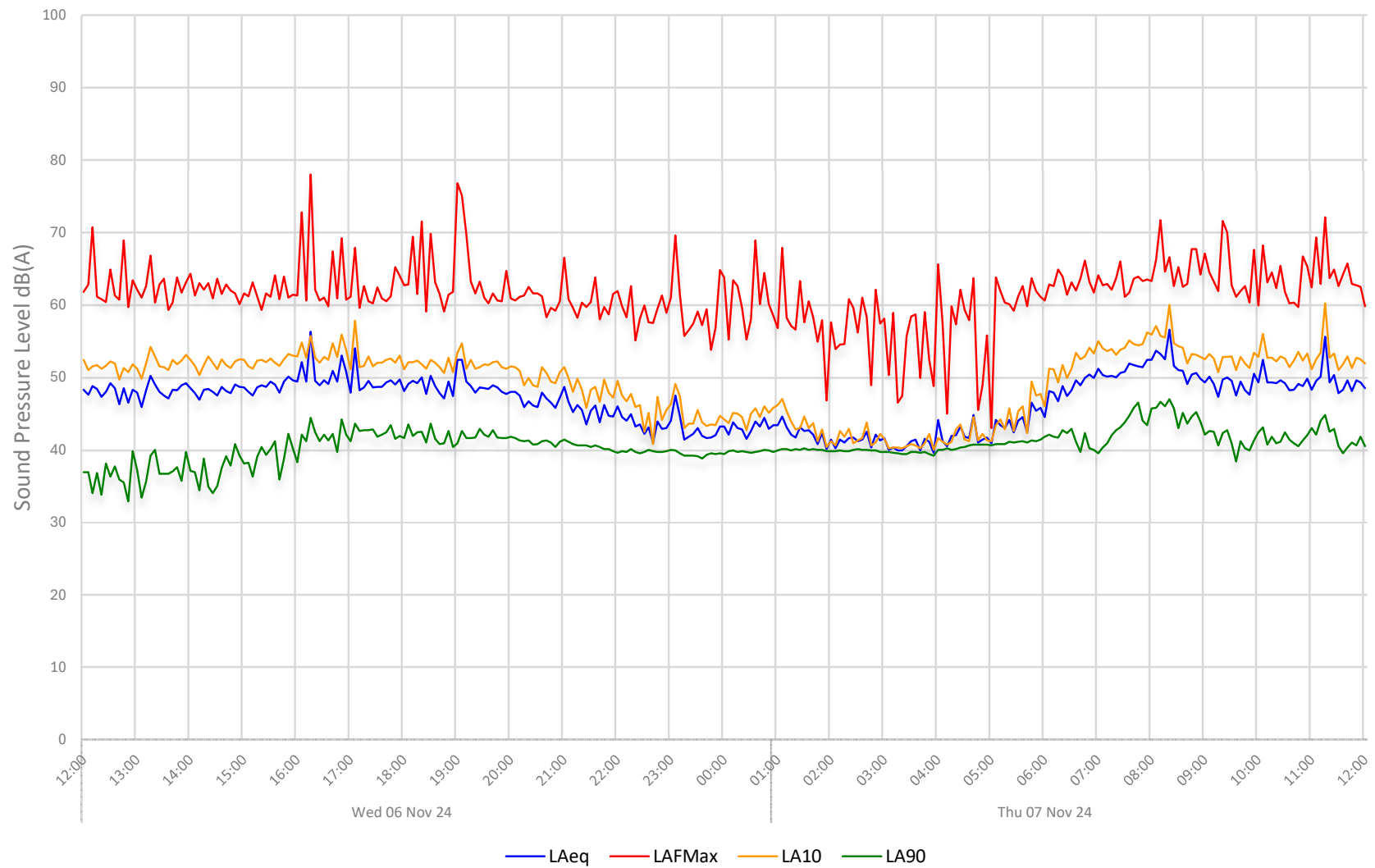


Longacre House, Winchester Road, Botley

Environmental Noise Time History: 1



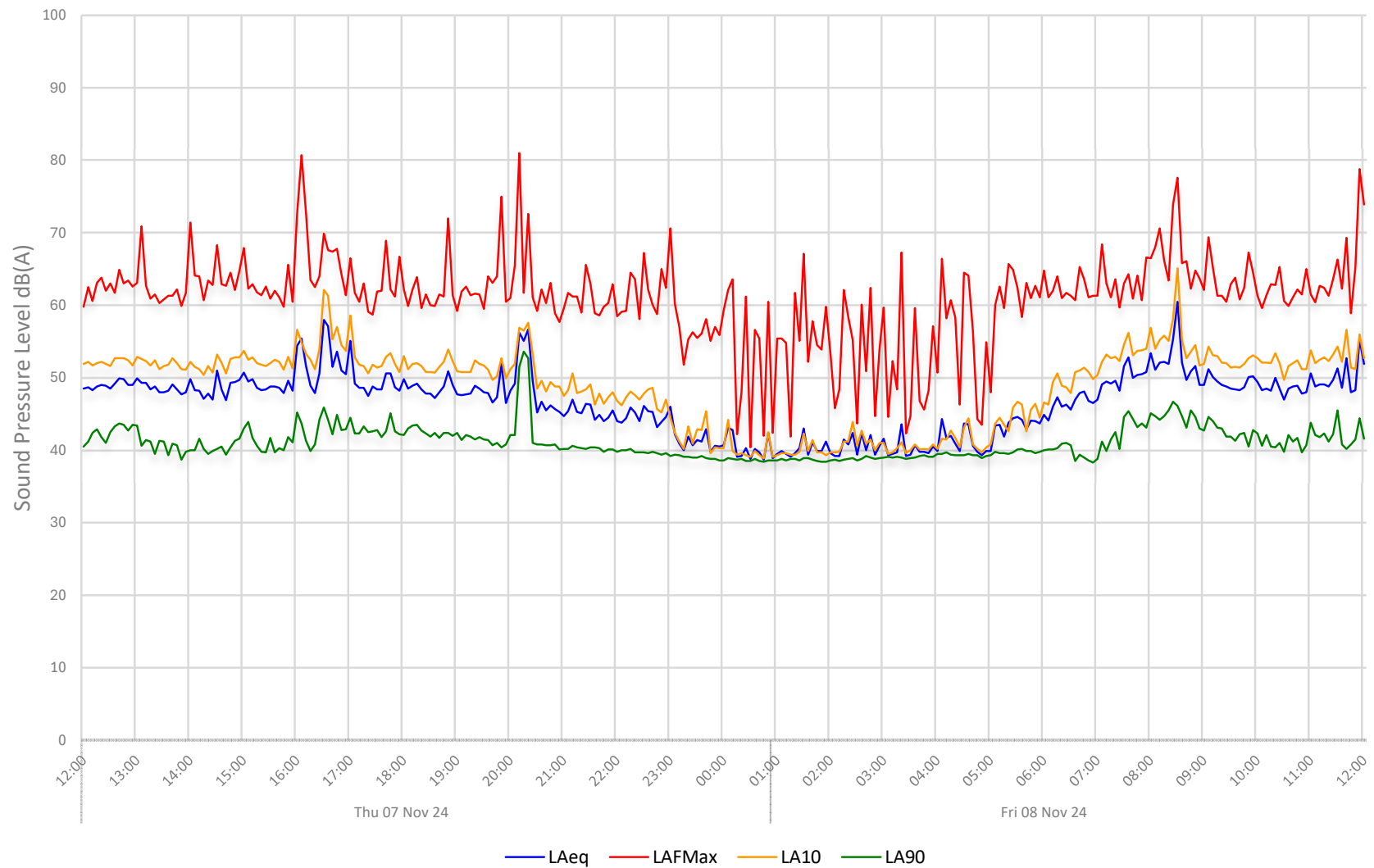
Figure VA5623/TH1



Longacre House, Winchester Road, Botley
Environmental Noise Time History: 2



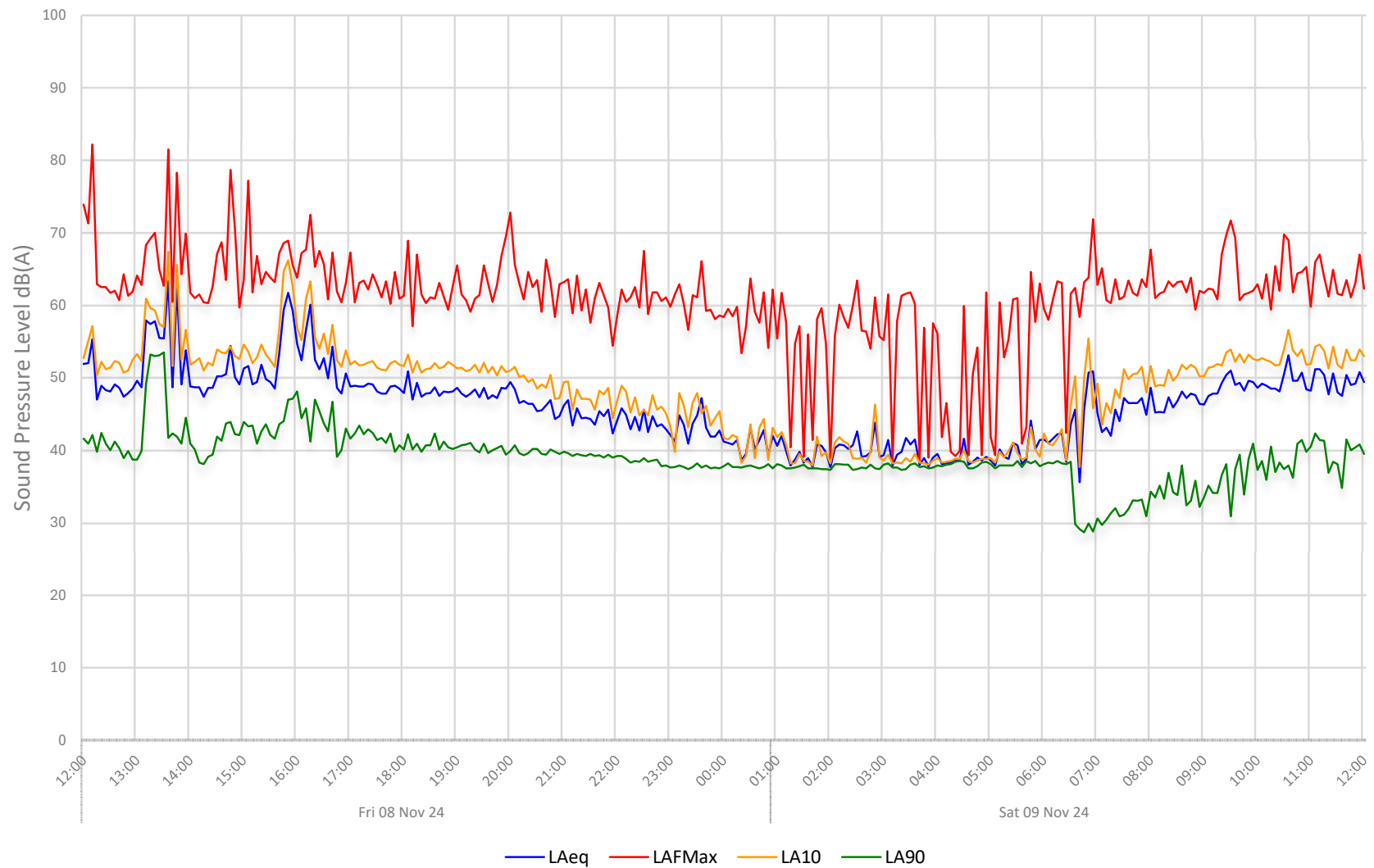
Figure VA5623/TH2



Longacre House, Winchester Road, Botley
Environmental Noise Time History: 3



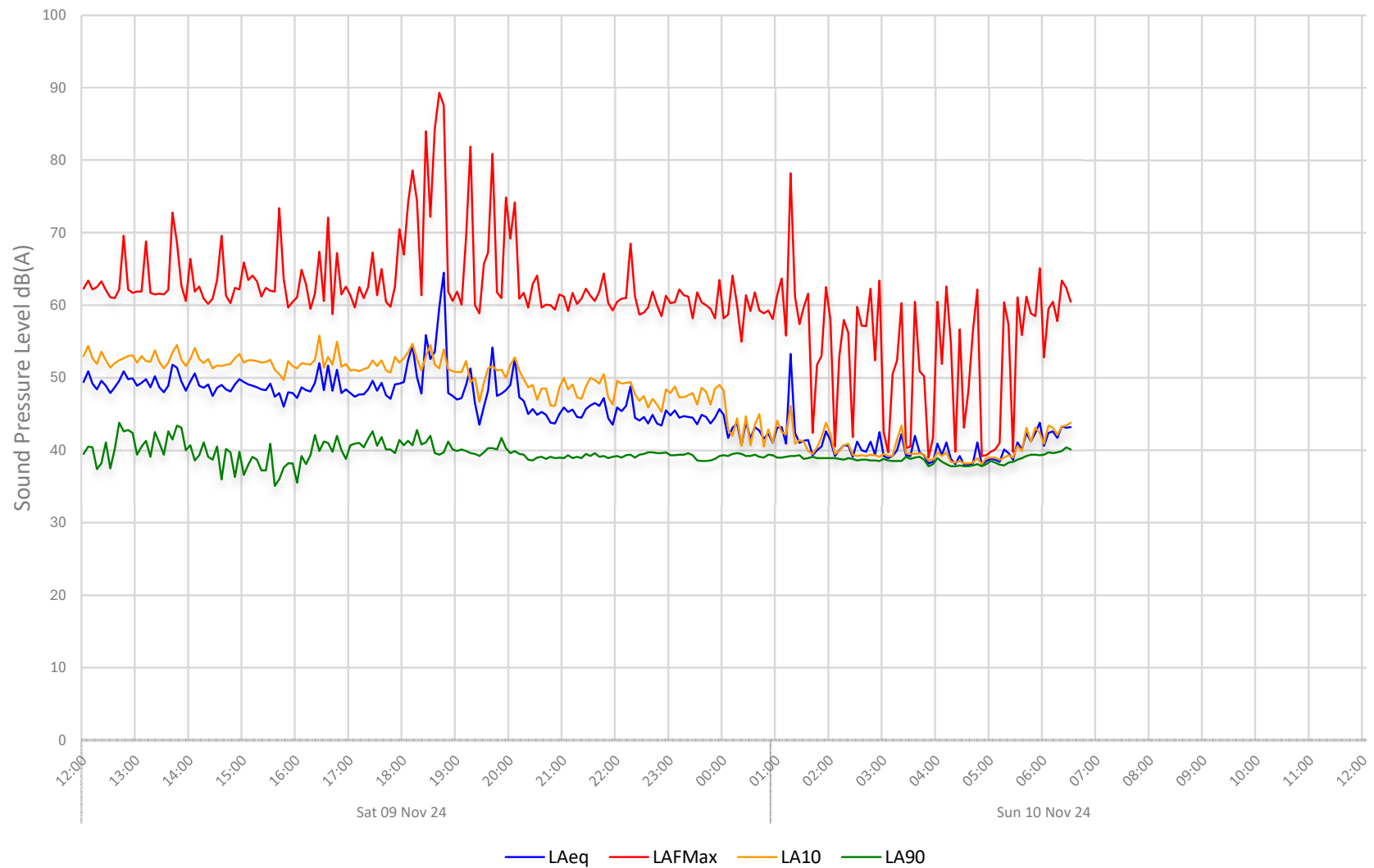
Figure VA5623/TH3



Longacre House, Winchester Road, Botley
Environmental Noise Time History: 4



Figure VA5623/TH4



APPENDIX A

Acoustic Terminology & Human Response to Broadband Sound

1.1 Acoustic Terminology

The human impact of sounds is dependent upon many complex interrelated factors such as 'loudness', its frequency (or pitch) and variation in level. In order to have some objective measure of the annoyance, scales have been derived to allow for these subjective factors.

Sound	Vibrations propagating through a medium (air, water, etc.) that are detectable by the auditory system.
Noise	Sound that is unwanted by or disturbing to the perceiver.
Frequency	The rate per second of vibration constituting a wave, measured in Hertz (Hz), where 1Hz = 1 vibration cycle per second. The human hearing can generally detect sound having frequencies in the range 20Hz to 20kHz. Frequency corresponds to the perception of 'pitch', with low frequencies producing low 'notes' and higher frequencies producing high 'notes'.
dB(A):	Human hearing is more susceptible to mid-frequency sounds than those at high and low frequencies. To take account of this in measurements and predictions, the 'A' weighting scale is used so that the level of sound corresponds roughly to the level as it is typically discerned by humans. The measured or calculated 'A' weighted sound level is designated as dB(A) or L_A . A notional steady sound level which, over a stated period of time, would contain the same amount of acoustical energy as the actual, fluctuating sound measured over that period (e.g. 8 hour, 1 hour, etc).
L_{eq} :	The concept of L_{eq} (equivalent continuous sound level) has primarily been used in assessing noise from industry, although its use is becoming more widespread in defining many other types of sounds, such as from amplified music and environmental sources such as aircraft and construction. Because L_{eq} is effectively a summation of a number of events, it does not in itself limit the magnitude of any individual event, and this is frequently used in conjunction with an absolute sound limit.
L_{10} & L_{90} :	Statistical L_n indices are used to describe the level and the degree of fluctuation of non-steady sound. The term refers to the level exceeded for n% of the time. Hence, L_{10} is the level exceeded for 10% of the time and as such can be regarded as a typical maximum level. Similarly, L_{90} is the typical minimum level and is often used to describe background noise. It is common practice to use the L_{10} index to describe noise from traffic as, being a high average, it takes into account the increased annoyance that results from the non-steady nature of traffic flow.
L_{max} :	The maximum sound pressure level recorded over a given period. L_{max} is sometimes used in assessing environmental noise, where occasional loud events occur which might not be adequately represented by a time-averaged L_{eq} value.

1.2 Octave Band Frequencies

In order to determine the way in which the energy of sound is distributed across the frequency range, the International Standards Organisation has agreed on "preferred" bands of frequency for sound measurement and analysis. The widest and most commonly used band for frequency measurement and analysis is the Octave Band. In these bands, the upper frequency limit is twice the lower frequency limit, with the band being described by its "centre frequency" which is the average (geometric mean) of the upper and lower limits, e.g. 250 Hz octave band extends from 176 Hz to 353 Hz. The most commonly used octave bands are:

Octave Band Centre Frequency Hz		63		125		250		500		1000		2000		4000		8000
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APPENDIX A

Acoustic Terminology & Human Response to Broadband Sound

1.3 Human Perception of Broadband Noise

Because of the logarithmic nature of the decibel scale, it should be borne in mind that sound levels in dB(A) do not have a simple linear relationship. For example, 100dB(A) sound level is not twice as loud as 50dB(A). It has been found experimentally that changes in the average level of fluctuating sound, such as from traffic, need to be of the order of 3dB before becoming definitely perceptible to the human ear. Data from other experiments have indicated that a change in sound level of 10dB is perceived by the average listener as a doubling or halving of loudness. Using this information, a guide to the subjective interpretation of changes in environmental sound level can be given.

Change in Sound Level dB	Subjective Impression	Human Response
0 to 2	Imperceptible change in loudness	Marginal
3 to 5	Perceptible change in loudness	Noticeable
6 to 10	Up to a doubling or halving of loudness	Significant
11 to 15	More than a doubling or halving of loudness	Substantial
16 to 20	Up to a quadrupling or quartering of loudness	Substantial
21 or more	More than a quadrupling or quartering of loudness	Very Substantial

APPENDIX B

VA5623 - Longacre House, Winchester Road, Botley

Noise Impact Assessment

	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	dB(A)
Music Internal Noise Level L_{eq}	50	66	70	71	78	80	78	78	74	74	73	73	70	70	70	67	67	64	66	64	63	63	79
Building envelope loss	-16	-18	-18	-16	-18	-24	-30	-35	-41	-45	-50	-54	-54	-58	-61	-64	-66	-68	-67	-62	-67	-70	
Distance Loss To 30m	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	
Level at receiver $EN L_{eq}$	4	18	22	26	30	26	18	13	4	-1	-6	-11	-13	-18	-20	-27	-29	-34	-31	-28	-34	-37	15
Background WEN L_{90}	38	42	35	32	40	29	37	31	31	33	33	32	30	31	31	30	27	27	21	20	19	19	39
EN difference from WEN	-34	-24	-13	-6	-10	-3	-19	-18	-27	-34	-39	-43	-43	-49	-51	-57	-56	-61	-52	-48	-53	-56	-25

	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	dB(A)
Music Internal Noise Level L_{10}	53	69	74	76	81	82	81	82	76	77	76	76	72	72	72	69	69	65	67	65	63	64	82
Building envelope loss	-16	-18	-18	-16	-18	-24	-30	-35	-41	-45	-50	-54	-54	-58	-61	-64	-66	-68	-67	-62	-67	-70	
Distance Loss To 30m	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	-30	
Level at receiver $EN L_{10}$	8	22	27	31	34	29	22	18	6	3	-3	-7	-11	-15	-18	-24	-26	-32	-29	-26	-33	-35	19
Background WEN L_{90}	38	42	35	32	40	29	37	31	31	33	33	32	30	31	31	30	27	27	21	20	19	19	39
EN difference from WEN	-30	-20	-8	-1	-6	0	-15	-13	-25	-30	-36	-39	-41	-46	-49	-54	-53	-59	-50	-46	-52	-54	-21

Appendix C

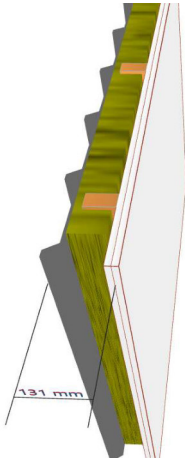
INSUL Output

Sound Insulation Prediction (v9.0.24)

Program copyright Marshall Day Acoustics 2017
Margin of error is generally within $R_w \pm 3$ dB
Venta Acoustics - Key No. 6556
Job Name: Long Acre Farm, Botley
Job No.: 5623
Date: 25/11/2024
File Name: 5623 Wall.ixl

Initials: JD

Notes:



R_w 48 dB
C -4 dB
Ctr -12 dB

Mass-air-mass resonant frequency = 79 Hz
Panel Size = 2.7 m x 4.0 m
Partition surface mass = 25.8 kg/m²

System description

Panel 1 : 1 x 0.6 mm Roof Cladding Windek (p:7800 kg/m³, E:2.1E02 GPa, η :0.01, ρ_s :5.35 kg/m², f_c :2.227E4 Hz)

Frame: Right timber stud + air gap (75 mm x 45 mm), Stud spacing 600 mm ; Cavity Width 100 mm , 1 x Fibreglass (22kg/m³) Thickness 90 mm
Panel 2 : 2 x 15 mm Gyproc Wallboard 15mm (p:653 kg/m³, E:1.1GPa, η :0.01, ρ_s :19.6 kg/m², f_c :4635 Hz)

freq.(Hz)	R(dB)	R(dB)
50	18	
63	18	17
80	16	
100	18	
125	24	21
160	30	
200	35	
250	41	39
315	45	
400	50	
500	54	52
630	54	
800	58	
1000	61	61
1250	64	
1600	66	
2000	68	67
2500	67	
3150	62	
4000	67	65
5000	70	

