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ACOUSTICS PLUS

Proposed Installation of Mechanical Plant

268 Upper Shoreham Road, Shoreham-by-Sea, BN43 6BF

Noise Impact Assessment

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Noise Impact Assessment Proposed Installation of Mechanical Plant	
Project Address:	268 Upper Shoreham Road Shoreham-by-Sea BN43 6BF
Project Reference:	104267

Issue/Revision Record			
Issue:	**Date:**	**Remarks:**	**Author:**
1	17/01/2022	First Issue	Phil Huffer

	Signature:	Print:	Title:	Date:
Author:		**Phil Huffer**	**Principal Consultant**	**17/01/2022**
Reviewer:		**Andy Dodd**	**Senior Consultant**	**17/01/2022**

1. INTRODUCTION

1.1 Acoustics Plus Ltd (APL) is an independent firm of multi-disciplinary acoustic engineers. APL is engaged by both private and public sector clients. APL is a registered member of The Association of Noise Consultants (ANC) and the author is a corporate member of The Institute of Acoustics (IOA).

1.2 APL has been instructed by the applicant Mr Ersin Kesen, to consider and advise upon the noise implications of the proposed change of use from an existing E class premises to a restaurant and take away together with the installation of an extractor flue pipe at the rear.

1.3 As part of the proposed works involved with the change of use, a kitchen extract system is proposed to be installed within the ground floor of the site.

1.4 It is understood the Local Planning Authority (LPA) require further information on noise levels from the proposed installation in order to fully assess the noise impact upon the surrounding neighbourhood. This report provides the response to the LPA, on behalf of the Applicant.

1.5 This report has been prepared by Acoustics Plus Limited (APL) with all reasonable skill, care, and diligence in accordance with generally accepted acoustic consultancy principles and taking account the services and terms agreed between APL and our client.

1.6 Any information provided by third-parties and referred to herein may not have been checked or verified by APL unless expressly stated otherwise. Certain statements made in the report are predictions based on reasonable assumptions and good industry practice.

1.7 Such statements involve risk and uncertainty which could cause measured and predicted results to differ materially. APL does therefore not guarantee or warrant any prediction contained in this report.

2. BASELINE SITUATION

2.1 The Application Site (the "site") is located at 268 Upper Shoreham Road, Shoreham-by-Sea, BN43 6BF. A site location plan is shown in Diagram 1.

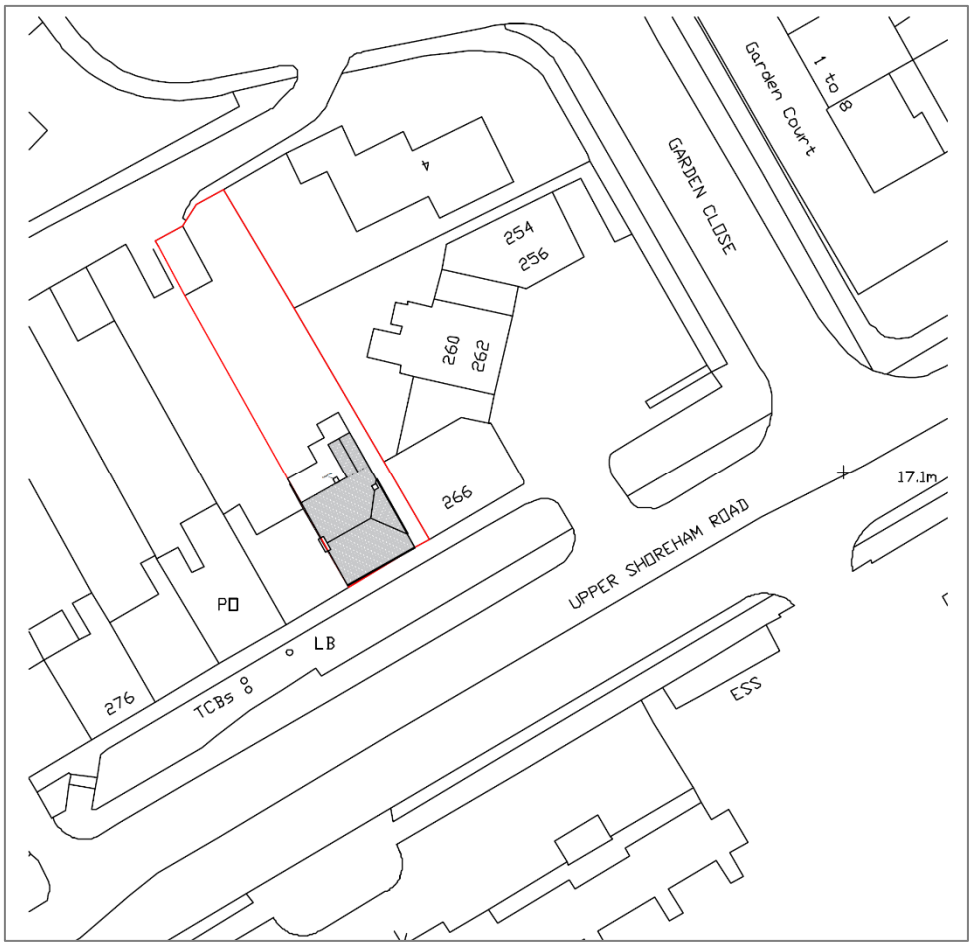


Diagram 1

2.2 It is understood that the submitted planning application for the "Change of use of existing E Class baking retail unit to on the ground floor into a hot food takeaway restaurant (Use Class Sui-generis) together with the installation of an extraction system and flue on the rear elevation and new shop front" (AWDM/2012/21) is being considered. Environmental Health have responded to the application and require the following additional information:

BS4142:2014+A1:2019 Noise assessment to ensure noise from the extraction system will not cause disturbance to nearest noise sensitive dwellings (as previously advised).

Noise insulation scheme and testing to ensure sound insulation between commercial unit and residential unit above achieve a minimum airborne sound insulation value of 50dB (DnTw+Ctr) for all floors (as previously advised).

2.3 The proposed trading hours of the site are Monday to Friday 11:00-23:00hrs, Saturday 11:00-23:00hrs and Sunday & Bank Holiday 11:00-22:00hrs.

2.4 The extract fan is proposed to be located internally within the ground floor premise and will be ducted to outside with the extract ducting running up the rear wall and terminating at least 1m above upper storey eaves level. The proposed location of the fan and extract ducting can be seen in Diagrams 2 and 3.

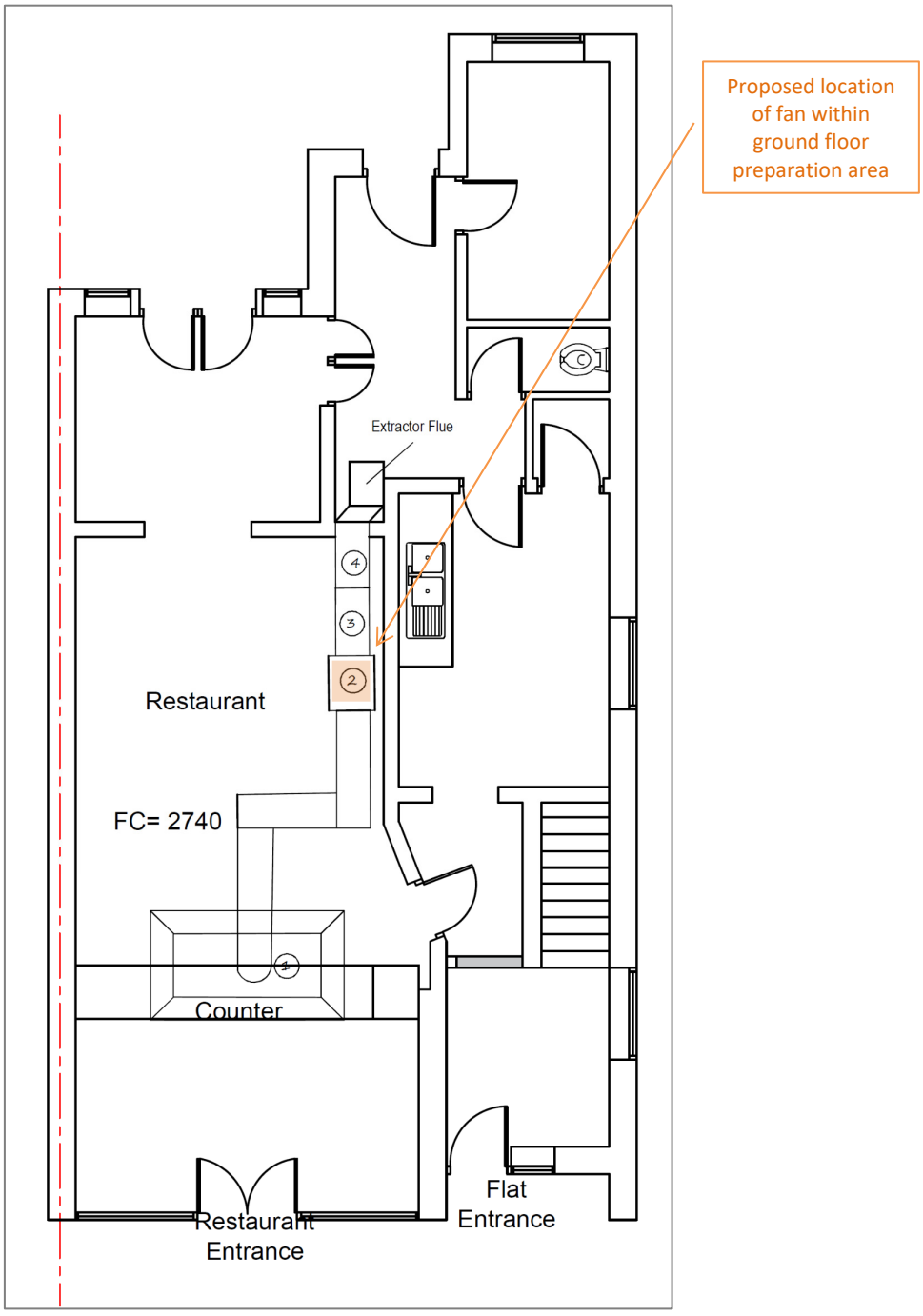


Diagram 2



Diagram 3

2.5 The nearest noise sensitive façade to the discharge terminus of the extract duct is shown in Diagram 4 below. The distance was determined to be approximately 6m.

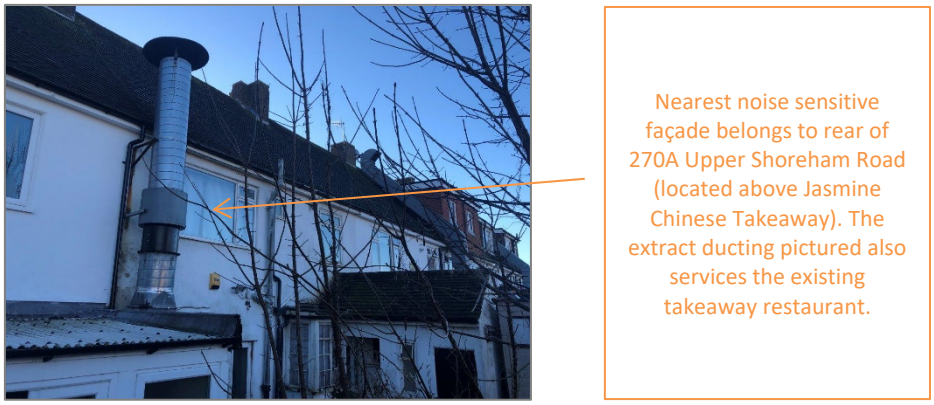


Diagram 4

2.6 It was also noted that the preparation area and customer area of the proposed restaurant/take away is below the kitchen/living area and bedroom of the flat located directly above (268A Upper Shoreham Road).

3. NOISE OUTLINE

3.1 In order to determine the noise impact of the kitchen extract fan and associated ducting, consideration must be given to existing noise levels on the site from the presence of ambient noise (road traffic movements and nearby commercial activities).

3.2 Measurements of background noise were obtained at the rear of the site over a 24 hour period to capture typical ambient noise levels during the proposed trading hours of the site.

3.3 The particulars of the measurement exercise are recorded below. The weather conditions were considered appropriate to monitor environmental noise.

Date: 13th – 14th January 2022
Start Time: 12:00hrs
Location: First floor level at rear of site.

3.4 The measurements carried out during the exercise are recorded below.

$L_{A90,15mins}$ percentile level (dB re 20µPa) – background noise level

3.1 Minimum background and average noise levels are shown in Table 1 below with the full 24 hour time history shown in Diagram 2 (L_{Aeq} and L_{A90}).

Time period	Lowest $L_{A90,15min}$	Average $L_{Aeq,T}$
11:00-23:00hrs	39dB	52dB

Table 1

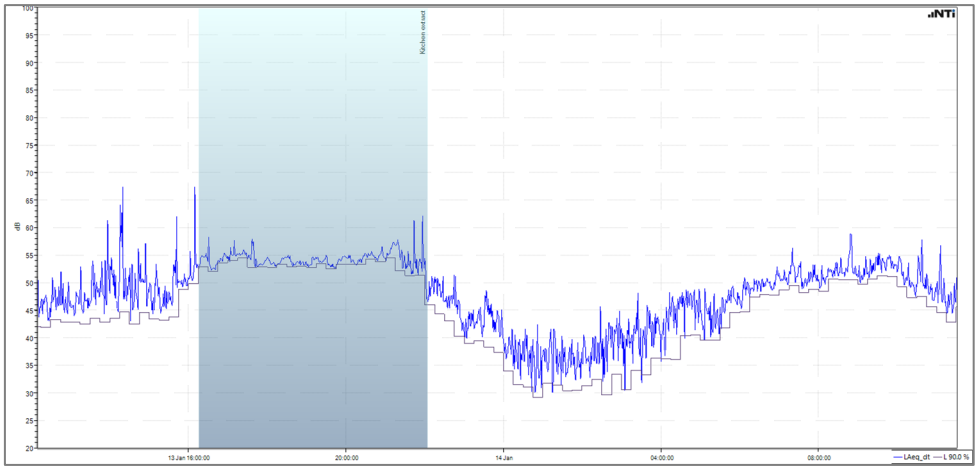


Diagram 5

3.2 The highlighted region of noise data in Diagram 5 above relates to a period of elevated ambient noise due to the operation of the extract duct at No. 270 Upper Shoreham Road.

4. EQUIPMENT

4.1 All measurements were obtained using the following equipment:

- *NTi XL2 Class 1 sound level meter, Serial No. A2A-14612-E0*
- *Rion Calibrator Type NC-74 Class 1 Serial No. 00410215*

4.2 The relevant equipment carries full and current traceable calibration. The equipment, where necessary, was calibrated prior to and after the measurements were carried out.

5. DESIGN CRITERIA

5.1 It is accepted that noise from new mechanical plant should be assessed in general accordance with the procedure outlined in *BS4142:2014+A1:2019 Methods for rating and assessing commercial sound.*

5.2 The procedure contained in BS4142 is to quantify the "specific sound level", which is the measured or predicted level of sound from the source in question over a one hour period for the daytime and a 15 minute period for the night-time. Daytime is defined in the standard as 07:00 to 23:00 hours, and night-time as 23:00 to 07:00 hours.

5.3 The specific sound level is converted to a rating level by adding penalties to account for either tonality or impulsivity. The standard sets out objective methods for determining the presence of tones or impulsive elements but notes that it is acceptable to subjectively determine these effects.

5.4 The penalty for tonal elements is between 0dB and 6dB, and the standard notes:

"Subjectively, this can be converted to a penalty of 2 dB for a tone which is just perceptible at the noise receptor, 4 dB where it is clearly perceptible, and 6 dB where it is highly perceptible."

5.5 The penalty for impulsive elements is between 0dB and 9dB, and the standard notes:

"Subjectively, this can be converted to a penalty of 3 dB for impulsivity which is just perceptible at the noise receptor, 6 dB where it is clearly perceptible, and 9 dB where it is highly perceptible."

5.6 The background sound level should normally be established in terms of the LA90 noise index. The standard states that the background sound level should be measured over a period of sufficient length to obtain a representative value. This should not normally be less than 15 minute intervals. The standard states that:

"A representative level ought to account for the range of background sound levels and ought not automatically to be assumed to be either the minimum or modal value."

5.7 And goes on to note:

"In using the background sound level in the method for rating and assessing industrial and commercial sound it is important to ensure that values are reliable and suitably represent both the particular circumstances and periods of interest. For this purpose, the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods.

Among other considerations, diurnal patterns can have a major influence on background sound levels and, for example, the middle of the night can be distinctly different (and potentially of lesser importance) compared to the start or end of the night-time period for sleep purposes. Furthermore, in this general context it can also be necessary to separately assess weekends and weekday periods."

5.8 The assessment outcome results from a comparison of the rating level with the background sound level. The standard states:

a) Typically, the greater this difference, the greater the magnitude of the impact.
b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
c) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
d) The lower the rating level is relative 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 sound level, this is an indication of the specific sound source having a low impact, depending on the context.
Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact."

5.9 The standard also notes that:

"*Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night."*

5.10 In addition to the margin by which the Rating Level of the specific sound source exceeds the Background Sound Level, the 2014 edition places emphasis upon an appreciation of the context, as follows:

"An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context."

5.11 The background noise level varied significantly throughout the day/evening period. The most commonly occurring background noise level during the proposed operational hours of the site was 52dB $L_{A90,15min}$. This is largely due to the operation of the extractor fan at No.270 Upper Shoreham Road and is not considered representative of typical ambient noise levels in the absence of plant noise.

5.1 The background noise levels were assessed using statistical analysis of the measured data, as directed in BS4142. The histogram for the sensitive night-time period can be seen in Diagram 6.

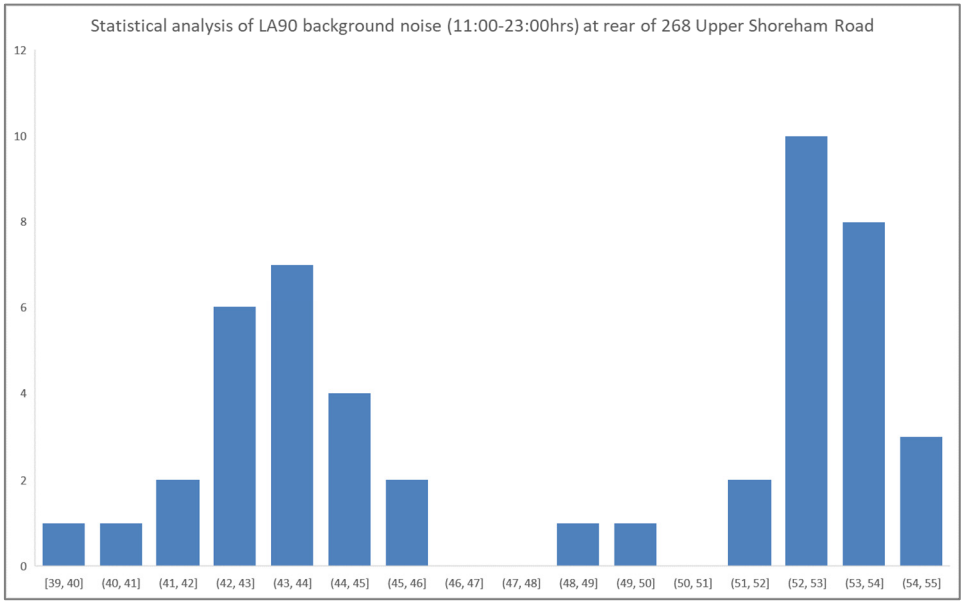


Diagram 6

5.2 In this instance it is considered that a representative background sound level of 42dB L_{A90} is deemed appropriate for the assessment. This would be a typical background noise level in the absence of the adjacent kitchen extract fan noise.

5.3 The plant noise emission criteria that should not be exceeded is therefore based on the preceding information and is shown in Table 2 below. This level should not be exceeded at the nearest noise sensitive façade and is indicative of being less than the considered measured background noise. At such a level, there is an indication that the specific sound source will have a low impact.

Time period	Noise emission limit for mechanical plant
11:00 - 23:00hrs	L_{Aeq} ≤42dB

Table 2

6. NOISE IMPACT OF PLANT

6.1 In order to predict the noise impact of the proposed installation of plant, a prediction exercise was undertaken. The calculation exercise utilised information provided by Ruck Ventilation and silencer manufacturer Lindab (a copy of the data sheets is provided in Appendix A). The proposed extract fan is a Ruck MPS 450 E4 20 combined with an Lindab SLU 315/900 (diameter/length) silencer.

6.2 Throughout the calculation exercise, guidance and formula were extracted from the authoritative publication *"Noise Control in Building Services" (published by SRL)*.

6.3 The ductwork system attenuation was calculated by considering the attenuation of sound energy produced by each component of the ductwork system. Detailed calculations are contained in Appendix B.

6.4 Noise leaving the ductwork system at the duct outlet was propagated to the nearest noise sensitive façade using point source propagation.

Source of noise egress	L_p dBA @ noise sensitive façade
Kitchen extract duct discharge	37dB

Table 3

6.5 The following corrections were accounted for to determine a rating level:

Results	Correction	Relevant clause	Commentary
Acoustic feature corrections	+2dB	9.2	Tonality - 2dB Impulsivity – 0dB Intermittency – 0dB Other – 0dB

Table 4

6.6 In order to comply with the requirements of the LPA, any noise from the proposed installation of mechanical plant should not exceed a rating level of 42dBA at 1m from the nearest noise sensitive façade.

6.7 The calculated noise impact rating level is 39dBA. The calculated rating level is 3dB below the considered background noise level (measured in the absence of adjacent plant noise). The calculation exercise demonstrates that the proposed installation meets the LPA criteria.

7. NOISE IMPACT OF KITCHEN ACTIVITIES

7.1 Given the proposed change of use at ground floor from Class E to Sui Generis (takeaway), there is a possibility of increased airborne noise transfer between the new proposed use and the existing residential use located above. The new noise sources at ground floor level include the following:

(a) Food preparation;
(b) Patron noise;
(c) Fan case breakout noise.

7.2 Access into the 1st floor flat was provided and a sound insulation test was carried out (in accordance with Approved Document E of the Building Regulations) to accurately determine the sound insulation afforded by the current floor construction. The performance of the separating floor (measured at the front and rear of the site) is as outlined in Table 5. The test graphs are contained in Appendix C.

Partition under test	Airborne $D_{nT,w} + C_{tr}$ dB		Pass /Fail
	Measured $D_{nT,w} + C_{tr}$	Required Performance	
Floor 1 – front of site	35dB	50dB	**Fail**
Floor 2 – rear of site	35dB	50dB	**Fail**

Table 5

7.3 To determine the worst case noise level in the ground floor, it has been assumed that the customer area is occupied with 12 patrons and half of the patrons are using a raised vocal effort (70dBA) to communicate. The overall patron noise would therefore be 78dBA. The radiated case breakout noise (L_w) from the extract fan in the preparation area is reported to be 62dBA.

7.4 Based on the foregoing and utilising the equation below, the worst case noise level in the first floor kitchen/dining area was calculated as shown in Table 5.

$$L_{p_1} - L_{p_2} = R - 10\mathrm{Log}_{10}\mathrm{S} + 10\mathrm{Log}_{10}\mathrm{A}$$

Where L_{p_1} *is the sound pressure level in the source room*
L_{p_2} *is the sound pressure level in the receive room*
R is the sound reduction index of the separating floor
S is the area of the separating floor
A is the absorption area in the receive room

Calculation step	**Result**
Raised vocal effort (L_p)	70dBA
6No. patrons using raised vocal effort (L_p)	78dBA [$70+10\mathrm{Log}_{10}(6)$]
Radiated case breakout (extract fan) (L_p)	51dBA
Sound reduction of floor	35dB
Area of separating floor m^2	$18m^2$ (4.5m x 4m)
Absorption area of first floor flat	$10m^2$
Sound level in receive room (L_p)	46dBA

Table 6

7.5 Given typical background noise levels in living areas are approximately 30-35dBA, the predicted noise level within the first floor flat from patron noise is considered to be in excess of the anticipated background noise and therefore has the potential to cause an adverse impact.

7.6 In order to reduce the noise ingress into the first floor flat to acceptable levels, it is essential that additional sound proofing works are undertaken. The following proposed construction is recommended. This would need to be installed throughout the ground floor of the site (above: preparation area, counter and customer area).

- Existing structural ceiling construction to be retained and made good;
- Install an independent ceiling framework below level of ceiling construction.
- Independent joists should only be fixed to the surrounding walls. A clearance of at least 25mm should be left between the top of the independent ceiling joists and the underside of the existing floor construction.
- Ceiling void to be a minimum of 125mm;
- Additional support only to be provided by resilient hangers (British Gypsum's GAH1 or GAH2) attached directly to the existing floor base;
- Install a layer of 50mm Isowool APR 1200 or equivalent in the newly created ceiling void;
- Underside of the new independent ceiling to be formed using at least 2 layers of 15mm Soundbloc plasterboard.

7.7 Alternatively a concealed grid suspended metal framed ceiling system could be used. This would need to be supported by GAH1 resilient hangers.

7.8 Where possible, downlighters or recessed lighting should not be incorporated into the ceilings. If they must be built in, it is recommended no more than one light per $2m^2$ of ceiling area at centres not less than 0.75m into openings not exceeding 100mm diameter. Acoustic hoods should be used behind the downlights.

7.9 An example construction is shown in Diagram 7 below.

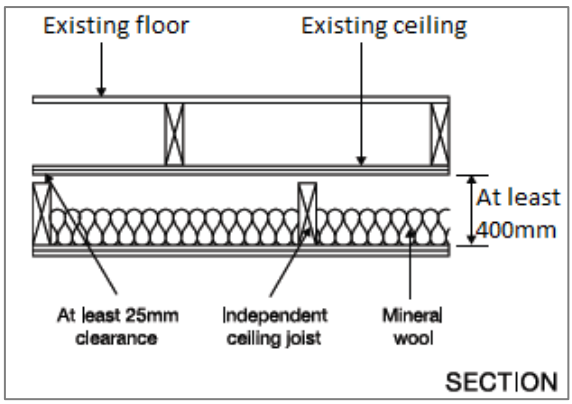


Diagram 7

7.10 It is anticipated that the construction as detailed, should achieve a minimum sound performance of 50dB $D_{nT,w} + C_{tr}$.

7.11 The responsibility for the behaviour of noisy patrons must rest with the designated premises supervisor, who should take all reasonable steps to ensure that they do not cause noise nuisance whilst on the premises, or disturbance from the premises. The following additional measures should be considered:

(a) *Provide notices in conspicuous positions requesting the co-operation of patrons particularly when leaving the premises.*

(b) *A reliable taxi firm should be used for collecting customers, insuring that the firm are aware that there should be no sounding of horns etc. that may disturb nearby residents.*

7.12 In addition to the above, noise disturbance can occur if stock deliveries are made at unsociable hours, i.e late at night or early in the morning. The following should be considered:

(a) *When loading or unloading takes place consideration should be given to working methods, which minimise noise.*

(b) *Ensure deliveries are not made late at night or early in the morning. The use of heavy plant, noisy equipment or operations and deliveries, should not take place outside the hours of; Monday – Friday 8.00 – 18.00 Saturday 8.00 – 13.00. No noisy activities on Sundays or Bank Holidays.*

8. CONCLUSION & MITIGATION MEASURES

8.1 The foregoing assessment indicates that the proposed change of use will meet the requirements imposed by the LPA and not cause adverse noise impact to adjacent residential occupiers. The following additional mitigation measures will be required to ensure no loss of amenity:

(a) The use of an in-line rectangular silencer within the extraction ducting (Lindab SLU 315/900).

(b) The installation of an independent sound insulating ceiling within the preparation, counter and customer area of the proposed use (the specification of the ceiling to be equal to para 7.6 or prior approved).

8.2 If an alternative supplier or manufacturer extract fan or silencer is chosen, the acoustic performance should be checked prior to installation to ensure that the installation will still meet the requirements imposed by the LPA.

8.3 The extract fan to service the proposed change of use will be located on the underside of the ceiling and therefore directly attached to the floor separating ground from first. The possibility of structural borne sound and vibration exists and therefore the fan should be hung using proprietary anti-vibration suspension mounts. The fan and motor units should be joined to ductwork using flexible couplings.

8.4 The use of anti-vibration mounts and flexible couplings will prevent the transmission of vibrations either to the building structure or along the ducting.

8.5 Additionally, it is recommended that the external section of vertical ductwork is bolted to the building using lateral isolation fixings.

Figures

268 Upper Shoreham Road, Shoreham-by-Sea, BN43 6BF



Figure 1



Figure 2



Figure 3



Figure 4

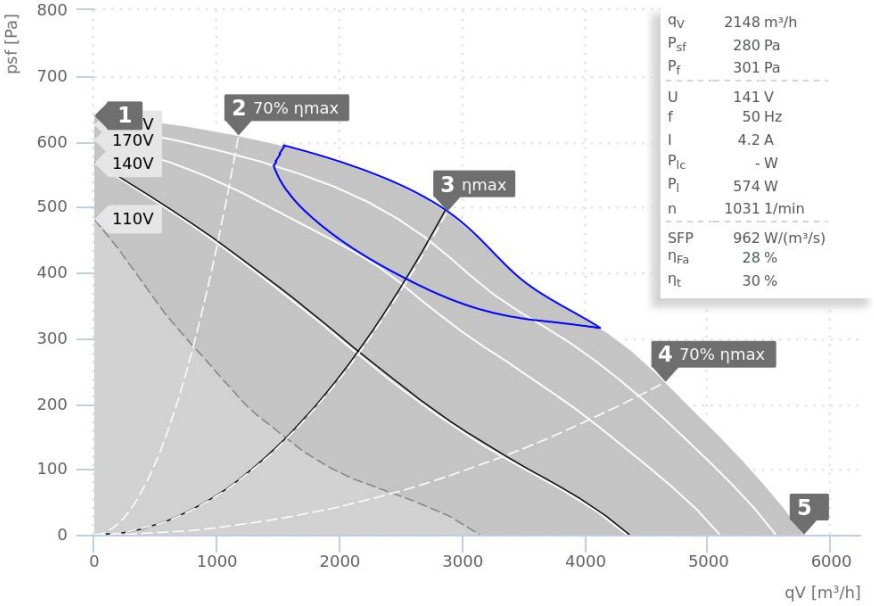


Figure 5

Appendix A

DATA SHEET

MPS 450 E4 20 | 126652



— **ErP compliant range**



- Max. medium temperature 120ºC
- Motor outside of air stream
- Speed controllable
- Galvanized sheet steel double wall casing
- Swing-out fan unit
- With condensate and grease drain

		Operating Point	1	2	3	4	5
Current I	A		1,7	2,5	3,4	3,7	3,4
Power consumption P_1	W		363	565	769	840	771
Rotation speed n	1/min		1444	1403	1359	1343	1365
SWL inlet L_{WA5}	dB(A)		77	76	75	77	81
SWL outlet L_{WA6}	dB(A)		79	78	76	78	81
SWL housing break out L_{WA2}	dB(A)		67	66	66	69	71

Sound power (L_W) dB(A)		Medium Frequency Band								
		Σ	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**
Inlet	L_{WA5}	69	43	59	61	62	60	61	60	48
Outlet	L_{WA6}	72	49	64	64	62	65	65	61	50
Housing radiation	L_{WA2}	62	41	61	53	45	45	46	40	29

MPS 450 E4 20 | 126652	
Voltage U_N	230 V 1~
Current I_{max}	4,7 A
Ambient temperature t_A	50 °C
Conveyed medium temperature t_M	120 °C
Speed Control	V
Motor protection	TAO
Insulation class motor	F
Weight	72,0 kg
Number of poles	4
IP motor	IP54
IP terminal box	-
IP complete unit	-
Min. operating temperature	-25 °C

Print 17.01.2022

Circular straight silencer SLU



Description

SLU is a circular straight silencer

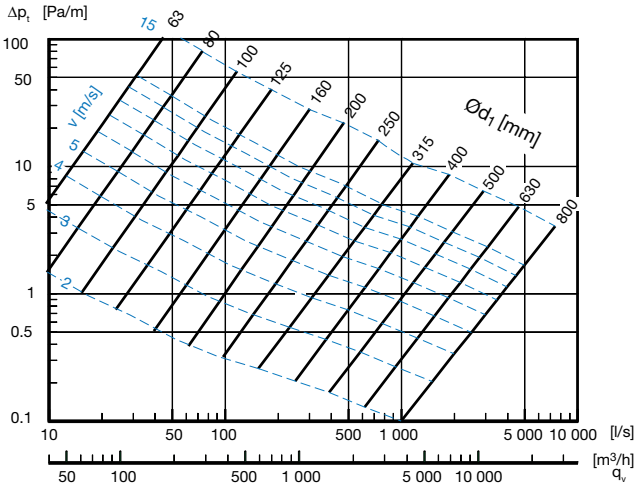
Nominal insulation thicknesses are 50 mm or 100 mm.

Attenuation material is mineral wool. The SLU's are made of strong outer spiral seemed tube and an inner tube made of sheet steel with small openings to be able to withstand mechanical cleaning and at the same time not interfere with the insertion loss. The space between them is filled with mineral wool and a nonwoven cloth is inserted between inner tube and the attenuation material, to prevent fibres from the insulation getting into the duct system. Silencer can be cleaned by rotating nylon brushes, vacuum cleaner or damp cloth.

Tested according to ISO 7235 standard.

Special materials, sizes and flanges on request. Please contact Lindab sales.

Technical data



Order code

Product	SLU	d	l	t
SLU				

Connection (d) in mm ($Ød_{1nom}$)

63 - 400 mm (50 mm insulation)

315 - 800 mm (100 mm insulation)

Length (l), in mm (l_{nom})

300 - 1200 mm (50 mm insulation)

600 - 1500 mm (100 mm insulation)

Insulation thickness (t) in mm

50 or 100 mm

Example: SLU 200 - 900 - 50

LindQST

To select the attenuator to suit your needs use Lindab's advanced sound calculation and dimensioning web tool LindQST. This tool will allow you to optimize width, height and length for the best performance and to meet your on site requirements.

Visit www.lindQST.com to find preforance out more.

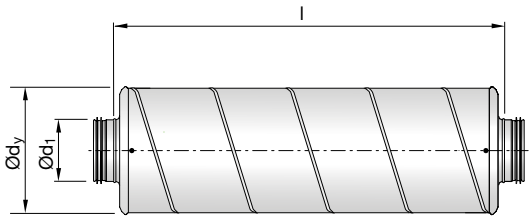
EUROVENT CERTIFIED PERFORMANCE
DUCT-MC
Identification number 17.11.002
www.eurovent-certification.com

Lindab reserves the right to make changes without prior notice
2021-02-15

Circular straight silencer SLU

Technical data for silencer with 50 and 100 mm insulation

Dimensions and sound data for silencer with 50 mm insulation.

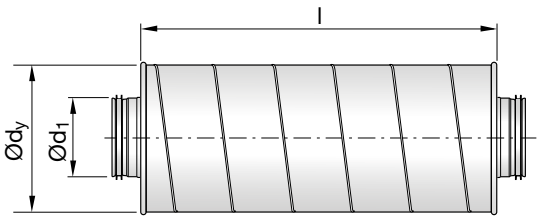


Ød$_1$ [nom]	l [nom]	Insertion loss [dB] for centre frequency [Hz] 63	125	250	500	1k	2k	4k	8k	Ød$_y$ [mm]	l [mm]	m [kg]
63	300	0	6	13	21	32	44	36	26	170	300	1,8
63	600	0	7	20	35	50	50	50	34	170	600	3,0
80	300	1	5	8	15	25	25	21	15	190	300	2,0
80	600	2	8	14	28	49	50	47	24	190	600	3,0
80	900	3	10	21	40	50	50	50	34	190	900	5,0
80	1200	4	13	27	50	50	50	50	43	190	1200	7,0
100	300	1	5	7	15	25	25	21	13	210	360	2,0
100	600	1	7	12	25	43	48	35	20	210	660	3,0
100	900	2	10	17	34	50	50	49	28	210	960	5,0
100	1200	3	12	22	44	50	50	50	35	210	1260	7,0
125	300	0	4	5	13	23	20	16	11	235	365	3,0
125	600	1	5	10	22	39	37	26	16	235	665	4,0
125	900	1	7	14	30	50	50	37	21	235	965	7,0
125	1200	2	9	18	39	50	50	47	26	235	1265	9,0
160	300	0	3	5	11	22	16	11	7	270	370	3,0
160	600	1	4	8	19	37	28	17	11	270	670	6,0
160	900	1	5	12	27	50	39	24	14	270	970	8,0
160	1200	2	6	15	35	50	50	30	17	270	1270	10,0
200	300	0	2	4	9	19	11	7	5	310	385	4,0
200	600	1	3	8	15	28	19	12	8	310	685	7,0
200	900	2	4	11	21	37	28	16	10	310	985	10,0
200	1200	2	5	14	27	46	36	21	13	310	1285	12,0
250	300	0	1	3	7	15	8	5	5	365	300	6,0
250	600	1	2	6	14	26	14	8	7	365	600	9,0
250	900	1	3	9	19	38	19	11	9	365	900	12,0
250	1200	2	4	11	24	50	24	13	11	365	1200	15,0
315	300	0	1	2	6	12	5	4	4	427	300	8,0
315	600	0	2	4	10	22	9	6	7	427	600	12,0
315	900	2	3	7	16	31	13	8	9	427	900	18,0
315	1200	2	3	8	20	39	16	9	10	427	1200	24,0
400	300	0	1	2	3	3	2	3	1	508	300	12,0
400	600	0	2	4	8	10	5	4	4	508	600	16,0
400	900	0	2	5	12	16	7	5	6	508	900	22,0
400	1200	0	2	7	16	20	9	6	7	508	1200	32,0

There is given max. attenuation values of 50 dB in the table above.

Sizes 63–315 are supplied with preinstalled Safe-connectors.
Size 400 is supplied with loose NPU-couplings.

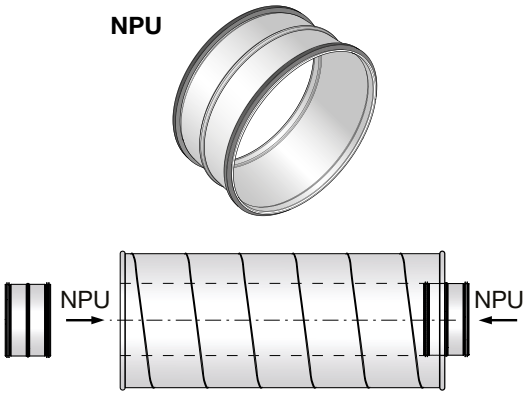
Dimensions and sound data for silencer with 100 mm insulation.



Ød$_1$ [nom]	l [nom]	Insertion loss [dB] for centre frequency [Hz] 63	125	250	500	1k	2k	4k	8k	Ød$_y$ [mm]	l [mm]	m [kg]
315	600	2	5	9	14	12	6	4	5	510	600	12,0
315	900	3	6	13	20	19	10	6	7	510	900	18,0
315	1200	4	8	16	27	25	15	9	10	510	1200	24,0
400	600	4	5	8	10	7	4	4	6	625	600	16,0
400	900	4	5	10	17	13	6	6	8	625	900	22,0
400	1200	6	6	13	24	18	8	7	10	625	1200	32,0
500	900	4	4	10	14	8	4	6	6	735	900	26,0
500	1200	3	5	11	21	12	6	7	9	735	1200	39,0
630	900	2	3	7	12	5	4	4	5	880	900	44,0
630	1200	2	4	8	17	7	4	5	7	880	1200	56,0
800	1200	2	3	8	11	5	4	5	6	1030	1200	69,0
800	1500	2	3	10	16	6	5	6	7	1030	1500	86,0

There is given max. attenuation values of 50 dB in the table above.

Size 315 is supplied with preinstalled Safe-connectors.
Sizes 400–800 are supplied with loose NPU-couplings.



Appendix B

ACOUSTICS PLUS

CONTRACT TITLE: 268 Upper Shoreham Road
SOUND SOURCE: Kitchen extract fan
MAKE & MODEL: Ruck MPS 450 E4 20
From: Exhaust air

					OCTAVE BAND CENTRE FREQUENCY (Hz)								
OVERALL Lw					63	125	250	500	1k	2k	4k	8k	dBA
1			Fan sound power		75	80	73	65	65	64	60	51	72
2			Grille area	1.000									
3			Lw at grille		75	80	73	65	65	64	60	51	72
4													
5	LENGTH (m)	C or R	x (mm)	x (mm)									
6	4.00	C	400-800		0.28	0.28	0.28	0.40	0.64	0.64	0.64	0.64	
7													
8													
9													
10													
11													
12													
13													
14													
15													
16	Bends (Unlined)												
17	NUMBER	TYPE	SIZE (mm)										
18	1	90	0400-0500		0.00	0.00	5.00	8.00	4.00	3.00	3.00	3.00	
19													
20													
21													
22													
23													
24													
25	BRANCHES												
26					0	0	0	0	0	0	0	0	
27													
28													
29	DUCT X-SECTIONAL AREAS												
30													
31													
32	OTHER ATTENUATION												
33	Silencer RO2 6 - 1200				2	3	7	16	31	13	8	9	
34													
35													
36													
37	END REFLECTION SIZE (m)												
38	0.101 – 0.150				10	6	2	0	0	0	0	0	
39													
40				**Lw LEAVING SYSTEM**	63	71	58	41	29	47	48	38	57
41	Room Volume (m^3)			100000	-36	-36	-36	-36	-36	-36	-36	-36	
42	Mid-Frequency RT (s)			0.05	-13	-13	-13	-13	-13	-13	-13	-13	
43				**REVERBERANT SPL**	14	22	9	-8	-20	-2	-1	-11	8
44	Distance to Listener			6	-27	-27	-27	-27	-27	-27	-27	-27	
45	Q=1 in free space			0.086 – 0.220	1	3	5	7	8	8	9	9	
46	Q=2 flush with surface			n/a	0	0	0	0	0	0	0	0	
47	Q=4 junction with 2 surfaces			n/a	0	0	0	0	0	0	0	0	
48				**DIRECT SPL**	37	47	37	21	11	29	31	21	37
49				**RESULTANT TOTAL SPL**	37	47	37	21	11	29	31	21	37

Appendix C

Standardized level difference in accordance with Approved Document E (2003)
Field measurements of airborne sound insulation between rooms

ACOUSTICS PLUS

Client: Mr Ersin Kesen

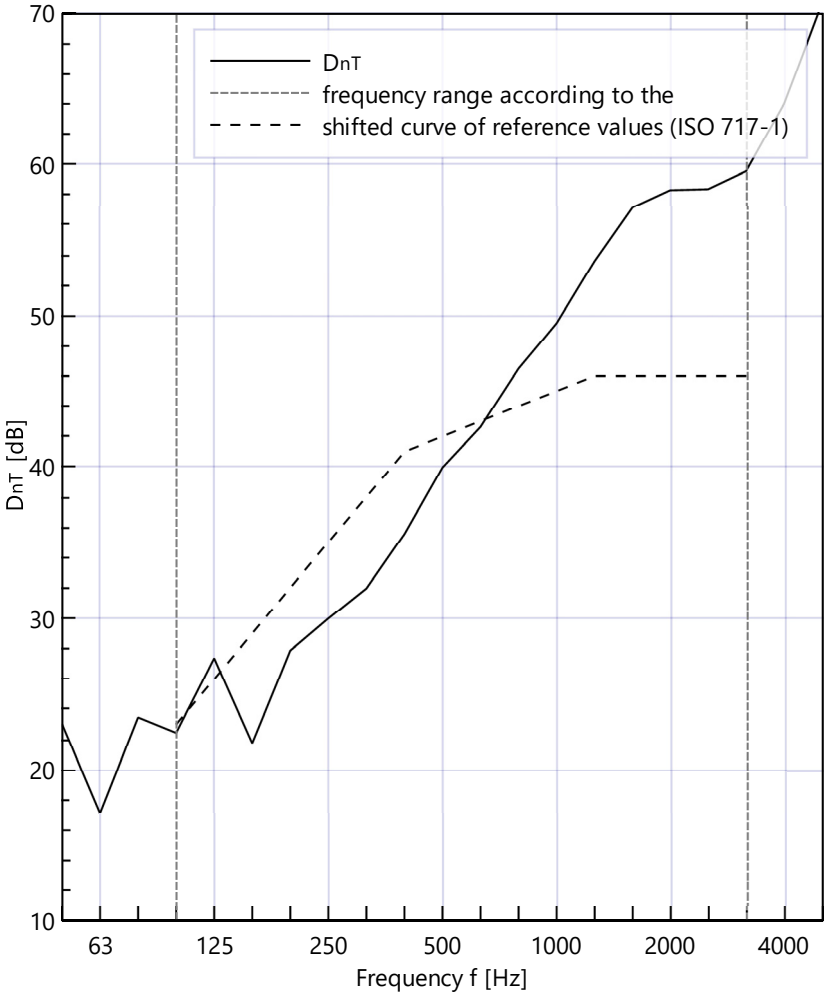
Date of test: 14/01/2022

Location: 268 Upper Shoreham Road, BN43 6BF

No.268 ground floor unit to No.268A (rear bedroom)

Area of common partition: 18.00 m^2
Source room volume: 105.00 m^3
Receiving room volume: 30.00 m^3

Frequency f Hz	D_{nT} 1/3 octave dB
50	23.0
63	17.1
80	23.5
100	22.4
125	27.4
160	21.7
200	27.9
250	30.0
315	32.0
400	35.5
500	40.0
630	42.6
800	46.5
1000	49.5
1250	53.6
1600	57.1
2000	58.3
2500	58.4
3150	59.5
4000	64.0
5000	70.6



Rating in accordance with ISO 717-1:

$D_{nT,w}(C;C_{tr})$ = 42 (-2; -7) dB

$C_{50\text{-}3150}$ = -3 dB; $C_{50\text{-}5000}$ = -2 dB; $C_{100\text{-}5000}$ = -1 dB

$C_{tr,50\text{-}3150}$ = -9 dB; $C_{tr,50\text{-}5000}$ = -9 dB; $C_{tr,100\text{-}5000}$ = -7 dB

Evaluation based on field measurement using results obtained by an engineering method.

Report No.: 104267 Name: Acoustics Plus

Date: 14/01/2022 Signature:

Standardized level difference in accordance with Approved Document E (2003)
Field measurements of airborne sound insulation between rooms

ACOUSTICS PLUS

Client: Mr Ersin Kesen

Date of test: 14/01/2022

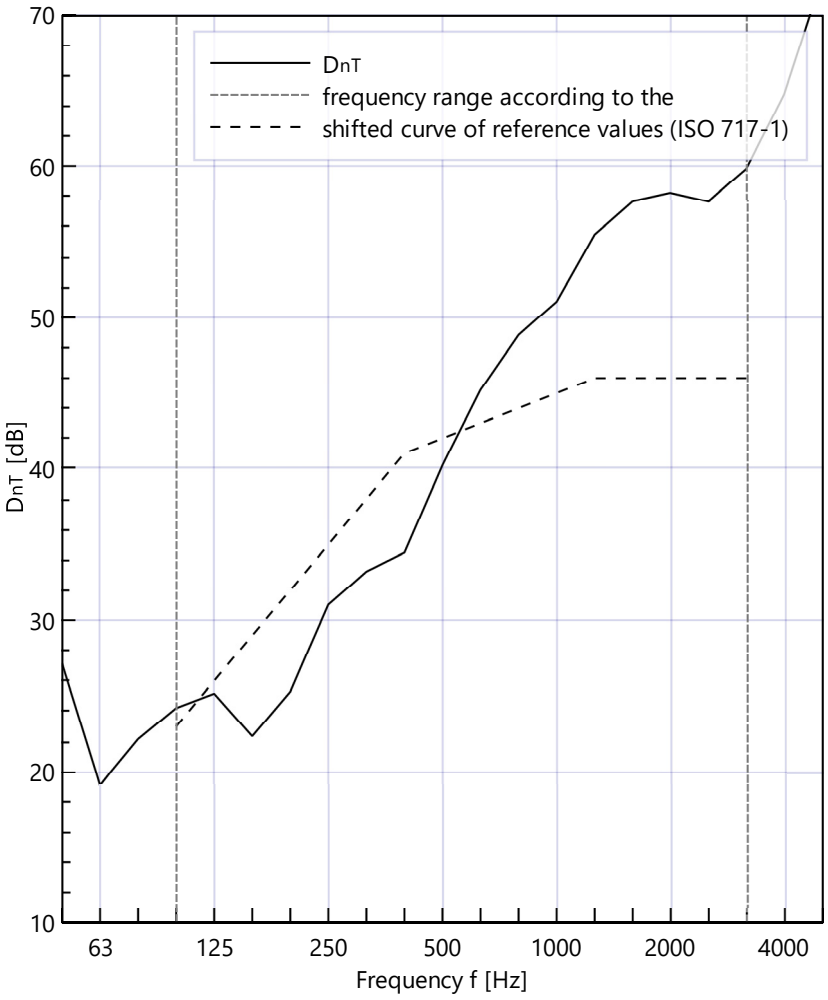
Location: 268 Upper Shoreham Road, BN43 6BF

No.268 ground floor unit to No.268A (front living room)

Source room volume: 105.00 m³

Receiving room volume: 35.00 m³

Frequency f Hz	D_{nT} 1/3 octave dB
50	27.1
63	19.1
80	22.2
100	24.2
125	25.2
160	22.4
200	25.3
250	31.0
315	33.2
400	34.5
500	40.2
630	45.2
800	48.8
1000	51.0
1250	55.5
1600	57.7
2000	58.2
2500	57.7
3150	59.8
4000	64.7
5000	72.3



Rating in accordance with ISO 717-1:

$D_{nT,w}(C;C_{tr})$ = 42 (-2; -7) dB

$C_{50\text{-}3150}$ = -2 dB; $C_{50\text{-}5000}$ = -1 dB; $C_{100\text{-}5000}$ = -1 dB

$C_{tr,50\text{-}3150}$ = -8 dB; $C_{tr,50\text{-}5000}$ = -8 dB; $C_{tr,100\text{-}5000}$ = -7 dB

Evaluation based on field measurement using results obtained by an engineering method.

Report No.: 104267

Name: Acoustics Plus

Date: 14/01/2022

Signature: