

Acoustic South East



Noise Impact Assessment – New Residential Development

Report by: Josh Robinson AMIOA

Date: 29/05/2026

Project: J4199

Issue 1

Site: **19-21 Sea Rd, East Preston, BN16 1JN**

Client: **The Podgy Spaniel Steak and Fish House Ltd**

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Report by: Josh Robinson AMIOA

Checked by: George Orton BEng(Hons) MIOA

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1 Introduction and Executive Summary

Acoustic South East have been appointed to undertake an acoustic assessment in support of a planning application for a commercial restaurant located at 19-21 Sea Road, East Preston. The restaurant has an occupied domestic dwelling above it on the 1st floor. The proposal includes new and replacement plant to service the kitchen area which has been assessed according to the criteria set out in BS4142:2014. The plant consists of a replacement Inverter and an extraction system.

Standards and guidance referenced for this assessment include:

- Acoustics Ventilation and Overheating Guidance, January 2020
- BS8233:2014 – Guidance on Sound Insulation and Noise reduction for Buildings.
- BS4142:2014+A1:2019 (Methods for rating and assessing industrial and commercial noise)
- World Health Organisation Guidelines for Community Noise (1999, revised 2018)
- Approved Document E of the Building Regulations 2010 (2015 amendments)
- Planning Noise Advice Document 2023

A class 1 sound level meter was installed at a representative location at the rear of the existing residential property. This was to identify the soundscape and the modal L_{A90} background sound levels at the nearest residential receptor (NSR) between the 17th to the 21st of April 2026. The nearest NSR is to be the flat immediately above the premises on the 1st floor and the soundscape is dominated by the sound of road traffic noise from Sea Road.

A vertical airborne sound insulation test was conducted between the commercial ground floor and the residential flat on the 1st floor. This achieved a $D_{nT,w} + C_{tr}$ of 52 dB. This 9db better than the requirement set out by Approved Document E.

The proposed operational hours are in the daytime period only (07:00 – 22:00). For this operational period, the representative modal L_{A90} background sound level is 41 dB. The combined sound pressure level from the proposed plant is predicted to have a Rating Level of 43 $L_{Ar,Tr}$. This is 2dB over the representative L_{A90} background level.

Measures have been detailed to reduce the emissions to parity or below the L_{A90} background level. This should not be a major issue given the existing commercial sound sources that will be replaced and the commercial nature of the existing soundscape.

If the implementation of appropriate mitigation measures can be put into place, it is recommended that planning not be refused on noise grounds.

2 Context, Noise Criteria & Noise Assessment Methodology

2.1 Context

The proposal is for a change of use planning application. The site is located at 19-21 Sea Road, East Preston. The proposed changes would comprise of refitting the commercial ground floor unit to serve as restaurant. The location is a on promenade of commercial shops/units. There are already significant numbers of plant to the rear of all of the units belonging to the dentist, the coffee shop and an Indian restaurant. Pre-existing plant from the premise's previous tenure as a pharmacy also remains.

The 1st floor above the commercial unit contains an occupied residential flat.

ASE has been informed by the client that the proposed hours of operation are 07:00 – 22:00, open all week. As such the assessment is for the daytime period only.

An operational Inverter already exists at the property which was used by the previous tenants, A Lloyds Pharmacy. This is being replaced with a new unit and moved to a new location. The extraction system is a new addition. Refrigeration is understood to be internal.

2.2 Location

The development site is located on the East side of Sea Road, East Preston. The premises' neighbours are a with the properties' immediate neighbour being a coffee shop and a small dentist practice.

The nearest NSR is the flat above the restaurant. The nearest window is approximately 4.2m from the proposed termination point.

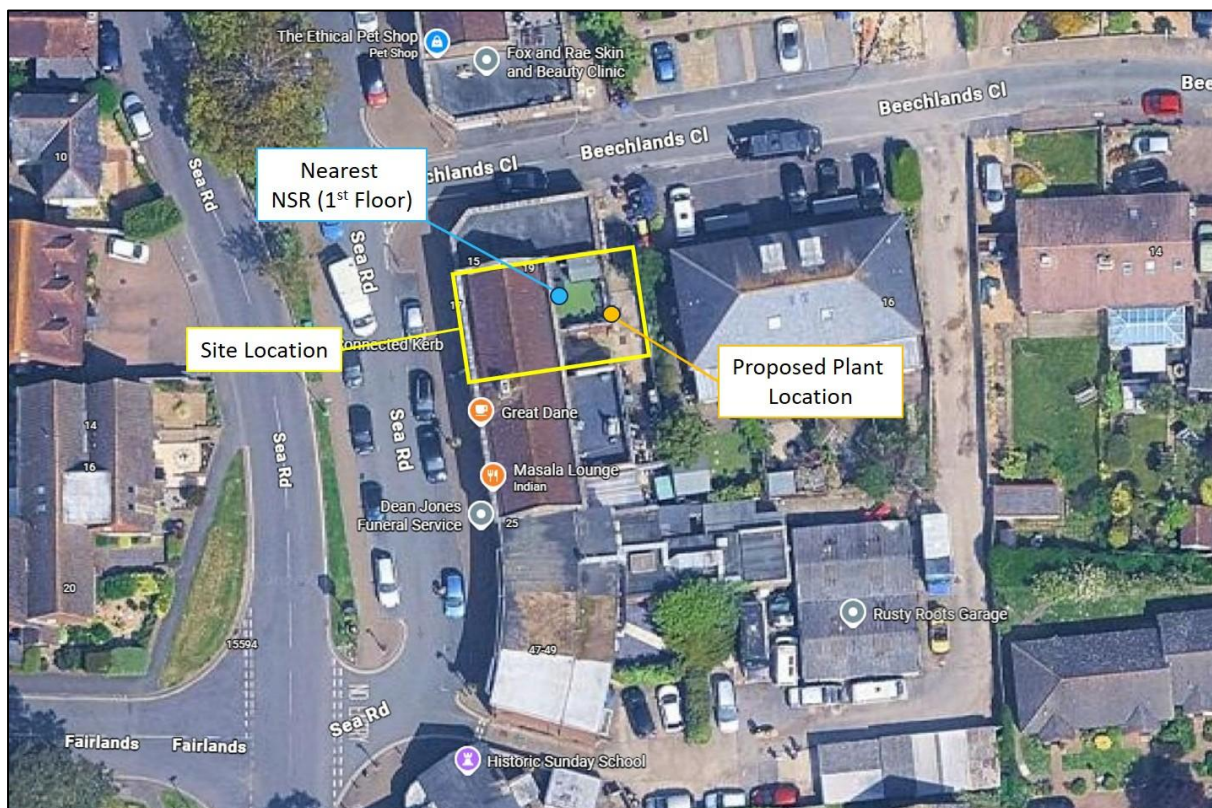


Figure 1. Site Location

2.3 Proposed Floor Plans



Figure 2. Proposed Floor Plans

2.4 Site Soundscape

The sound from Sea Road dominates the soundscape at the front façade, mostly from both road traffic and pedestrian noise. The rear is dominated by road traffic noise from Sea Road and Beechlands Close. Occasional aviation sound was also heard.

2.5 Relevant Standards and Policies

2.5.1 BS8233:2014 – Guidance on Sound Insulation and Noise Reduction for Buildings

Table 4 of BS8233 provides the following guideline values:

Activity	Location	Period of day	
		07:00-23:00	23:00-07:00
Resting	Living Rooms	35dB $L_{Aeq,16hour}$	-
Dining	Dining Room/Area	40dB $L_{Aeq,16hour}$	-
Sleeping (daytime resting)	Bedroom	35dB $L_{Aeq,16hour}$	30dB $L_{Aeq,8hour}$

Table 1 BS8233:2014 Criteria

Please note this relates to continuous and anonymous sound and a soundscape which has acoustic character or features, which may draw a listener's attention, will typically require either the use of a worst-case hour or, a reduced internal criterion.

2.5.2 National Planning Policy Framework (NPPF)

The National Planning Policy Framework (Dec 2024) defines the Government's planning policies for England and how these are expected to be applied. It sets out the Government's requirements for the planning system only to the extent that it is relevant, proportionate and necessary to do so.

The following paragraphs are relevant within NPPF Section 15 (Conserving and enhancing the natural environment) states the following:

Paragraph 187(e) - Preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability, and

Paragraph 198 - Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

- a) mitigate and reduce to a minimum potential adverse impact resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;
- b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and

Paragraph 200– Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed.

It should be noted that as the agent of change principle would apply, the introduction of residential receptors to the site has been accounted for.

2.5.3 Planning Noise Advice Document – Sussex, November 2023

A planning noise advice document which all Sussex local authorities have contributed to and signed up to (including Arun District Council) remains relevant. The guidance document has been followed in respect of measurement parameters and report presentation of data.

3 Methodology

3.1 Survey Locations



Figure 3. Measurement Position.

3.2 Sound Survey Details

A survey of the site soundscape was carried out between the 17th and the 21st of April, 2026. This was to measure the existing sound pressure levels experienced by the site. All noise levels in this report are in free field, fast time weighted and A-weighted levels, unless stated otherwise. The sound level meter was set to a 1-minute resolution.



Figure 4. LT1

Front of Property.	
Survey(s) carried out by	Josh Robinson AMIOA
Equipment Used	Svantek 971- Class 1 Sound Level Meter. Mounted on tripod. Serial No. 154249
	Norsonic 1251 Calibrator. Serial No. 31698
Location of Microphone	1.8m from floor level, 4.2 from façade. W3W: newest.ranking.grumbling
Duration of Survey	17 th - 21 st of April, 2026
Weather	Variable temperatures, mix of wet and dry, variable windspeeds generally less than 5m/s

4 Results of the Unattended Sound Survey

4.1 Noise Survey Results

The results obtained from the survey are seen in Figure 5 below. Only complete daytime periods have been presented from the dataset.

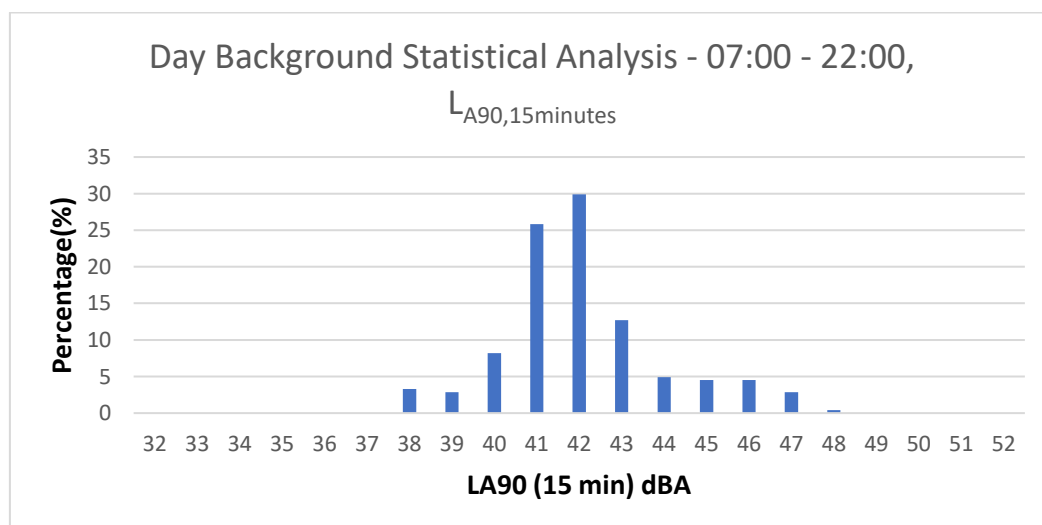


Figure 5. L_{A90} backgrounds

As shown in figure 5 above, the modal L_{A90} Background for the proposed hours of operation is 42 dB. In order to assess to the worst case, the lower level of 41 dB will be used as it occurs almost as often.

Day	$L_{Aeq, 16-Hour}$
Sat	51.7
Sun	50.9
Mon	54.2
Tue	56.9

Table 2. $L_{Aeq, 16-Hour}$

Table 2 shows the $L_{Aeq, 16-Hour}$ for the measured survey period.

5 Plant & Ductwork

5.1 Proposed Plant

The proposed external plant is as follows:

- MPS 500 D4 30 – 140708 Fan Unit - To be located near floor level on the external façade. Please see Figures 6&7 below. Sound Data: Please see figure 10.
- Lindab HN Roof Hood – Located approximately 6m above the fan unit. Please see Figure 6 below. Product data sheet: Please see the Appendix
- RAV-GP1101 AT-E/TR Inverter – To be located above the external kitchen window. Please see Figure 7 below. Product Data Sheet: Please see the Appendix

It is understood that the client is also proposing the use of an in-line silencer but the details are yet to be confirmed.

It is worth noting that an operational Inverter Unit already exists on site. This model (PUHZ - RP100VHA) has a listed sound pressure level of 51dBA^{*1}. The sound pressure level of the replacement proposed model is 49 dBA*.

The new model is 3dB quieter than the existing model.

¹ *The distances at which these sound pressures were measured was not listed on either the data sheets or the technical engineering handbook that accompany them. This report is assuming these are at 1m. This data was not used for calculations.

5.2 Proposed Plans

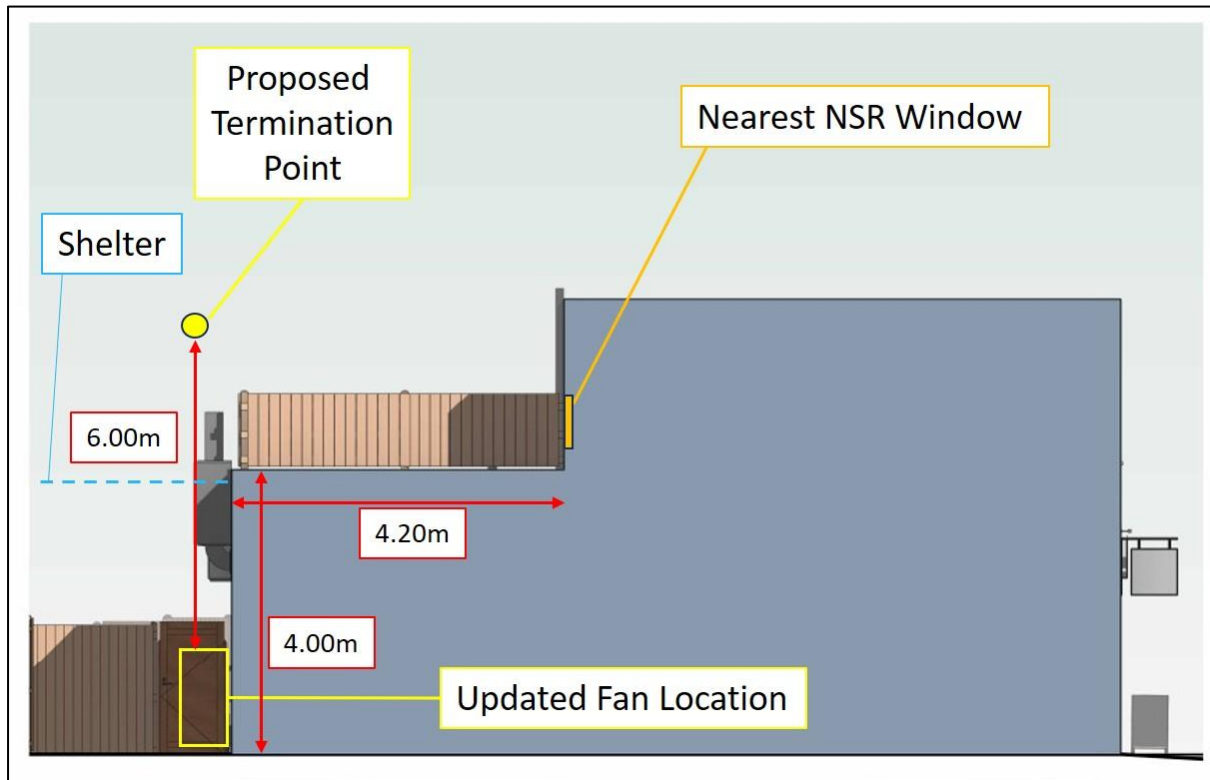


Figure 6. North Elevation - Updated Fan Location.

No updated plans were available at the time of writing. Figures 6 & 7 show the approximate location of the fan unit as informed by the client. The proposed replacement Inverter is remaining in the position detailed.



Figure 7. Proposed East Elevation.

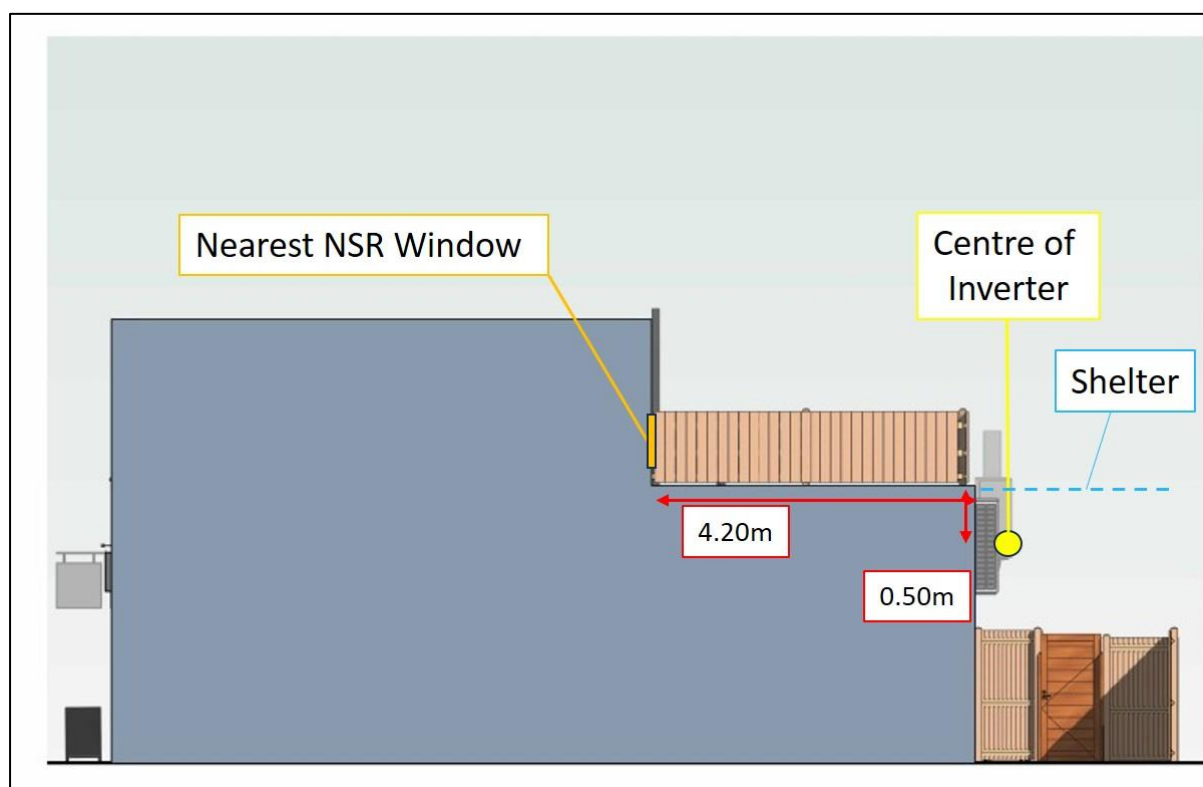


Figure 8. Proposed South Elevation



Figure 9. Installation location with Shelter.

5.3 Internal Ductwork

All ductwork, cooker hoods and sources of vibration inside 19-21 Sea Road must be fitted with appropriate anti vibration mounts and isolation from party wall/floor surfaces in accordance with the manufacturers recommendations to prevent vibration energy being radiated into the building structure.

5.4 Plant and Ductwork

The external fan with 400mm diameter circular ductwork and roof hood will be located on the external kitchen wall at the rear of the premises. An atmosphere side silencer is proposed with the termination point located at 4.2m from the nearest habitable window. It should be noted that the nearest window is the kitchen with the habitable room located on the front side of the property.

It is proposed to box in the external fan unit.

5.5 Duct Calculations

5.5.1 Assessment location

The background sound pressure level measured at the receptor location is 41dB $L_{A90,15\text{minutes}}$.

With the fan being boxed in, the relevant element of the assessment will be the termination point and the duct breakout only.

The distance between the termination point for the kitchen ductwork and the residential window is 4.2m.

The fan and associated attenuators are located outside on the rear wall and will require siting on appropriate anti vibration mounts, again to prevent sound energy being radiated into the building structure.

The fan proposed is a MPS 500 D4 30 with the Sound Power Levels as follows:

Sound power (L_W) dB(A)		Medium Frequency Band								
		Σ	63	125	250	500	1k	2k	4k	8k
Inlet	L_{WA5}	81	57	74	72	73	74	73	68	60
Outlet	L_{WA6}	80	58	68	69	72	75	73	67	58
Casing	L_{WA2}	70	53	66	64	59	58	56	51	43

Figure 10. MPS 500 D4 30 Manufacturers Sound Power Levels.

The fan is proposed to be located on the external kitchen wall with 6m of ducting from the fan to the roof hood. The ducting is to contain a silencer. The termination point is approximately 7m from ground floor level.

The attenuators used in the assessment comprise of two circular straight silencers with 50mm of insulation applied. Figure 7 below details the likely attenuation for a single unit. Table 3 shows the total required Insertion Loss.

Attenuation [dB] for centre frequency [Hz]												
Ød _{1 nom} mm	l _{nom} mm	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	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	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	* 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

Figure 11. Straight Circular 50mm insulation attenuators

Total Required Insertion Loss								
Frequency - Hz	63	125	250	500	1000	2000	4000	8000
Attenuation Required dB	0	4	14	32	40	18	12	14

Table 3. Total Required Insertion Loss

5.5.2 Sound Emission from Termination Point

Discharge Breakout								
Frequency - Hz	63	125	250	500	1000	2000	4000	8000
Fan Sound Power (dBA) from manufacturer	58	68	69	72	75	73	67	58
Silencer details (two in line units)	0	4	14	32	40	18	12	14
Attenuation per m of 400mm circular duct	0	0.06	0.07	0.09	0.12	0.16	0.17	0.17
Insertion loss for duct length	0	0.36	0.42	0.54	0.72	0.96	1.02	1.02
Duct discharge is 0.13 m ² in cross section	13.7	7	3.2	0.6	0	0	0	0
SWL radiated from discharge	44.3	56.6	51.4	38.9	34.3	54.0	54.0	43.0
Radiating next to wall, discharge at 1 m above roof (including 8.6m distance attenuation)	23.0	35.4	30.1	17.6	13.0	32.8	32.7	21.7
Total sound pressure level at NSR - dBA	39.3							

Table 4. Termination Point Assessment

The specific sound pressure level generated from the roof hood outlet at the receptor location is 39.3 dB $L_{Aeq,T}$ during operation.

5.5.3 Ducting Breakout

The breakout from the ducting can be see below in Table 5.

It is assumed that the ducting is made of 20 swg steel. The transmission loss for this has been obtained from CIBSE Guide B4 Table 4.31. As 400mm was not available, 600mm data was used to ensure a worst-case outcome.

Duct Breakout								
Frequency - Hz	63	125	250	500	1000	2000	4000	8000
Fan Sound Power (dBA) from manufacturer	58	68	69	72	75	73	67	58
Silencer details	0	4	14	32	40	18	12	14
Sw/Sd	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3
swld	58	64.0	55.0	40.0	35.0	55.0	55.0	44.0
20g steel (duct SRI - cibse B4)	37.0	32.0	27.0	26.0	30.0	35.0	39.0	40.0
swlb = swld-R+10log (Sw/Sd)	32.2	43.2	39.2	25.2	16.2	31.2	27.2	15.2
Barrier Attenuation (Calculated)	13.2	15.8	18.7	21.6	24.6	27.5	30.5	33.5
Barrier Attenuation (Realistic)	13.2	15.0	15.0	15.0	15.0	15.0	15.0	15.0
Level After Barrier Attenuation	0.8	10.0	6.0	-8.0	-17.0	-2.0	-6.0	-18.0
Total sound pressure level - dBA	12.1							

Table 5. Duct Breakout

The predicted breakout from the duct is 12.1 dB. This is more than 10db below that of the sound pressure level from the discharge and will therefore be inaudible at the NSR.

5.6 Enclosure of the Ductwork/Silencers/Fan Motor

Whilst it is common to enclose ductwork and ancillary items for a variety of reasons, it is still necessary to ensure that access is allowed for future maintenance and servicing of the fan, and/or odour control equipment and access to the silencers for cleaning.

Any future access points will need to face away from the resident's window. Additionally, access points need to be carefully designed and detailed to ensure that they do not act as weak areas for the onward transmission of sound.

A system of heavy-duty panel enclosures is likely to enclose the fan unit such as those detailed below from CMS Danskin which come in 20, 50, 100 and 200mm panels which can achieve a reduction up to 53dB. The fittings allow these to be formed into a box shape around the relevant plant to be enclosed.

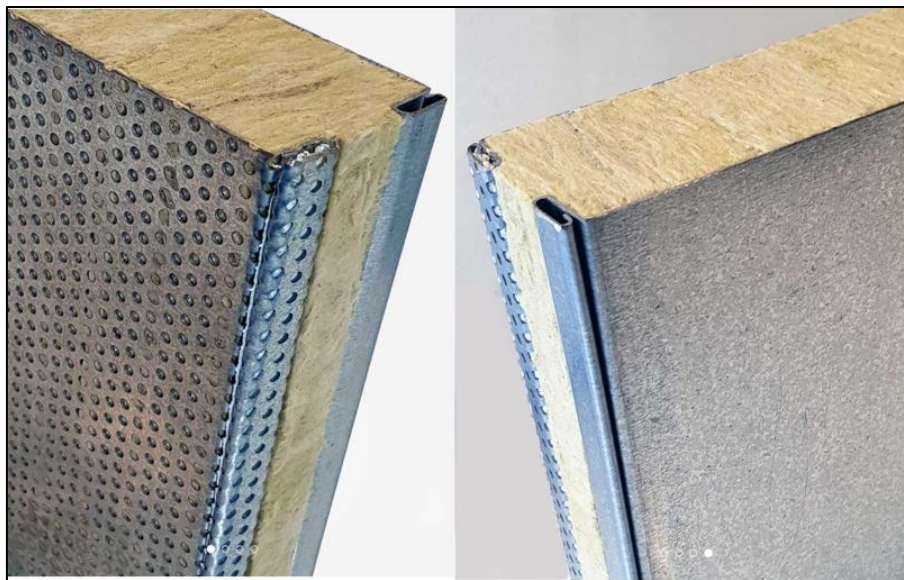


Figure 12. Acoustic Panel System

An alternative to this would be:

- Weatherproofing outer layer
- 2 x 22mm ply or 2 cementitious boards
- Timber frame with internal Rockwool supported by metal wire/mesh

5.7 Predicted Sound Pressure Level at Receptor Location

With appropriate enclosure of the fan and associated motor unit, as well as the ductwork, the termination point distance to the window indicates that the resulting sound pressure levels will be below the measured background sound pressure levels ($L_{A90,15\text{minutes}}$). The predicted sound pressure level is rounded to 39dB $L_{Aeq,T}$ and has taken account of atmospheric reflections as well as directivity. The discharge termination point is the dominant contributor to the source of sound.

6 Inverter

A wall mounted inverter is also proposed. The inverter is a RAV-GP1101AT (8)-E. The manufacturers engineering handbook states the unit's Sound Power data in 1/3 octave bands

Figure 15 in the Appendix shows the 1/3 octave band data from the manufacturer. It should be noted that the data does not provide sufficient information to calculate the 63Hz octave band.

The 1/3 octave bands were logarithmically summed into 1/1 Octave bands for the purposes of calculating barrier attenuation. The results are detailed in table 6 below

Sound Power from Manufacturer (Summed from 1/3 Octave Bands)							
Frequency	125	250	500	1000	2000	4000	8000
LwA	50.8	57.1	59.3	60.5	56.6	50.9	42.1

Table 6. Octave band Data

6.1.1 Barrier

Hypotenuse: $\sqrt{4.2^2 + 0.5^2} = 4.22$

Path difference: $(4.2 + 0.5) - 4.22 = 0.48$

Barrier Calculation							
Frequency - Hz	125	250	500	1000	2000	4000	8000
wavelength - Metres	2.72	1.36	0.68	0.34	0.17	0.09	0.04
Path difference. =	0.48	0.48	0.48	0.48	0.48	0.48	0.48
2*P.D/wavelength=	0.35	0.71	1.41	2.82	5.65	11.29	22.59
barrier Attenuation=	10.0	12.3	14.9	17.7	20.6	23.6	26.6
Actual barrier attenuation never realistically more than 15	10.0	12.3	14.9	15	15	15	15
level minus barrier	40.8	44.7	44.3	45.5	41.6	35.9	27.1
Total Sum (LwA)	50.9						
Lw to Lp 50.9-20LOG (4.22)-8	30.4						

Table 7. Barrier calculation

As table 7 above shows, the predicted level of the Inverter at the nearest NSR window is predicted to be 30.4 dB.

6.2 Combined Sound Pressure of Proposed Plant

The total predicted sound pressure level from the extraction system is 39.3dB at the nearest NSR. The total predicted sound pressure level from the Inverter is 30.4db

In order to assess the impact of these on the nearest NSR to have been logarithmically summed together.

$$10 \cdot \log(10^{3.93} + 10^{3.04}) = 39.8 \text{ dB}$$

This will be rounded to the nearest whole value (40dB) and used as the specific sound level for the purposes of the BS4142:2014 assessment.

7 BS4142:2014 Assessment

The BS4142:2014 assessment has considered using the worst case and highest predicted external sound pressure level at the closest receptor. In this instance, this equates to the 1st floor rear window at the flat above the proposed restaurant. For the BS4142 assessment, this considers a worst case of all internal units operating simultaneously and at maximum capacity.

7.1 Character Corrections

The specific sound level may have character corrections applied when appropriate. This is to ensure that the perceived nature of the sound is weighted appropriately. BS4142 lists 4 types of character corrections, tonality, impulsivity, intermittency and other.

The manufacturers sound power data for the Inverter show a notable frequency 'spike' at 16kHz. Strictly speaking this would not be considered tonal according to BS4142 as it is above 10kHz (Annex C, objective method). As the plant has not been installed, a subjective assessment of tonality cannot be made either. It is likely that this 'spike' may give the inverter a notable character however. Therefore, in order to assess the worst-case outcome, a 3dB correction has been applied for 'other notable characteristics' as defined by BS4142:2014 section 9.2.

7.2 BS4142:2014-A1:2019 Assessment

It is important to differentiate between noise rating level and specific noise level. Certain acoustic features can increase the likelihood of complaint (see section 7.1 above).

Daytime - Hours of Operation (07:00-22:00)			
Results	Measurement Parameter		Relevant Clause
Specific sound level	$L_{Aeq}(T)$	40	7.3.4
On time corrected value	Not Applied	0	
Acoustic feature correction	Other	3	9.2
Rating level	$L_{Ar,Tr}$	43	9.2
Background sound level	$L_{A90}(T)$	41	8
Excess of rating level over/under background sound level		2	11
Assessment indicates:	Above background. Low impact, depending on context. Mitigation required		11
Uncertainty of the assessment	Discussed		10

Figure 13. Daytime Assessment

7.3 Discussion

Contextually the site already has multiple pieces of plant in the immediate vicinity, primarily 3 condenser units belonging to the neighboring Dentist practice, which are in close proximity to the nearest NSR. Additionally, the proposed plant is not proposed to be run past the operating hours of 07:00 – 22:00. This means the plant will not be running in the nighttime period.

As detailed in section 5.1 the replacement Inverter unit is approximately 3dB quieter than the new proposed unit. As the old unit is functional and actively contributing to the sound scape, the replacement unit is unlikely to negatively impact the current airborne soundscape.

The shelter, while blocking line of sight to the nearest NSR, currently lacks the required mass to be considered as a barrier for the purposes of assessment. It has therefore not been included in any of the calculations. It should be noted however that the inverter is 9dB lower in sound pressure level than the termination point. Given that a difference of 10dB or more would be considered inaudible, it is likely that the 16kHz frequency ‘spike’ will not be audible at the receptor. This would effectively lower the Rating Level by 3dB as the character correction detailed in section 7.1 would not apply. To assess the worst-case outcome, the correction has been left into assessment.

It is assumed the plant will be running at full capacity. If it is practicable to operate both pieces of plant at a lower capacity, this will likely assist with lowering the Rating Level to be either at parity with the L_{A90} background level or below it.

If this is not achievable, then additional attenuation would be required to reduce the sound emission from the discharge point. An additional 2dB of attenuation would be required to lower the Rating Level to parity with the L_{A90} Background Level. Lagging the ducting will not contribute any meaningful reduction to the sound pressure levels as the calculated duct break out is 12.1dB compared to the discharge point’s emission of 39.3 dB. In this case, the additional reduction would need to come from the in-line silencer. The total attenuation it will need to provide is presented in the table below.

Required Insertion Loss								
Frequency - Hz	63	125	250	500	1000	2000	4000	8000
Attenuation Required dB	0	4	16	32	40	26	20	14

Table 8. Silencer Insertion Loss required to achieve L_{A90} parity.

7.4 BS8233:2014 Consideration

It is worth considering the impact this will have on the internal sound pressure level of the dwelling. The worst-case Rating level is 43 dB $L_{A,T,r}$.

AVOG states that the attenuation afforded by an open window is 13dB. This would equate to 30dB internally.

It is recognised however that the BS8233 criteria only considers continuous anonymous sound so applying a 5dB enhancement to accommodate this would be appropriate.

BS8233 - Adjustment for Non-Continuous Anonymous Sound						
Activity	Location	Table 4 Daytime $L_{Aeq-16Hour}$	Table 4 Nighttime $L_{Aeq-8 Hour}$	5db Adjustment for non-Continuous Anonymous Sound	Resulting Daytime $L_{Aeq-16Hour}$	Resulting Nighttime $L_{Aeq-8 Hour}$
Resting	Living Room	35	-	5	30	-
Dining	Dining Room	40	-	5	35	-
Sleeping (daytime resting)	Bedroom	35	30	5	30	25

Table 9. BS8233 Table 4 with the heightened criteria

Taking this into account, the values would be 30 dB internally and therefore the same value as the heightened Daytime $L_{Aeq, 16-Hour}$. As no night time operation is planned, only the Daytime criterion needs to be achieved.

8 Building Regulations – Approved Document E – Resistance to the Passage of Sound

8.1 Compliance With ADE E1

Approved Document E of the Building Regulations 2010 specifies minimum performance values of Weighted Standardised Level Difference ($D_{nT,w} + C_{tr}$) for airborne noise transmission through party floors and walls and Weighted Standardised Sound Pressure Level ($L'_{nT,w}$) for impact sound transmission through a floor.

It should be noted that with airborne sound insulation, it is the level difference between rooms that is measured. The higher the result the better the insulation.

ADE 0.8 makes comment about mixed commercial and residential tenure.

0.8 The performance standards set out in Tables 1a and 1b are appropriate for walls, floors and stairs that separate spaces used for normal domestic purposes. A higher standard of sound insulation may be required between spaces used for normal domestic purposes and communal or non-domestic purposes. In these situations the appropriate level of sound insulation will depend on the noise generated in the communal or non-domestic space. Specialist advice may be needed to establish if a higher standard of sound insulation is required and, if so, to determine the appropriate level.

A summary of the acoustic requirements, for a conversion property, are as follows:

Requirements of:	Element	Airborne Sound Insulation ($D_{nT,w} + C_{tr}$)	Impact Sound Insulation ($L_{nT,w}$)
Commercial/Dwelling*	Floor	$\geq 48\text{dB}$	N/A
B-regs Dwelling/Dwelling	Floor	$\geq 43\text{dB}$	$\leq 64\text{dB}$
B-regs Dwelling/Dwelling	Wall	$\geq 43\text{dB}$	N/A

Table 10 Building Regulations Noise Criteria

* For many other projects the Local Authorities in Sussex require that the basic ADE target is exceeded when there is a commercial unit directly adjacent to a dwelling. In this case the Building Regulations +5dB target should be sufficient.

This approach is consistent with the Planning Noise Advice Document 2023.

8.1.1 Sound Insulation Test Results

A vertical airborne sound insulation test was conducted on site to measure the current level of sound insulation between the commercial ground floor and the 1st floor. The test was conducted in accordance with ADE and Acoustic South East are registered members of the Association of Noise Consultants.

A result of $D_{nT,w} + C_{tr}$ 52 dB was calculated. This is 4dB above the heightened 48 $D_{nT,w} + C_{tr}$ that is often required by Local Authorities for commercial conversion properties and 2dB above the 50 $D_{nT,w} + C_{tr}$ required for commercial new build properties. This therefore complies with Approved Document E.

Please see the Appendix for the test graph.

8.2 Services

The following applies to any services that pass from one floor to another or that pass through a separating wall.

- Pipes and ducts that penetrate a party floor separating commercial unit and habitable rooms in the residential flat should be enclosed for their full height.
- The enclosure should be constructed of two layers of board material having a combined mass per unit area of at least 16kg/m². (2x12.5mm plasterboard)
- Either line the enclosure, or wrap the duct or pipe within the enclosure, with 25 mm unfaced mineral wool.
- Penetrations through a separating floor by ducts and pipes should have fire protection to satisfy Building Regulation Part B - Fire safety. Fire stopping should be flexible and also prevent rigid contact between the pipe and floor. Note: There are requirements for ventilation of ducts at each floor where they contain gas pipes. Gas pipes may be contained in a separate ventilated duct or they can remain un-ducted. Where a gas service is installed, it shall comply with relevant codes and standards to ensure safe and satisfactory operation.
- Do seal the joint between casings and ceiling with tape & sealant.
- Do leave a nominal gap (approx. 5 mm) between the casing and any floating layer and fill with sealant.

9 Uncertainty & Context

The following measures were taken to reduce uncertainty:

- The equipment was calibrated before and after measurements were undertaken with no significant drift occurring.
- The worst-case scenario was assessed to ensure appropriate outcomes.
- Decibel values were rounded to the nearest 0.1 dB
- The sound pressure levels at the rear have been predicted based on the worst assumptions.
- The 16kHz 'spike' noted in the inverter's manufacturer's data sheet is unlikely to be audible due the 9dB sound pressure level difference between it and the termination point.
- The location already contains numerous commercial sound sources.
- No adverse weather conditions were recorded during the survey period

10 Conclusion

A class 1 sound level meter was installed at a representative location at the rear of the existing residential property. This was to identify the soundscape and the modal L_{A90} background sound levels at the nearest residential receptor (NSR) between the 17th to the 21st of April 2026. The nearest NSR is to be the flat immediately above the premises on the 1st floor and the soundscape is dominated by the sound of road traffic noise from Sea Road.

A vertical airborne sound insulation test was conducted between the commercial ground floor and the residential flat on the 1st floor. This achieved a $D_{nT,w} + C_{tr}$ of 52 dB. This 9dB better than the requirement set out by Approved Document E.

The proposed operational hours are in the Daytime period only (07:00 – 22:00). For this operational period, the representative modal L_{A90} background sound level is 41 dB. The combined sound pressure level from the proposed plant is predicted to have a Rating Level of 43 $L_{A_{r,Tr}}$. This is 2dB over the representative L_{A90} background level.

Measures have been detailed to reduce the emissions to parity or below the L_{A90} background level. This should not be a major issue given the existing commercial sound sources that will be replaced and the commercial nature of the existing soundscape.

If the implementation of appropriate mitigation measures can be put into place, it is recommended that planning not be refused on noise grounds.

11 Appendix

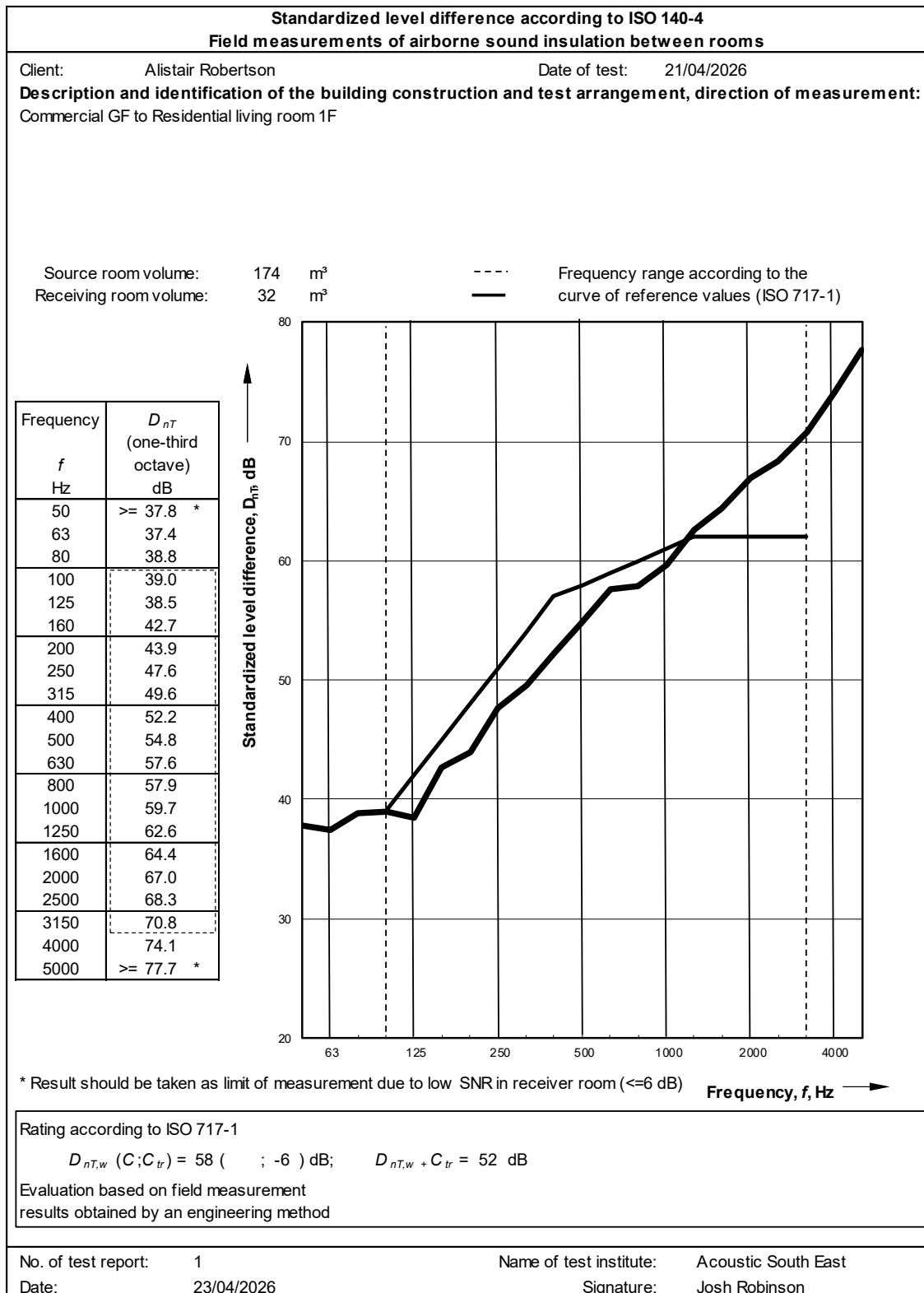
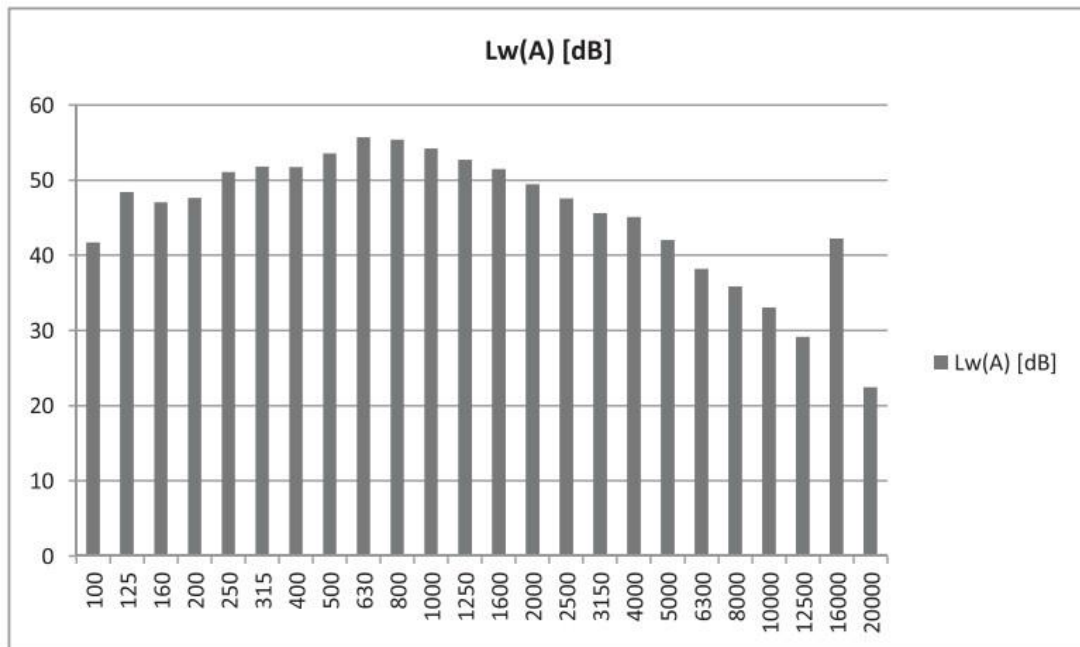


Figure 14. Sound Insulation Results Graph – GF to 1F

RAV-GP1101ATP-E

Cooling



Heating

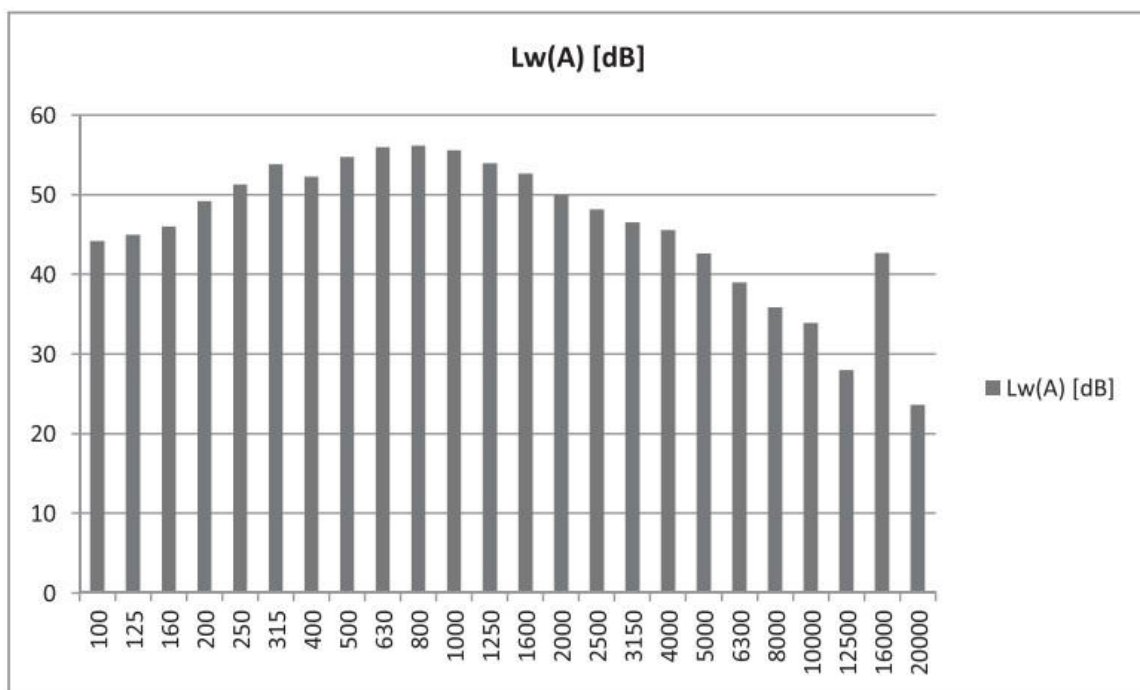


Figure 15. Inverter 1/3 octave data – RAV-GP1101AT-E/TR

TOSHIBA					
SUPER DIGITAL INVERTER					
SUPER DIGITAL INVERTER Physical data outdoor - Single phase					
Outdoor unit		RAV-GP561ATW-E/TR	RAV-GP801ATW-E/TR	RAV-GP1101AT-E/TR	RAV-GP1401AT-E1/TR1
		2 HP	3 HP	4 HP	5 HP
Air flow	m³/h - l/s	2250	3180	6960	6960
Sound pressure level	dB(A) C	46	46	49	50
Sound power level	dB(A) C	63	63	66	67
Operating range	°C C	-15 / 52	-15 / 52	-15 / 52	-15 / 52
Sound pressure level	dB(A) H	48	48	50	51
Sound power level	dB(A) H	65	65	67	68
Operating range	°C H	-27 / 15	-27 / 15	-27 / 15	-27 / 15
Dimensions (HxWxD)	mm	630 x 799 x 299	1050 x 1010 x 370	1550 x 1010 x 370	1550 x 1010 x 370
Weight	kg	45	74	104	104
Compressor type		DC Twin Rotary	DC Twin Rotary	DC Twin Rotary	DC Twin Rotary
Flare connections					
Gas	in	1/2	5/8	5/8	5/8
Liquid	in	1/4	3/8	3/8	3/8
Minimum pipe length	m	3	3	3	3
Maximum pipe length	m	50	50	75	75
Maximum height difference	m	30	30	30	30
Chargeless pipe length	m	20	30	30	30
R32 Refrigerant	kg/TCO ₂ eq	1.35/0.91	1.9/1.28	3.1/2.09	3.1/2.09
Power supply	V-ph-Hz	220/240-1-50	220/240-1-50	220/240-1-50	220/240-1-50

Figure 16. Inverter Data Sheet – RAV-GP1101AT-E/TR

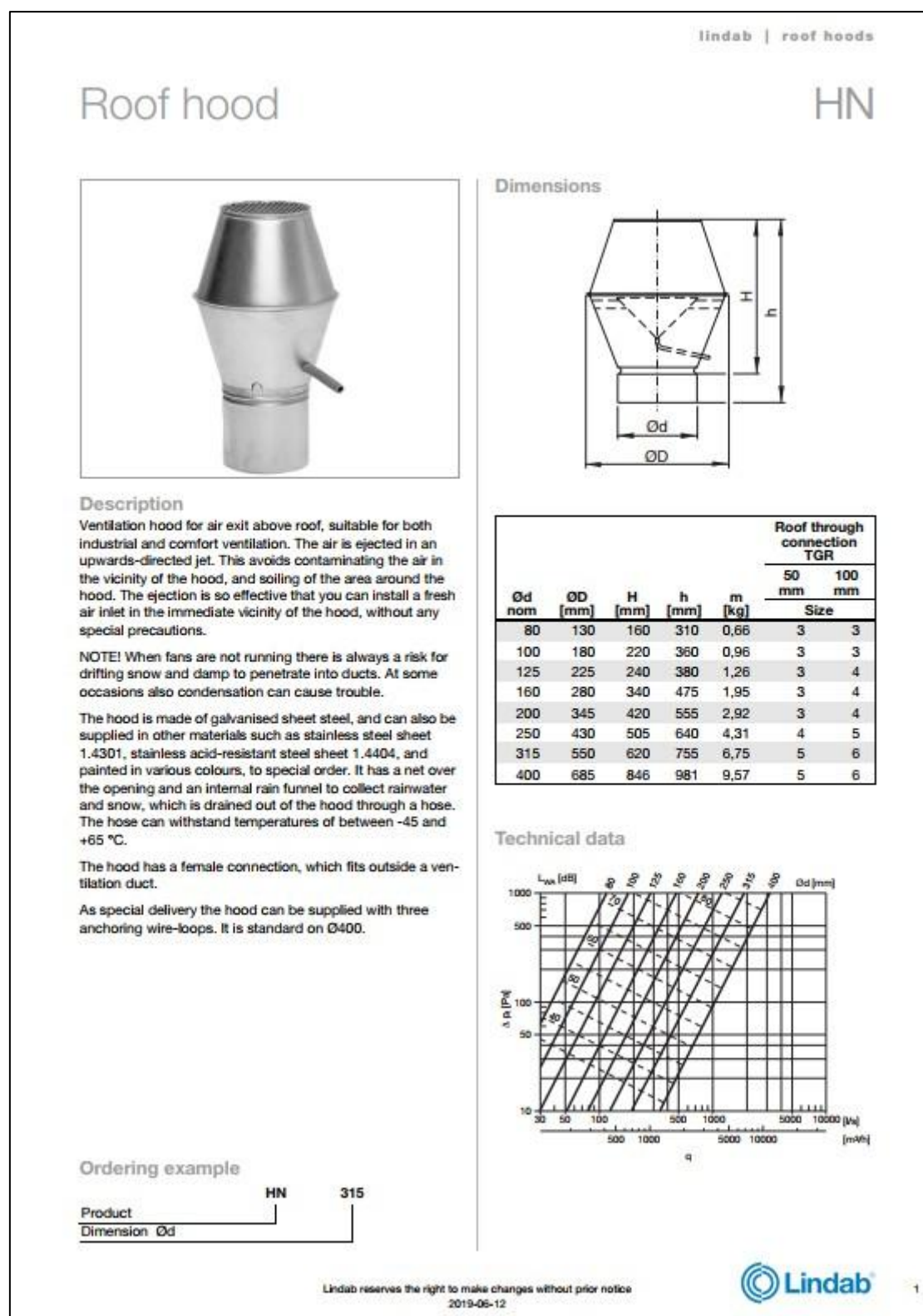


Figure 17. Roof Hood Data Sheet