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CLIENT PROJECT REFERENCE:

292 Goring Road, Goring-by-Sea, Worthing, BN12 4PE

Environmental Noise Impact Assessment

PREPARED FOR: 292 Goring Road, Goring-by-Sea, Worthing, BN12 4PE

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1. Summary

An environmental noise impact assessment was carried out at the premises at 292 Goring Road, Goring-by-Sea, Worthing, BN12 4PE, on Saturday 15th November 2025. ***The aim of this report is to determine the impact of the proposed extractor fan unit upon noise sensitive receptors in accordance with BS4142:2014+A1:2019 guidance***.

The results of the environmental noise impact assessment are reasonable considering the location of the measurement position and the existing noise sources in the local neighbourhood. Noise calculations of the sound sources were undertaken using available details and plans provided by the client. The data and information form the basis of the assessment. BS4142:2014+A1:2019 and BS8233: 2014 noise assessment were conducted at the site.

The summary of the difference between the Rating Level $\boldsymbol{L_{Aeq,Tr}}$ and Background Noise Level $L_{A90,T}$ of noise sensitive receptors is given in table below.

Noise sensitive receptor	**Difference between The Rating Level and Background Level**	
	Day	**Night**
312 Goring Road (first floor rear window)	– 28dB(A)	– 26dB(A)
310 Goring Road (first floor rear window)	– 29.6dB(A)	– 27.6dB(A)
318 Goring Road, flats (first floor rear window)	– 37.5dB(A)	– 35.5dB(A)

In accordance with BS4142:2014+A1:2019 guidance, the day Rating Level $L_{Aeq,Tr}$ at nearest noise sensitive receptors does not exceed the background sound level $L_{A90,T}$ as shown in Table above. *Therefore, the operation of the proposed extractor fan indicates the specific sound source having a low adverse impact during daytime.*

The predicted daytime Rating Level $\boldsymbol{L_{Aeq,Tr}}$at the external amenity space of 312 Goring Road is 26dB(A). Rating Level $\boldsymbol{L_{Aeq,Tr}}$ 26dB(A) at the external amenity space does not exceed 50dB $L_{Aeq,16hr}$ of desirable category of BS8233:2014.

It can be confirmed that the Rating Levels $L_{Aeq,Tr}$ of the proposed extractor fan is expected to comply with BS4142:2014+A1:2019 guidance.

2. Introduction

Environmental noise assessment was carried out at the premises at 292 Goring Road, Goring-by-Sea, Worthing, BN12 4PE, on Saturday 15th November 2025. The site is seeking planning permission for proposed extractor fan unit at the rear elevation of the premises. Environmental Noise Survey was undertaken in accordance with BS4142:2014+A1:2019. The site is located on a busy road (Goring Road) with high background noise level.

3. Site Description

The site is located at 292 Goring Road, Goring-by-Sea, Worthing, BN12 4PE. The building comprises a ground floor commercial unit with residential units at upper floors. The site is located in a mixed commercial and residential area. The site will be open for business between 11:00am and 01:00am on Monday to Sunday.

4. Environmental Noise Survey Methodology

Environmental noise survey was undertaken at the site to determine noise levels in accordance with the methodology contained within BS4142:2014 +A1:2019. Noise survey at given time covers the most sensitive period of the time in which the proposed extractor fan may be operational.

4.1 Sound source under investigation

During the measurements carried out at the site, the primary noise identified was road traffic noise from Goring Road. Secondary noise was noise from mechanical units (extractor fan, AC units, compressor/condenser units) of shops nearby. An extractor fan system with the attenuator for the kitchen of the premises will be installed at the rear of the premises. The details of the extractor fan unit are as follow: Helios GigaBox centrifugal fan 560mm (GBW 560/4). The details of the extractor fan and attenuator are given in Appendix B.

Anti-vibration mounts will be used to provide isolation from vibration and noise via high resilience rubber. These isolation products provide high levels of reduction in vibration.

4.2 Measurement equipment

A description of the equipment used for the noise survey are given in the Table 1.

Table 1: Description of the equipment used for measurements

Equipment	Description	Quantity	Serial No
Norsonic SLM	Type 1 sound level meter, NOR140	1	1403870
Norsonic	½ inch microphone	1	1225
Norsonic	Preamplifier	1	1209
Norsonic Calibrator	Class 1 Calibrator (114 dB)	1	Nor-1251-32544

4.3 Parameters measured

BS4142:2014+A1:2019 gives a method for assessing the impact of specific sounds based upon the amount, in dB, that a specific sound level exceeds the background sound level, taking into account the context of the situation. The standard requires measurement of the specific sound level, in $L_{Aeq,T}$ over a period of 1 hour (daytime) and 15 minutes (night time), and the background sound level, L_{AF90}, when the specific sound is not in operation, the residual sound level, L_{Aeq}, when the specific sound is not in operation, and the background and residual sound should be measured at times which are representative of and similar to those at which the specific sound is in operation.

Noise parameters were measured using a calibrated system over a period of the time that is representative of the worst-case condition. Residual noise levels were measured in 1/3 octave bands throughout the noise survey.

Weather conditions were noted to be 12 degrees Celsius with mostly cloudy skies at the beginning of the measurements with a light wind, which was less than 2m/s, and 11 degrees Celsius at the end of the measurements with a cloudy sky and a wind which was less than 4m/s. These weather conditions were checked against and confirmed using the Meteorology Office mobile application available on smart phone technology.

The noise monitoring equipment was calibrated before and after the measurements. No significant drift was recorded during calibration as shown in Table 2.

Table 2: Calibration details

Measurement	Calibrator Ref Level (dB)	Level Before (dB)	Deviation Before (dB)	Level After (dB)	Deviation After (dB)
	114.0	114.10	0.10	114.00	0.00

4.4 Measurements

To undertake a BS4142:2014+A1:2019 assessment, it is necessary to measure the noise levels at the site to determine day and night noise levels. Ambient and background noise levels for day and night were measured at the site. The sound level meter was positioned at minimum 1 metres away from nearby walls/fences. The sound level meter was mounted onto a tripod at 1.40 metre above the ground at the site as shown in Appendix D.

5. Noise Survey Results and Observations

5.1 Results

An environmental noise survey was carried out at the site. Details of measured noise level results are given below.

5.1.1 Day noise levels

Measured ambient ($L_{Aeq,1h}$), and background ($L_{AF90,1h}$) levels at the site are 54dB, and 46dB respectively. Highest L_{AMax}, was 84.2dB that was observed at 13:45 during measuring background noise levels at the rear of the site. A comparison of L_{Aeq}, L_{AMax}, L_{A10}, and L_{A90} results for day is given numerically in Table 3 and graphically in Figure 1.

Table 3: Day Noise Levels measured at the site.

Recorded Time (hh:mm)	L_{Aeq}	L_{AFmax}	$L_{AF,10}$	$L_{AF,90}$
9:00	53.4	70.2	54.6	47
9:15	55	71.6	56.5	46.5
9:30	51.6	65.1	53.4	46.5
9:45	50.1	63.6	51.7	46.4
10:15	63.3	76	68.3	48.6
10:30	53.5	67	54.8	46.6
10:45	52	66.5	54	46.9
11:00	54.8	68	55.6	46.4
11:15	57.6	68.8	61.6	45.9
11:30	56.7	70.3	55.9	46.1
11:45	49.7	61.1	51.4	46.9
12:00	50.8	58.8	54.1	45.7
12:15	54.7	79.7	52.7	45.1
12:30	49.9	61.5	52.6	45.5
12:45	55.5	73.4	54.8	44.8
13:00	49.2	62	51.6	45.2
13:15	50.2	66	52.7	45.3
13:30	48.5	59.4	50.9	44.9
13:45	58.5	**84.2**	52.2	44.4
14:00	51	66.5	53.2	44.8
14:15	50	67.8	51.9	45.2
14:30	49.3	60.6	51.2	44.9
14:45	51.6	66.9	54.8	45
15:00	50.1	61.4	53	46.3
15:15	51	64.8	52.6	45.4
15:30	47.8	61.9	49.8	43.7
15:45	49.5	62.8	52.3	44.3

16:00	50.5	60.6	55	43.7
16:20	49.7	62.1	51.3	44.7
16:35	57.2	80	61.1	44.1
16:50	53	58	55.7	48.3
17:05	49.6	61.5	52	45.8
17:20	49.8	58.2	52	46.6
17:35	53	67.9	53.7	46
17:50	50	58.8	52.3	44.7
18:05	50.1	61.2	52.3	44.9
18:20	49.5	62.2	51.8	45.3
18:35	49	67.8	50.5	45.3
18:50	54.6	75.3	52.7	45.7
19:05	51.8	64.6	54.4	44.9
19:20	57.6	71	61.5	48.7
19:35	53.9	71.5	53.4	47.3
19:50	53.4	72.3	54.5	47.4
20:05	54.1	73.1	55.8	47.8
20:20	53.6	66.5	56.4	47.5
20:35	53.2	67.2	55.5	48
20:50	51.5	67.9	53.2	46.9
21:05	56.1	73.7	59.2	46.1
21:20	50	61.6	52.7	46.5
21:35	52.1	72.4	54.5	46.9
21:50	55.2	73.8	58.2	48
22:05	52	62.6	55.8	47.9
22:20	48.7	60.1	50.5	45.6
22:35	50	69.3	51.2	45.1
22:50	51.6	64.3	53.6	45.9
23:05	50.4	68.8	50.8	45.5
Average	**$L_{Aeq,1h}$ =54**	**$L_{AMax,1h}$=72**	**$L_{AF10,1h}$=56**	**$L_{AF90,1h}$=46**

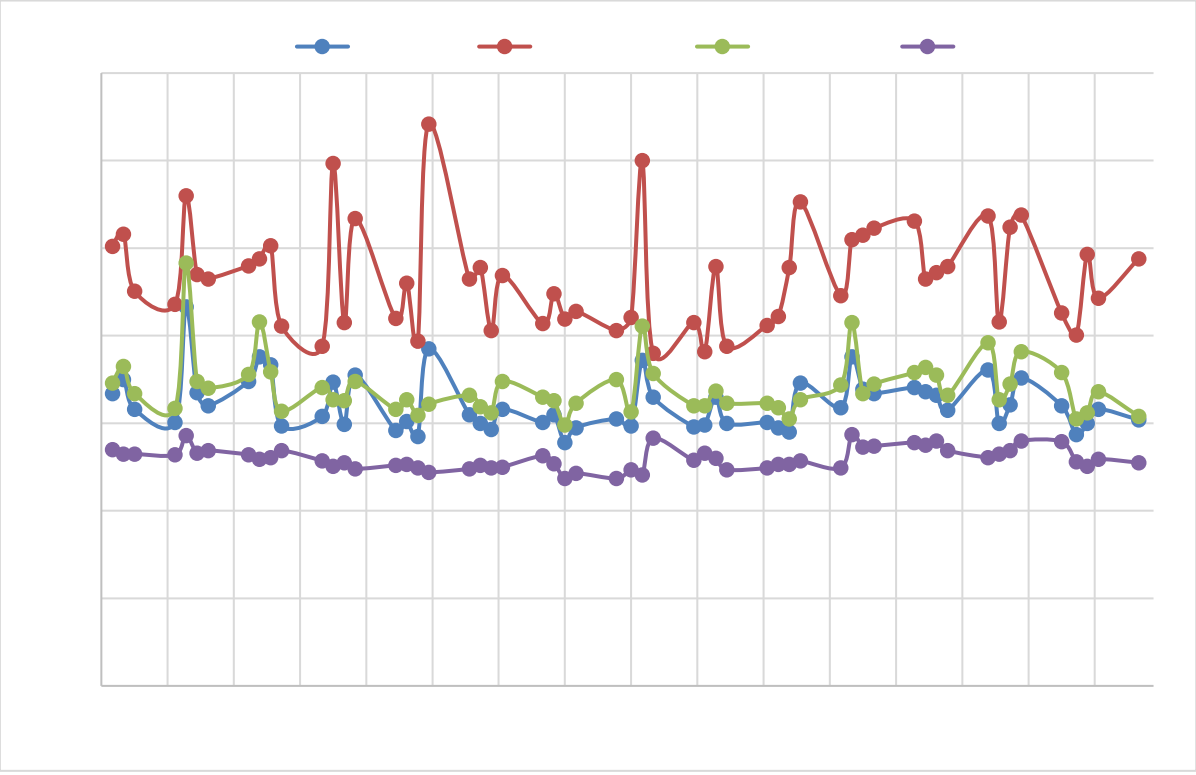


Figure 1: Day Sound Pressure Levels measured at the site.

5.1.1.1 Objective method to determine noticeable characteristics

Section B.2.1.1 of BS4142:2014+A1:2019 states "Establish whether standing waves/interference patterns are present by considering the nature of the source and the influence of any nearby sound reflecting surfaces. This can be carried out subjectively by listening in several places around the measurement location, or by measuring any change in sound pressure levels with a sound level meter at different locations in the immediate locality when traversing the measurement location".

Section 9.3 of BS 4142:2014+A1:2019 states that if the subjective method is not sufficient for assessing the audibility of tones in sound or the prominence of impulsive sounds, use the one-third octave method in 9.3.2.

Annex C of BS 4142:2014+A1:2019 states that the test for the presence of a prominent, discrete-frequency spectral component (tone) typically compares the $L_{Zeq,T}$ sound pressure level averaged over the time when the tone is present in a one-third-octave band with the time-average linear sound pressure levels in the adjacent one-third-octave bands. For a prominent, discrete tone to be identified as present, the time-averaged sound pressure level in the one-third-octave band of interest is required to exceed the time-averaged sound pressure levels of both adjacent one-third-octave bands by some constant level difference.

The level differences between adjacent one-third-octave bands that identify a tone is:

- ***15 dB in the low-frequency one-third-octave bands (25 Hz to 125 Hz);***
- ***8 dB in the middle-frequency one-third-octave bands (160 Hz to 400 Hz); and***
- ***5 dB in the high-frequency one-third-octave bands (500 Hz to 10 000 Hz).***

The proposed extractor fan system is a brand-new system. Therefore, no acoustic features (tonality, impulsivity, and intermittency) are expected from the new extractor fan system.

5.1.2 Night noise levels

The proposed shop will be open for the business until 01:00am. Therefore, it is necessary to measure night noise levels. Measured ambient ($L_{Aeq,15m}$), and background ($L_{AF90,15m}$) levels at the site are 49dB, and 44dB respectively. Highest L_{AMax}, was 69.2dB that was observed at 23:50 during measuring background noise levels at the rear of the site. A comparison of L_{Aeq}, L_{AMax}, L_{A10}, and L_{A90} results for day is given numerically in Table 4.

Table 4: Night Noise Levels measured at the site.

Recorded Time (hh:mm)	L_{Aeq}	L_{AFmax}	$L_{AF,10}$	$L_{AF,90}$
23:20	49.7	65.1	51.7	44.9
23:35	48.3	61.3	50.8	44.1
23:50	48.4	**69.2**	50.3	44.2
00:05	49.3	55.3	51.1	47.1
00:20	50.3	65.5	51.1	47.6
00:35	49.1	55	51.7	45.8
00:50	49.7	62.4	51.9	45.1
01:05	48.4	59.3	50.1	44.8
01:20	47.8	58.1	49.8	44.6
01:35	41.5	54.3	46.3	38.4
Average	$L_{Aeq,15m}$ **=49**	$L_{AMax,15m}$**=63**	$L_{AF10,1h}$**=51**	$L_{AF90,15m}$**=44**

5.2 Observation

Attended environmental noise measurements were carried out at the site. Observations and detailed notes were made of the significant noise sources, which contribute to each of the measured levels.

Road traffic noise: Road traffic noise from Goring Road and Mulberry Gardens was audible at the monitoring locations and it was subjectively loud during the measurements.

People noise: The noise from pedestrians walking by the site was audible at measurement location but it was subjectively loud during the measurements.

Site sound sources: Currently, there are not any sound sources in operation at the site. The site is not open for business yet.

Neighbourhood sound sources: The noise from mechanical units (Extractor fan, AC units, compressor/condenser units) of nearby shops was audible at measurement location and it was subjectively loud during the measurements at the rear of the site.
Bird noise: The sound from seagulls was audible at the measurement location but it was not subjectively loud during measurement.
Car park noise: The noise from car park at the rear of the site was audible at the measurement location and it was subjectively loud during the measurements.

5.3 Uncertainty
The levels of uncertainty in the data and calculations are low given the robust measurements undertaken in noise monitoring and the confidence in the data statistical analysis.

6. Noise Impact Assessment
6.1 BS4142:2014 + A1:2019
BS4142:2014+A1:2019 provides guidance on the assessment of the likelihood of complaints relating to noise from industrial sources. The key aspects of the BS4142:2014+A1:2019 are summarised below. The standard presents a method of assessing potential noise impact by comparing the noise level due to industrial sources (the Rating Level) with that of the existing background noise level at the nearest noise sensitive receiver in the absence of the source (the Background Sound Level). The Specific Noise Level - the noise level produced by the source in question at the assessment location - is determined and a correction applied for certain undesirable acoustic features such as tonality, impulsivity or intermittency. The corrected *Specific Noise Level* is referred to as the *Rating Level*.
The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs.

a) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
b) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
c) 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.
d) 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.

BS4142:2014+A1:2019 criteria are given below.

Difference between the rating level and the background level	Assessment (All dependant on the context)
Around 10 dBA or more	*Indicates a significant adverse impact*
Around 5 dBA	*Indicates an adverse impact*
Below 5 dBA	*Lower the adverse impact*
Below 0 dBA	*Low adverse impact likely*

6.2 BS8233:2014 Noise Assessment Criteria
For desirable internal and external noise levels to be maintained, given in BS8233:2014 as:

- 35dB $L_{Aeq,16hr}$ within living rooms (07:00 – 23:00).
- 30dB $L_{Aeq,8hr}$ within bedrooms (23:00 – 07:00).
- 45dB L_{Amax} should not be regularly exceeded within bedrooms (23:00 – 07:00).
- <55dB $L_{Aeq,16hr}$ within external amenity spaces.

6.3 Assessment
6.3.1 Day noise impact
Specific noise level from the proposed extractor fan is 45dB(A) at 1m from the discharge of the extractor fan as calculated in Appendix B. No tonality and impulsivity are expected from proposed extractor fan unit. Therefore, the rating levels $L_{Aeq\ Tr,1h}$ are equal to the specific noise levels.
Day Rating levels $L_{Aeq\ Tr,1h}$ is 45dB

6.3.2 Night noise impact

The site will be open for business until 01:00am. Therefore, the impact of specific noise levels from the proposed extractor fan for night-time were considered and assessed.

Specific noise level from the proposed extractor fan is 45dB(A) at 1m from the discharge of the extractor fan as calculated in Appendix B. No tonality and impulsivity are expected from proposed extractor fan unit. Therefore, the rating levels $L_{\text{Aeq Tr,1h}}$ are equal to the specific noise levels.

Night Rating levels $L_{\text{Aeq Tr,1h}}$ is 45dB

6.4 Distance attenuation

The nearest noise sensitive receptors to noise sources were noted to be windows of first floor of 312 and 310 Goring Road. The noise levels at window of the noise sensitive receptors can be predicted using outdoor sound propagation equation given below.

$$L_{\text{Aeq,Tr}} - L_{\text{Receptor}} = 20\log\left(\frac{r_2}{r_1}\right)$$

- Distance attenuation at 5m (window of first floor of 312 Goring Road) from the discharge of the extractor fan is 14dB(A) using a 1m distance from the noise source.
- Distance attenuation at 6m (window of first floor of 310 Goring Road) from the discharge of the extractor fan is 15.6dB(A) using a 1m distance from the noise source.
- Distance attenuation at 15m (window of second floor of 318 Goring Road) from the discharge of the extractor fan is 23.5dB(A) using a 1m distance from the noise source.

6.5 Barrier attenuation

Screening of the noise units to prevent line of sight to the sound source would reduce noise levels at the receivers. *Theory of outdoor sound propagation suggest that if the line-of-sight is significantly cut by a barrier/wall then a 10dB(A) reduction can be expected. If the line-of-sight is just cut by a barrier/wall, then a 5dB(A) reduction might be expected.*

The line-of-sight of first floor windows of 310 and 312 Goring Road is significantly cut by the rear wall of the site so 10dB reduction is expected at windows level.

6.6 BS41424142:2014 + A1:2019 Assessment for nearest noise sensitive receptors

6.6.1 First floor rear window (312 Goring Road)

The predicted Rating Level $\boldsymbol{L_{\text{Aeq,Tr}}}$ at the receptor is 28dB(A) and 26dB(A) below background noise level for night at the window level of noise sensitive receptor for day and night respectively as calculated in table below.

In accordance with BS 4142:2014+A1:2019 guidance and criteria, ***the rating level does not exceed the background sound level. This is an indication of the specific sound source having a low adverse impact (low adverse impact likely)***.

BS4142:2014+A1:2019 Assessment	**Day dB(A)**	**Night dB(A)**
Specific Sound Level	**45**	**45**
Characteristic penalty	0	0
Façade correction	-3	-3
Distance attenuation at 5m	-14	-14
Line-of-site significantly cut	-10	-10
Rating Level at receptor point	18	18
Daytime background level, L_{A90}	**46**	**44**
Difference between rating level and background level	**-28**	**-26**

6.6.2 First floor rear window (310 Goring Road)

The predicted Rating Level $L_{Aeq,Tr}$ at the receptor is 29.6dB(A) and 27.6dB(A) below background noise level for night at the window level of noise sensitive receptor for day and night respectively as calculated in table below.

In accordance with BS 4142:2014+A1:2019 guidance and criteria, ***the rating level does not exceed the background sound level. This is an indication of the specific sound source having a low adverse impact (low adverse impact likely)***.

BS4142:2014+A1:2019 Assessment	Day dB(A)	Night dB(A)
Specific Sound Level	**45**	**45**
Characteristic penalty	0	0
Façade correction	-3	-3
Distance attenuation at 6m	-15.6	-15.6
Line-of-site significantly cut	-10	-10
Rating Level at receptor point	16.4	16.4
Daytime background level, L_{A90}	**46**	**44**
Difference between rating level and background level	**-29.6**	**-27.6**

6.6.3 First floor rear window (318 Goring Road flats)

The predicted Rating Level $L_{Aeq,Tr}$ at the receptor is 37.5dB(A) and 35.5dB(A) below background noise level for night at the window level of noise sensitive receptor for day and night respectively as calculated in table below.

In accordance with BS 4142:2014+A1:2019 guidance and criteria, ***the rating level does not exceed the background sound level. This is an indication of the specific sound source having a low adverse impact (low adverse impact likely)***.

BS4142:2014+A1:2019 Assessment	Day dB(A)	Night dB(A)
Specific Sound Level	**45**	**45**
Characteristic penalty	0	0
Façade correction	-3	-3
Distance attenuation at 15m	-23.5	-23.5
Line-of-site significantly cut	-10	-10
Rating Level at receptor point	8.5	8.5
Daytime background level, L_{A90}	**46**	**44**
Difference between rating level and background level	**-37.5**	**-35.5**

6.6.4 External amenity at the site

BS8233:2014 provides a desirable guideline of 50dB $L_{Aeq,16hr}$ for external amenity spaces and an acceptable guideline of 55dB $L_{Aeq,16hr}$ for noisier environments.

Nearest external amenity space is rear terrace of 312 Goring Road, which is approximately 2 meters from the discharge of the extractor fan unit. The predicted daytime Rating Level $L_{Aeq,Tr}$ at the external amenity space is 26dBA. Therefore, Rating Level $L_{Aeq,Tr}$ at the external amenity space is in the desirable category of BS8233:2014.

BS8233:2014 Assessment- Daytime	dB(A)
Specific Sound Level	**45**
Characteristic penalty	0
Façade correction	-3
Distance attenuation at 2m	-6

Line-of-site just cut (barrier attenuation)	-10
Rating Level at receptor point	**26**

6.7 Sound Insulation

6.7.1 Sound Insulation Assessment

The Approved Document E states that "The scheme shall achieve a minimum airborne sound insulation value of 43dB(A) (D_{nTw} + C_{tr} dB) for all floors. A higher standard of sound insulation may be required between spaces used for normal domestic purposes and communal or non-domestic purposes. $D_{nT,w}$ is the standardised level difference measured on-site. With the regard to noise emanating from the shop to noise sensitive flat above the site, BS 8233:2014 states "Airborne sound insulation is mainly considered for intermediate floors between spaces containing either noise sources or noise-sensitive occupants. For a ground floor where there is neither an appreciable noise source nor a noise-sensitive occupant below the floor, the floor is only of interest if it could contribute to flanking transmission*". A higher standard of sound insulation may be required between spaces used for normal domestic purposes and communal or non-domestic purposes.*

The first-floor flat which is above the site is used for residential purpose. A visual inspection of the building and shop was conducted. To control the transfer of noise from the shop to the flat above the site, sound insulation scheme for the ceiling between the shop and first floor flat that is given in Figure 2 is recommended is suggested to achieve a minimum airborne sound insulation value of 43dB (D_{nTw} + C_{tr} dB. It is predicted that the highest internal ambient noise level generated inside the shop will be 85dB(A) during busiest times of operation. This specific internal ambient noise level is considered for worst-case noise level in the shop. The proposed ceiling scheme will attenuate the noise levels to the required minimum sound insulation value. This will contain noise from the private dining areas and non-dining areas within the premises.

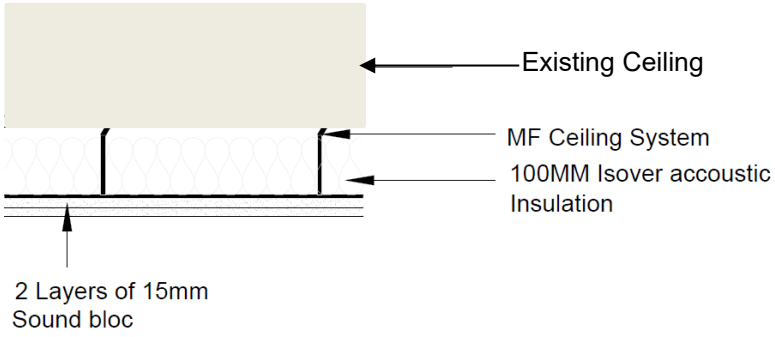


Figure 2: Suggested ceiling scheme for the sound insulation.

7. Vibration

In addition to the control of airborne noise transfer, it is important to consider the transfer of noise as vibration to adjacent properties as well as any sensitive areas of the same building. Proposed extractor fan unit will be installed with proper vibration dampening connections and with rubber anti-vibration mounts at the rear of the site. Vibration isolation products provide high levels of reduction in vibration. No vibration from brand new extractor fan unit is expected. There will not be any structural borne noise from the brand-new extractor fan unit.

8. Conclusion

An environmental noise survey was undertaken at the site in order to determine prevailing day noise levels that are representative of the nearest noise sensitive neighbouring residential receivers. A BS4142:2014+A1:2019 noise assessment was carried out at the site. All worst-case situations were considered for the assessment.

The summary of the difference between the Rating Level $\boldsymbol{L_{Aeq,Tr}}$ and Background Noise Level $L_{A90,T}$ of noise sensitive receptors is given in table below.

Noise sensitive receptor	Difference between The Rating Level and Background Level	
	Day	**Night**
312 Goring Road (first floor rear window)	– 28dB(A)	– 26dB(A)
310 Goring Road (first floor rear window)	– 29.6dB(A)	– 27.6dB(A)
318 Goring Road, flats (first floor rear window)	– 37.5dB(A)	– 35.5dB(A)

In accordance with BS4142:2014+A1:2019 guidance, the day Rating Level $L_{\mathrm{Aeq,Tr}}$ at nearest noise sensitive receptors does not exceed the background sound level $L_{\mathrm{A90,T}}$ as shown in Table above. *Therefore, the operation of the proposed extractor fan indicates the specific sound source having a low adverse impact during daytime.*

The predicted daytime Rating Level $\boldsymbol{L_{\mathrm{Aeq,Tr}}}$at the external amenity space of 312 Goring Road is 26dB(A). Rating Level $\boldsymbol{L_{\mathrm{Aeq,Tr}}}$ 26dB(A) at the external amenity space does not exceed 50dB $L_{\mathrm{Aeq,16hr}}$ of desirable category of BS8233:2014.

It can be confirmed that the Rating Levels $L_{\mathrm{Aeq,Tr}}$ of the proposed extractor fan is expected to comply with BS4142:2014+A1:2019 guidance.

9. References

- BS4142:2014+A1:2019 "*Methods for rating and assessing industrial and commercial sound*".
- BS8233:2014 "*Guidance on sound insulation and noise reduction for buildings*".
- CIBSE Guide B4: 2016, "*Noise and vibration control for building services systems"*.

10. Appendixes

10.1 Appendix A: Acoustic terminology

Parameter	Description of acoustic parameters
Decibel (dB)	A logarithmic scale representing the sound pressure or power level relative to the threshold of hearing ($20x10^{-6}$ Pascals).
Ambient noise level	The totally encompassing sound in a given $L_{Aeq,T}$ situation at a given time, usually composed of sound from many sources near and far.
Background noise level	The A-weighted sound pressure level of the $L_{A90,T}$ residual noise at the assessment position exceeded for 90% of a given time interval T, measured using the fast response and reported to the nearest whole dB.
Rating level $L_{Ar,T}$	The specific noise level plus any adjustment for the characteristic features of the noise.
Residual noise level	The ambient noise level at the assessment $L_{Aeq,T}$ position in the absence of the noise source under investigation.
Specific noise level	The equivalent continuous A-weighted noise $L_{Aeq,T}$ level produced by the source over a given reference time interval.
$L_{Aeq,T}$	The A-weighted equivalent continuous noise level over the time period T (typically T= 16 hours for daytime periods, T = 8 hours for night-time periods). This is the sound level that is equivalent to the average energy of noise recorded over a given period.
$L_{n,T}$	The noise level exceeded for n% of the time over a given period T. e.g., L90, the noise level exceeded for 90% of the time (background noise) level.
L_{Max}	The maximum noise level measured.
$L_{eq,ff}$	The equivalent continuous sound pressure level outside the room elements under consideration

10.2 Appendix B: Calculation of sound pressure level of the fan unit and its details.

Sound pressure level of the extractor fan unit using 1m from the discharge of the extractor fan are calculated using the equation given below and the results are given in the table below. The values of attenuations for duct components are given in the CIBSE GUIDE B4:2016. For more information, please see Table 4.19, Table 4.23, and Table 4.26 in the CIBSE GUIDE B4:2016.

$$L_P = L_W - 20\log(r) - 11 - L_{Attenuator} - L_{Ducts} - L_{Elbow}$$

Fan noise	125Hz	250Hz	500Hz	1kHz	2kHz	Overall dB(A)
Exhaust L_W dB(A)	71	73	76	77	74	
Attenuator dB(A)	-12	-20	-31	-39	-40	
Attenuation for straight duct/ unlined (1m)	-0.4	-0.3	-0.1	-0.1	-0.1	
Attenuation for elbow	0	0	0	0	0	
The end reflection loss	-4	-2	-1	0	0	
L_P dB(A) 1m from the façade using the equation given above	43.6	39.7	32.9	26.9	22.9	**45**

GB

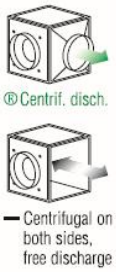
Arbitrary installation position and flexible assembly by five possible discharge directions.

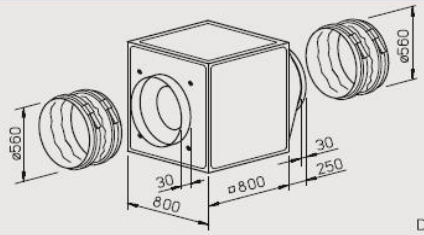


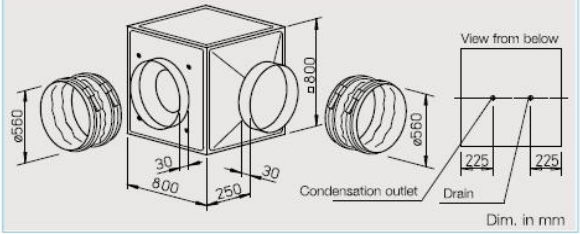
GB T120

Designed for moving dirty, humid and hot air up to max. 120° C.
Motor located outside the air flow.





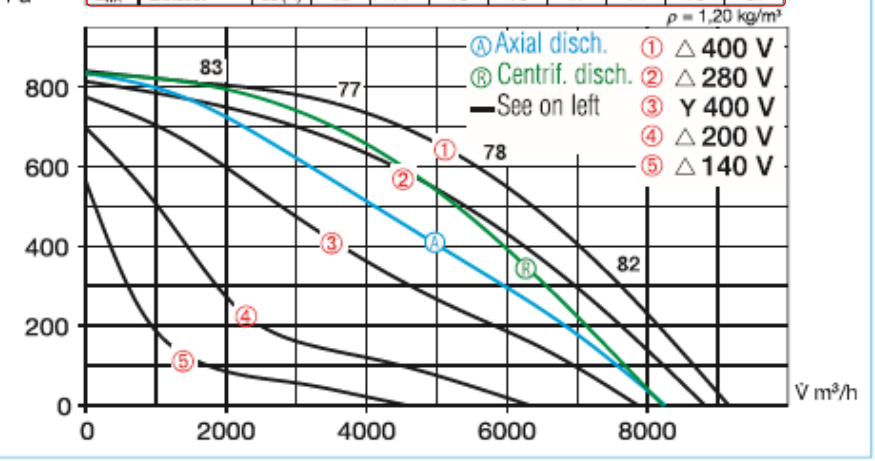




Type	Ref. no.	Air flow volume (FID)	R.P.M.	Sound press. case breakout	Motor power (nominal)	Current Full load	Current speed controlled	Wiring diagram	Maximum air flow temperature Full load	Maximum air flow temperature controlled	Weight (net) kg	5 step transformer controller with mot. protect. unit Type	5 step transformer controller with mot. protect. unit Ref. no.	5 step transformer controller without mot. protect. unit Type	5 step transformer controller without mot. protect. unit Ref. no.	Full motor protection unit using the thermal contacts Type	Full motor protection unit using the thermal contacts Ref. no.
		$\dot{V}$ m³/h	min⁻¹	dB(A) in 4 m	kW	A	A	No.	+°C	+°C	kg						
1 Phase motor, 230 V / 1 ph. / 50 Hz, capacitor motor, protection to IP 54																	
GBW 560/4	5508	9123	1409	45	1.83	7.93	10.4	867	45	45	92	**MWS 10**	1946	**TSW 10**	1498	**MW** [1]	1579

GBW 560/4

Frequency		Hz	Total	125	250	500	1k	2k	4k	8k
L_{WA}	Case breakout	dB(A)	65	62	61	51	50	48	44	38
L_{WA}	Intake	dB(A)	76	63	68	69	71	69	64	57
L_{WA}	Exhaust	dB(A)	82	71	73	76	77	74	70	61



R02
Rectangular Silencers

R02 - 2 - Attenuator

Available in seven standard lengths R02 2 Rectangular Duct Mounted Silencers have excellent attenuation properties, achieved with sound absorbing infill splitters, retained in the attenuator casing by a perforated liner. The resistance to airflow is a function of the face velocity and length. It is not recommended to select the R02 2 Silencers with a face velocity above 2.5 metres per second without asking advice regarding re-generated self noise. We can advise on the selections and can perform system analysis to ensure the correct unit is specified.



- High performance rectangular duct silencer
- Seven standard lengths
- Many connection options
- Cross section dimensions in 1mm increments
- System pressure within ducted systems to 1500 Pa
- Special lengths on request

Insertion Loss (dB) - Centre Band Frequency

Product Code	Length (mm)	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
R02 - 2 - 600	600	7	12	20	31	39	40	38	27
R02 - 2 - 900	900	9	16	25	42	50	50	50	41
R02 - 2 - 1200	1200	11	20	20	50	50	50	50	48
R02 - 2 - 1500	1500	13	24	25	50	50	50	50	50
R02 - 2 - 1800	1800	15	30	20	50	50	50	50	50
R02 - 2 - 2100	2100	16	33	25	50	50	50	50	50
R02 - 2 - 2400	2400	7	38	20	50	50	50	50	50

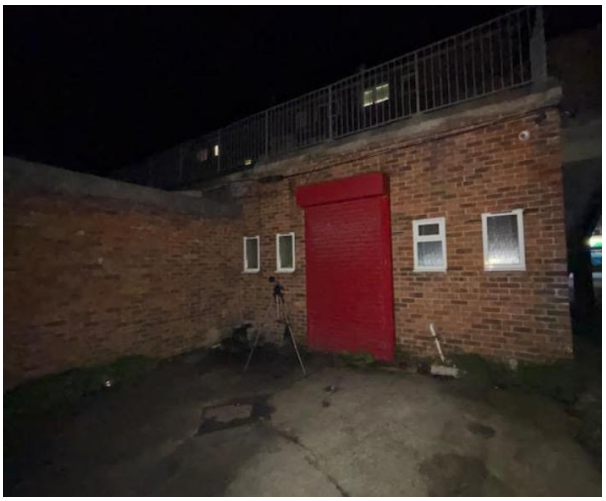
Insertion loss data is derived from continual testing to BS4718 and other standards in independent UKAS certified laboratories, which includes where appropriate, re-generated or self noise testing in both forward and reverse flow conditions. If you request system analysis from our technicians all predictions will be assessed using the relevant certified insertion loss data together with relevant dynamic corrections.

10.3 Appendix C: Measurement set-up, images and proposed plan

Measurement set-up and images of equipment used for environmental noise survey are given below.









10.4 Appendix D: Building Plan

