

Noise Report

Assessment of noise impact from proposed
Cafe, at Beach Terrace,
Newbiggin-by-the-Sea.

Report number 23-51-977

Prepared for:

c/o Henry Lowrie,
[REDACTED] (address redacted)

Author:	M Johnson BEng (hons) MSc CEng MCIBSE MIOA	Checked by:	H Parkinson BSc
Signature:	[REDACTED]	Signature:	[REDACTED]

C:\Northburn Acoustics\Projects\2023\23-51-977 (Needles Eye)\Noise Report.docx

Revision	Description	Issued by	Date
Original	Issued	MJ	12/5/2023

Contents

1	Summary.....	4
2	Writer's qualifications.....	4
3	Source(s) being assessed.....	5
4	Subjective Impressions.....	6
5	The existing context.....	7
6	Measurement location.....	7
7	Sound measuring system.....	7
8	Weather conditions.....	7
9	Reference time intervals.....	8
10	Background sound level.....	8
11	Specific sound level.....	9
12	Rating level.....	10
13	Excess of rating level over background.....	10
14	Noise due to vehicles.....	10
15	Conclusions.....	10
	Appendix A – Fan data sheets.....	11
	Appendix B - Glossary of acoustic terms.....	14

1 Summary

This report sets out the findings of a noise assessment at Beach Terrace, Newbiggin-by-the-Sea, to support a planning application. The proposal is for the construction of a café on the promenade in the vicinity of Beach Terrace.

The proposed use has the potential to create noise/disturbance, and, as such, it was necessary to conduct a noise assessment to ensure that the proposal is not likely to cause a loss of amenity for existing residential properties.

The proposed development has been assessed in accordance with BS4142:2014 +A:2019. This methodology compares the rating level of the specific sound source(s) with the existing background sound level, to determine the impact.

The report is based upon measured residual sound levels in the vicinity of the site, together with noise data as published by the equipment manufacturer.

The report concludes that the rating level from the proposed use will be entirely masked by the existing background sound level, and, as such, there are no reasons to object on the grounds of noise.

The report follows the format given in section 12 of BS4142:2014.

2 Writer's qualifications

This report has been compiled by Mr. M. Johnson, who has over 25 years experience in acoustics. His academic and professional qualifications include:

- MSc in Acoustics, vibration and noise control.
- BEng (hons) in Building Services Engineering.
- Corporate membership of the Institute of Acoustics.
- Corporate membership of the Chartered Institution of Building Services Engineers.
- Registered with the Engineering Council as a Chartered Engineer.

3 Source(s) being assessed

The noise source being assessed consists of a kitchen extract system associated with a proposed café. The extract system will remove heat and odours from the kitchen, which will then be discharged to the atmosphere. The primary mover is an extractor fan, which will be housed within a mushroom cowl mounted on the kitchen roof. The fan will generate noise to a certain degree, and, as such, it is necessary to assess the impact of such noise.

It is understood that the proposed cafe would operate normal business hours.

A location plan and site plan are presented in Figure 1 and Figure 2 respectively.



Figure 1: Location plan (after Google)

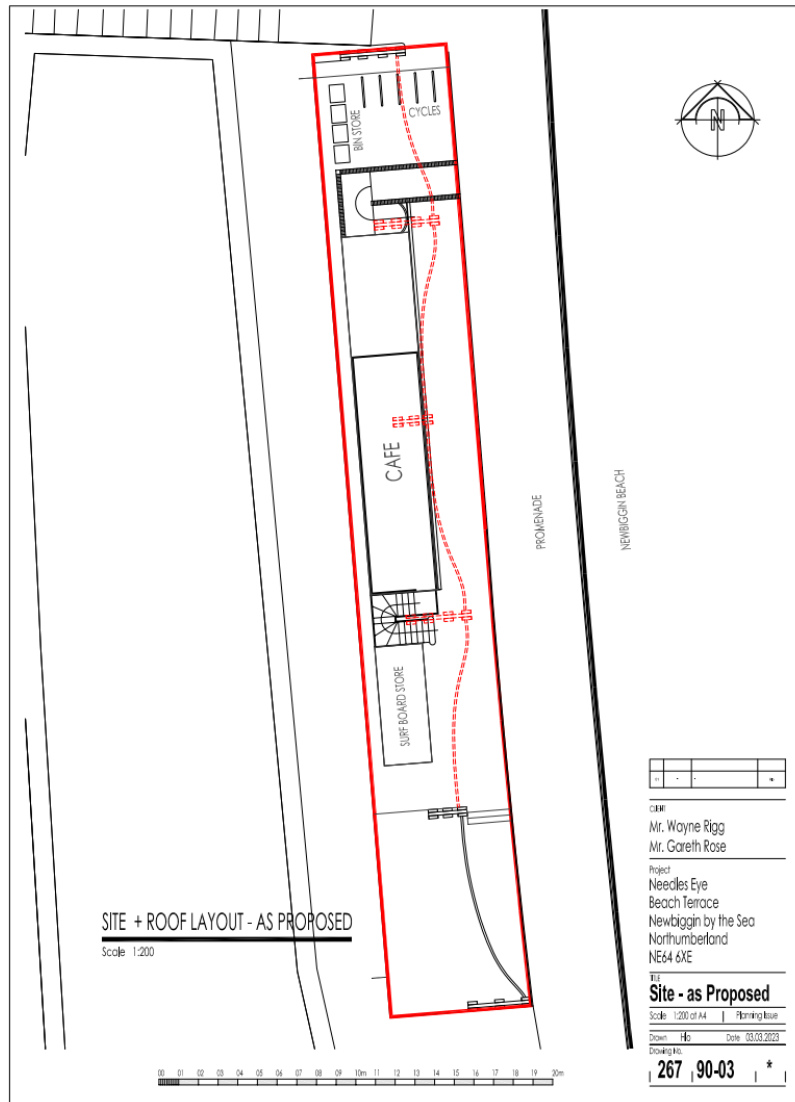


Figure 2: Site plan (after Henry Lowrie)

4 Subjective Impressions

The nearest noise sensitive property is located on Beach Terrace, which is 22m from the proposed café.

From a subjective viewpoint, the residual sound level is typical for a seaside area that is subjected to noise from waves breaking on the shore. This was evident regardless of whether the tide was in or out.

5 The existing context

The proposed site is a vacant lot on the promenade. The context is that of introducing a new source of noise to an area that is residential, whilst being mindful not to create a loss of amenity for the noise sensitive properties.

6 Measurement location

Measurements of residual sound were made at the boundary of the nearest noise sensitive receptor, as shown in Figure 1. The microphone was positioned at a height of 1.5 m above ground level.

7 Sound measuring system

The sound measuring system consisted of the items detailed in Table 1:

Equipment	Type	Serial number
Svantek 959	Type-1 sound analyser	11261
Cal 21	Type-1 acoustical calibrator	50241757

Table 1: Sound measuring systems

The sound analyser was checked before and after use, using an acoustic calibrator. The acoustic calibrator has an output of 94 dB (re: 2×10^{-5} Pa) at 1 kHz. The sound analyser showed a reading of 94 dBA, both before and after use. This indicates that the sound analyser was reading correctly.

8 Weather conditions

The weather conditions during the measurement period were:

Wind speed:	0 m/s;
Wind direction:	Not applicable;
Precipitation:	Zero;
Fog;	Zero;
Ground condition:	Dry;
Temperature:	Approximately 10 °Celsius;
Cloud cover:	40-50%;
Date(s) of measurements:	28 th April, 2023, and 3 rd May, 2023.

Note: Environmental noise measurements can be affected by air movement, temperature, cloud cover, and fog. The effects of the above climatic conditions were minimal, if not zero.

9 Reference time intervals

The reference time interval for daytime operation is 1-hour, according to BS4142:2014. The reference time is not the minimum measurement time, it is the time period over which the specific sound level must be integrated. In other words, a sound source that operates for 5 minutes every hour would be averaged over the entire 1-hour period.

10 Background sound level

Measurements from the residual sound survey are presented in Table 2 (high tide) and Table 3 (approaching low tide).

The L_{Aeq} value is an indication of the average sound level over the measurement period. The L_{A90} is the sound level prevailing for 90% of the time, which is generally used as an indicator of background sound level.

The residual sound level was influenced by the movement of the tide, which caused waves to break on the shoreline. It was noted that it was marginally quieter when the tide was approaching the low water mark, due to the breakers being farther away. For assessment purposes the lowest value of 56 dB L_{A90} has been used.

Time	L_{Amax} dB	L_{Amin} dB	L_{Aeq} dB	L_{A90} dB
16:33-16:38	69.4	55.6	61.0	58.6
16:38-16:43	72.8	56.9	61.2	59.1
16:43-16:48	71.2	55.8	60.7	58.4
16:48-16:53	72.7	55.0	61.1	58.4
16:53-16:58	67.8	57.5	61.0	59.1
16:58-17:03	72.8	55.7	61.0	58.3
Logarithmic average			61	
Arithmetic average				59

Table 2: Residual sound levels 28th April, 2023 (High water mark)

Time	L _{Amax} dB	L _{Amin} dB	L _{Aeq} dB	L _{A90} dB
20:30-20:35	72.1	53.8	58.9	56.0
20:35-20:40	76.6	54.5	60.1	56.1
20:40-20:45	66.0	54.8	57.4	55.7
20:45-20:50	70.3	54.0	58.1	55.8
20:50-20:55	72.3	53.6	58.7	55.1
20:55-21:00	109.5	53.5	77.6	55.1
			70.1	
				56

Table 3: Residual sound levels 3rd May, 2023 (approaching low water mark)

11 Specific sound level

The specific sound source does not currently exist at the application site. It was, therefore, necessary to calculate the specific sound level from the manufacturer's published data sheets.

The proposed extract fan is a Systemair AW500E4 sileo Axial fan (see Appendix A). The fan will be mounted on the roof of the café, and will be installed under a mushroom cowl.

The manufacturer has stated that the fan produces a sound pressure level of 66 dB(A) at a distance of 1m.

The sound pressure level at a distance of 22m has been calculated by applying the correction for geometric divergence according to the formula:

$$20\text{Log}(d_1/d_2)$$

In this case $d_1 = 1\text{m}$, $d_2=22\text{m}$. Hence, the correction is calculated to be -27 dB.

There is also a correction for the fact that there will be no direct line of sight between the fan and noise-sensitive property (this is because the promenade is at a much lower level, and will be obscured by the bank). According to chart 9 of the CRTN, there will be a minimum attenuation of 5 dB.

The specific sound level due to the extract fan is calculated to be 34 dB L_{Aeq,Tr}.

12 Rating level

The rating level is determined by adding certain penalties, where applicable, to the specific sound level. These penalties are added when the specific sound contains certain acoustic features, such as intermittency; and/or tonality; and/or impulsivity.

The value of the penalties vary depending upon whether the specific sound is just perceptible, clearly perceptible, or highly perceptible, ranging from +3 to +9 dB. In this case the specific sound source is significantly lower than the representative background sound level, therefore, penalties do not apply. On that basis the rating level has been determined to be 34 dB $L_{Ar,Tr}$.

13 Excess of rating level over background

A simple subtraction of the background sound level (56 dB L_{A90}) from the rating level (34 dB $L_{Ar,Tr}$) returns a value of -22 dB.

The rating level will be 22 dB lower than the background sound level. This means that noise due to the specific sound source (the extract fan) will be entirely masked by the underlying background sound level, and, as such, the specific sound source will have no impact whatsoever on the nearest noise-sensitive receptors.

14 Noise due to vehicles

The location of the proposed café is such that access would generally be gained via the promenade by pedestrians only.

Deliveries would, presumably, be made via Beach Terrace. However, given the relatively size of the café, it is unlikely the delivery vehicles would have any impact on the existing noise climate.

15 Conclusions

The noise assessment shows that noise from the proposed café will have no impact on the existing noise climate at Beach Terrace, Newbiggin-by-the-Sea. On that basis, there should be no reasons to object to the proposal on the grounds of noise.

Appendix A – Fan data sheets



AW 500E4 sileo Axial fan

Axial wall fan

Item Number: 37412

Variant: 230V 1~ 50Hz - D (Delta)

- speed controllable by voltage reduction, plus option of 2-step operation by D/Y switching for 400V versions
- inlet protection guard up to size 630 (from size 710-1000 available as an accessory)
- safe and maintenance free operation
- can be installed in any mounting position
- electric connection via terminal box mounted on the motor
- single phase fans are supplied with capacitor

Axial fans of the AW sileo range do have a bionic shape of the fan blade, and are driven by external rotor motors. The AW range is equipped with a square wall plate, galvanized steel and powder coated in black (RAL9005). Sizes 200-630 include are protection guard on the intake side. Protection guards for the sizes 710-1000 are available as an accessory. The axial impeller is manufactured from pressure die cast aluminum and also painted in black (RAL9005). The impeller is balanced dynamically in two levels in accordance with DIN ISO 1940 part 1, quality G6.3.

The motors are equipped with thermal contacts for motor protection, with leads to be connected to a motor protection unit.



Technical parameters

Nominal data	
Voltage (Nominal)	230 V
Frequency	50 Hz
Phase(s)	1~
Motor circuit connection	D
Input power	720 W
Input current	3.2 A
Impeller speed	1,240 r.p.m.
Air flow	max 2.466 m ³ /s
Air flow at max. efficiency	1.593 m ³ /s
Specific ratio	1,000000
Capacitance of capacitor	16 µF
Temperature of transported air	max 70 °C
Max temperature of transported air, when speed controlled	70 °C

Article name: AW 500E4 sileo Axial fan | Item Number: 37412 | Variant: 230V 1~ 50Hz - D (Delta) | Document type: Product card | Date: 03.08.2020 | Generated by: systemair Online Catalogue | Language: English

Page 1 of 7

Sound data

Sound pressure level at 1m	66	dB(A)
----------------------------	----	-------

Protection/Classification

Enclosure class, motor	IP54
------------------------	------

Insulation class	F
------------------	---

Data according to ErP

ErP ready	ErP 2018
-----------	----------

Measurement category	A
----------------------	---

Efficiency grade	40.3	η_{actual}
------------------	------	------------------------

Efficiency, static	32.9	η_{statA}
--------------------	------	-----------------------

Target efficiency grade ErP2013	36	$\eta_{\text{target2013}}$
---------------------------------	----	----------------------------

Target efficiency grade ErP2015	40	$\eta_{\text{target2015}}$
---------------------------------	----	----------------------------

Dimensions and weights

Weight	20	kg
--------	----	----

Others

Color name, casing	Black
--------------------	-------

Motor type	AC
------------	----

RAW 500/560 Roof Cowl c/w BG

Article Number: 86521



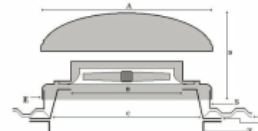
Description

The RAW horizontal discharge roof cowl is manufactured from UV stabilised glass reinforced polyester to ensure a rigid, lightweight, corrosion-free, weather resistant unit. Can be used purely as a terminal or combined with a ZSP or ZAP plate axial fan to create a powered extract/supply unit. Coloured to BS 00 A 05 goosewing grey as standard, but available in any BS or RAL colour if required. All RAW cowls are supplied fitted with a birdguard.

Technical parameters

Dimensions and weights	
Weight	21 kg

Dimension



Unit Ref	A Weather Cowl Ht.	B Purlin box Aperture	C Purlin box base/roof Aperture	D Unit Height	E Weatherkit Base Ht.	S Soaker Sheet HxW Ht.	Weight kg**
RAW 200/250	400	310	400	270	400/400	400	4.25
RAW 300/315	555	350	505	340	520/555	510	6.5
RAW 300	675	400	600	380	600/600	640	6.5
RAW 400/450	785	510	700	480	750/795	750	12
RAW 500/560	965	620	810	580	820/860	860	21
RAW 630/710	1155	700	950	650	1010/1055	1000	27
RAW 800	1410	810	1150	750	1120/1170	1100	34
RAW 1000	1630	1140	1300	800	1270/1400	1370	45

*All dimensions indicated are nominal and subject to design change. The right to alter specification is reserved.
** Owing to the hand lay process, all weights are indicative and subject to variation.

Accessories

- BDS 500/560 RA l'vd shutter (8675)
- PB 500/560 Purlin Box (8696)
- SKR 500/560 RA soaker sheet (8462)

Documents

RAW_RAV O&M.pdf

Appendix B - Glossary of acoustic terms

Sound Pressure Level (L_p)

The basic unit of sound measurement is the sound pressure level. As the pressures to which the human ear responds can range from 20 μPa to 200 Pa, a linear measurement of sound levels would involve many orders of magnitude. Consequently, the pressures are converted to a logarithmic scale and expressed in decibels (dB) as follows:

$$L_p = 20 \log_{10}(p/p_0)$$

Where L_p = sound pressure level in dB; p = rms sound pressure in Pa; and p_0 = reference sound pressure (20 μPa).

A-weighting Network

A frequency filtering system, which approximates the frequency response of the human ear. The A-weighted sound pressure level, expressed in dB(A), has been shown to correlate well with subjective response to sound.

Equivalent continuous A-weighted sound pressure level, $L_{Aeq, T}$

The value of the A-weighted sound pressure level in decibels of continuous steady sound that within a specified time interval, T , has the same mean-square sound pressure as a sound that varies with time.

$$L_{AN, T}$$

The A-weighted sound pressure level in decibels exceeded for $N\%$ of the measurement period, T .

$$L_{AF \max}$$

The maximum A-weighted sound level recorded during the measurement period. The subscript 'F' denotes fast time weighting, slow time weighting 'S' is also used.

Background sound level $L_{A90, T}$

The A-weighted sound pressure level of the residual sound in decibels exceeded 90% of a given time interval, T . L_{A90} is typically taken as representative of background sound.

Specific sound level $L_{Aeq, Tr}$

The equivalent continuous A-weighted sound pressure level at the assessment position produced by the specific sound source over a given reference time interval.

Rating level $L_{Ar, Tr}$

The specific sound level plus any adjustment for the characteristic features of the sound.