



Acoustic & Odour Survey and Assessment for Proposed change of use at Salisbury Conservative Club, Badger Street, Bury, BL9 6AD.

Prepared for:

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September 2022



Contents

1. Introduction	3
Site Location and Context	3
2. Policy and Guidance	4
Noise	4
Odour	8
3. The Assessment	9
The Proposed Development	9
The Assessment	9
Extraction system	10
Consideration of BS4142:2014	11
4 Odour Assessment	12
5 Conclusion	14
Noise	14
Odour	14
Figure 1 – Aerial Photograph	15
Appendix A – Full Monitoring Results	16
Appendix B – Construction elements	17
Appendix C – Extraction Fan Detail	19
Appendix D – Weather Station	21
Appendix E - Odour Risk Assessment	22



1. Introduction

- 1.1. Martin Environmental Solutions has been commissioned to undertake an acoustic and odour survey and assessment to support a planning application for the conversion of the former Salisbury Conservative Club into a small sweet manufacturing site, located on Badger Street, Bury.

Site Location and Context

- 1.2. The development site is situated on the corner of Badger Street and Peter Street. The building has previously been split in two following the closure of the conservative club. To the west is now located a plumbing merchant on the ground floor and flats to the first floor. Beyond these a terrace of residential properties along the main road. To the north beyond the road is a car park to a funeral directors and adjacent a warehouse. To the east on the far side of the road a church and to the south a car sales yard.
- 1.3. An aerial Photograph is enclosed in Figure 1.
- 1.4. Concerns have been raised over the potential impact of the development on neighbouring properties, hence the request for this report.



2. Policy and Guidance

Noise

- 2.1. The impact of noise can be a material consideration in the determination of planning applications. The planning system has the task of guiding development to the most appropriate locations. It is recognised that on occasions it will be difficult to reconcile some land uses, such as housing, hospitals, or schools, with other activities that generate high levels of noise. However, the planning system is tasked to ensure that, wherever practicable, noise-sensitive developments are separated from major sources of noise (such as road, rail and air transport and certain types of industrial development).
- 2.2. The Government's publication of the National Planning Policy Framework (NPPF), updated in July 2021, states that planning policies and decisions should prevent new and existing development from contributing to or being put at unacceptable risk from, of being adversely affected by unacceptable levels of noise pollution.
- 2.3. The Government have also issued the Noise Policy Statement for England (NPSE). The NPSE clarifies the Government's underlying principles and aims in relation to noise and sets a vision to promote good health and a good quality of life through the effective management of noise while having regard to the Government's sustainable development strategy. The NPSE aims to mitigate and minimise adverse impacts on health and quality of life through the effective management and control of noise.
- 2.4. The NPSE introduces the following terms, although no sound levels are given to represent these, many authorities have identified the sound level criteria in line with the World Health Organisation, BS8233:2014 and BS4142: 2014 levels. The terms introduced by the NPSE are:

NOEL – No Observed Effect Level (<30dB(A) inside <50dB(A) outside, 10dB below background)
LOAEL – Lowest Observed Adverse Effect Level (30-35dB(A) inside 50-55dB(A) outside, background to +5dB)
SOAEL – Significant Observed Adverse Effect Level (>35dB(A) inside, >55dB(A) outside, >+10dB above background)
- 2.5. The sound levels within the brackets of the previous paragraph are those determined as appropriate levels to indicate the relevant effect levels represented by the NPSE.



- 2.6. Other commonly used examples of standards utilised by Local Planning authorities for the consideration of noise impacts include comparison of the likely noise levels to be experienced at a development, with levels that have been recommended by the World Health Organisation (WHO) as Guidelines for the prevention of Community Noise Annoyance and within BS8233: 2014.
- 2.7. The WHO recommended noise levels for outdoor amenity areas (gardens) that should not be exceeded are 55dB(A) $L_{Aeq,16hr}$ in order to avoid 'Serious Community Annoyance' or 50dB(A) $L_{Aeq,16hr}$ to avoid 'Moderate Community Annoyance' during the day. For indoor levels WHO set 35dB(A) $L_{Aeq,16hr}$ during the day to prevent Moderate Annoyance and 30 dB(A) $L_{Aeq,8hr}$ at night to prevent sleep disturbance.
- 2.8. The WHO guidance also recommends that maximum sound levels at night should not regularly exceed 45dB(A) within bedrooms to prevent sleep disturbance. Regularly is considered to be more than 10 times during any 8-hour night-time period.
- 2.9. BS 8233:2014 'Guidance on sound insulation and noise reduction for buildings' also specifies desirable noise levels to be achieved inside dwellings.
- 2.10. BS 8233:2014 'Sound insulation and noise reduction for buildings – Code of Practice' also specifies desirable noise levels to be achieved inside dwellings. BS 8233 presents two levels, the first between the hours of 07:00 – 23:00 and the second between 23:00 -07:00.
- 2.11. The daytime period suggests internal noise levels of 35dB $L_{Aeq,16hr}$, for resting in living rooms and bedrooms while for night-time a level of 30dB $L_{Aeq,8hr}$ is recommended. Criteria for external areas mirrors that within the WHO guidance.
- 2.12. Another commonly used standard is British Standard 4142:2014 'Method for rating industrial and commercial sound' compares the sound predicted by the source in question against the background, L_{A90} sound levels.



- 2.13. The "residual" L_{Aeq} measurement is then subtracted from the "ambient" L_{Aeq} measurement (with the sound source) to calculate the sound level created by the "problem" sound alone -termed the "specific" sound level.
- 2.14. If the "problem" sound is tonal, such as whine or hum, or if it is impulsive such as bangs or clatters or if it is irregular enough to attract attention a correction is added to the "specific level" to produce the "rating level". The "background" L_{A90} measurement is then compared against the "rating level".
- 2.15. If the "rating level" exceeds the "background" by around 10dB(A) or more this "indicates a significant adverse impact". A difference of around 5dB(A) 'indicates an adverse impact. The lower the commercial noise level is, the lower the likely impact.
- 2.16. In addition, the 'ProPG Planning & Noise, Professional Practice Guidance on Planning & Noise, New Residential Development' provides a 4-staged approach to undertaking a risk assessment in relation to anticipated sound levels at new residential development and the provision of mitigation measures. The guidance is principally aimed at sites exposed predominantly to noise from transportation sources.
- 2.17. The first stage consists of an initial noise risk assessment, based on indicative day and night-time *noise* levels. Simply put, the higher the ambient noise in an area the greater the impact. The levels given are shown below although it should be noted that these are in excess of both the Lancashire guidance, WHO and BS 8233: 2014.

Noise Risk Category*	Potential Effect if Unmitigated	Pre-Planning Application Guidance
0 – Negligible $L_{Aeq,16hr} < 50dB$ $L_{Aeq,8hr} < 40dB$	May be noticeable but no adverse effect on health and quality of life	In this category the development is likely to be acceptable from a noise perspective, nevertheless a good acoustic design process is encouraged to improve the existing environment and/or safeguard against possible future deterioration and to protect any designated tranquil areas. A noise assessment may be requested to demonstrate no adverse impact from noise. Application need not normally be delayed on noise grounds.
1 – Low $L_{Aeq,16hr} 50-63dB$ $L_{Aeq,8hr} 40-55dB$	Adverse effect on health and quality of life	In this category the development may be refused unless a good acoustic design process is followed and is demonstrated via a Level 1 Acoustic Design Statement which confirms how the adverse impacts of noise on the new development will be mitigated and minimised and that a significant adverse impact will not arise in the finished development. Planning conditions and other measures to control noise may be required.
2 – Medium $L_{Aeq,16hr} 63-69dB$ $L_{Aeq,8hr} 55-60dB$ $L_{AFmax} > 80dB^{**}$	Significant adverse effect on health and quality of life	In this category the development is likely to be refused unless good acoustic design process is followed and is demonstrated via a Level 2 Acoustic Design Statement which confirms how the adverse impacts of noise on the new development will be mitigated and minimised, and clearly demonstrates that a significant adverse noise impact will not arise in the finished development. Planning conditions and other measures to control noise will normally be required.
3 – High $L_{Aeq,16hr} > 69dB$ $L_{Aeq,8hr} > 60dB$ $L_{AFmax} > 80dB^{**}$	Unacceptable adverse effect of health and quality of life	In this category the development is very likely to be refused on noise grounds, even if a good acoustic design process is followed and is demonstrated via a Level 2 Acoustic Design Statement. Applicants are advised to seek expert advice on possible mitigation measures. Advice on the circumstances when the refusal of a new housing on noise grounds should normally be anticipated is included in the ProPG.

2.18. Stage 2, consists of a full assessment of the prevailing ambient noise and requires 4 elements to be considered:

- I. Element 1 – Good Acoustic Design
- II. Element 2 – Internal Noise Level Guidelines
- III. Element 3 – External Amenity Area Noise Assessment
- IV. Element 4 – Assessment of Other Relevant Issues

2.19. A good acoustic design is implicit in meeting the requirements of the NPPF and can help to resolve many potential acoustic issues.

2.20. Details of the criteria considered suitable are provided above for both internal and external sound levels. Element 4 includes such issues as local and national policy, likely occupants, wider planning objectives.



Odour

- 2.21. The Government sets out its policy in relation to planning in the National Planning Policy Framework (NPPF). The NPPF states that planning policies and decisions should “preventing new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability”; and “In preparing plans to meet development needs, the aim should be to minimise pollution and other adverse effects on the local and natural environment”
- 2.22. While Odour is not specifically mentioned in is implied by the above and the Planning Practice Guidance (PPG) note issued by the government on Air Quality states “odour and dust can also be a planning concern, for example, because of the effects on local amenity” it continues to state, “mitigation options where necessary, will depend on the proposed development and should be proportionate to the likely impact”.
- 2.23. Before an odour can be present an adverse effect, there must be exposure to the odour and therefore a source, a pathway, and a receptor without these three links no exposure can occur. In the case of this application the source is the take-away. The pathway is the air, and the receptor are the occupants of the nearby existing dwellings.
- 2.24. In assessing the impact of odour on or from a development the scale of the exposure and therefore impact is determined by the parameters collectively known as the FIDO factors (Frequency, Intensity, Duration and Offensiveness) In addition the sensitivity of the receptor (location) will determine the magnitude of the exposure. Factors that influence the magnitude of a commercial odour problem include the size/volume of the cooking facility, the type of food being prepared, and the type of cooking appliances being used.
- 2.25. Furthermore, new and updated guidance on assessing the impact of extraction systems from commercial kitchens has been published by EMAQ ‘*Control of Odour and Nose from Commercial Kitchen Extraction Systems*’. This is a revision of the 2005 guidance document ‘*Control of Odour and Nose from Commercial Kitchen Extraction Systems*’ produced by NETCEN and DEFRA which has been withdrawn.



- 2.26. This document details a methodology which should be followed to assess the potential impact from commercial kitchen extraction systems on nearby land uses and how to identify suitable control and mitigation measures as required.
- 2.27. The proposed development is in effect a kitchen, with a standard kitchen extraction system being fitted.

3. The Assessment

The Proposed Development

- 3.1 The proposed development will involve the conversion of the former club into a small sweet manufacturing site. The equipment to be used will include mixers, rollers, coating pans. These are low noise emitting units.
- 3.2 An extraction system will also be installed above the line.
- 3.3 The proposed operating hours are 08:00-18:00 Monday to Friday.

The Assessment

- 3.4 In order to obtain representative background sound levels for the area on site monitoring was undertaken over the 10th-11th August 2022.
- 3.5 The sound level meter, a Cirrus Optimus Green CR:171C, was positioned on the flat roof of the building overlooking the corner of Peter Street and Badger Street.
- 3.6 The meters were field calibrated at the start and end of the monitoring period with no significant variation and full laboratory calibration certificates are available on request.
- 3.7 The weather during the monitoring was dry and warm with little to no wind.
- 3.8 The full results are shown in Appendix A, with a summary in the tables below.

Start Time	End Time	Duration	L _{Aeq}	L _{A90}	L _{AMax}
10/08/2022 08:24	10/08/2022 19:00	10:35:23	54.9	49.5	86.2
10/08/2022 19:00	10/08/2022 23:00	04:00:00	51.8	46.8	77.6



10/08/2022 23:00	11/08/2022 07:00	08:00:00	49.7	41.7	83.1
11/08/2022 07:00	11/08/2022 07:08	00:08:25	54.7	50.0	68.6

- 3.9 Prevailing sound levels were dominated by nearby traffic along the main road and have been identified as 54.9dB(A) for the proposed operating hours of the site.
- 3.10 Internal sound levels for the proposed development are considered to be low, but to ensure a worse case assessment a level of 80dB(A) has been identified, equivalent to the lower limit within the Control of Noise at Work Regulations.
- 3.11 The building consists of a cavity brick wall, with an attenuation of ~50dB R_w , there are some single glazed windows are located along the eastern façade having a reduction of 30dB R_w . The overall façade therefore having an attenuation between the two but for this assessment a worse-case figure of 30dB attenuation is to be used. Resulting in an external sound level of 44dB(A) 1m from the façade. Below the prevailing background sound level. The northern facade will contain offices and welfare facilities.
- 3.12 At the nearest noise sensitive properties, the housing to the northeast a level of 18.5dB(A).
- 3.13 To the west and adjoining the site is the plumbers, merchants with a flat to the first floor.
- 3.14 The adjoining property is constructed from a solid brick wall, with the conservative club being added to it at a later stage. While the whole site was at one time under the same use it has now been spilt again and the openings bricked up flush with the internal solid wall. A reduction of 55dB R_w is provided by this wall. Resulting in sound level of 30dB(A) in the adjacent commercial unit and first floor flat.

Extraction system

- 3.15 The site is to include an extraction system which will terminate to the southwest corner of the site. The nearest window to the first floor flat is 2.2m away and the fan will terminate above the eaves of the building.
- 3.16 The extraction fan has already been specified as a Flaktwood JM Aerofoil 50JM/20/4/6/32 unit. Sound levels for this unit have been obtained from the manufacturer and are included in Appendix C. A silencer has also been identified as the resulting sound levels will be above those recommended in Section 2 of this report.



3.17 The silencer a CDAP.2D/A silencer will reduce the sound levels at the window to 42.6dB(A), below the prevailing background sound level. Given a 15dB reduction for an open window the internal sound level at this nearby room will be 27.6dB(A), below the recommended daytime sound level of 35dB(A) for internal environments.

Consideration of BS4142:2014.

3.18 As detailed above BS4142 considers the “problem” noise, in this case the fan and applies corrections for tonality, impulse sounds and intermittent sounds. This ‘Rating’ level is then compared to the prevailing background sound level L_{A90} , the greater the rating level is above the background the greater the likelihood of complaints.

3.19 The proposed extraction system will be operating throughout the production period; thus, no intermittent or impulse sounds will occur. In addition, a review of the sound levels from the manufacturer indicates no tonal element to the system. Furthermore, a 3dB has been applied for ‘other sound characteristics’. The rating level would then be 45.6dB. The background level has been identified at 49.5dB L_{A90} . Therefore, the rating level is 3.9dB below the background indicating no adverse impact.

3.20

	Day	
Measured Ambient sound level		
Residual Sound level	$L_{Aeq} = 54.9\text{dB}$	Measured on site
Background Sound Level	$L_{A90} = 49.5\text{dB}$	Measured on site
Reference period	60 minutes	Normal ref period,
Specific sound Level	$L_{Aeq} = 42.6\text{dB}$	Calculated
Acoustic feature	3dB	+3dB Other sound characteristics
Rating level	45.6dB	
Background sound level	$L_{A90} = 49.5\text{dB}$	
Excess of Rating level over background level	$(45.6-49.5) \text{ dB} = -3.9\text{dB}$	



	indicates no significant adverse impact	
Uncertainty		

4 Odour Assessment

- 4.1 The proposed extraction system is located to the southwest of the development, and will terminate above the eaves of the building at a height of approx. 6.7m. The nearest residential property being the first-floor flat, with the nearest window (the kitchen) being 2.2m below.
- 4.2 The development is in essence a medium kitchen with a standard kitchen extraction system being installed above the production line. Although there will be no grease or smoke emissions.
- 4.3 Prevailing wind direction for the area, obtained from the nearest available weather stations at Rosehill Burnley and Manchester Airport, Appendix D, is west/south-westerly. This would carry any odours away from the nearest residential properties, blowing it eastward and to the front of the building. The nearest properties being on the far side of the road some 40m away.
- 4.4 The EMAQ document identifies a number of control measures to avoid odour emissions from commercial kitchens becoming a problem. The document lists the various control measures available and identifies minimum standards to ensure odour emissions will not create a problem to neighbouring land uses. 'Appendix 3' of the document identifies a risk assessment to assess the impact and control measures required, and this will be used as the basis of this assessment.
- 4.5 The following are included within the extraction design:
- The extraction system will terminate above the eaves of the building. The system will be fitted with a jet cowl, with a velocity above 10m/s, in line with the guidance a score of 10 is applied.
 - The nearest residential receptor is located 20m away, as such a score of 10 is applied.



- The business has identified as “medium’, and therefore score 3 has been applied.
- The odour characteristics from the venue are considered to be low, in line with the guidance document a scoring of 1 is applied.

4.6 Based on the above parameters the risk assessment has been conducted, see Appendix E, and has identified a high potential odour impact risk.

4.7 In order to mitigate against this potential impact and to ensure no adverse impact, in line with the guidance, the following measures are recommended as part of the extraction system.

- Prefilters (baffle filters) attached to the extraction hood in the cooking range
- To remove odour from the extracted air an activated carbon filter with a designed 0.2s contact time to remove odour.

4.8 Alternatively, to minimise ongoing maintenance costs the activated carbon filter can be changed for an ozone system.

4.9 The system will need to be maintained and cleaned in line with the manufacturer’s instructions and a separate cleaning schedule will be produced and maintained once the chosen unit has been installed.

4.10 The installation of the above mitigation measures will ensure suitable removal of odour from the extraction system. The height of the flue and use of an accelerator jet cowl will further ensure that should any odours not be treated they will be directed vertically into the atmosphere for dilution without affecting the adjacent or any other nearby properties.



5 Conclusion

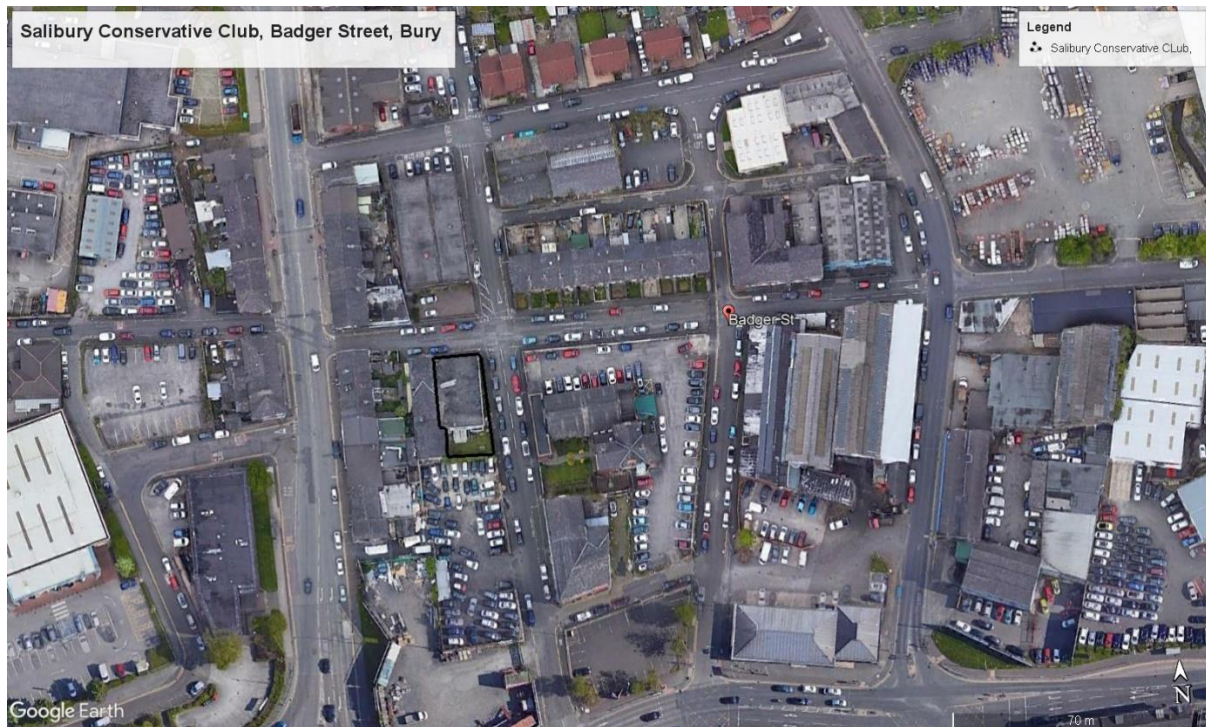
Noise

- 5.1 On-site monitoring has identified existing background sound levels in the area and an assessment of potential sound emissions from the building has been undertaken.
- 5.2 The assessment has identified that internal sound level will not result in any adverse impact on the neighbouring properties.
- 5.3 A further consideration of the extraction system has been undertaken and to avoid any adverse impact a CDAP.2D silencer has been identified. The resulting sound levels from the system once the silencer is installed will not result in any adverse impact and will be below the prevailing background sound levels.
- 5.4 The inclusion of the above mitigation measures to all habitable rooms will ensure that the internal and external sound levels are acceptable and will result in a No Observe Effect on the future residents in line with the Noise Policy Statement for England.
- 5.5 As such the development will meet the objectives of the National Planning Policy Framework in ensuring that no significant adverse impact is experienced by the future residents. The development is therefore considered to be acceptable in terms of noise.

Odour

- 5.6 A consideration of the potential for the development to result in an adverse impact due to odour emissions has been undertaken. This has identified the need for an odour control system to be installed within the extraction system of either a carbon filter or ozone system.
- 5.7 This will remove any odours from the extracted air preventing any adverse impact.
- 5.8 As such the development will meet the objectives of the National Planning Policy Framework in ensuring that no significant adverse impact is experienced by the future residents. The development is therefore considered to be acceptable in terms of odour.

Figure 1 – Aerial Photograph



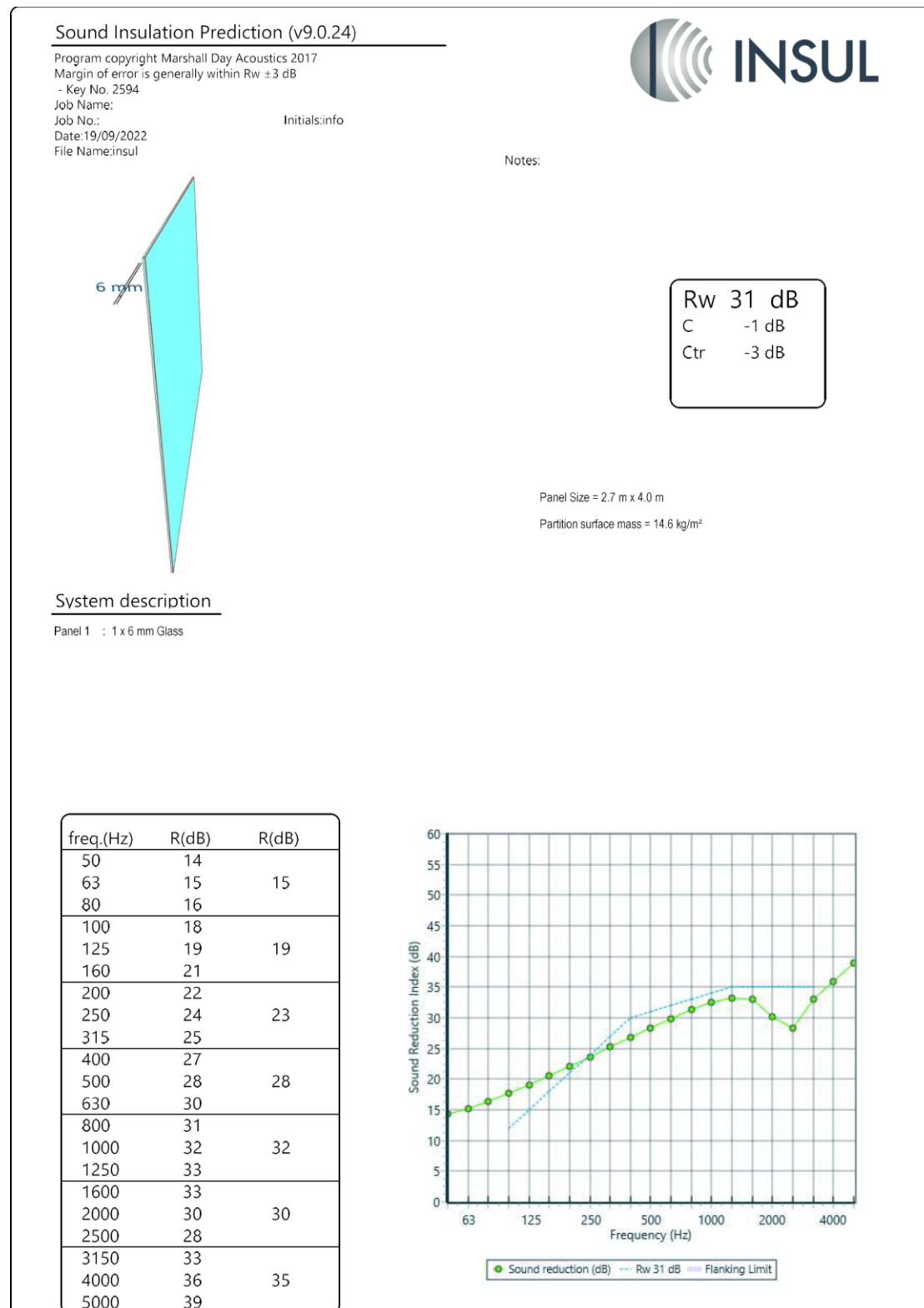


Appendix A – Full Monitoring Results

Time	L _{Aeq} (dB)	L _{AMax} (dB)	L _{A90} (dB)
10/08/2022 08:24	54.6	78.9	49.9
10/08/2022 09:00	54.3	80.3	49.4
10/08/2022 10:00	54.5	75.8	49.8
10/08/2022 11:00	53.0	69.9	49.6
10/08/2022 12:00	55.5	72.8	49.8
10/08/2022 13:00	57.0	81.7	49.5
10/08/2022 14:00	55.8	86.2	49.2
10/08/2022 15:00	53.3	74.2	49.3
10/08/2022 16:00	55.4	78.8	49.5
10/08/2022 17:00	54.2	81.6	49.4
10/08/2022 18:00	54.3	85.1	48.8
10/08/2022 19:00	52.2	71.9	47.8
10/08/2022 20:00	53.1	77.6	47.1
10/08/2022 21:00	50.5	69.2	46.4
10/08/2022 22:00	51.0	74.2	46.3
10/08/2022 23:00	51.0	83.1	43.6
11/08/2022 00:00	47.1	68.1	41.8
11/08/2022 01:00	44.8	66.8	40.2
11/08/2022 02:00	45.5	64.7	41.4
11/08/2022 03:00	44.4	64.7	39.9
11/08/2022 04:00	47.3	60.6	42.8
11/08/2022 05:00	52.6	73.8	45.3
11/08/2022 06:00	53.9	70.4	50.2
11/08/2022 07:00	54.7	68.6	49.9

Appendix B – Construction elements – from insul software

Glazing



Party wall

Sound Insulation Prediction (v9.0.24)

Program copyright Marshall Day Acoustics 2017

Margin of error is generally within $R_w \pm 3$ dB

- Key No. 2594

Job Name:

Job No.:

Date: 19/09/2022

File Name: insul

Initials: info



Notes:



R_w 55 dB
C -1 dB
Ctr -5 dB

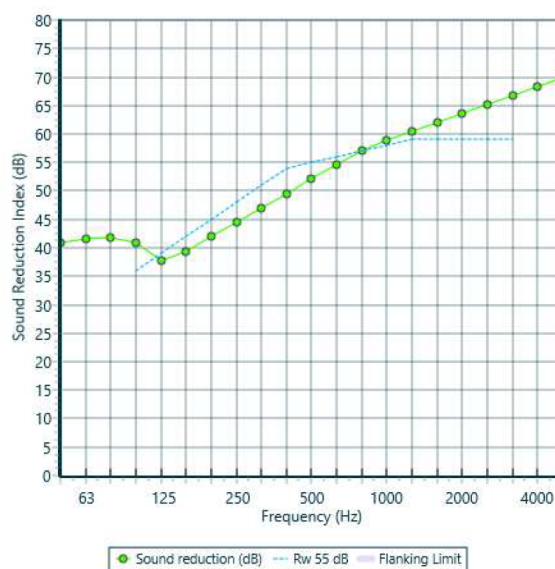
Panel Size = 2.7 m x 4.0 m

Partition surface mass = 360 kg/m²

System description

Panel 1 : 1 x 225 mm Brick

freq.(Hz)	R(dB)	R(dB)
50	41	
63	41	41
80	42	
100	41	
125	38	39
160	39	
200	42	
250	44	44
315	47	
400	50	
500	52	52
630	55	
800	57	
1000	59	59
1250	60	
1600	62	
2000	64	63
2500	65	
3150	67	
4000	68	68
5000	70	



Appendix C – Extraction Fan Detail

Fan



Northern Fan Supplies Ltd
Technical Data Sheet
JM Aerofoil



Quotation Number :		Project Code :	
Project Name :		Customer :	
Item Reference: :		Date: :	Tuesday, May 25, 2021
Fan Code	50JM/20/4/6/32	Performance data has been derived from tests carried out in a Flakt Woods laboratory, in accordance with ISO 5801 and is specifically applicable for Ducted installations. When an electronic controller is incorporated, enhanced motor noise can occur - particularly when the operating speed is well below maximum. FWL therefore recommend using an auto transformer speed controller for noise sensitive applications. Bifurcateds are Erp exempt when used continuously at >100C. They are not for use in the EEA at lower temperatures.	
Fan Diameter / Size	500 Size / mm		
Blades	6		
Fan Speed	1420 rpm		
Velocity	9.1 m/s		
Blade Angle	32°		
Installation Type / Form of Running	D / B (Horizontal)		
Fan Casing	Long		
Requested Duty	1.79m³/s @ 175 Pa (static)		
Outlet Dynamic Pressure	50 Pa		
Duty Shaft Power	0.612 kW	Acoustic data has been derived from tests carried out in a Flakt Woods laboratory, in accordance with BS 848 Pt 2, 1985 / ISO 5136 under Ducted conditions. The LpA figure provided is the overall inlet sound pressure level calculated at the specified distance, under spherical, free field conditions. Breakout levels stated are estimated from induct sound power levels and are provided for guidance.	
Max Shaft Power	0.626 kW		
Total Efficiency	66.1 %		
Motor Frame	CT9 [Class F]		
Motor Rating	0.680 kW		
Full Load Current	4.8 A		
Starting Current	11 A		
Motor Mounting	Pad		
Electrical Supply	220-240 Volts 50 Hz 1 Phase		
Start Type	DOL		
Motor Winding	Standard	Acoustic figures for adjusted running speeds have been interpolated and are for reference only.	
Enclosure	Standard All		
ErP [FMEG] Rating	N 50 (Not ErP Compliant)		
ErP [FMEG] Target	N 58		
FMEG Blade Angle [Range]	32° [32° - 34°]		
Measurement Category	D (Total)		
VSD	N		
Fan + Motor Efficiency	44.0% (2.11 m³/s @ 187 Pa)		
Motor Input Power (ErP)	0.900 kW		
SFP value	0.53 W/(l/s) @ Requested Duty	This Offer is made subject to the latest version of our A100-19 Terms and Conditions, a copy of which can be made available on request.	
Power from mains	0.95 kW		
Energy Consumption	2841 kWh (3000 h/year)		
Running Cost / Year	£341		
Air Density	1.2 kg/m³ / 20 °C / 0 m / 40% RH		
Smoke Venting	Non Smoke Venting		
Product Number	EJ511466		

	Sound Spectrum (Hz)								Overall	
	63	125	250	500	1k	2k	4k	8k	Lw*	LpA @ 3 m**
Inlet*	76	78	76	74	72	69	65	60	83	56
Outlet*	78	79	76	74	73	69	67	61	83	57
Breakout*	68	61	54	51	48	41	45	37	69	33

* Lw dB re 10⁻¹² W

** dBA re 2x10⁻⁵ Pa

Sound data at requested duty.

Silencer

STANDARD CIRCULAR SILENCER INSERTION LOSS DATA										
@ +20oC and 5m/sec FACE VELOCITY										
SILENCER SIZE	CODE	P.A	OCTAVE BAND CENTRE FREQUENCIES (Hz)							
			63	125	250	500	1K	2K	4K	8K
200-550 dia	CDA.1D	ALL	2	4	6	10	14	10	7	8
		A	4	8	13	17	23	17	12	11
		B	4	8	12	17	23	17	12	10
	CDAP.1D	C	4	7	10	15	19	16	12	9
		A	4	6	8	12	21	21	18	15
		B	4	6	8	11	18	19	17	14
	CDAP.2D	C	4	6	8	11	14	16	11	10
		A	7	10	12	24	29	29	27	23
		B	7	10	12	21	26	26	24	22
		C	7	10	11	18	21	20	17	15



Extraction system impact

	63	125	250	500	1000	2000	4000	8000	Lw	Lp@3m	Lp@2.2m
50JM/20/4/6/32	78	79	76	74	73	69	67	61	83	56	68.2
silencer - CDAP-2D	7	10	12	24	29	29	27	23			
Directivity	0	0	1	2	3	4	8	13			
a-weighting	-26.2	-16.1	-8.6	-3.2	0	1.2	1	-1.1			
resulting sound level	44.8	52.9	54.4	44.8	41	37.2	33	23.9	57.4	40	42.6

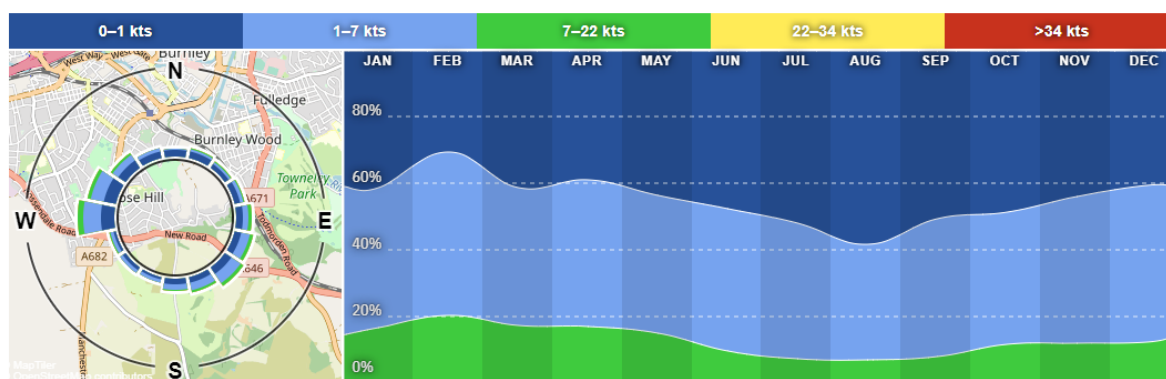
Appendix D – Weather Station

Monthly wind speed statistics and directions for Rosehill/Burnley

 Dominant wind direction

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
WSW	WSW	SE	WSW	ENE	WNW	W	W	WSW	S	W	SW

Monthly wind direction and strength distribution

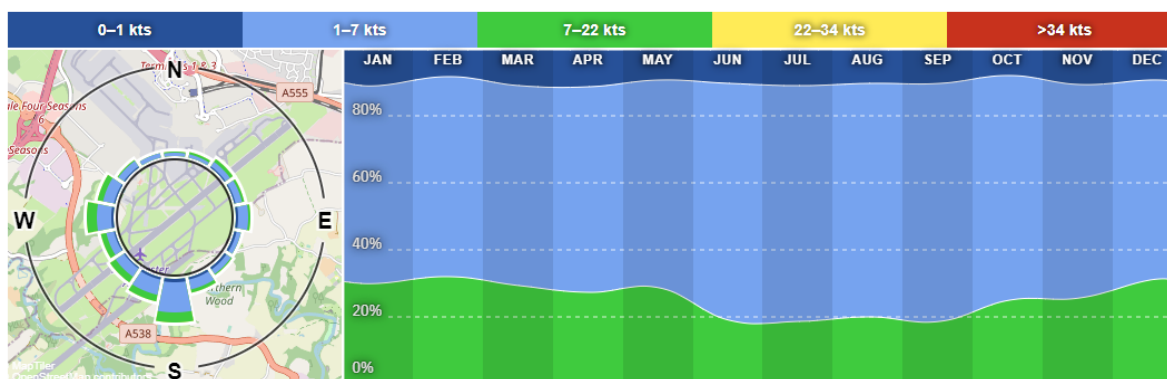


Monthly wind speed statistics and directions for Manchester Airport

 Dominant wind direction

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
SW	SW	SW	W	WSW	WSW	WSW	WSW	SW	SSW	SSW	SSW

Monthly wind direction and strength distribution





Appendix E - Odour Risk Assessment

Impact Risk	Odour Control Requirement	Significance Score*
Low to Medium	Low level odour control	Less than 20
High	High level odour control	20 to 35
Very high	Very high level odour control	more than 35

Criteria	Score	Score	Details
Dispersion	Moderate	10	Discharging 1.5m above the eaves
Proximity to Receptors	Medium	10	Closest sensitive receptor 3.3m from kitchen discharge
Size of Kitchen	Medium	3	
Cooking type	Low	1	Grilled kebab style food
Total		24	