REPORT

NOISE IMPACT ASSESSMENT OF MECHANICAL PLANT FOR KITCHEN EXTRACTION SYSTEM

SITE ADDRESS

26 HIGH STREET, YIEWSLEY, WEST DRAYTON, MIDDLESEX UB7 7DP

REFERENCE

HA/AE689/V1

HEALTHY ABODE ACOUSTICS
BUILDING ACOUSTICIANS & ENVIRONMENTAL NOISE CONSULTANTS

Our Ref	HA/AE689/V1
Site Address	26 High Street, West Drayton, Middlesex UB7 7DP
For	Mrs Chouleebhorn Messing
Client Address	26 High Street, Yiewsley, West Drayton, Middlesex UB7 7DP
Date of Report	18 October 2022
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EXECUTIVE SUMMARY

- Mrs Chouleebhorn Messing instructed Healthy Abode Ltd t/a as HA Acoustics to undertake a noise impact assessment for the proposed installation of kitchen extract system at 26 High Street, Yiewsley, West Drayton, Middlesex UB7 7DP.

- HA Acoustics has undertaken an environmental noise survey at the site in order to determine prevailing background noise levels that are representative of the nearest noise sensitive receptors (NSR). The nearest NSR to the proposed plant installation is the window of a residential property at first floor level of the adjacent building, flats 1-6 Deen Court, located approximately 2 metres from the kitchen extract duct terminus.

- A baseline noise survey and assessment has been undertaken in line with the guidance contained in BS 4142: 2014 +A1: 2019, measurements being taken over continuous 15-minute periods.

- The unattended survey was conducted on Friday 23rd September 2022 – Monday 26th September 2022, at a fixed monitoring point, located at the rear of the site.

- The operation of the mechanical plant shall be as required, 08:00 – 22:00 hours, Monday to Sundays, including bank holidays.

- The typical background noise level has been calculated at 45 dB $L_{A90,15\ min}$. The noise criteria has been set 5 dB below background at 40 dB $L_{Ar,Tr}$ in line with the local authority's requirements

- Noise calculations of the proposed plant have been undertaken using all available details and plans provided by the client and obtaining manufacturers' specifications. The resultant sound pressure level has been calculated at the NSR at 39 dB(A).

- In accordance with BS 4142:2014 +A1: 2019 guidance, the noise impact from the operation of the kitchen extract "***is an indication of the specific sound source having no impact***" at the NSR.

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Appendices

1. INTRODUCTION

1.1. Mrs Chouleebhorn Messing instructed Healthy Abode Ltd t/a HA Acoustics to undertake a noise impact assessment at 26 High Street, Yiewsley, West Drayton, Middlesex UB7 7DP for submission as part of documentation to be provided to the Local Authority, Hillingdon London Borough Council.

1.2. 26 High Street, Yiewsley, West Drayton, Middlesex UB7 7DP is proposing to install a new kitchen extract system terminating in an alley way at the side of the premises. The kitchen extract system is proposed to service the commercial property, the noise from which could have the potential to affect existing noise sensitive properties nearby.

1.3. The purposes of this report are:

1.3.1. To determine prevailing environmental noise levels affecting surrounding properties due to nearby noise sources (e.g. road traffic, commercial plant etc.);

1.3.2. Based on the above, to present noise emission limits in accordance with the requirements of BS 4142: 2014 +A1: 2019, and

1.3.3. To undertake an assessment to demonstrate compliance with the Local Authority noise requirements.

2. SITE DESCRIPTION

2.1. 26 High Street, Yiewsley, West Drayton, Middlesex UB7 7DP (hereafter referred to as 'the site') is a commercial premises at ground floor level with residential premises located directly above. The site is situated on the end of a line of commercial premises with residential above. Adjacent, number 24 High Street, is a commercial premise with residential above.

2.2. The site is located in an urban area comprising of residential and commercial premises. The site fronts onto the High Street, which runs along the west boundary. Mixed residential and commercial are located to the north and south. Located to the east is a cark park at the rear of the site. The NSR and the site are separated by a 1.5 metre alley way, in which the ducting for the extract terminus is proposed to run parallel up the wall and terminate at 1m above the eaves.

2.3. A site plan (SP1-SP2) can be found in appendix A. SP1 shows the monitoring location and surrounding site. SP2 identifies the proposed located of the kitchen extract, from the rear façade. The extract ducting and terminus is to be located mid-way along the alleyway façade.

2.4. The nearest noise sensitive receptor (NSR) located to the proposed plant location is noted to be the side façade of a residential property at Flat 1-6 Deen Court, at approximately 2 metres from the plant. It can be confidently assumed that if the noise impact assessment indicates that the specific sound source has a low impact at this premises then it can be safely assumed it will be met at other properties of equal distance and/or those further away.

2.5. At the time of installation and collection of the monitoring equipment, the dominant noise sources emanated from road traffic, overhead airplane movements and some commercial and residential activity noise. These noise sources are considered normal to the site location. No significant abnormal noise sources were identifiable. It is considered that the measured noise levels are reasonable given the location of the measurement position.

3. ENVIRONMENTAL NOISE SURVEY METHODOLOGY

3.1. An unmanned environmental noise survey was undertaken at a single measurement location at the rear of the site. The survey was undertaken between 16:00 hours on the Friday 23rd September 2022 and 10:30 hours on Monday 26th September 2022.

3.2. The sound level meter (SLM) was positioned approximately 2 metres from the rear façade of the property and mounted approximately 2 metres above ground level. The position is not considered to be 'free-field' therefore acoustic corrections of -3dB have been applied to the measurements. The position was chosen for site security and is considered representative of background noise levels at the nearest identified NSR.

3.3. The monitoring position is identified in Appendix A.

3.4. The equipment used for the noise survey is summarised in Table 3.1.

Equipment	Description	Quantity	Serial Number
Svantek 977	Class 1 automated logging sound level meter	1	69506
ACO Pacific 7052E	Class 1 ½" microphone	1	68191
Svantek SV33A	Class 1 Calibrator	1	73297

Table 3.1 Description of Equipment used for Noise Survey

3.5. Ambient, background and maximum noise levels (L_{Aeq}, L_{A10}, L_{A90} and L_{AFmax} respectively) were measured throughout the noise survey in consecutive 15-minute periods.

3.6. The noise survey and measurements were conducted, wherever possible, in accordance with BS7445-1:2003 *'Description and measurement of environmental noise. Guide to quantities and procedures'*. Measurements were made generally in accordance with ISO 1996-2:2007 *'Acoustics – Description, measurement and assessment of environmental noise – Part 2: Determination of environmental noise levels'*.

3.7. The noise monitoring equipment was calibrated before and after the noise survey period. No significant drift was recorded. Equipment calibration certificates can be provided upon request.

3.8. Weather conditions were noted to be:

3.8.1. during installation - mild (approximately 17° Celsius), dry, with cloudy skies (approximately 60% cloud cover) and a light wind (<5m/s).

3.8.2. during collection - mild (approximately 14° Celsius), dry, with cloudy skies (approximately 50% cloud cover) and a light wind (<5m/s).

3.8.3. throughout the entire noise survey period – mild (approximately 10-20°Celsius), generally dry, with partially cloudy skies (approximately 50% cloud cover) and a light wind (<5m/s).

3.9. These weather conditions were checked against and confirmed using the Met Office mobile application available on smart phone technology. These conditions were maintained throughout the whole survey period and are considered reasonable for undertaking environmental noise measurements.

4. EXTERNAL NOISE EMISSION CRITERIA

4.1. Local Authority Criteria

4.2. The proposed site lies within the jurisdiction of the Local Authority, London Borough of Hillingdon. An acoustic report is required to support a planning application as stipulated below:

> *'British Standard 4142:1997 gives advice on measuring and assessing the noise from machinery or plant and is relevant if surrounding residential areas might be affected. Developments with a BS4142 assessment of marginal significance or above would not ordinarily be permitted.*
> *Consequently, the development should be controlled such that the rating level of the noise from the proposed development determined according to BS4142 is at least 5 dB below the background noise level $L_{A90,T}$. Ideally, the assessment of noise should give a positive indication that complaints are unlikely.'*

4.3. It is understood that the plant will be operational between 08:00 hours and 22:00 hours. The noise criteria will therefore be set 5dB below the typical background levels of the stated operational hours. In this case the criteria to be met is a maximum rating noise level of 40 dB L_{ArTr} measured at the NSR.

4.4. National Planning Policy Framework (2021)

4.5. In March 2012, the National Planning Policy Framework (NPPF) came into force and was revised in 2019 and 2021. This document replaces a great many planning guidance documents, which previously informed the planning system in England.

4.6. The NPPF (2021) sets out the Government's economic, environmental, and social planning policies for England and these policies articulate the Government's vision of sustainable development.

4.7. The Noise Policy Statement for England (NPSE) published 2010 applies to *'all forms of noise, including environmental noise, neighbour noise and neighbourhood noise'.*

4.8. Paragraph 185 of the NPPF (2021) considers noise, stating:

> *"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*
- *c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation."*

4.9. National Planning Policy is guided by the NPPF. With regard to noise, the terms 'significant adverse impact' and 'other adverse impacts' are defined in the explanatory notes of the 'Noise Policy Statement for England' (NPSE). These state that there are two established concepts from toxicology that are currently being applied to noise impacts, for example, by the World Health Organisation. They are:

- 'NOEL – No Observed Effect Level, this is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise, and
- LOAEL – Lowest Observed Adverse Effect Level. This is the level above which adverse effects on health and quality of life can be detected.

4.10. Extending these concepts for the purpose of this NPSE leads to the concept of SOAEL - significant observed adverse effect level. This is the level above which significant adverse effects on health and quality of life occur'. However, no specific noise limits for LOAEL and SOAEL have been defined. Therefore, guidance from other acoustic standards must be employed to determine suitable levels within the overall principal of the National Planning Policy Framework, such as BS 8233:2014.

4.11. **BS 4142: 2014 +A1: 2019**

4.12. BS 4142: 2014 +A1: 2019 "Methods for Rating and Assessing Industrial and Commercial Sound" presents a method for assessing the significance and possible adverse impact due to an industrial or commercial noise source, based on a comparison of the source noise levels and the background noise levels, both of which are measured or predicted at a noise sensitive receiver e.g., a residential property.

4.13. The specific noise level due to the source is determined, with a series of corrections for tonality, impulsivity, intermittency, or any other unusual characteristic. This can result in a maximum total

correction of +21dB being added if the new noise source demonstrates all the above characteristics. The background noise level is then subtracted from the rating level and a comparison made.

4.14. The significance of the new noise source and the likelihood of any adverse impact is determined in accordance with the following advice:

"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 difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.*
- *A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.*
- *The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context."*

5. NOISE SURVEY RESULTS

5.1. The ambient and background noise levels at the measurement position as seen in Appendix A are provided below and have been based on an analysis of the monitoring data.

5.2. A summary of the data results is provided in Table 5.1. The time history can be seen in Appendix B (TH1).

	Ambient Noise Level $L_{Aeq, 15min}$	**Typical Background Noise Level $L_{A90, 15min}$**
Day (07:00 – 23:00)	59 dB*	45 dB*
Night (23:00 – 07:00)	49 dB*	34 dB*
Operating Hours (08:00 – 22:00)	60 dB*	45 dB*

*Includes -3dB facade noise correction

Table 5.1 Summary of typical noise measurement data

5.3. These noise levels are considered normal to the site location. No significant abnormal noise sources were identifiable during installation or collection of the equipment. It is considered that the measured noise levels are reasonable given the location of the measurement position.

6. NOISE IMPACT ASSESSMENT

6.1. It is proposed to install a Helios Gigabox GBD 630/4/4 Centrifugal fan internally at ground floor level and duct to the north façade upwards, terminating 1m above the existing eaves.. The flue is proposed to be vertically mounted. Calculations have been undertaken to gain the specific noise level of the plant using information provided by the client and from manufacturer specifications.

6.2. Table 6.1 lists the proposed plant to be installed and its operational maximum sound power level.

Plant Make/Model	Reference Sound Power Level*
Helios Gigabox GBD 630/4/4 Extractor Fan (Extract)	88 dB

* Manufacturer's specifications are provided in Appendix C.

Table 6.1 Proposed plant

6.3. Table 6.2 lists the sound power spectral data for the plant.

	Frequency Spectral Data (Hz) at 1m								
	LZFeq 63*	LZFeq 125	LZFeq 250	LZFeq 500	LZFeq 1000	LZFeq 2000	LZFeq 4000	LZFeq 8000	dB(A)
Helios Gigabox GBD 630/4/4 (Extract)	83	79	83	84	84	82	77	70	88

Table 6.2 Spectral sound data

***63 Hz level extrapolated from similar unit, as not provided by manufacturer**

NOTE – Spectral noise level data provided by the manufacturer has been adjusted (increased) by 2dB so that the overall dBA equates to 88dBA as shown in appendix C.1. This provides a more robust assessment in terms of a 'worst-case' scenario.

6.4. Detailed calculations to predict the noise level of the plant at 1metre from the NSR are given in Appendix D. The following factors have been taken into account during the assessment and within the calculations.

6.4.1. There is no direct line of sight between the extract terminus and the NSR. This is conservatively estimated to provide -10dB attenuation. This will be accounted for in the calculations.

6.4.2. A 'penalty' addition has been added to the fan for intermittency as the operation is considered to be such that it could attract attention at the NSR. A penalty has been applied for tonality as there is the potential for the fan to have tonal characteristics. Penalty additions have not been applied for impulsiveness or any other unusual characteristics as plant of this type generally do not generate such features.

6.5. To meet the noise criteria of 40 dB(A) at the NSR, the proposed plant requires mitigation. It is recommended that an acoustic silencer is installed to the extract ducting The client has provided the following details, as seen in Table 6.3, on the silencer they are proposing to install.

	Frequency Spectral Data (Hz) at 1m							
	LZFeq 63	**LZFeq 125**	**LZFeq 250**	**LZFeq 500**	**LZFeq 1000**	**LZFeq 2000**	**LZFeq 4000**	**LZFeq 8000**
Acoustica R02-6-2100 Ducting Silencer	5	8	19	33	39	39	25	17

Table 6.3 Proposed Mitigation

6.6. The proposed plant installation with silencer would be expected to meet the requirements of the proposed criteria.

6.7. Detailed calculations to predict the noise level of the plant at 1metre from the NSR are given in Appendix D. The rating noise level at the NSR with mitigation is **39 dB $L_{Ar,Tr}$** and **6 dB(A) below** the assessed background noise level (45dB $L_{A90,T}$). In accordance with BS 4142:2014 guidance, the rating noise ***"is an indication of the specific sound source having no impact****. The lower the rating level is relative to the measured background level, the less likely it is that the specific sound source will have an adverse impact."*

6.8. Vibration from plant is not expected. However, as a precaution, all plant should be installed with anti-vibration isolators. Anti-vibration mounts are widely available from system suppliers/installers and shall need to be installed in accordance with the type, make and model of the mechanical plant specified. Anti-vibration mounts are often in pedestal rubber mountings. Examples of these are MPO

and MP1, and ISL Maxi pedestal vibration mounts. These types of anti-vibration and shock isolators are industry standard and commonplace on air conditioning and ventilation systems. They are designed to provide medium to high frequency isolation from vibration and noise via high resilience rubber. Once type, location, manufacturer make and model of proposed mechanical plant is known, the M+E contractor shall be able to advise upon the specific anti-vibration isolators required to ensure no adverse impact occurs.

6.9. As BS 4142:2014 advises, the impact must be considered within the context of the site and the surrounding acoustic environment. The following must, therefore, also be taken into consideration when determining the potential impact that may be experienced:

6.9.1. The assessment is undertaken at the most affected existing residential windows. The impact on all other nearby residential windows will be lower due to screening and distance attenuation.

6.9.2. The site is located within a busy urban area with other comparable uses with similar plant located within the vicinity.

6.9.3. It should be noted that the above assessment is based on the plant operating at maximum duty. Given that the plant will not at maximum capacity all of the time, the above assessment is considered to be representative of the worst case.

6.10. British Standard 8233:2014 'Sound insulation and noise reduction for buildings – Code of Practice' gives recommendations for acceptable internal noise levels in residential properties. Assuming worst case conditions, of the closest window being for a bedroom, BS8233:2014 recommends 35dB(A) as being acceptable internal resting/sleeping conditions during daytime. According to BS8233:2014, the façade of a residential dwelling; with a window partially open for ventilation offers 10-15 dB attenuation. Therefore, considering this reduction for a partially open window the internal noise level with the plant operating would be 29 dB(A) which is lower than the acceptable internal noise level as seen under BS 8233: 2014.

7. UNCERTAINTY

7.1. The levels of uncertainty in the data and calculations are considered to be low given the robust exercise undertaken in noise monitoring and the confidence in the statistical analysis.

7.2. All measurements taken on-site by instrumentation are subject to a margin of uncertainty. This is relatively small, with a sound level meter manufacturer's margin of uncertainty at +/-1.1dB. It is due to the tolerances associated with the Class 1 sound level meter and calibrator equipment used to measure background.

7.3. The meter and calibrator used have a traceable laboratory calibration and were field calibrated before and after the measurements.

7.4. Manufacturers' data for the plant is likely to be robust. Detailed calculations and resultant noise levels at the residential location are considered to be confidently predicted.

7.5. Uncertainty in the calculated impact has been reduced by the use of a well-established calculation method.

8. CONCLUSION

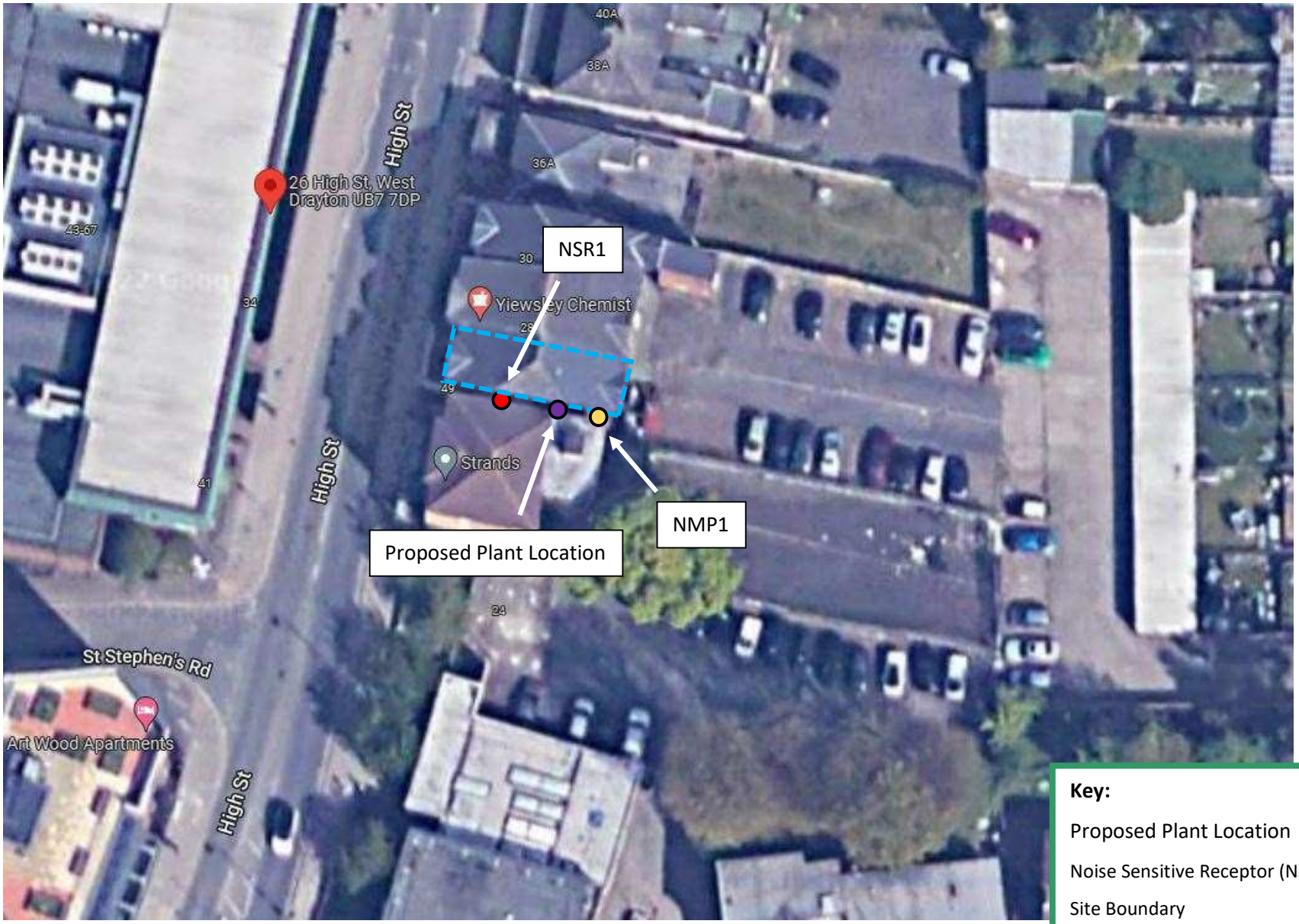
8.1. A noise assessment has been undertaken at 26 High Street, Yiewsley, West Drayton, Middlesex UB7 7DP. The noise survey was undertaken at a fixed monitoring point, representative of the nearest noise sensitive receptor.

8.2. Following on-site measurement of pre-existing noise levels, calculations have been made of the noise rating level of the proposed plant at the NSR. From this assessment, together with information from the plant manufacturer, the potential noise impact has been determined.

8.3. Noise levels from the plant at the NSR are predicted to be **39 dB $L_{Ar,Tr}$**. BS 4142: 2014 +A1: 2019 assessment methodology shows that the rating noise level from the kitchen extract system at the NSR is predicted to be **6 dB(A) below** the typical background of **45 dB $L_{A90,T}$**. In accordance with BS 4142:2014, noise levels from the plant "***is an indication of the specific sound source having a no impact"***.

8.4. Considering the results of the noise survey, the illustrative layouts and the calculations, the predicted resultant noise levels from the proposed plant are predicted to meet appropriate and reasonable guidance and the relevant noise criteria. Therefore, an adequate level of protection against noise for occupants of the nearest noise sensitive receptor is afforded, including when factoring in potential uncertainty.

Appendix A – Site Plan (SP1)



Key:

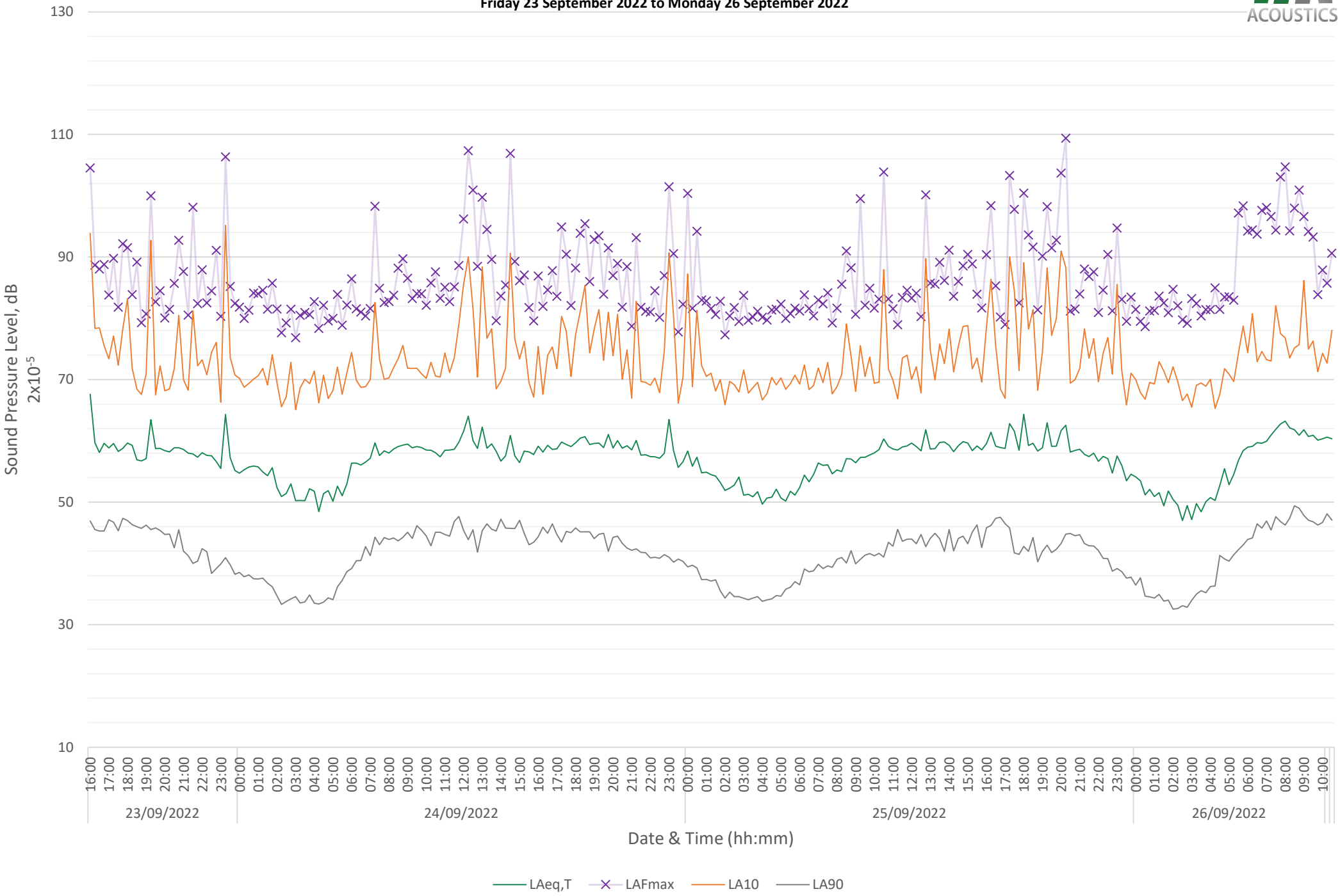
- Proposed Plant Location
- Noise Sensitive Receptor (NSR1)
- Site Boundary
- Noise Monitoring Position

Appendix B.1 - NMP1 Time History

26 High Street, Yiewsley, West Drayton, UB7 7DP

Friday 23 September 2022 to Monday 26 September 2022

ACOUSTICS



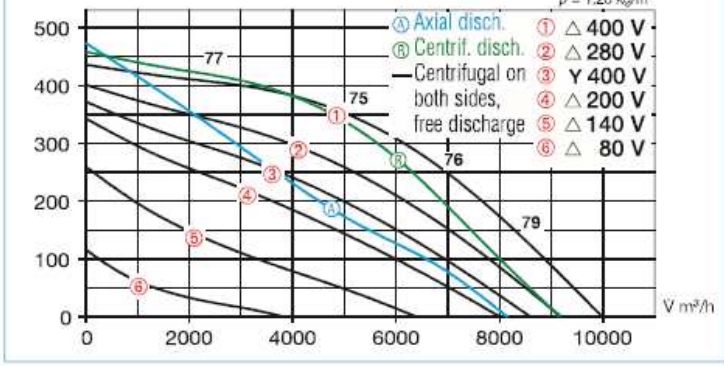
Helios

GigaBox centrifugal fan 630 mm ø

GBD 630/6/6

Frequency		Hz	Total	125	250	500	1k	2k	4k	8k
L_{WA}	Case breakout	dB(A)	62	59	58	48	47	45	41	35
L_{WA}	Intake	dB(A)	73	63	64	67	66	66	63	57
L_{WA}	Exhaust	dB(A)	79	68	72	73	73	71	66	59

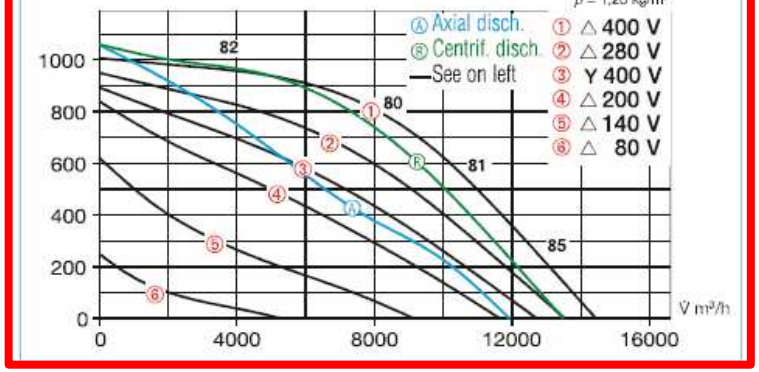
ρ = 1,20 kg/m³



GBD 630/4/4

Frequency		Hz	Total	125	250	500	1k	2k	4k	8k
L_{WA}	Case breakout	dB(A)	71	68	57	57	56	54	50	44
L_{WA}	Intake	dB(A)	82	72	73	76	75	75	72	66
L_{WA}	Exhaust	dB(A)	88	77	81	82	82	80	75	68

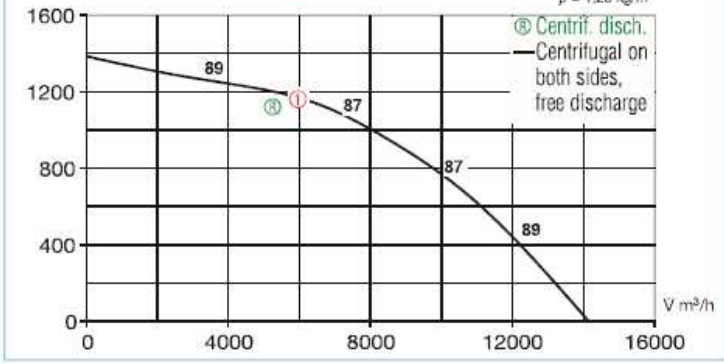
ρ = 1,20 kg/m³



GBD 630/4 T120

Frequency		Hz	Total	125	250	500	1k	2k	4k	8k
L_{WA}	Case breakout	dB(A)	73	66	67	65	65	65	61	55
L_{WA}	Intake	dB(A)	87	74	83	80	79	78	75	67
L_{WA}	Exhaust	dB(A)	90	81	82	84	84	82	77	69

ρ = 1,20 kg/m³



R02 6 RECTANGULAR SILENCER

Available in **eight** standard lengths R02 6 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 6 silencers with a face velocity above 6 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.

INSERTION LOSS (db) - CENTRE BAND FREQUENCY

PRODUCT CODE	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
R02 6-600	2	3	6	7	12	14	11	10
R02 6-900	3	6	11	19	24	24	15	11
R02 6-1200	4	7	15	26	29	32	20	14
R02 6-1500	5	8	19	33	39	39	25	17
R02 6-1800	6	10	21	36	45	45	28	19
R02 6-2100	7	13	25	43	50	50	33	21
R02 6-2400	7	15	28	49	50	50	38	25

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.

ACOUSTICS

Sitesafe Carbon Filters

purified air® since 1984

We manufacture Sitesafe carbon filters, these innovative carbon units measure 594x196x597mm, three combining to 594x594x597mm, directly replacing our original carbon blocks whilst providing exactly the same filter performance as an existing full size cell.

Their advantage is that they only weigh 18kg each against the 66kg of our original blocks. This takes the strain out of fitting and servicing, allowing only one engineer to complete the task where two had been previously required.

Our Sitesafe carbon filters use panels of activated carbon to remove the malodourous gases within the commercial kitchen extract duct through the process of chemical adsorption. By installing our ESP units before our Sitesafe filters, the carbon life span is greatly increased, allowing it to nullify malodours at optimum efficiency for much longer.

Will require two people plus lifting gear to carry and install.

Carbon PA242424

Size	594x594x597
Gross Weight	68.20kg
Carbon Weight	50.00kg
Rated Airflow	3600m³/hr*
Pressure Drop	120Pa

Safe for one person to carry. No special lifting gear required.

Sitesafe PA240824

Size	594x196x597
Gross Weight	17.95kg
Carbon Weight	16.6kg
Rated Airflow	1200m³/hr*
Pressure Drop	120Pa

Sitesafe 3 x PA240824

Size	594x594x597
Gross Weight	53.85kg
Carbon Weight	50.00kg
Rated Airflow	3600m³/hr*
Pressure Drop	120Pa

Please see below for the recommended minimum dwell times required for different applications and scale up accordingly.

It should be noted that filtration performance will be improved by increasing the dwell times applied.

Application	Recommended Dwell Time	Grade
Cooking - Low Odour, Tea Shop, Canteens	0.1 to 0.2 Seconds	Carbon grade Enhanced for improved performance for light catering odours
Cooking - Moderate Odour. Pizza, Steak House, French, Italian, Pubs, Chinese, Japanese, Cantonese	0.2 to 0.4 Seconds	Enhanced Carbon grade suitable for many applications 65% Minimum CTC
Cooking High Odour, Indian, Thai, Vietnamese, Kebab	0.4-0.6 Seconds	Enhanced Carbon grade suitable for many applications 65% Minimum CTC
Cooking Very High Odour. Fried Chicken, Pubs with large fried food turnover, Fish and Chip Shops, Fast Food / Burgers	0.4-0.8 Seconds	Enhanced Carbon grade suitable for many applications 65% Minimum CTC
Reduction of Kerosene Exhaust fumes	0.1 to 0.2 Seconds	General Purpose Activated Carbon
Reduction of Ozone	0.1 to 0.2 Seconds	General Purpose Activated Carbon
Reduction of Diesel Fumes, including H_2S, SO_2, NOX, HCl	0.2 Seconds	Carbon Museum,Archive, Café Directive: SO2 SOX NO2 NOX Removal
Museum and Archives	0.2 Seconds	Carbon Museum,Archive, Café Directive: SO2 SOX NO2 NOX Removal

The cooking odour classes above are as classified by DEFRA in **Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems, PB10527**

Appendix D - HA Calculations

Noise Sensitive Receiver 1

Source: Helios Gigabox GBD 630/4/4 Centrifugal Extract Fan

	Frequency Spectral Data (Hz)								
	63*	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	**dB(A)**
GBD 630/4/4 Extract Fan Lw	83	79	83	84	84	82	77	70	**88**
Conversion to Sound Pressure Level	-11	-11	-11	-11	-11	-11	-11	-11	
GBD 630/4/4 Extract Fan Lp	72	68	72	73	73	71	66	59	**77**
Distance propagation (2m)	-6	-6	-6	-6	-6	-6	-6	-6	
No line of sight	-10	-10	-10	-10	-10	-10	-10	-10	
BS4142 Penalty for Intermittency	3	3	3	3	3	3	3	3	
BS4142 Penalty for Tonality	2	2	2	2	2	2	2	2	
Mitigation provided by Silencer	-5	-8	-19	-33	-39	-39	-25	-17	
Calculated level at Receiver 1	**56**	**49**	**42**	**29**	**23**	**21**	**30**	**31**	**39**

**level extrapolated from similar*

Noise Criteria	**40**
No Observed Effect Level	

BS8233: Internal Daytime Levels

	Frequency Spectral Data (Hz)								
	63	**125**	**250**	**500**	**1000**	**2000**	**4000**	**8000**	**dB(A)**
Calculated level at NSR	56	49	42	29	23	21	30	31	39
Partially Open Window Attenuation	-10	-10	-10	-10	-10	-10	-10	-10	
Calculated level in Internal Receiver	46	39	32	19	13	11	20	21	**29**

BS8233 Daytime Criteria	**35**

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