

ACOUSTIC SOLUTIONS

Noise and Environmental Assessments

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ODOUR ASSESSMENT CONDUCTED AT

74 Heene Road, Worthing BN11 3RG

Prepared for:

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Institute of Acoustics number: 43468

Reference: AS26-04.O.V2



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1.0 Introduction

This odour assessment has been conducted in response to instructions from GC Reports regarding a proposed development of dwellings in the vicinity of a proposed food business premises, 74 Heene Road, Worthing BN11 3RG.

1.1 Site Details

The site of the proposed development is 74 Heene Road, Worthing BN11 3RG. 74 Heene Road is currently the site of Worthing Fisheries. An extraction system serving this business is currently in situ. It is proposed that a second new extraction system be installed to serve a fried chicken takeaway, also at the premises.

2.0 Guidance and Policy

The following legislation and guidance have been used in this assessment:

- EMAQ, (2018) Control of Odour and Noise from Commercial Kitchen Exhaust Systems, an amendment of the original DEFRA document published in 2005, deals specifically with the control of kitchen odours.
- Guidance on the Assessment of Odour for Planning, Version 1.1 Institute of Air Quality Management (IAQM), 2018. The IAQM published the 'Guidance on the Assessment of Odour for Planning' document in July 2018. This guidance specifically deals with assessing odour impacts for planning purposes, namely potential effects on amenity.

The magnitude of odour impact depends on a number of factors and the potential for adverse impacts varies due to the subjective nature of odour perception. The FIDOR acronym is a useful reminder of the factors that can be used to help determine the degree of odour pollution:

- **F**requency of detection - frequent odour incidents are more likely to result in adverse impacts;
- **I**ntensity as perceived - intense odour incidents are more likely to result in adverse impacts;
- **D**uration of exposure - prolonged exposure is more likely to result in adverse impacts;
- **O**ffensiveness - more offensive odours have a higher risk of resulting in adverse impacts; and,
- **R**eceptor sensitivity - (The type of land use and nature of human activities in the vicinity of an odour source. Tolerance and expectation of the receptor.)

It is important to note that even infrequent emissions of odours may cause loss of amenity if odours are perceived to be particularly intense or offensive.

3.0 Assessment Methodology

3.1. Baseline Survey

A survey has been undertaken to review the ventilation system and the potential impact on the surrounding properties. This assessment has been conducted using EMAQ (2018) Control of Odour and Noise from Commercial Kitchen Exhaust Systems.

- 74 Heene Road is currently the site of Worthing Fisheries. An extraction system serving this business is currently in situ. It is proposed that a second new extraction system be installed to serve a fried chicken takeaway, also at the premises.
- Air extraction will be provided by 1x Kitchen extraction system comprising of 1x Helios 560mm 6/6 gigabox centrifugal fan. Kitchen fumes will be extracted to the outside via 0.5 m² diameter ducting that will terminate 3m above the property's first storey eaves.
- At this location, the ductwork will terminate 4x metres from bedroom window of a first floor dwelling above 74 Heene Road.
- Air will discharge air at a rate of approximately 0.339m³/s vertically.

3.2. Assessment Criteria of Proposed Kitchen Extract Vent

From the available information, the risk of odour impact on nearby receptors has been assessed using the guidance in the EMAQ, (2018) Control of Odour and Noise from Commercial Kitchen Exhaust Systems.

- **Dispersal.** The Helios 560mm 6/6 gigabox with a quoted volumetric air flow of 2.5 m³/s through a 500mm extraction-point will provide a discharge velocity of approximately 12.7 m/s.
The flue extends to at least 3m above the eve height, suggesting a **moderate** dispersal score of 10 in the EMAQ criteria.

Calculations as follows:

$$\text{Discharge Velocity} = \frac{\text{volumetric air flow}(m^3/s)}{\text{Area}(m^2)}$$

$$= \frac{2.5}{0.196} = 12.7m/s$$

- **Proximity of Receptors.** The receptors in the accommodation surrounding the exhaust will be less than 20m from the discharge, suggesting a **Close** distance, suggesting a score of 10 in the EMAQ criteria.

- **Size of Kitchen.** The kitchen will cater for less than 30 covers and includes takeaway so is categorized as a **Small** kitchen suggesting a score of 1 in the EMAQ criteria.
- **Cooking Type** (Odour -grease loading). Fried chicken, so is classified as **Very High** odour/grease loading, suggesting a score of 10 in the EMAQ criteria.

Table 1. Proposed Kitchen Extraction Vent Score

Criteria	Score	Score	Details
Dispersion	Moderate	10	Not low level, but below eaves, or discharge at below 10m/s
Proximity of receptors	Close	10	Closest sensitive receptor less than 20m from kitchen discharge
Size of kitchen	Small	1	Less than 30 covers or small takeaway
Cooking type (odour -grease loading)	Very High	10	Most pubs (no fried food, mainly reheating and sandwiches etc.) Tea rooms
Total Score		31	High level odour control

Table 2. Proposed Kitchen Extraction Vent, Criteria

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

3.3. Odour Control Recommendations

The initial EMAQ risk assessment score of 27 suggests that a **High** level of odour control is needed in order to reduce the risk of odour impact on the nearby receptors.

High level odour control may include:

- Extend ducting to 1m above the ridge to improve dispersion.
- Fine filtration or ESP followed by carbon filtration (carbon filters rated with a 0.2 – 0.4 second residence time) to reduce the odours emitted from the system.

It is understood, from talking with the proprietor of 74 Heene Road that carbon filtration with a rating of 0.6 second dwell time will be installed within the extraction system.

4.0 Conclusions

This odour assessment has been conducted in response to instructions provided by GC Reports following a proposal for a food establishment at 74 Heene Road, Worthing serving fried chicken.

An assessment using the guidance in the EMAQ (2018) Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems has been conducted. Considering the dispersion, proximity of receptors, food type and kitchen size the initial risk assessment score is 31 which suggests that, unabated, a High level of odour control is needed in the proposed kitchen in order to reduce the risk of odour impact on the nearby receptors.

References

EMAQ, (2018) Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems

APPENDIX 1

Risk assessment for odour from EMAQ, (2018) Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems

Criteria	Score	Score	Details
Dispersion	Very poor	20	Low level discharge, discharge into courtyard or restriction on stack
	Poor	15	Not low level, but below eaves, or discharge at below 10m/s
	Moderate	10	Discharging 1m above eaves at 10-15m/s
	Good	5	Discharging 1m above eaves at 15m/s or greater
Proximity of receptors	Close	10	Closest sensitive receptor less than 20m from kitchen discharge ¹
	Medium	5	Closest sensitive receptor between 20 and 100m from kitchen discharge
	Far	1	More than 100m from kitchen discharge ¹
Size of kitchen	Large	5	More than 100 covers or large sized takeaway
	Medium	3	Between 30 and 100 covers or medium sized takeaway
	Small	1	Less than 30 covers or small takeaway ¹
Cooking type (odour and grease loading)	Very High	10	Pub (high level of fried food), fried chicken, burgers or fish and chips. <i>Turkish, Middle Eastern cooking or any premises cooking with solid fuel</i>
	High	7	Vietnamese, Thai, Indian, <i>Japanese, Chinese, steakhouse</i>
	Medium	4	Cantonese, <i>Italian, French, Pizza (gas fired)</i>
	Low	1	Most pubs (<i>no fried food, mainly reheating and sandwiches etc.</i>) <i>Tea rooms</i>

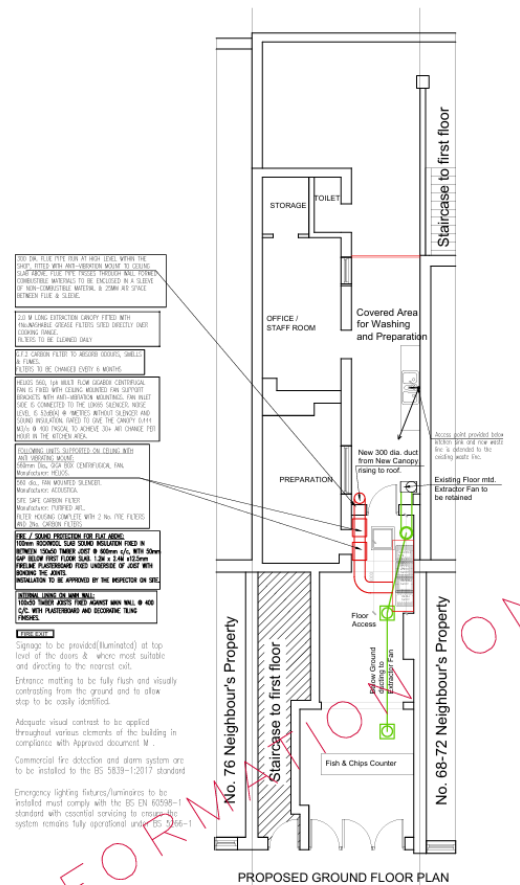
APPENDIX 2

Datasheet for Helios 560mm 6/6 gigaboxTwo-Stage fan.

Type	Ref. no.	Connection Ø	Air flow volume min./max.	R.P.M. min./max.	Sound pressure level in 1 m case breakout	air noise min./max.	Power consumption min./max.	Current min./max.	Wiring diagram	Max. air flow temperature	Weight net approx.	Transformer-speed controller 5-step	Electronic* speed controller, stepless flush/surface		
		mm	V m³/h	min ⁻¹	dB (A)	dB (A)	W	A	No.	+ °C	kg	Type	Ref. no.	Type	Ref. no.
Single-stage in-line fan, 230 V, 50 Hz, capacitor motor, IP 44															
MV 100 A	6050	100	150/190	2070/2620	34/38	45/50	12/15	0.05/0.07	844.1	60	1.2	TSW 0,3	3608	ESU 1/ESA 1	0236/0238
MV 100 B	6051	100	170/240	1590/2170	32/38	46/52	20/23	0.09/0.11	844.1	60	1.7	TSW 0,3	3608	ESU 1/ESA 1	0236/0238
Two-stage in-line fan, 230 V, 50 Hz, capacitor motor, IP 44															
MVZ 100 B	6058	100	170/240	1590/2170	37/43	49/55	40/46	0.18/0.22	845.1	60	4.5	TSW 0,3	3608	ESU 1/ESA 1	0236/0238
Parallel-twin-unit, 230 V, 50 Hz, capacitor motor, IP 44															
MVP 100 B	6065	—	340/480	1590/2170	35/41	49/55	40/46	0.18/0.22	845.1	60	5.7	TSW 0,3	3608	ESU 1/ESA 1	0236/0238

* In noise sensitive cases, transformer-control devices should be used. Electronic phase angle control may generate disturbing increase in motor noise.

Proposed internal plans



APPENDIX 4

Proposed Filtration

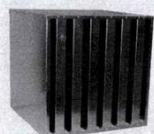
Sitesafe Carbon Filters

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 68kg 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 malodorous 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 17.96kg
Carbon Weight 16.8kg
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 ₂ S, SO ₂ , NO _x , HCl	0.2 Seconds	Carbon Museum/Archive, Café Directive: SO ₂ SO _x NO ₂ NO _x Removal
Museum and Archives	0.2 Seconds	Carbon Museum/Archive, Café Directive: SO ₂ SO _x NO ₂ NO _x 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**