7. ODOUR RISK ASSESSMENT

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APPENDIX - 'A'



Odour Risk Assessment	
32 HIGH ST, WESTBURY BA13 3DH	
Job number:	J0211
Document number:	J0211/1/F2
Client:	Mr Kamrul Islam
Date:	**02 JAN 2021**

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1 Introduction

1.1.1 This report considers the potential for annoyance due to kitchen odours from the proposed restaurant and takeaway at **32 HIGH ST, WESTBURY BA13 3DH**. Odours from the kitchen have the potential to impact on the amenity of residents at nearby properties and on the residential unit above the restaurant and takeaway. The assessment has been prepared in support of the planning application.

1.1.2 This report includes an odour risk assessment that follows the methodology set out in Defra's Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems (Defra, 2005). The guidance was withdrawn on 15th September 2017; however, the risk assessment methodology has been used to determine the level of odour abatement that will be required, and whether the proposed kitchen extract system will provide an adequate level of odour control.

1.1.3 The assessment has been undertaken on behalf of Mr Kamrul Islam by Air Quality Assessments Ltd (AQA).

1.1.4 The references used in this assessment are shown in **Section 6**.

2 Odour Risk Assessment

2.1. Introduction

2.1.1 Defra Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems includes a risk assessment methodology for identifying the potential risk of odour impacts from commercial kitchen operations. The results of the risk assessment may then be used to determine a suitable level of odour abatement to be installed into a commercial kitchen.

2.1.2 The risk assessment for odours is split into the following four sections;

- dispersion;
- proximity of receptors;
- size of kitchen; and
- cooking type (odour and grease loading).

2.1.3 A risk rating is scored for each section and the total risk rating, i.e. the sum of the risk rating for each section, is compared with the significance score in **Table 1.** The level of odour control which is likely to be required to prevent the kitchen from causing odour nuisance impacts can then be determined.

Table 1: Significance Score and Odour Control Requirement

Impact Risk	Odour Control Requirement	Significance Score [a]
Low to Medium	Low level of odour control	Less than 20
High	High level of odour control	20 to 35
Very High	Very high level of odour control	More than 35

a based on the sum of scores from dispersion, proximity to receptors, size of kitchen and cooking type.

2.2. Risk Assessment

Dispersion

2.2.1 The risk rating for dispersion relates to the location of the kitchen extraction system discharge flue, and the flow rate of the exhaust air at the point of discharge. Details of the risk ratings for dispersion are shown in **Table 2.**

Table 2: Risk Ratings for Dispersion

Criteria	Rating	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 10 m/s.
	Moderate	10	Discharging 1 m above eaves at 10-15 m/s.
	Good	5	Discharging 1 m above ridge at 15 m/s.

2.2.2 The proposed kitchen extract system will terminate through a high velocity cowl above the roof of the building at a height above the roof eaves (see **Figure 1**). Therefore, based on the information in **Table 2**, the risk rating for dispersion would be described as **Moderate**.

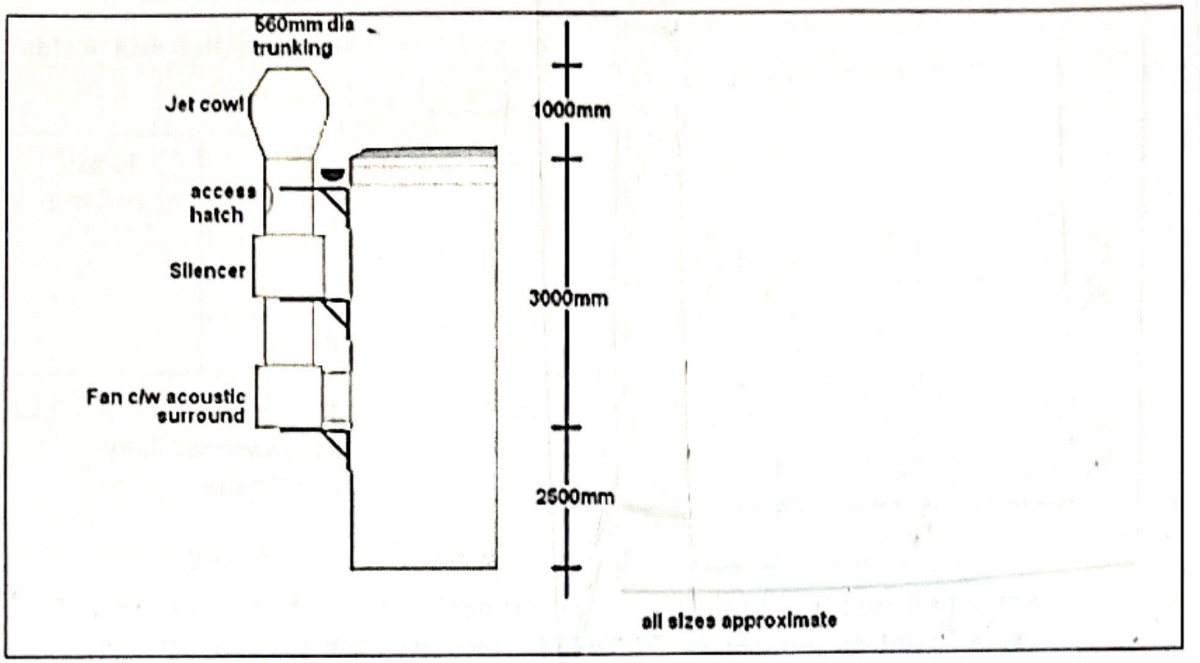


Figure 1: Proposed Flue Terminal

Proximity to Receptors

2.2.3 The risk rating for proximity to receptors relates to the distance from the point of discharge of the kitchen extraction system to the nearest sensitive receptor. Examples of high sensitivity receptors, as set out in the Institute of Air Quality Management (IAQM) Guidance on the Assessment of Odour for Planning (IAQM, 2014), include residential dwellings. Details of the risk ratings for the proximity of receptors are shown in **Table 3**.

Table 3: Risk Ratings for the Proximity of Receptors

Criteria	Rating	Score	Details
Proximity of Receptors	Close	10	Closest sensitive receptor less than 20 m from kitchen discharge.
	Medium	5	Closest sensitive receptor between 20 and 100 m from kitchen discharge.
	Far	1	Closest sensitive receptor more than 100 m from kitchen discharge.

2.2.4 Residential units at the rear of the property (and proposed above the application site), are within 20 m of the kitchen discharge; therefore, based on the information in **Table 3**, the risk rating for dispersion would be described as **Close**.

Size of Kitchen

2.2.5 The risk rating for the size of kitchen relates to the volume of food prepared by the kitchen, as described by the number of covers of a restaurant, or the size of a takeaway. Details of the risk ratings for the size of kitchen are shown in **Table 4**.

Table 4: Risk Ratings for the Size of Kitchen

Criteria	Rating	Score	Details
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.

2.2.6 It is understood that the restaurant will provide 30-40 covers and also operate as a small takeaway; therefore, based on the information in **Table 4**, the risk rating for the size of kitchen would be described as **Medium**.

Cooking Type

2.2.7 The risk rating for cooking type relates to the type of food prepared in the kitchen, and the cooking methods used. Details of the risk ratings for cooking type are shown in **Table 5**.

Table 5: Risk Ratings for Cooking Type

Criteria	Rating	Score	Details
Cooking Type (Odour and Grease Loading)	Very High	10	Pub (high level of fried food), fried chicken, burgers or fish & chips.
	High	7	Kebab, Vietnamese, Thai or Indian.
	Medium	4	Cantonese, Japanese or Chinese.
	Low	1	Most pubs, Italian, French, pizza or steakhouse.

2.2.8 The restaurant and takeaway will serve either Indian, Chinese/Cantonese, Thai, Italian or Lebanese food. Based on the information in **Table 5** and to provide a conservative assessment, the risk rating for cooking type would be described as **High**.

Summary

2.2.9 A summary of the risk assessment and the total risk rating for the restaurant and takeaway is shown in **Table 6**. With regard to the significance scores set out in **Table 1**, the overall risk rating for the restaurant/takeaway is **High**; therefore, the extraction system would require a high level of odour control to mitigate the potential odour impacts at local sensitive receptors.

Table 6: Odour Risk Assessment Summary

Criteria	Rating	Significance Score	Details	Comments
Dispersion	Moderate	10	Discharging 1 m above eaves at 10-15 m/s.	The kitchen extract discharges above the roof eaves, but below the roof ridge and is fitted with a high velocity cowl.
Proximity of Receptors	Close	10	Closest sensitive receptor less than 20 m from kitchen discharge.	The kitchen extract is discharged within 20m of the residential unit above the restaurant.
Size of Kitchen	Medium	3	Between 30 and 100 covers or medium sized takeaway.	Restaurant will seat 30-40 and operate as a small takeaway.
Cooking Type (Odour and Grease Loading)	High	7	Kebab, Vietnamese, Thai or Indian.	The most odorous food that the restaurant may provide is Lebanese or Thai.
Overall Risk Rating	**High**	**30**	**High level of odour control required.**	

3 Proposed Odour Abatement

3.1.1 The proposed kitchen extract system has been designed by Dane-Tec Catering & Fabrication Ltd and is shown in **Figure 2.**

Coarse Filtration

3.1.2 The extract canopy located above the cooking unit will be fitted with washable grease baffle filters. Grease laden air passing through the filter is forced through direction and velocity changes, depositing grease on the vanes, which is then drained from the filter. Baffle filters have a grease removal efficiency of 65-80%.

Pre-Filter

3.1.3 The coarse filtration provided by the baffle filters will be followed by a disposable filter system. Pre-filters would have a typical grease removal efficiency of between 65% and 90%.

Activated Carbon Filtration

3.1.4 The pre-filter protects the proposed modular activated carbon filtration stage from grease contamination. The activated carbon will remove odorous components from the ventilation air through adsorption. Carbon filters typically have an odour removal efficiency of up to 95% under optimum conditions.

Extract System Flue

3.1.5 The final stage of odour abatement is the discharge of the ventilation air via a flue. The kitchen extraction flue will be located above the roof eaves towards the rear of the building. The flue will be fitted with a high velocity cowl to ensure optimum dispersion.

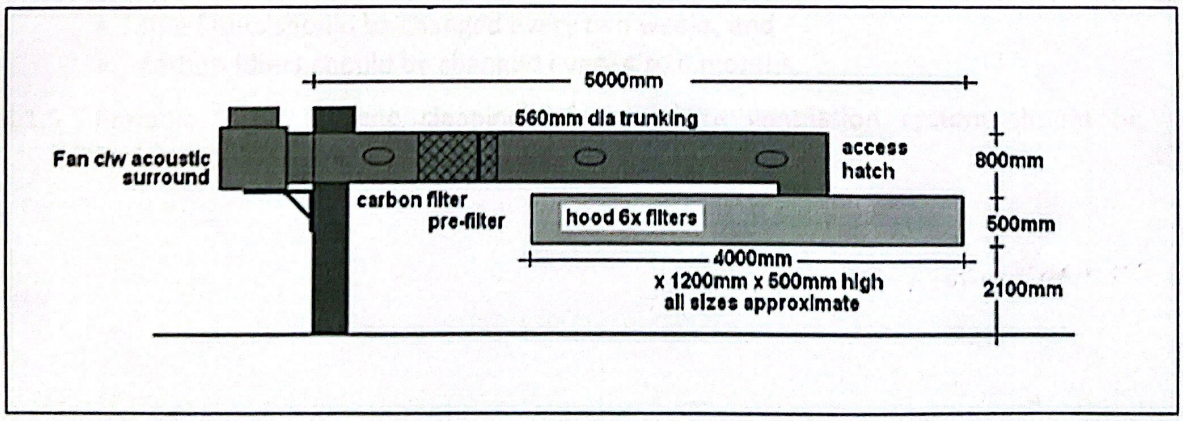


Figure 2: Proposed Extract System

4 Odour Mitigation

4.1.1 The odour risk assessment has identified that the restaurant and takeaway will require a high level of odour control (see **Table 6**). The Defra guidance includes minimum requirements to achieve a high level of odour control as follows:

1. Fine filtration or electrostatic precipitator (ESP) followed by carbon filtration (carbon filters rated with a 0.2 - 0.4 second residence time).
2. Fine filtration or ESP followed by UV ozone system to achieve the same level of control as 1.

4.1.2 The installed odour abatement meets the requirements for a high level of odour control and no further odour controls should be required.

4.1.3 The extract flow rate of the system should be sufficient to ensure a capture velocity at the extract canopy appropriate to the type of cooking to be undertaken. An adequate capture velocity will also help prevent untreated odour emissions due to leakage from the building, i.e. through doors and windows. Any adjustments to the flow rate of the ventilation air will need to take account of the residence time requirements of the carbon filtration system.

Installation and Maintenance

4.1.4 Regular maintenance of the ventilation system is essential to ensure that it operates effectively, and continues to provide adequate mitigation against odour nuisance. The Defra guidance provides recommended cleaning schedules for ventilation systems as follows:

- cooker hoods should be cleaned daily;
- the minimum cleaning period for baffle filters should be weekly;
- ductwork (moderate use – 6-12 hours/day) should be cleaned every six months;
- fine filters should be changed every two weeks, and
- carbon filters should be changed every 4 to 6 months.

4.1.5 Periodic 'deep hygiene cleaning' of the entire ventilation system should be undertaken by a specialist contractor.

5 Conclusions

5.1.1 The odour risk assessment has identified that the restaurant and takeaway would have a high risk rating with regard to odour effects.

5.1.2 The installed odour abatement system consists of coarse, fine and activated carbon filters and discharges at a high level through a high velocity cowl. The proposed system meets the requirements for a high level of odour control and no further abatement should be required.

5.1.3 It is judged that there will not be a significant risk of odour effects from the restaurant and takeaway and there should be no constraints to the use of the site as a restaurant and takeaway, with regard to odour.

6 References

Defra (2005) *Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems*.

IAQM (2014) *Guidance on the Assessment of Odour for Planning*.