

Kitchen Odour Risk Assessment

172 Oxford Road, Reading

July 2020

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1. Introduction

- 1.1 Phlorum Ltd has been commissioned by Rammurti Design Ltd to undertake a kitchen odour risk assessment (KORA) to assist in the prior approval planning application (Ref: 200403) for the change of land-use class from office use (A2) to a small Indian restaurant (A3), at 172 Oxford Road, Reading (RG1 7PL).
- 1.2 A prior approval planning application was submitted in May 2020, but was then removed following a request from Reading Borough Council (RBC) that the application must include an odour assessment. This KORA should identify whether odour emissions from the proposed restaurant could cause nuisance to nearby sensitive receptors, and whether such risks can be sufficiently reduced using appropriate odour abatement technology.
- 1.3 This assessment provides guidance on what an appropriate level of mitigation might comprise, based on the identified level of risk, to limit odour risks associated with a new restaurant.
- 1.4 This scope of assessment was agreed with RBC Technical Officers in July 2020. It was also requested by RBC that the recommendations from this KORA should not conflict with those made by the appointed consultants that are dealing with noise issues.

2. Kitchen Odour Risk Assessment

Methodology

- 2.1 Defra provides guidance¹ on the determination of the odour impact risk from commercial kitchens. The guidance also outlines the level of mitigation that might be required to reduce the risk to an acceptable level. Whilst this guidance has been withdrawn (due to the onus for provision of environmental guidance being shifted from the government to industry), it still provides a framework from which the likely odour risk can be determined. EMAQ+ have produced an amendment to this guidance² which has also been referred to in this KORA.
- 2.2 Across both guidance documents, the odour risk impact is determined as a function of:
- 👁 dispersion characteristics;
 - 👁 proximity of sensitive receptors;
 - 👁 cooking type; and
 - 👁 the size of kitchen.
- 2.3 The odour risk assessment scoring matrix is set out in Table 2.1 below.

Table 2.1: Odour Risk Assessment Scoring Matrix

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 10 m.s ⁻¹ .
	Moderate	10	Discharging 1 m above eaves at 10-15m.s ⁻¹ .
	Good	5	Discharging 1 m above ridge at 15m.s ⁻¹ .
Proximity of receptors	Close	10	Closest sensitive receptor less than 20m from Kitchen discharge.
	Medium	5	Closest sensitive receptor between 20 and 100m from kitchen discharge.

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

2 EMAQ+ (2018) Amendment to Defra (2005). *Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems*

Criteria	Score	Score	Details
	Far	1	Closest sensitive receptor more than 100m from kitchen discharge.
Size of kitchen	Large	5	More than 100 covers or large sized take-away.
	Medium	3	Between 30 and 100 covers or medium sized take away.
	Small	1	Less than 30 covers or small take-away.
Cooking type (odour and grease loading)	Very high	10	Pub (high level of fried food), fried chicken, burgers or fish & chips. <i>Middle Eastern or any premises cooking with solid fuel.</i>
	High	7	Vietnamese, Thai, Indian, Japanese, Chinese, Steakhouse.
	Medium	4	Cantonese, Italian, French, Pizza (gas fired)
	Low	1	Most pubs (no fried food, mainly reheating and sandwiches etc, tea rooms.

- 2.4 Once the total score has been determined, the odour impact risk, and the level of odour control required to negate that risk, can be identified from the matrix in Table 2.2, below.

Table 2.2: Odour impact risk and control requirement level

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

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- 2.5 It is understood that the proposed development comprises a change in land-use class from A2 office to A3 restaurant. The restaurant seating area will be located at the front of the building facing Oxford Road, with kitchen and storage areas to the rear. High sensitivity residential receptors would be located adjacent to and above the restaurant, within 20m of the kitchen exhaust stack.

- 2.6 Food will be served at the restaurant between 12:00 and 23:00 daily, with peak periods at lunchtime and between 19:00 and 23:00. The restaurant capacity would be up to 30 covers.
- 2.7 The restaurant would specialise in Indian cuisine and would utilize specialist equipment, including a Tandoor, when cooking. Though encased, the Tandoor would rely on solid cooking fuels, such as charcoal, which are often associated with heavy particulate smoke loading.
- 2.8 Furthermore, one of the combustion products commonly associated with solid fuel burning in commercial kitchens is carbon monoxide gas. Given the high toxicity of carbon monoxide, advice published in the Health and Safety Executive's (HSE's) guidance^{3, 4} must be followed when using such cooking appliances.
- 2.9 The KORA for the restaurant is set out below in Table 2.3.

Table 2.3: Odour impact risk for this Restaurant

Criteria	Score	Score	This Restaurant
<i>Dispersion</i>	Moderate	10	A high velocity kitchen exhaust stack is proposed to be located approximately 1m above the eaves of the building, but below the ridge.
<i>Proximity of receptors</i>	Close	10	Residential receptors are located above and adjacent to the property, within 20m of the exhaust stack.
<i>Size of kitchen</i>	Small	1	The restaurant provides up to 30 covers.
<i>Cooking type (odour and grease loading)</i>	Very high	10	This is an Indian Restaurant, cooking primarily spicy, oily foods and the use of a charcoal-fuelled Tandoor.
Score			31

- 2.10 Based on the proposed ventilation strategy, odour emissions from the restaurant are considered to present a *High Impact* odour risk.

Mitigation and Recommendations

- 2.11 With regards to reducing odour concentrations before they are released from the exhaust stack, a *High Level* of odour abatement equipment should be installed.

3 HSE (2016). Catering Information Sheet No 26: Preventing exposure to carbon monoxide from use of solid fuel appliances in commercial kitchens.

4 HSE (2019). Solid fuel catering appliances – enforcement guidance.

- 2.12 EMAQ+ provides guidance on what a *High Level* of odour mitigation might include:

- "1. Fine Filtration or 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."*

Note: ESP = Electrostatic Precipitation, used to separate solid or liquid particles from the ventilation air.

- 2.13 Currently, the restaurant's proposed extraction system comprises an extract canopy complete with three grease filters, which will be located directly above the Tandoor. It is noted within HSE's guidance³ that the canopy should be sufficiently close to the cooking emissions to effectively collect them.
- 2.14 The grease filters feed into a spiral ductwork which transfers extracted air from the canopy to the roof-level high-velocity exhaust stack. Within the ductwork there will be an ESP unit, an activated carbon filtration unit and kitchen extract fan, fitted with noise attenuators. It is assumed that all ductwork and ventilation plant will comply with the requirements of appropriate HSE guidance.
- 2.15 EMAQ+ guidance advises that the carbon filtration unit be rated with a residence time between 0.2 and 0.4 seconds. Following this, the full extraction system is anticipated to meet EMAQ+ odour abatement requirements.

3. Conclusion

- 3.1 Phlorum Ltd has been commissioned by Rammurti Design Ltd to undertake a kitchen odour risk assessment (KORA) to assist with the prior approval planning application (Ref: 200403) for the proposed Indian restaurant at 172 Oxford Road, Reading.
- 3.2 The KORA has been undertaken in line with EMAQ+ Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems and has identified that this restaurant requires a *High Level* of odour control, notably due to the type of cuisine and proposed utilisation solid-fuel cooking techniques.
- 3.3 Currently, the proposed restaurant kitchen extract system comprises: three grease filters within the extraction canopy; an ESP unit; an extract fan; carbon filtration unit; and a high velocity exhaust stack above roof eaves. Following EMAQ+ guidance, the restaurant is anticipated to meet EMAQ+ odour abatement requirements.
- 3.4 Following implementation of the *High Level* of odour control measures discussed herein, the risk of odour impact from this restaurant will be minimised and it would be considered compliant with the recommendations of the relevant guidance.



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