

Kitchen Odour Risk Assessment

105 Field End Rd, Eastcote

April 2020

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1. Introduction

- 1.1 Phlorum Ltd has been commissioned by Argent Architects to undertake a kitchen odour risk assessment (KORA) to assist in the retrospective planning application (Ref: 21404/APP/2018/3693) for the installation of ventilation and heating plant at Lahore Eastcote, an Asian restaurant, at 105 Field End Road, Eastcote, Pinner (HA5 1QG). This follows concerns from the London Borough of Hillingdon (LBH) regarding the current odour abatement strategy at the restaurant.
- 1.2 The proposals approved in the planning application were for extensions and alterations to the existing restaurant, providing that the conditions listed in the planning decision notice could be discharged.
- 1.3 The odour-based concerns raised by LBH regard a complaint from a nearby resident on a recently installed kitchen flue system. The flue connects to the extraction canopy hood cover over the cooking hob and grill of the restaurant, which specialises in Asian cuisine. The flue's point of termination is at the same elevation as occupants of the dwellings above the restaurant. As such, the concern is that these occupants might sometimes be affected by odours released from the flue.
- 1.4 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 the new flue system.

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 Whilst this guidance has been withdrawn, it still provides a framework from which the likely odour risk can be determined.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

Kitchen Odour Risk Assessment

- 2.5 It is understood that Lahore Eastcote is currently operational at the site. The restaurant seating area is located at the front of the building facing the main road, with kitchen, storage and yard to the rear. No details have been provided regarding the type of kitchen equipment used, but the restaurant specialised in spicy and oily Asian cuisine. Food is served at the restaurant between 12:00 and 00:00 daily, with peak periods between 19:00 and 21:00 on Friday and Saturday. The restaurant capacity is 75 covers.

2.6 The KORA for the restaurant is set out below in Table 2.3.

Table 2.3: Odour impact risk for Lahore Eastcote

Criteria	Score	Score	Lahore Eastcote
<i>Dispersion</i>	Very Poor	20	The three-phase inverter fan odour extraction system at the restaurant comprises a Flakt Woods 560MM JM extract fan unit (56 MaXfan Compac). The discharge Velocity of one of these fans alone is 5.2m.s^{-1}. However, as this is a 'three-phase' system, the discharge rate towards the termination points is suspected to be closer to 15m.s^{-1}. The flue discharges above the ridge of the 1st floor, but the site has a tiered elevation, so the flue is also discharging below the rooftop of the 2nd floor residences. Furthermore, although the stack discharges vertically, it is capped by a conical cowl hood which could limit vertical dispersion. As such, dispersion is considered to be very poor.
<i>Proximity of receptors</i>	Close	10	Residential receptors are located above and adjacent to the property, within 10m.
<i>Size of kitchen</i>	Medium	3	The restaurant provides up to 75 covers.
<i>Cooking type (odour and grease loading)</i>	Very high	7	This is an Asian Restaurant, cooking primarily spicy oily foods.
			Score
			40

2.7 Based on the current ventilation strategy, odour emissions from Lahore Eastcote are considered to present a *Very High* Impact risk.

Mitigation and Recommendations

2.8 The two general mitigation measures most appropriate to this KORA are to improve odour dispersion and reduce odour concentrations before dispersion.

- 2.9 Currently, the vent designers consider it likely that the discharge velocity is close to 15m.s^{-1} , which is considered appropriate for odour dispersion. However, it is also recommended that the kitchen extraction system vents vertically, to further force the discharging plume out of the wake of nearby residences. The stack's cowl could be restricting vertical dispersion, so it is recommended that this be removed and the design altered accordingly. Further discussion and examples of best practice stack designs are displayed in Appendix A and provided by EMAQ+ guidance²
- 2.10 Furthermore, the stack's position and height could be altered in line with best practice measures – the termination point should be at least 1m above the eaves of the building and away from any nearby windows. This should allow for considerably better odour dispersion.
- 2.11 Following at least one of these recommended measures, the odour impact risk should reduce to *High*, rather than a *Very High* impact risk.
- 2.12 With regards to reducing odour concentration pre-dispersion, a *High Level* of odour abatement equipment should also be installed. It should be noted that if neither of the above recommended mitigation measures for effective dispersion are followed, a *Very High Level* of odour abatement would be required.
- 2.13 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."*
- 2.14 EMAQ+ also provides guidance on what a *Very High Level* of odour mitigation might include, if odour dispersion is not improved:
- "1. Fine Filtration or ESP followed by carbon filtration (carbon filters rated with a 0.4 -0.8 second residence time);*
- 2. Fine Filtration or ESP followed by carbon filtration and by counteractant/neutralising system to achieve the same level as 1;*
- 3. Fine Filtration or ESP followed by UV ozone system to achieve the same level of control as 1."*

3. Conclusion

- 3.1 Phlorum Ltd has been commissioned by Argent Architects to undertake a kitchen odour risk assessment (KORA) to assist with the retrospective planning application (Reference: Ref: 21404/APP/2018/3693) for the flue extraction system at 105 Field End Rd, Eastcote.
- 3.2 Concerns have been raised by the London Borough of Hillingdon regarding odours emitted from the Asian restaurant, Lahore Eastcote, with odours discharging from a flue in close proximity to nearby residences. A complaint has been received by one of these residents.
- 3.3 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 Lahore Eastcote requires a *Very High Level* of odour control. If they can make the necessary adjustments to improve odour dispersion from the stack, as discussed in Sections 2.9 and 2.10, the required level of odour control would instead be *High*.
- 3.4 Currently, Lahore Eastcote comprises a baffle-type grease filter. Following EMAQ+ guidance, Lahore Eastcote is likely to require at least a *High Level* of odour mitigation measures, as discussed above.
- 3.5 Following implementation of the odour mitigation measures discussed herein, the risk of odour impact from Lahore Eastcote will be minimised and it is considered unlikely to significantly impact the amenity of surrounding dwellings.

Appendix A – Stack Dispersion

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Good stack design requires adequate stack height and dispersion velocity. The effective stack height can be estimated using the below equation, provided in EMAQ+ and Defra's *Control of Odour and Noise from Commercial Kitchen Exhaust Systems*²:

$$\Delta H = 3W.d/U$$

where,

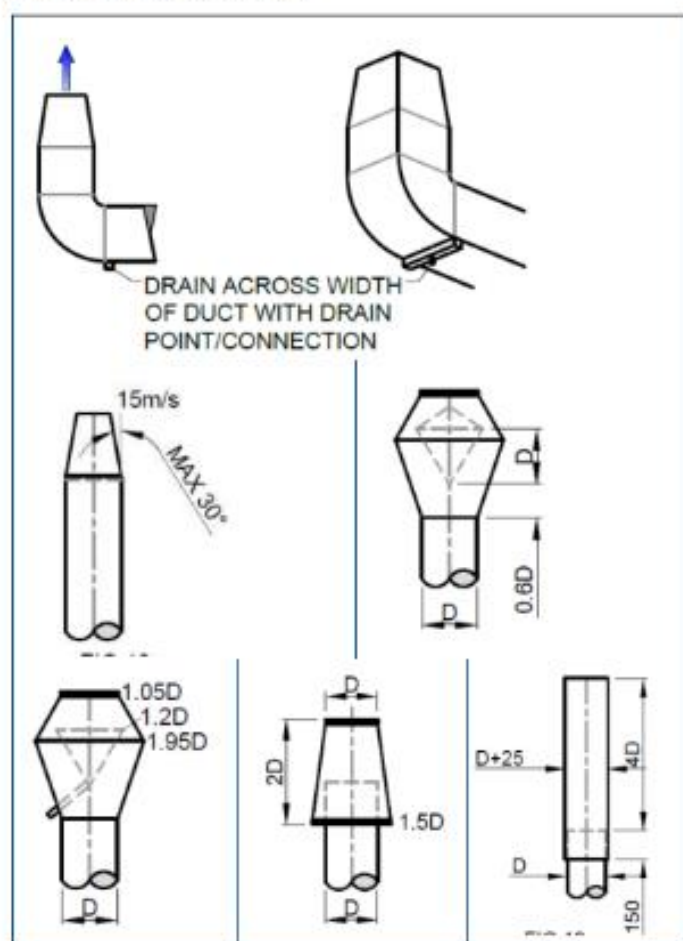
W (m/s) is the efflux speed at the chimney top

U (m/s) is the wind speed at the height of the stack

d (m) is the internal diameter of the stack

Examples of best practice stack design are included in Figure 17 of the guidance document, and shown below.

Figure 17: Examples of best stack design





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