

1. INTRODUCTION

This document has been prepared to provide details of the Hotel/Restaurant Kitchen Ventilation.

2. PLANNING CONDITION 22 : Fumes, Vapours and Odours

Final details of the method of extraction of any fumes, vapours and odours from the hotel/restaurant kitchen shall be submitted to and approved in writing by City Council as local planning authority prior to commencement of those uses. The details of the approved scheme shall be implemented prior to occupancy and shall remain in situ whilst the use or development is in operation.

3. INFORMATION ON PREMISES PLANS AND DRAWINGS

The kitchens are designed to cater for up to 400 meals per day. The food preparation is completed on site and comprises general hotel catering.

The kitchen is located within Ground Floor level of the Building and it is proposed that it will be mechanically ventilated and provided with ductwork systems designed in accordance with DW/172, DW 144 and EMAQ(2018) guidelines.

The Kitchen layouts are attached along with floor plans for information. The kitchen extract will terminate at 16th floor roof level.

Please refer to the attached ground floor ventilation drawing 3919-M300(Ground Floor) Ventilation indicating the location of the kitchen & the ductwork routes serving the kitchen.

Please refer to the attached drawing 3919 -M301 (Mezzanine) Ventilation for location of kitchen Air Handling Unit & continuation of supply ductwork serving the kitchen.

Please refer to the attached drawings 3919-M302 (level 1) , 3919-M303 (level 2-6), 3919-M304 (level 7-11), 3919-M305 (level 12-15) for continuation of the kitchen extract ductwork throughout the building.

Please refer to the attached drawing M3919-M306(level 16) Ventilation for location of kitchen extract fan & termination of kitchen extract ductwork, also attached is the architects site plan(10227-A-G200-PL-RF-001) indicating the proximity of the extract discharge point to the surrounding areas .

4. CANOPY

It is proposed that extract canopy with full length extract plenums fitted with stainless steel baffle type grease filters will be provided in the kitchen. The canopies are to be constructed from grade 304 satin finish stainless steel with all joints and seams welded and/or liquid tight. Removable stainless steel Teflon coated grease collecting drawers are to be provided within the apron of the filter housing.

A full-length, integral, fully insulated make-up-air plenum is to be incorporated inside the front face of the canopies, parallel to the grease filters, with removable, perforated plate diffusers in the outer face.

It is proposed that the supply air plenums are to have internal baffle plates to ensure even air discharge across the outer faces. The canopy is to be fitted with welded hanging cleats to each corner and pre-drilled to accept M10 drop rods. The supply air from the canopies will be supplemented by ceiling mounted grilles connected by ductwork to the dedicated kitchen supply ventilation system that also serves the canopy supply air plenum.

The canopy is to conform fully to the standards and specifications of HVCA Specification for Kitchen Ventilation Systems DW172. The grease filters are to comply with the requirements of LPS 1263. The canopy will overhang the appliances by 300mm.

The Canopy is fitted with baffle filters. The Baffle filters are sized based on the extract capacity of the kitchen which will vary between 3 and 4 m³/sec.

Please refer to the attached kitchen canopy manufacture drawing(0929- Maldron Manchester- Rev C- Canopy Layout) for further details of the kitchen canopy & baffle filter numbers & locations.

5. KITCHEN EXTRACT SYSTEM

It is proposed that each kitchen will be served by single roof mounted extract system. Attenuators will be provided to ensure noise from the plant is in-line with the planning conditions.

It is proposed that the kitchen extract ventilation will terminate vertically to discharge the exhaust air from the kitchen with an efflux velocity of 10 - 15 m/s.

The fan will be selected with a 10% pressure margin over and above the design resistance and the motor will be IP55 rated.

The proposed extract fan will be mounted on a Big-Foot or similar load spreading pad system complete with high deflection anti-vibration mounts with 95% isolation efficiency at the lowest potentially intrusive audio frequency (20 Hz). The proposed platform will be supported on the roof from the most significant structural element available (e.g. beams and columns). The platform will also incorporate a mass element such as paving slabs which will act to stabilise the platform and

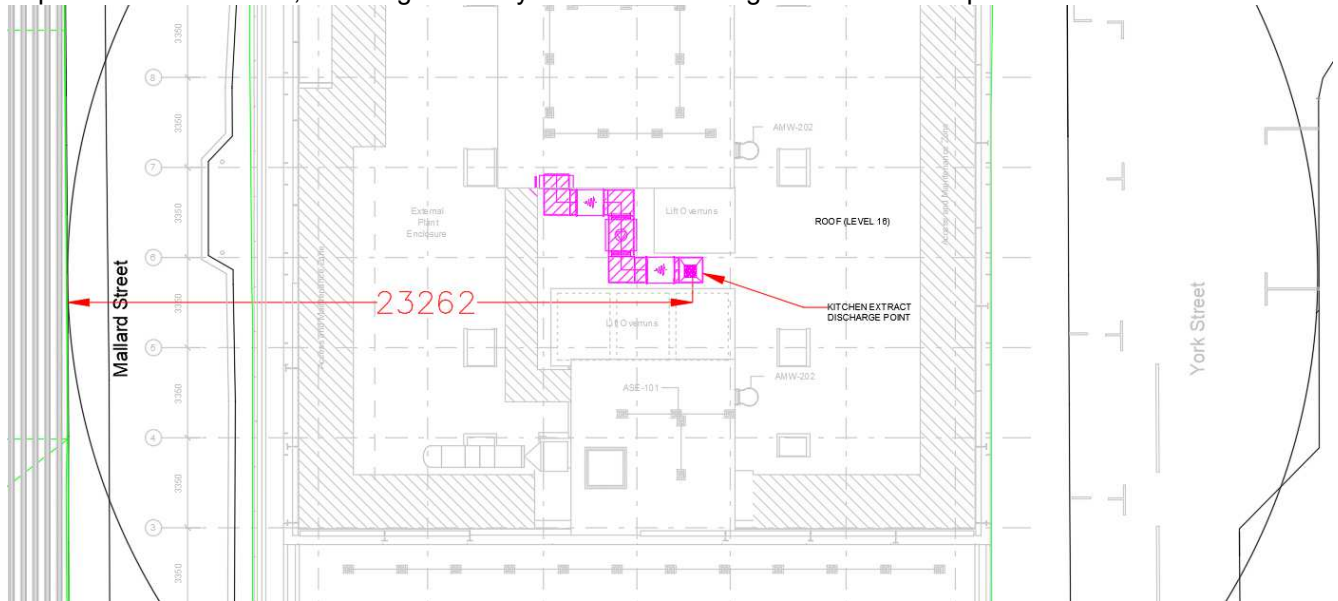
Ground Floor kitchen 4.06m³/sec extract Flow rate.

The final discharge of the kitchen extract ductwork will be in excess of 1.0 m above roof level

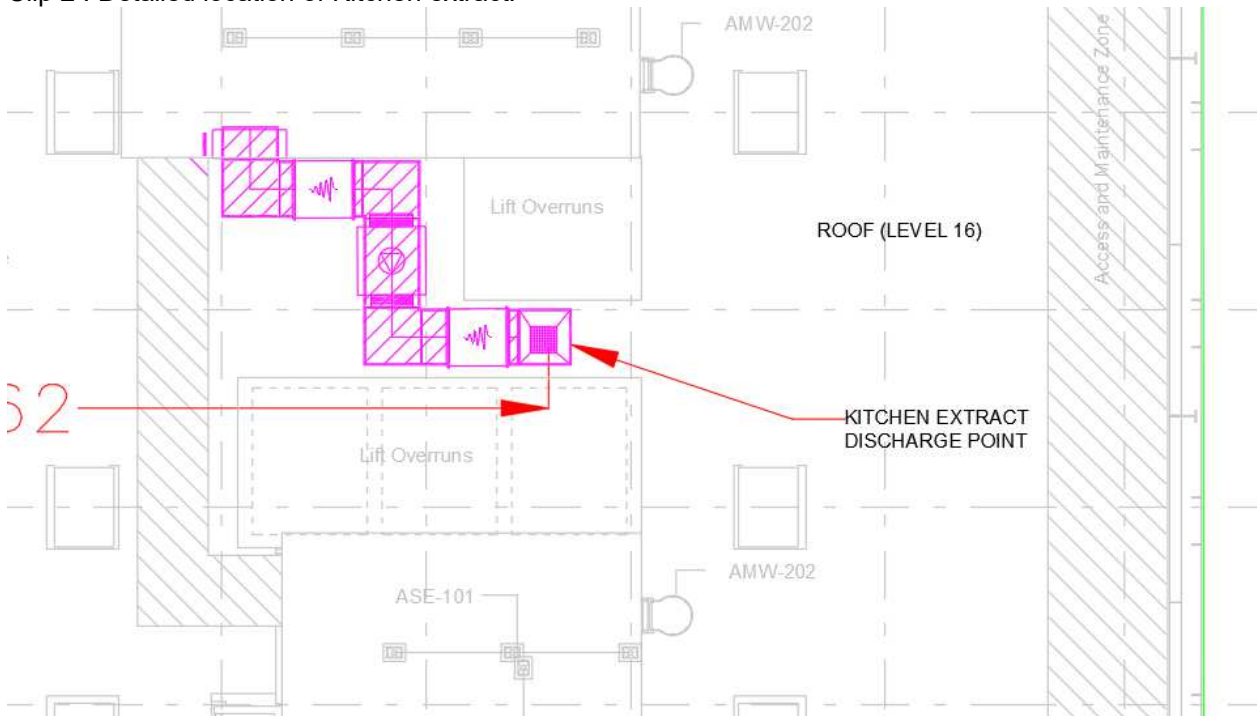
Please refer to clip 1 & 2 detailing the site location. Location of kitchen extract on roof & proximity of extract discharge to nearest building.

Please refer to clip 3 detailing the complete horizontal & vertical distance to the closest receptor. The complete drawing is attached for reference (3919MSK- 20)

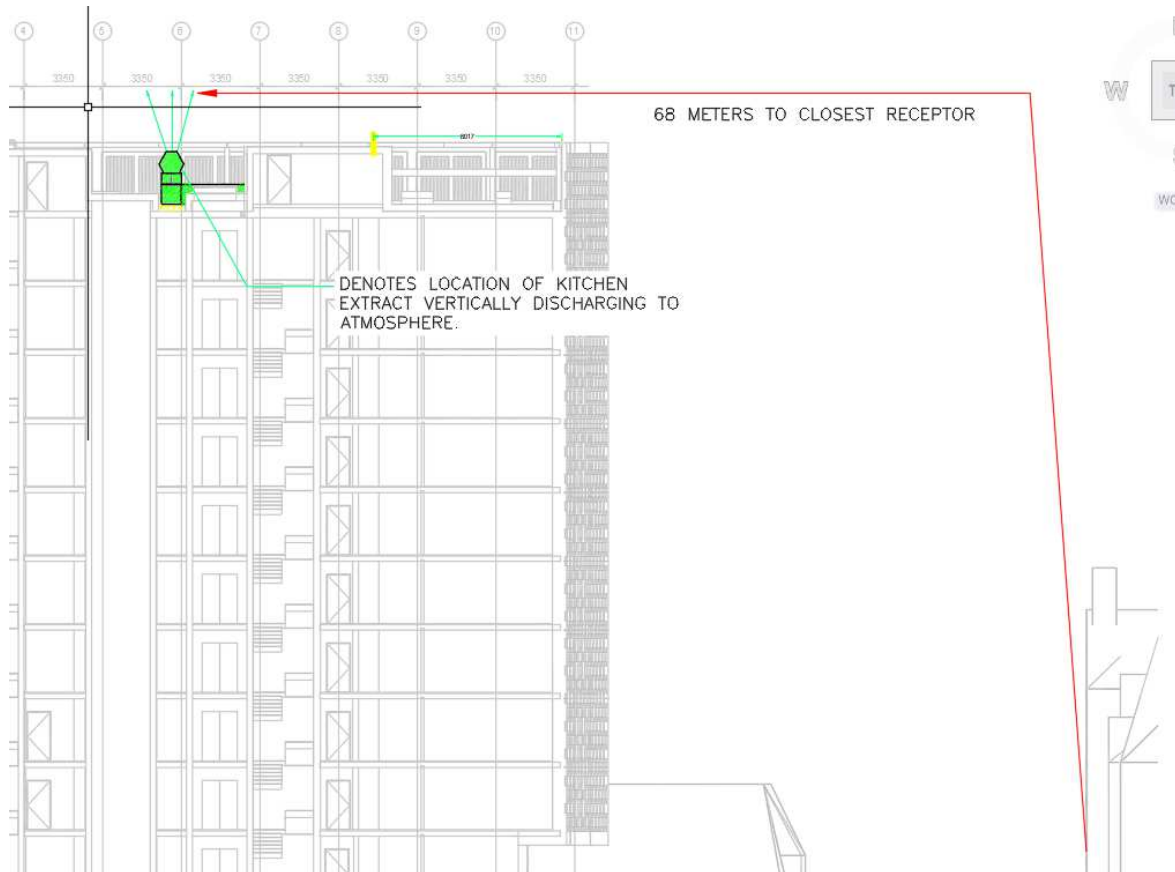
Clip No 1 : Site Location, Detailing Proximity of Extract Discharge to closest Receptor.



Clip 2 : Detailed location of Kitchen extract.



Clip 3 : Section view detailing the horizontal & vertical distance to the closest receptor.



6. KITCHEN SUPPLY SYSTEM

Supply ventilation will be designed to meet 85% of the extraction rate, therefore maintaining negative pressure within the kitchen and preventing any smells from escaping the kitchen envelope. It is proposed that the supply air system is installed in accordance with DW172, Section 6 and incorporate all the necessary interlocks in accordance with BS6173.

It is proposed that the kitchen supply air is tempered by means of an air handling unit with low temperature hot water and refrigerant DX cooling batteries complete with food grade air filtration located at roof level. Supply air is to be ducted from the air handling unit to the kitchen.

The supply fan will be mounted using anti-vibration mounts and provided with flexible connections on either side to minimise noise and vibration transmission to the structure.

7. ODOUR AND GREASE

Given the location of the kitchen extract terminal, proximity of receptors, dispersion, the kitchen size and cooking type, is has been determined based upon *Appendix 3: Risk Assessment for Odour* contained within *EMAQ(2018) Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems*, that the impact risk is in the low bracket, as detailed in the risk assessment below :

The extract from the EMAQ gives an example of scoring for a Pub(Item 1 ,example 2). I believe the kitchen at the Maldron Hotel replicates this scoring, as the pub is **cooking a range of food types** within a large kitchen again similar to the Maldron Hotel.

The pub's proximity of receptors scoring replicates that of the hotels proximity of receptors i.e between 20 & 100meters from the kitchen discharge(see item 3,Proximity of receptors medium = 5) please also refer clip No.3 & attached drawings 3919- MSK20.

Item 3. Represents the scoring system on the EMAQ guidance, I have carried out a revised risk assessment based on the above & below findings :

Dispersion = **5** Discharging 1 m above ridge at 15/ms
 Proximity of receptors = **5** Closest sensitive receptor between 20 and 100m
 Size of Kitchen = **5** More than 100 covers or large sizes takeaway.
 Cooking type = **4** (Medium) cooking a range of foods

Total = **19** Low level odour control requirement.

*Please refer to item 2 for the impact risk scoring impact risk scoring.

With grease filters included in the canopy, ducting the kitchen extract to roof level (16th floor), discharging at a high velocity (greater than 15m/s) greater than 20m from the nearest receptor, & taking into consideration the findings & case examples noted above, we are at a low level of odour control, Therefore, we do not feel there is a requirement for additional filtration/odour control measures.

Item 1.

Example application of scoring procedure for four different cooking situations

Example	Dispersion	Proximity of receptors	Size of Kitchen	Cooking Type	Total Score
1. Small Indian restaurant	20	10	1	7	38
2. Pub	5	5	5	4	19
3. Medium sized French restaurant	15	10	3	4	33
4. Large burger restaurant	10	10	5	10	35

Example 1 Represents a small Indian restaurant with the kitchen ventilation extract discharging into a small court yard.

Example 2 Represents a traditional pub cooking a range of food types with the kitchen ventilation extract discharging at roof ridge. The pub is located in a rural location with the closest receptors 25 m away.

Example 2 is a location where the risk of problem occurring due to this type of cooking activity is low to medium. Based on this assessment approach the emissions from these restaurants will need a low to medium level of odour control to prevent nuisance.

Item 2.

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

* based on the sum of contributions from dispersion, proximity of receptors, size of kitchen and cooking type:

Item 3. EMAQ – Scoring Criteria.

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.
	Moderate	10	Discharging 1m above eaves at 10 -15 m/s.
	Good	5	Discharging 1m above ridge at 15 m/s.
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.
	Far	1	Closest sensitive receptor more than 100m from kitchen discharge ¹ .
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 ¹ .
Cooking type (odour and grease loading)	Very high	10	Pub (high level of fried food), fried chicken, burgers or fish & chips. <i>Turkish, Middle Eastern or any premises cooking with solid fuel</i>
	High	7	<i>Vietnamese, Thai, Indian, Japanese, Chinese, steakhouse</i>
	Medium	4	<i>Cantonese, Italian, French, Pizza (gas fired),</i>
	Low	1	<i>Most pubs (no fried food, mainly reheating and sandwiches etc), Tea rooms¹</i>

8. DUCTWORK

Access for cleaning the kitchen extract ductwork will be provided at 3.0 meter intervals on horizontal runs, all in accordance with section 25 of HVAC publication TR/19.

All ductwork shall be low pressure class A and be in accordance with DW/172 and DW/144

The kitchen extract ductwork will be routed via the kitchen ceiling void and a dedicated riser shaft to the roof. All ductwork will be suitably fire rated along its entire length in accordance with BS3476 part 24 and BS9999.

The supply ductwork is to be insulated along its length to minimise the risk of condensation during periods of cold weather.

Both the supply and extract ductwork will be supported using isolation hangers on all points of support.

SIGNED*Dermot Mc Laughlin*

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