



Project:
Premier Inn & Thyme Restaurant – Manchester Piccadilly

Document:
Kitchen Ventilation Strategy – Issue 01

Client:
Whitbread

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Executive Summary

This Odour Control strategy report produced by Thornley & Lumb Partnership details how the Odour Control strategies operate, the equipment provided and how each system complies with relevant regulations.

It has been carefully assessed to ensure that the existing environment can coexist with the proposed Thyme Restaurant. With this in mind the ventilation strategies for the development have been carefully designed to ensure minimal impact on its surroundings and beyond the boundary of the site.

The report will detail and give relevant information and guidance on the canopy design, including the supply and extract ventilation rates / plant details and how to control and stop any issues which may arise from this installation i.e odour and noise issues. It also gives requirements and the installation of the ductwork and access for cleaning.

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1. INTRODUCTION

Premier Inn are the UK's largest hotel brand and they aim to grow their business significantly as part of their 'ambitious growth plan' set to increase the number of Premier Inn bedrooms in the UK from 59,000 to 85,000 by 2020.

The proposed hotel will consist of a 129-bedroom hotel with a Thyme restaurant situated on the first floor of the hotel for hotel and public use.

This report has been prepared to provide details of the kitchen restaurant ventilation systems to support planning applications for the Premier Inn Bristol Avonmouth. These will be submitted to Manchester City Council which will follow the guidance in the Town and Country Planning Act 1990 and Town and Country Planning (Development Management Procedure) (England) Order 2015

It will also be compliant with the guidance on Control of Odour and Noise from Commercial Kitchen Exhaust System.

Problems associated with nuisance odour and noise emissions from commercial kitchen exhausts are very common, particularly in urban areas. Responsibility for the enforcement of statutory controls available to Local Authorities is shared between a number of regulatory functions: -

- An authority's Building Control Officer would usually handle building Regulation requirements relating to the structural safety of installations such as high exhaust flues.
- Planning issues relating to new premises, and to the acceptability and positioning of new ventilation systems that involve the provision of a large flue, are likely to require planning consent. The application for which would be submitted to the Local Planning Authority or the Planning Service in the Department of the Environment in Northern Ireland.
- Environmental Health Officers providing advice on the odour and noise control aspects of any planning application to the Planning Officers.
- Environmental Health Officers/Technical Officers would deal with any complaints of statutory nuisance arising from the smell or noise of a kitchen extraction system.

2. DEVELOPMENT DESCRIPTION

The proposed hotel will consist of a 195 bedroom hotel with a Thyme restaurant situated on the first floor of the hotel for hotel and public use. The proposed building is located off Piccadilly, Manchester and as such will be subject to planning Conditions defined by Manchester City Council.



Figure 1 – Site Location



3. PROPOSED SCHEME

The proposed hotel will consist of a 129-bedroom hotel with a Thyme restaurant situated on the First floor of the hotel for hotel and public use.

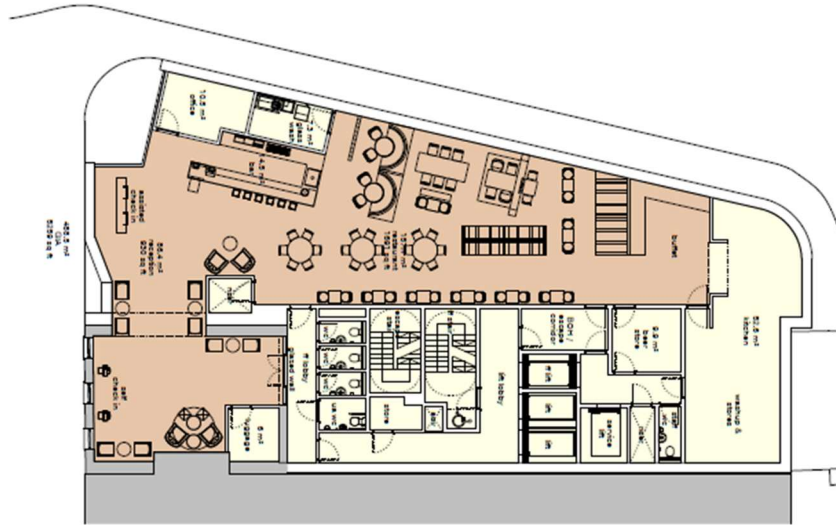


Figure 2: Image to show first floor general arrangement plan of the Hotel & Thyme Restaurant Piccadilly, Manchester.

4. KITCHEN SUPPLY & EXTRACT VENTILATION

The kitchen is located at first floor level and it is proposed that it will be mechanically ventilated and provided with ductwork systems designed in accordance with DW/172 2nd Edition, DW/144, TR/19 and DEFRA guidelines.

Hours of Operation

The system will operate for breakfast, lunch and dinner between 06.30AM and 11.00PM

Kitchen Canopy

It is proposed that a single wall type canopy (Extract & Supply) with full length extract plenums fitted with stainless steel baffle type grease filters will be provided in the kitchen. The canopy is to be constructed from grade 304 satin finish stainless steel with all joints and seams welded and/or liquid tight. Removable stainless steel grease collecting drawers are to be provided within the apron of the filter housing. A full-length, integral make-up-air plenum is to be incorporated inside the front face of the canopy, parallel to the grease filters, with removable, perforated plate diffusers in the outer face.

It is proposed that the supply air plenum is to have internal baffle plates to ensure even air discharge across the outer face. The canopy is to be fitted with welded hanging cleats to each corner and pre-drilled to accept M10 drop rods.

The anticipated total ventilation rates will be as follows:

Extract – 1.3 m³/s

Supply – 1.1 m³/s

The canopy is to conform fully to the standards and specifications of HVCA Specification for Kitchen Ventilation Systems DW172 2nd Edition. The grease filters are to comply with the requirements of LPS 1263.

Kitchen Extract

It is proposed that the kitchen will be served by a single extract system located on the Roof. Attenuators will be provided to ensure noise from the plant is in-line with the planning conditions. It is proposed that a suitable termination will be provided to discharge the exhaust air from the kitchen with an efflux velocity greater than 10m/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 provide some protection from the noise radiated from the underside of the unit.

Extract Ductwork

Access for cleaning the kitchen extract ductwork will be provided at a minimum of 1.5 meter intervals on both vertical & 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 2nd Edition and DW/144. The kitchen extract ductwork will be routed down from the roof level into the canopy connection spigots. All ductwork will be suitably fire rated where required in accordance with BS3476 part 24 and BS9999.

Odour Control

In order to determine the level of odour the site will produce, and the necessary mitigation measures needed, a risk assessment has been carried out in line with Appendix 3: Risk Assessment for Odour of DEFRA's Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems. The assessment summary is included for information.

The levels of risk are grouped in the table below.

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:

Four areas of risk as assessment to work out the score for the system which can then be correlated to the level of odour control required as detailed above.

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	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 rooms¹</i>

Based on the matrix above the results are shown in the table below.

Description	Dispersion	Proximity of Receptors	Size of Kitchen	Cooking Type	Total Score
PI & Thyme Manchester Piccadilly	Moderate (10) <i>It is proposed that the discharge termination will be 1.0m above ridge level.</i>	Close (10) <i>Closest sensitive receptor less than 20m from kitchen discharge.</i>	Large (5) 118 Cover Restaurant	Low (1) Pub	26
RESULTANT RISK					HIGH LEVEL
ODOUR CONTROL REQUIRED – HIGH LEVEL					



The Kitchen Equipment to be installed on the cook line will be generally as follows: -

- 2 x Electric Twin Pan Fryer
- 1 x Electric Chargrill
- 1 x 2 Zone Induction Top
- 1 x Rise & Fall Grill
- 2 x Electric Combination Oven

Odour Control Proposal

The following odour control measures have been proposed:-

Electrostatic Precipitators (ESP)

The ESP's have been specifically designed for kitchen extract systems; they have integral sumps to collect the oil, grease and smoke particles filtered out of the exhaust. This not only simplifies servicing but eradicates potentially dangerous spillage from the bottom of the units and greatly cuts down on build-ups of grease within the ducting.

The ionisation voltage has been designed to run at a negative potential which enhances the ionisation of particles and also produces more ozone which is helpful in reducing cooking odours.-

Key Features

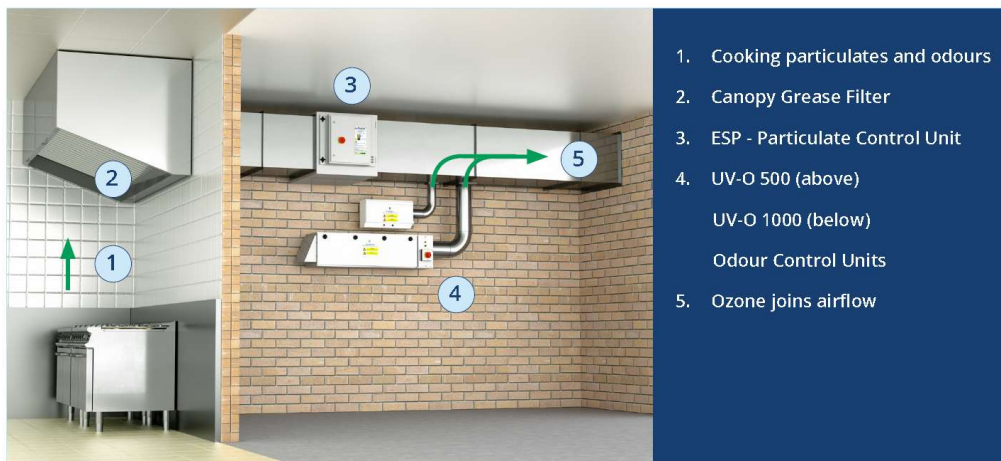
- Eliminates up to 98% of oil, grease, and smoke particles
- Filters particles down to sub-micron levels
- Produces Ozone to help reduce malodours
- Designed with an integral sump
- Modular in design
- Specifically designed for commercial kitchen application
- Energy efficient: - uses no more than 50W
- Greatly reduces grease build-up within the duct run

1 No ESP units capable of handling 1.3m³/s Total will be installed

Typical ESP Unit



Typical Installation Schematic





5. MAINTENANCE

Recommendations for Maintenance of Odour Control System include:

- System employing fine filtration and Carbon filtration:
 - Change fine filters every two weeks
 - Change Carbon filters every 4 to 6 months
- System employing ESP and other inline abatement, typically:
 - ESP systems cleaned, and sump emptied on a four weekly basis
 - Carbon Filters with ESP pre-treatment change carbon filter every 6 to 12 months
- Other maintenance recommendations:
 - The Canopy Grease Filters are washed on a daily basis
 - The Combi Steam Ovens operate a cleaning cycle on a daily basis
 - All Fans & Equipment are checked
 - All Extract ductwork from the Canopy to the riser are cleaned on a 6 Monthly Basis (Minimum)

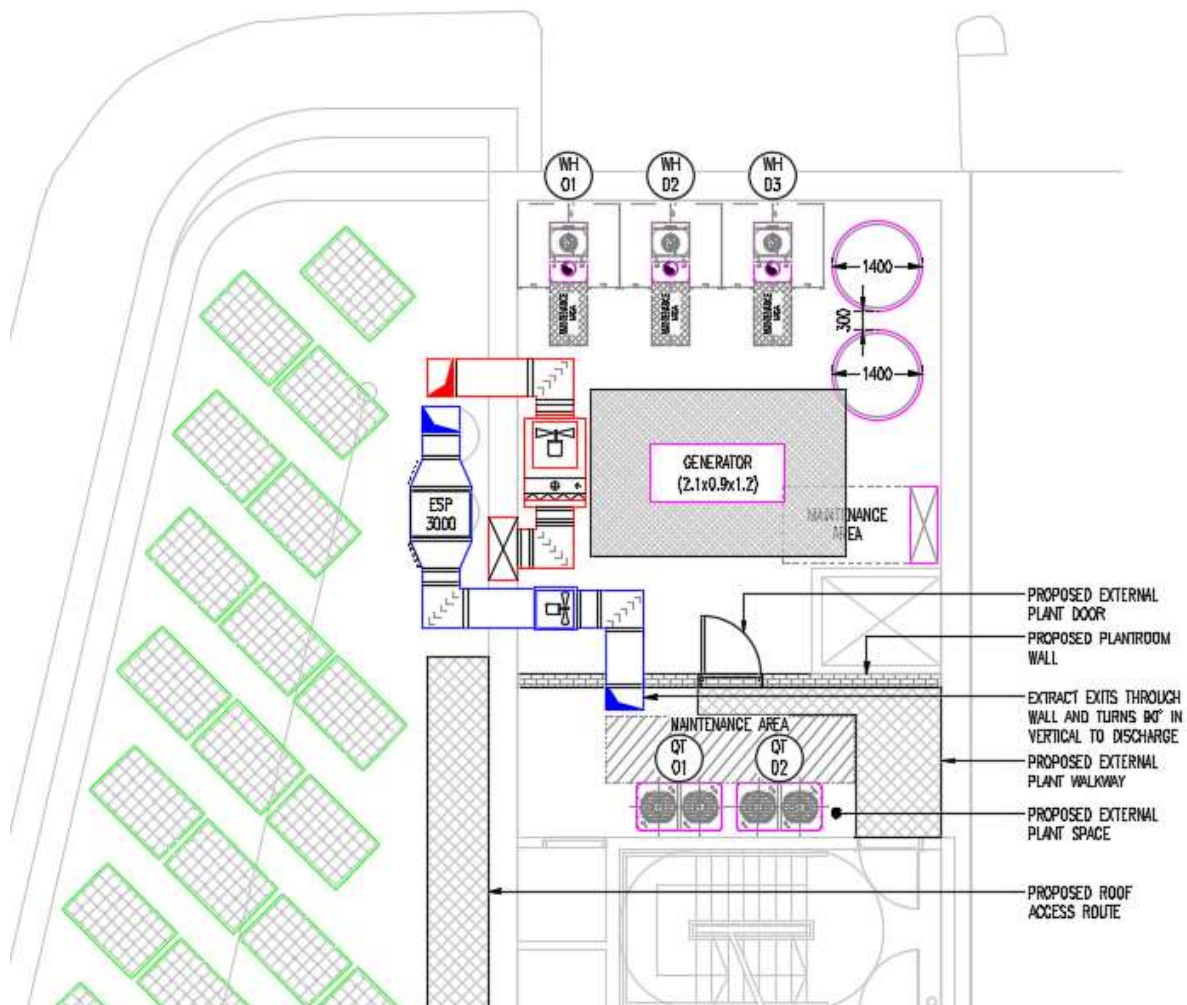


Figure 5: Proposed Roof mounted Kitchen Supply & Extract Plant serving 1F Kitchen



6. KITCHEN SUPPLY

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 into the restaurant. 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 provided by means of an air handling unit with electric heater battery and air filtration located at roof level. Supply air from the unit will run vertically to 1F level and is then ducted from the horizontally to serve the kitchen & restaurant areas.

7. VENTILATION ARRANGEMENT

For First Floor Kitchen Ventilation layout see below.

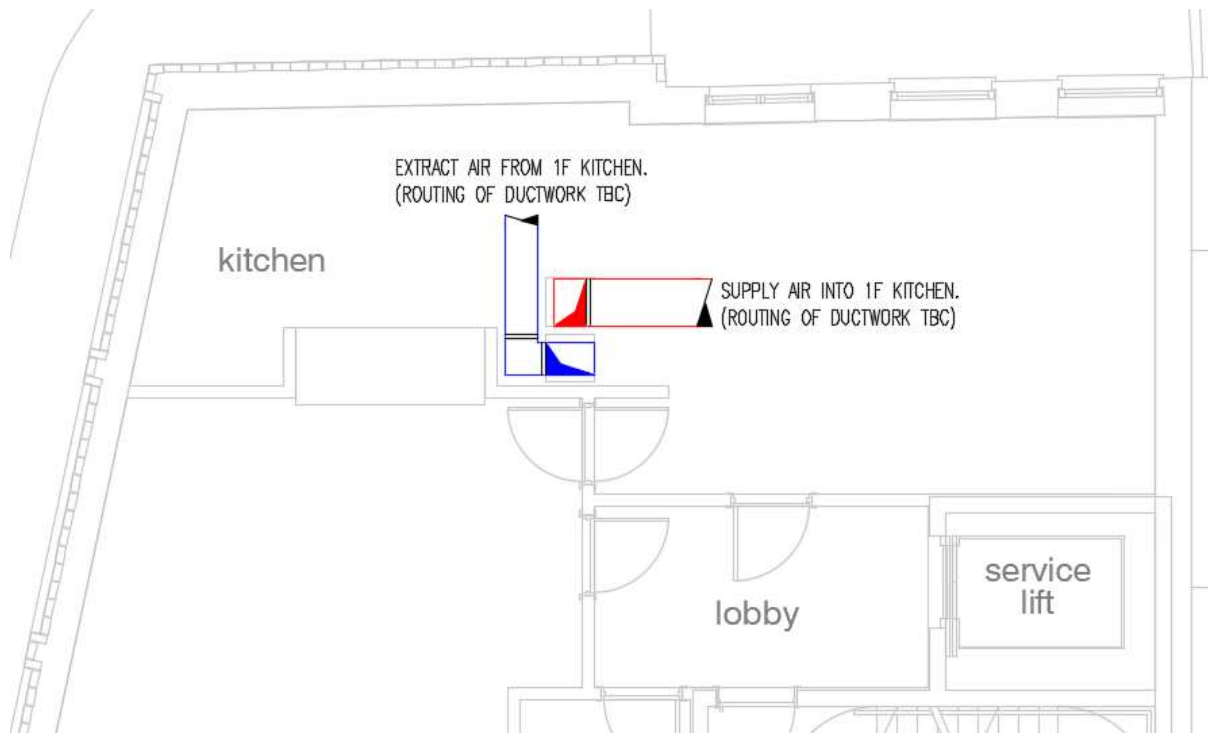


Figure 7: First Floor Kitchen Ventilation Layout.