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Building Services Engineering | Sustainability | Acoustics

Camden Stables Market, Arch 6

LabTech

Kitchen Ventilation Design Report

P1

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P0	Initial Issue for Planning	20/04/20	MB	JQ
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1 Introduction

This report outlines the extract and odour control systems (including maintenance details) operating within Arch 06 and aims to satisfy the relevant conditions of the planning permission granted in November 2019 (Ref: 2019/4574/P)

1.1 Information on Premises

Arch 6 is set within the Railway Viaduct Arches at the south east section of Camden Stables Market and comprises 5no. individual market stalls (Class A5) serving hot food for consumption off the premises. The market stalls are fully enclosed by an existing viaduct arch and are configured as open-air service counters with catering facilities provided behind. The names of the food stall operators are listed below (Table 1) together with their cooking methods and meal types.

Table 1: Arch 7 food stalls operators

Unit	Operator	Cooking method(s)	Meal type(s)
6A	Hot Pot	Deep Frying, Range oven	Chinese
6B	Pino's Warung	Induction cookers, Electric Grille	Indonesian
6C	Sweet Kitty	Crepe maker, Waffle maker	Crepes, Waffles
6D	Malaysian Seafood	Induction cooker, Range oven	Malaysian
6E	Shawarma Bar	Kebab machine, Range oven	Lebanese

The food stalls operate 7 days a week from 10am to 8pm.

1.2 Drawings

For general arrangements refer to the following plan, section and elevation drawings.

- Camden Market Arch 6 & Arch 7 - Proposed Plan (CMA6A7P001)
- Camden Market Arch 6 & Arch 7 - Proposed Elevation (CMA6A7P004)
- Camden Market Arch 6 & Arch 7 - Proposed Section AA (CMA6A7P018)

For location of fans, canopies and ductwork refer to the following typical ventilation drawing

- Ventilation Plan (China alley05_Updated_R6_18.03.2019)
- Ventilation Section (China alley05_Section_Elev3_R2_18.03.2019)

2 Risk Assessment for Odour

Odour control requirements are based on the following risk assessment.

2.1.1 Methodology

The EMAQ Guide (Control of Odour and Noise from Commercial Kitchen Exhaust Systems) advises that a risk assessment for odour to be carried for each premise to determine the level of odour control required.

The risk for each premises has been assessed using the following scoring methodology.

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

Criteria	Details	Score
Dispersion	Low level discharge	20
	< 10 m/s	15
	Between 10 m/s and 15 m/s	10
	> 15 m/s	5
Proximity of receptors	< 20m	10
	Between 20 and 100m	5
	> 100m	1
Size of kitchen	> 100 covers	5
	Between 30 and 100 covers	3
	< 30 covers	1
Cooking type (odour and grease loading)	Fried food, fish and chips	10
	Indian, Chinese, steakhouse	7
	Gas fired	4
	Mainly reheating and sandwiches	1

2.2 Arch 6 Risk Assessment

Unit	Operator	Dispersion	Proximity of receptors	Kitchen Size	Cooking Type	Total Score
6A	Hot Pot	20	5	1	7	33
6B	Pino's Warung	20	5	1	7	33
6C	Sweet Kitty	20	5	1	1	27
6D	Malaysian Seafood	20	5	1	7	33
6E	Shawarma Bar	20	5	1	7	33

All total scores are within the 20-35 range. Therefore, each unit has a 'High' impact risk and will require a 'High' level of odour control.

2.3 Discussion

The units identified with high impact risk incorporate a variety of cooking methods with moderate to high odour potential, grease content and smoke content. On this basis we have proposed an odour abatement system providing a high level of grease and odour control:

- Canopy mounted baffle type grease filters
- In-line double pass electrostatic precipitator (ESP)

This package of measures will provide a high level of odour and grease control in accordance with the EMAQ guidance.

3 Extraction Canopies

Where indicated, each commercial kitchen has been designed with an extraction system capable of maintaining the internal working environment within comfortable temperature, moisture, and air quality levels insofar as is practicable in the covered external application.

3.1 Extract Flow Rates

We understand that extract flow rates have been determined by the specialist catering consultant in accordance with the Thermal Convection method set out in B&ES DW/172 for each kitchen to suit the installed equipment, typically approximately 0.7m³/s per canopy.

3.2 Make-up Air

The frontage to each food and beverage outlet is a roller shutter which will be permanently open during the hours of operation. The make-up air provision will therefore be entirely by natural infiltration.

3.3 Canopy Type and Dimensions

Each extraction canopy is to be an overhead wall type which we understand has been designed to achieve the following.

- A minimum exceedance of the plan dimensions of the catering equipment on each free side (front, left and right) of 250mm
- Height to underside of canopy approximately 2100mm
- A minimum distance of 1000mm between the lowest edge of the grease filter and the cooking surface

Extract canopies vary in footprint according to the size of the cooking area in each unit but generally measure 2000mm x 1100mm in plan area providing a cooking area of 1500mm wide x 850mm deep.

4 System Operation

4.1 System Configuration

The extraction systems operate in the following stages:

- Cooking pollutants captured by kitchen canopy baffle type grease filters
- Particulate and gaseous contaminants removed using in-line double pass ESP
- Centrifugal fans provide pressure rise to match system resistance
- Low level medium velocity discharge terminal

4.2 Electrostatic Precipitators (ESPs)

Double-pass ESP units will be provided for all units with high impact risk. The ESP units are specifically designed for kitchen extract usage and incorporate integral sumps to collect the oil, grease and smoke particles filtered out of the exhaust. The ESPs will operate to separate particles down to 0.01 micron at an operating efficiency in excess of 95%.

Refer to appendices for the technical data for the installed ESPs.

4.3 Fans

The kitchen extract fans have been selected in accordance with the following general requirements.

- Backward curved centrifugal impellers
- Mounted within acoustically lined box frame
- Flexible connections to minimise vibration transmission

Refer to appendices for the technical data for the installed extract fans.

5 Inspection, Cleaning & Maintenance Requirements

5.1 General

The inspection, cleaning and maintenance regimes for the extraction systems shall follow the guidance set out in B&ES DW/172, TR/19 and the manufacturers recommendations. Some of the key maintenance activities and service intervals are set out below, and should be incorporated into the operation & maintenance manuals for the systems.

5.2 Electrostatic Precipitators (ESPs)

The manufacturer requires that the ESP units are internally inspected and cleaned at an interval ranging between 1 week and 3 months dependent on the operating conditions. We would propose that the units are initially inspected on a frequent (weekly) basis which can be relaxed to suit the actual operating conditions as they become apparent for each unit.

5.3 Extract Canopies & Ductwork

All exposed metal surfaces of the ductwork and extract canopies within the kitchen area should be inspected at least weekly to ensure that there is no accumulation of grease or dirt, or surface damage.

The baffle type grease filters contained within the canopy should be removed and cleaned on a minimum weekly basis.

Specialist cleaning of the internal surfaces of the ductwork surfaces will be required on a periodic basis which should be advised by a specialist cleaning contractor based on the intensity of usage, however initially this is likely to be on a 3 monthly basis.

5.4 Extract Fans

The internal surfaces of the extract fans should be inspected and cleaned at the same intervals as the ductwork to prevent any build up of grease or dirt.

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