ScotchPartners
Building Services Engineering | Sustainability | Acoustics

Camden Karma Kitchen – Triangle Building

LabTech

Kitchen Ventilation Design Report

P02

21/09/2019

Scotch Partners LLP
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Project Particulars

Client Name: LabTech

Project Name: Camden Karma Kitchen – Triangle Building

Project Number:

Document Reference: SP-ZZ-ZZ-RP-M-001

Disclaimer

Revision History

Revision	Description	Date	Prepared By	Checked By
P01	Issued for Planning	21/10/19	JWB	JQ
P02	Minor Amendments	11/11/19	JB	JQ

Contents

1 Introduction

The proposed development comprises a refurbishment of existing kitchen accommodation located at the sub-basement level of the Triangle Building into new kitchens and ancillary areas. Food prepared here will be delivered to customers outside of the Triangle Building.

Seven shared kitchens and two dedicated kitchens are planned. The shared kitchens are each to be of between 20 to 30m^2 in area and will each include cooking, preparation and wash-up facilities. The two dedicated kitchens will be of approximately 50 and 70m^2 area respectively and will include cooking, preparation, wash-up and cold storage facilities.

Cooking equipment for all areas will initially comprise multiple of 4 burner gas ranges on gas ovens along with electric combination steamer ovens.

This document is intended to set out Scotch Partners proposed approach to ensuring no nuisance, disturbance or loss of amenity is caused by odour, fumes, food droplets or noise from our ventilation systems to nearby properties.

Mechanical extract ventilation from kitchens is to be combined into either of two central extract systems, reusing appropriate parts of existing mechanical ventilation plant as far as is practicable.

2 Information on Premises

A total of nine kitchen are proposed in the basement, of which seven may be shared between different users at different times and two are dedicated to single users.

Information on each proposed kitchen is provided in the table below. expect The kitchens will be operating from approximately 24hrs (Refer to operational management statement).

Unit	End user	Kitchen Area m^2	Cooking Equipment	Meal type(s)
1	Unallocated	30	4 burner gas range on gas oven. Electric combination steamer oven.	Unknown
2	Unallocated	20	4 burner gas range on gas oven. Electric combination steamer oven.	Unknown
3.	Unallocated	20	4 burner gas range on gas oven. Electric combination steamer oven.	Unknown
4	Unallocated	20	4 burner gas range on gas oven. Electric combination steamer oven.	Unknown
5	Unallocated	20	4 burner gas range on gas oven. Electric combination steamer oven.	Unknown
6	Unallocated	20	4 burner gas range on gas oven. Electric combination steamer oven.	Unknown
7	Unallocated	20	4 burner gas range on gas oven. Electric combination steamer oven.	Unknown
8	Unallocated	52	2 no. 4 burner gas range on gas oven. 2 no. Electric combination steamer oven.	Unknown
11	Unallocated	74	2 no. 4 burner gas range on gas oven. 2 no. Electric combination steamer oven.	Unknown

3 Risk Assessment for Odour

3.1 Risk Assessment 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 then 35

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

3.2 Risk Assessment Results

The risk assessment results for each food and beverage outlet are set out in the table below.

Unit Served	End User	A	B	C	D	Total Score	Impact Risk
1	Unallocated	15	5	3	7	30	High
2	Unallocated	15	5	3	7	30	High
3	Unallocated	15	5	3	7	30	High
4	Unallocated	15	5	3	7	30	High
5	Unallocated	15	5	3	7	30	High
6	Unallocated	15	5	3	7	30	High
7	Unallocated	15	5	3	7	30	High
8	Unallocated	15	5	5	7	32	High
11	Unallocated	15	5	5	7	32	High

3.3 Risk Assessment Findings

3.3.1 High Impact Risk

The units identified with high impact risk incorporate 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 using:

- Grease filters in canopies
- In-line single pass electrostatic precipitator (ESP) in combined ducts
- UV ozone system in combined ducts

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

4 Extraction Canopies

All kitchens are to be served by one of two, common extraction and make-up air mechanical ventilation systems, capable of maintaining the internal working environment within comfortable temperature, moisture, and air quality levels. The extraction systems are also to be designed to avoid contributing more than 70dB of noise at the operator location in accordance with the Control of Noise at Work Regulations 2005.

Each kitchen is to be provided with one or more extraction canopies to suit the number and sizes of cooking equipment.

4.1 Determining Flow Rates

Extract air flow rates for each kitchen have been determined by Scotch Partners using methods set out in the document B&ES DW/172.

These rates provided will be the greater of:

a) a rate calculated on a linear extract rate for each canopy of 0.25m^3/s per metre, or
b) a rate calculated the air using the thermal convection method.

Calculated in this way, extract flow rates for each kitchen range from 0.95m^3/s for the smallest kitchen up to 2.0m^3/s for the largest kitchen.

4.2 Make-up Air

Conditioned make-up air is to be provided from two air handling units.

4.3 Canopy Type and Dimensions

Each extraction canopy is to be an overhead wall type and is to be designed to achieve the following.

- A maximum internal depth of 500mm
- A minimum 250mm exceedance of the plan dimensions of the catering equipment on each free side.
- A minimum canopy height of between 2000 and 2100mm.
- A minimum distance of 1000mm between the lowest edge of the grease filter and the cooking surface. (This is above 450mm minimum to minimise the risk of fire in the grease filter).

Canopies are generally to be in multiples, each canopy being approximately 2.1m long x 1.3 m deep in plan area, to suit the cooking area below.

5 System Operation

5.1 Units with High Impact Risk

The extraction systems are to operate in the following stages.

- Cooking pollutants/emissions captured by kitchen canopy baffle type grease filters
- Gaseous contaminants removed via UV system in combined extract ducts
- Particulate containments removed using in line ESP in combined extract ducts.
- Centrifugal fans provide pressure rise to match system resistance
- Discharge attenuators to attenuate noise to meet Local Authority noise criteria

5.2 Extract System Component Details

5.2.1 System Layouts

Refer to the provided drawings for the layout and locations of equipment, ductwork and exhaust discharge points.

5.2.2 Cooker Hood (Incorporating Grease Filters & UV system)

Product data for the cooker hood and grease filters is to be supplied by the kitchen consultant as standalone appendix to this document.

5.2.3 Electrostatic Precipitators (ESPs)

Single pass ESP units will be provided, 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 of up to 98%.

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.

A schedule for the proposed ESPs is provided in appendix A.

5.2.4 Fans

The kitchen extract fans are to be selected in accordance with the following general requirements.

- Backward curved centrifugal impellers
- Out-of-airstream motors
- Mounted within acoustically lined box frame
- Frequency inverter speed control

Fan noise (breakout and induct) has been considered in the selection of the fans to ensure that the noise emissions of the systems do not exceed the levels set out in Noise Impact Assessment

5.2.5 Anti-vibration Mountings

All fixed building services equipment associated with the kitchen extract systems are to be provided with suitable anti-vibration mountings selected in accordance with CIBSE Guide B4.

All fans will be installed with spring type anti-vibration mounts achieving a minimum 25mm static deflection

6 Appendix A – Equipment Details

Please see overleaf details of the following equipment:

- Schedule of Electrostatic Precipitators (ESPs)
- Schedule of Extract Fans
- Typical Anti-vibration Mount for Fans

6.1 Schedule of Electrostatic Precipitators (ESP)

Ref	System	Manufacturer's Reference	Dimensions W/H/D (mm)			Max AirFlow (m^3/s)	Pressure Drop (Pa)	Power Consumption (W)	Electricity Supply
ESP A.01	A	PurifiedAir ESP6000El	1800	630	640	2.8	200	30	220/240V 50Hz 1ph
ESP A.02	A	PurifiedAir ESP6000El	1800	630	640	2.8	200	30	220/240V 50Hz 1ph
ESP B.01	B	PurifiedAir ESP6000El	1800	630	640	2.8	200	30	220/240V 50Hz 1ph
ESP B.02	B	PurifiedAir ESP6000El	1800	630	640	2.8	200	30	220/240V 50Hz 1ph

6.2 Schedule of Extract Fans

Ref	System	Fan Type	Required Duty		Required SFP (W/l/s)	Manufacture's Reference	Width (mm)	Height (mm)	Depth (mm)	Electrical Supply	Fan Input Power (kW)	Motor Full Load Current (A)	Motor Starting Current (A)
			Flow Rate (m^3/s)	Pressure Drop (Pa)									
EF A.01	A		1.4										
EF A.02	A		1.4										
EF B.01	B		1.4										
EF B.02	B		1.4										

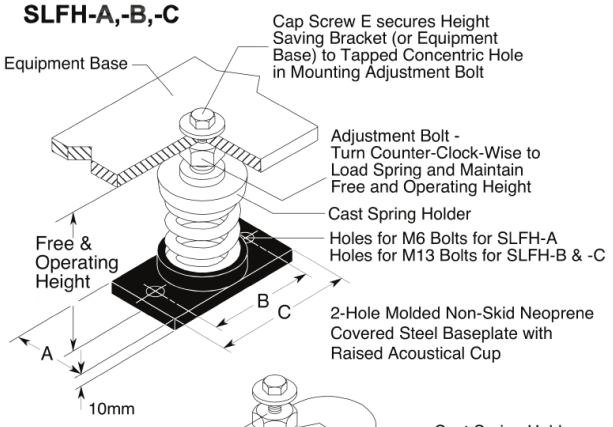
6.3 Typical Anti-Vibration Mount for Fans

MASON INDUSTRIES, Inc.
Manufacturers of Vibration Control Products
350 Rabro Drive, Hauppauge, NY 11788, 631/348-0282, FAX 631/348-0279, Info@Mason-Ind.com
2101 W. Crescent Ave., Suite D, Anaheim, CA 92801, 714/535-2727, FAX 714/535-5738, Info@MasonAnaheim.com
www.Mason-Ind.com

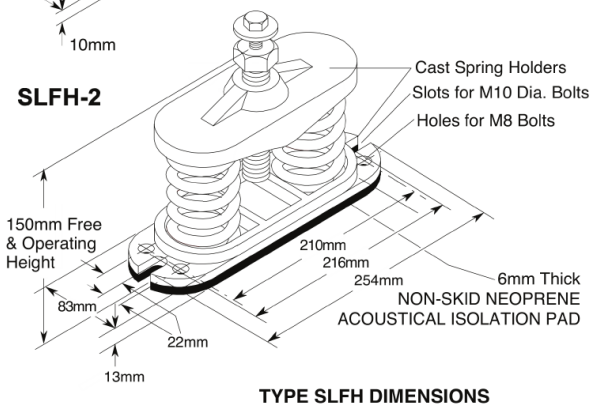
JOB NAME _____
CUSTOMER _____
CUSTOMER P.O. _____
MASON M.I. _____
DWG. NO. _____

TYPE SLFH
25mm Deflection A, B, C & 2 Series Mountings

SLFH-A,-B,-C



SLFH-2



Multiple spring Mounts have C-size springs.
SLFH-2 indicates 2 springs.

TYPE SLFH RATINGS

Size	Rated Capacity (kg)	Rated Defl. (mm)	Mount Constant (kg/mm)	Spring Color/Stripe
SLFH-A-45	20	41	0.5	Blue
SLFH-A-75	34	38	0.9	Orange
SLFH-A-125	57	34	1.7	Brown
SLFH-A-200	91	29	3.1	Black
SLFH-A-310	141	25	5.5	Yellow
SLFH-A-400	181	25	7.1	Green
SLFH-A-510	231	25	9.1	Red
SLFH-A-625	283	25	11.2	White
SLFH-B-65	29	53	0.6	Brown
SLFH-B-85	39	53	0.7	White/Black
SLFH-B-115	52	51	1.0	Silver
SLFH-B-150	68	51	1.3	Orange
SLFH-B-280	127	41	3.1	Green
SLFH-B-450	204	33	6.1	Red
SLFH-B-750	340	28	12.0	White
SLFH-B-1000	454	25	17.9	Blue
SLFH-C-1000	454	25	17.9	Black
SLFH-C-1350	612	25	24.1	Yellow
SLFH-C-1750	794	25	31.3	Black*
SLFH-C-2100	953	25	37.5	Yellow*
SLFH-C-2385	1082	25	42.6	Yellow**
SLFH-C-2650	1202	25	47.3	Red*
SLFH-C-2935	1331	25	52.4	Red**
SLFH-2-2700	1225	25	48.2	Yellow
SLFH-2-3500	1588	25	62.5	Black
SLFH-2-4200	1905	25	75.0	Yellow*
SLFH-2-4770	2164	25	85.2	Yellow**

* with RED core spring ** with GREEN core spring
All springs have additional travel to solid equal to 50% of the Rated Deflection. Solid Spring Height = Free Height minus 1.5 times the Rated Deflection.

TYPE SLFH DIMENSIONS

Size	Free & Oper. Height	A	B	C	Locking Cap Screw
SLFH-A-45-400♦	108	57	76	92	3/8 x 1
SLFH-A-510-625	117	57	76	92	3/8 x 1
SLFH-B	150	70	105	133	1/2 x 1 1/4
SLFH-C	150	76	121	152	1/2 x 1 1/4
SLFH-2	-	-	-	-	1/2 x 1 1/4

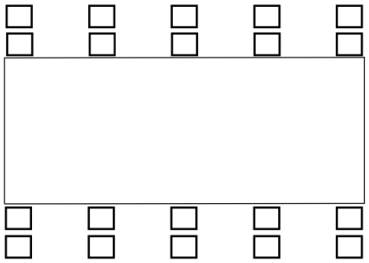
SPRING DATA

Spring OD	Free HT	Ratio K_x/K_y	Ratio OD/OH
45	76	0.70-0.90	0.88-1.25
45	79 -86	0.50-0.60	0.74-0.82
60	102	0.70-0.90	0.80-1.25
60	105	0.90-1.00	0.92-0.94
73	105	0.90-1.00	0.92-0.94

♦ If using 45 thru 400 with 510 or 625, Free & Operating Height is 118.

PLAN VIEW OF MOUNT LOCATIONS

TAG : _____
UNIT : _____



_____ inch SPECIFIED DEFLECTION

1 :	6 :
2 :	7 :
3 :	8 :
4 :	9 :
5 :	10 :
Material for One Set :	Sets Required

FORM S-201m 09/2010	DWN:	CHKD:	DATE:	DWG. No.

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