

Proposed Kitchen Ventilation System Design and Specification

In compliance with DEFRA/EMAQ+ guidelines and BESA DW 172:2018 Kitchen Ventilation Specification

Project Details

Planning Ref:	
Project Name:	Chick Inn 2 Meldon Road M13 OTZ
Contact Name:	Haseb Butt
Re: Drawing Number:	19657

Information on Premises

Number of Meals Served Per Day	Take away 100 +
Method(s) of Preparation and Cooking	Gas and Electric Equipment (ovens, hobs, fryers and grills)
Types of Meals Served	Mediterranean
Proposed Hours of Operation	TBC
Fuel of Preparation/Cooking Equipment	1ph/3ph Electric and Gas

Plans and Drawings

Type	Drawing Number
Internal Arrangement	19657-L1
External Elevations	PCE-Butt-October-22-Proposed Amended 19.12.25 / 19657-V1

Proposed Extraction System

Canopy Type	Wall Mounted 1 end enclosed
Gas Safe Interlock	Required
Carbon Monoxide Monitoring	Required
Level of Dispersion	Higher level discharge

DEFRA Risk Assessment for Odour

Criteria	Score	Score	Details	Result
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 15m/s	X
Proximity of Receptors	Close	10	Closest sensitive receptor less than 20m from kitchen discharge	X
	Medium	5	Closest sensitive receptor between 20 and 100m from kitchen discharge	
	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	X
	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	X
	High	7	Kebab, Vietnamese, Thai or Indian	

	Medium	4	Cantonese, Japanese or Chinese	
	Low	1	Most pubs, Italian, French, Pizza or steakhouse	

Impact Risk	Odour Control Requirement	Significance Score*	Result
Low to Medium	Low level odour control	Less than 20	
High	High level odour control	20 to 35	X
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.

Method to Mitigate Odour Control Risk:
<p>Higher level discharge with odour control will be carried out using heavy duty Eco Fleece grease filtration filters/separators and Plasma Clean Xtract Ozone injection to separate fats oils and grease and treat odours with Ozone for depletion.</p> <p>Extract rate will be variable and controlled via the fan extract speed controller to optimise performance.</p> <p>With a regular filter maintenance schedule as determined by use and pressure drop across disposable filters as part of a data log recorded service plan, odour exhaust will be minimised.</p>

Filters Specified**	Location	
ECO Fleece Baffle Style Grease filter	Canopy Filter Plenum	X
Secondary Mesh Grease particulate filter	Canopy Filter Plenum	X

**Please see attached manufacturers information on filter specifications.

Filter Maintenance Schedule	
Daily	Filter washing
Every 3 Months	Particulate Filters Changed Weekly or as required
Every 6 Months	Duct inspection and clean

Site Specific Extract Rate Calculations in Accordance with DW 172:2018

Item no.	Equipment Type	Width (mm)	Depth (mm)
1	Table	350	800
2	Donner Kebab M/C Gas	450	800
3	Chargrill Gas	600	800
4	Flat Griddle Gas	600	800
5	Table	350	800
6	Pressure fryer Gas	450	800
7	Deep Fat Fryer	450	800
8	Deep Fat Fryer	450	800
9	Table	350	800
10	6 Burner Gas range oven under	900	800

Thermal Coefficient Method of Calculation (DW 172:2018)

Item No.	Calculation	
1	0.35 x 0.8 x 0.03	= 0.0084

2	0.45 x 0.8 x 0.75	= 0.27
3	0.6 x 0.8 x 0.95	= 0.456
4	0.6 x 0.8 x 0.45	= 0.216
5	0.35 x 0.8 x 0.003	= 0.0084
6	0.45 x 0.8 x 0.5	= 0.18
7	0.45 x 0.8 x 0.5	= 0.18
8	0.45 x 0.8 x 0.5	= 0.18
9	0.35 x 0.8 x 0.03	= 0.0084
10	0.9 x 0.8 x 0.4	= 0.288
TOTAL		= 1.7952

Site Specific Extraction Rate

Thermal Coefficient x Canopy Factor = M3/SEC (M3/SEC x 60 x 60 = M3/HR)

Thermal Coefficient	Canopy Factor	Total - M3 per Second	Total - M3 per hour
1.8	1.2	2.16 m3/sec	7776 m3/hr

Kitchen Volume	124 m3
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Air Changes Per Hour (site specific extract rate m3/HR / kitchen volume)	62.7
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Noise Risk Assessment

	Type	Description
Canopy	Wall mounted	The Target extraction canopy is manufactured in 304 stainless steel with all around condensate drip channel and grease collection drawer set into the filter plenum. Wall mounted cantilever design with extract spigot to side.
Fan Type	System Air MUB-T Acoustic Fan Box	560 acoustic fan box is internally mounted on floor brackets with fan mounted on anti-vibrational mountings with inlet and outlet silencers fitted. Fan electronically variable speed controlled with gas safety interlock and CO2 monitoring.
Duct Type	500 x 500 Stainless steel flanged and stiffened	500 x 500 constructed out of stiffened 1mm 304 stainless steel with flanged sealed joints and inspection hatches set at 1500mm spacing. Ducting silencers and fan all internally fitted in plant room for easy access for inspection and cleaning. Duct routed to external high level vertical discharge outlet
Outlet Type	550x 550	Vertical discharge cowl with bird guard
Internal insulation	Isover Space saver	100mm thick in floor/ceiling cavity

Please see attached manufacturers information of fan specifications along with general system installation.

Fan Type	Octave Band Sound Power	Airflow Rate	Pressure Drop
MUB-T 560	55 dB(A) - 41dB(A)	2.16m3/sec	300 Pa

Pressure Drop across terminations	50 Pa
Velocity of the air at efflux	8.64m/sec
Area of the duct or opening	0.5x 0.5 = 0.25

Total Length of Duct Run	16M
Number of Duct Bends	3 at 90 degrees 2 at 45 degrees
Change in cross-section	500 x 500 to fan /silencers 678 x 678
Plenum Chambers	Canopy filter plenum
Termination Effects	Vertical unrestricted

Background Noise Level	House typical NR 30/40 on main road location

Noise Risk Assessment	
<p>With the positioning of the extract fan between silencers and flexible couplings as well as on antivibration mountings with the exhaust outlet at the farthest point from any residential receptors directly above with the fan mounted in an acoustic fan box to limit noise break out to below 50 dBA with in the restaurant kitchen external noise breakout will be in accordance so as not to exceed background noise levels with in adjoining residential properties and neighbouring properties.</p> <p>The fan speed controller will be limited and set to ensure background noise levels are not exceeded while maintaining the necessary minimum air change rates required in the kitchen environment.</p> <p>Supply air to the extract system will be drawn in via suitably sized and positioned supply air vents set into outside walls along with fixed supply air louvres above door and windows. All supply air inlets are to be suitably fly screened to prevent pest ingress.</p> <p>Should any noise nuisance occur this can be reduced by lowering fan speed and setting the controller maximum speed.</p>	

System Maintenance Schedule	
Every 6 Months	<p>Inspection to determine system condition as per manufacturer's instructions.</p> <p>Plasma Clean Ltd is recommended for this and will provide a maintenance schedule for the system based on their findings following inspection of eco Fleece filters and duct work system.</p>