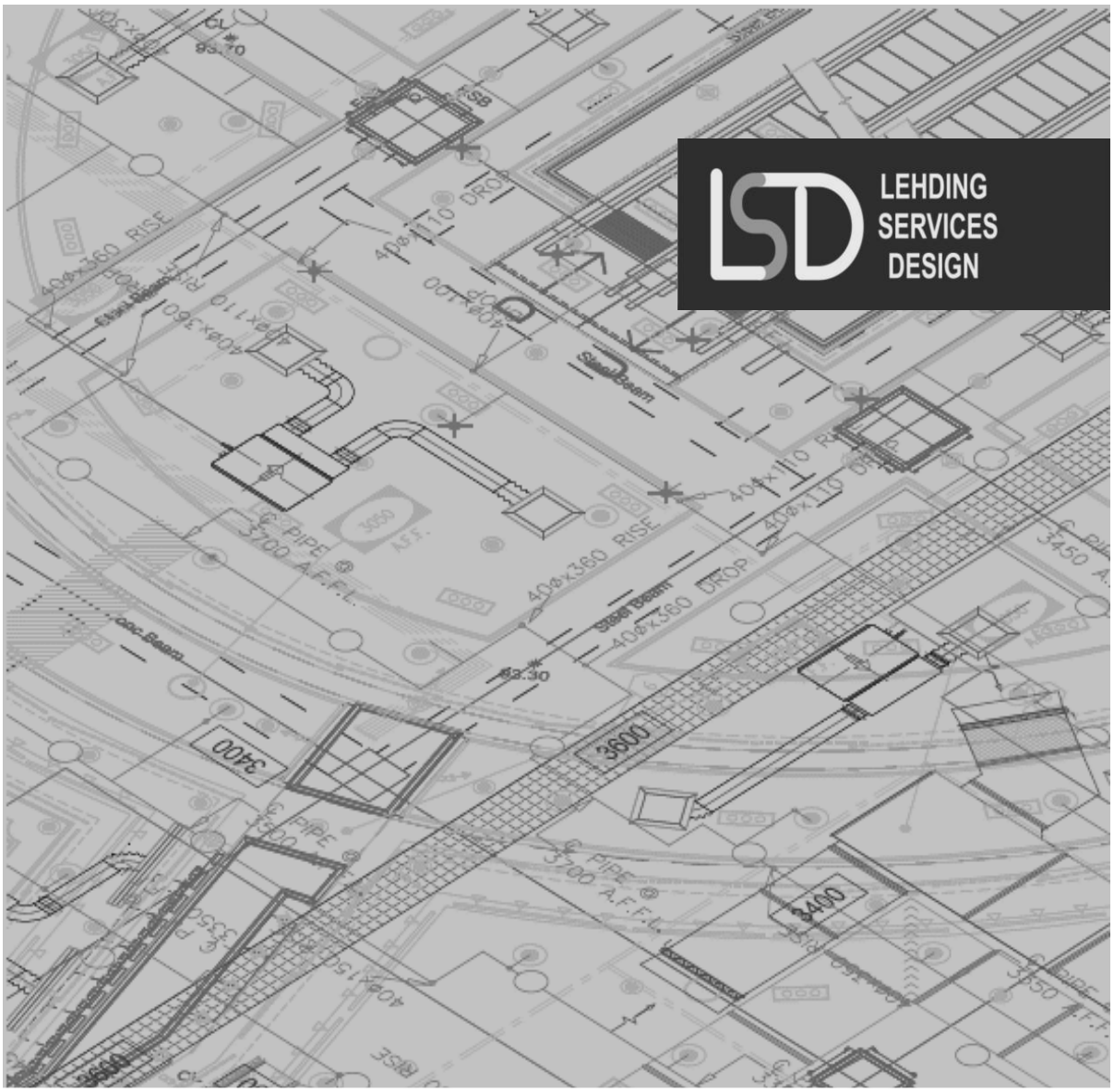


BUILDING SERVICES
MECHANICAL & ELECTRICAL CONSULTANCY

KITCHEN VENTILATION REPORT

at

LITTLE DOOR
200 DEANSGATE
MANCHESTER
M3 3NN

AUGUST 2026

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INTRODUCTION

Lehding Services Design have prepared a kitchen ventilation strategy proposal for the new commercial kitchen located at 200 Deansgate, Manchester.



The following report relates to the ventilation strategy and odour control measures proposed for the new commercial kitchen installation.

The basis of the ventilation strategy shall comply with the following documentation:

- EMAQ "Control of Odour and Noise from Commercial Kitchen Exhaust Systems" (previously known as DEFRA "Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems").
- DW/172 “Specification for Kitchen Ventilation Systems”.

The proposed cooking operation shall comprise full kitchen cooking. This assessment has been undertaken based on the anticipated cooking processes and associated ventilation requirements.

The kitchen will utilise a fully recirculating ventilation system incorporating a Purified Air Reflow Tower for the treatment and reduction of cooking odours and contaminants.

The kitchen will utilise the following appliance types:

- Electrical cooking appliances.

Solid fuel and gas-fired cooking appliances shall not be utilised within this scheme.

REPORT:

The cooking style involves general restaurant-style cooking including grilling of meat and fish, frying, steaming and boiling. The following calculations & requirements shall be used as the anticipated basis for the design of the kitchen ventilation installation and odour/grease control system.

Odour and Grease Control

General requirements
Kitchen ventilation systems compliant with the principles of the HVCA Specification for Kitchen Ventilation Systems DW/172 shall be installed. The design shall include adequate access panels of sufficient number, quality and size to enable unrestricted access for regular cleaning and inspection of the internal surfaces and in-line components.

All access panels shall be in accordance with the requirements of DW/144, DW/172 & TR/19.
Canopy grease filters shall comply with LPS 1263, as required within HVCA Specification for Kitchen Ventilation Systems DW/172, and shall be of non-combustible construction.

Typically, for a conventional commercial kitchen extract system, contaminated air containing grease, smoke and odours would be extracted through a canopy, treated through suitable filtration and discharged externally via a dedicated discharge arrangement.

For this scheme, there are no suitable routes available for external discharge of the kitchen ventilation air volume required. As a result, a fully recirculating kitchen ventilation system incorporating a Purified Air Reflow Tower shall be utilised to treat and reduce cooking odours, grease and particulate matter prior to returning the treated air back into the occupied space.

The recirculation system selected shall be suitable for commercial kitchen applications and shall be fully accessible for cleaning and maintenance. The motor and electrical components shall be located outside of the contaminated airstream to minimise the risk of ignition.
The filtration and air treatment system shall cover and serve all odour and/or grease producing appliances.

Kitchen Extract Filtration System
The performance of the Filter systems shall be sufficient to:

- Substantially reduce all cooking smells generated by cooking appliances.
- Prevent the migration of odours, smoke and/or convected heat from the demise.
- Prevent the passage of grease into the ductwork.

Recirculation Systems

The below table can be utilised as a selection guide to ensure appropriate levels of odour and grease mitigation for internal recirculating kitchen extract systems.

Low to medium level odour control may include:

01 Fine filtration or ESP followed by carbon filtration (carbon filters rated with a 0.1 second residence time).

02 Fine filtration followed by counteractant/ neutralising system to achieve the same level of control as 1.

High level odour control may include:

01 Fine filtration or ESP followed by carbon filtration (carbon filters rated with a 0.2 – 0.4 second residence time).

02 Fine filtration or ESP followed by UV ozone system to achieve the same level of control as 1.

Very high level odour control may include:

01 Fine filtration or ESP followed by carbon filtration (carbon filters rated with a 0.4 – 0.8 second residence time).

02 Fine filtration or ESP followed by carbon filtration and counteractant/neutralising system to achieve the same level of control as 1.

03 Fine filtration or ESP followed by UV ozone system to achieve the same level of control as 1.

04 Fine filtration or ESP followed by wet scrubbing to achieve the same level of control as 1.

A risk assessment of the cooking process and location identified that a low to medium level of odour and grease control is required for the kitchen.

As there is no suitable route for external discharge of the kitchen ventilation air, a Purified Air Reflow Tower system shall be implemented in place of a conventional extract and discharge arrangement.

Filtration and Air Treatment Stages

First Stage – Mesh Filters (Primary Grease Filtration)

Air is initially drawn through washable stainless-steel mesh filters located within the kitchen canopy or reflow tower intake. These filters provide the initial stage of grease and particulate removal, capturing larger grease droplets and debris generated during cooking.

Second Stage – Panel Filters (Fine Particulate Filtration)

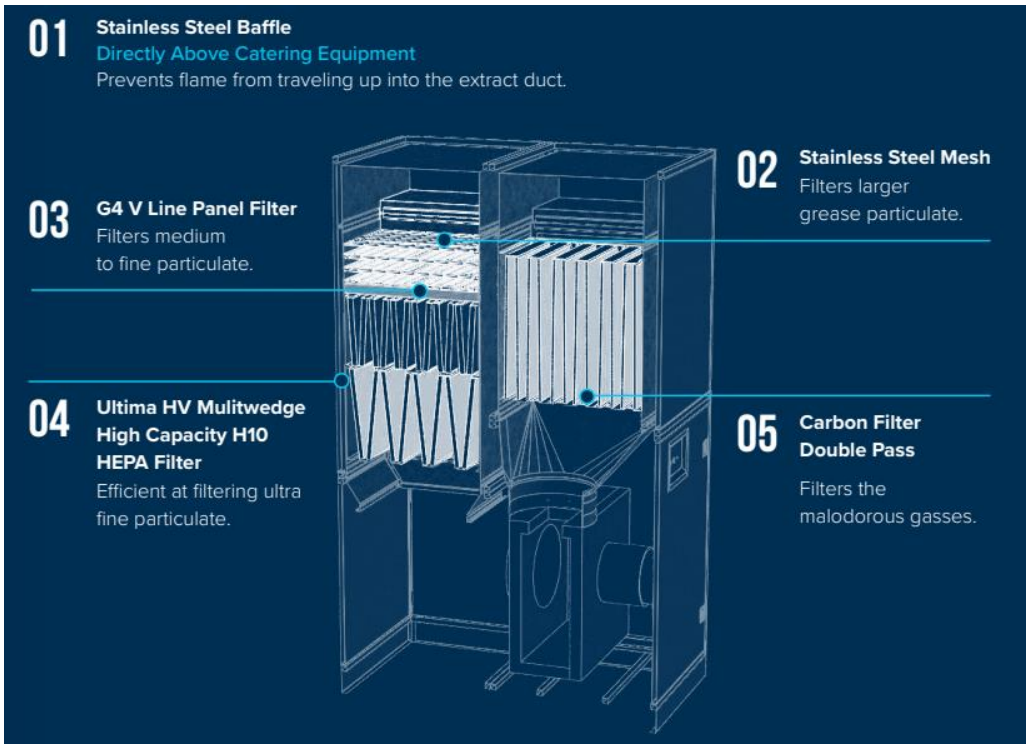
Following the mesh filters, the air passes through high-efficiency panel filters which remove finer airborne particles and grease aerosols. This stage protects and extends the service life of the subsequent HEPA and carbon filters.

Third Stage – HEPA Filters (High-Efficiency Particulate Filtration)

The third filtration stage utilises HEPA filters to capture ultra-fine particulates, ensuring a high level of air cleanliness prior to odour treatment. This stage significantly reduces smoke and micro-particulate concentrations within the recirculating airflow.

Fourth Stage – Activated Carbon Filters (Odour Control and Adsorption)

Finally, the air passes through activated carbon filters, which adsorb residual odours, vapours and volatile organic compounds (VOCs). This stage ensures the recirculated air is treated to remove cooking odours prior to being returned to the occupied space.



VENTILATION STRATEGY

The proposed ventilation strategy has been developed around a fully recirculating kitchen ventilation system incorporating a Purified Air Reflow Tower, selected due to the absence of a suitable route for external discharge.

Kitchen Supply / Make-Up and General Ventilation Air

Fresh air will be provided via the general mechanical ventilation system, supplying the kitchen area at 10 air changes per hour (ACH). This air will provide dilution ventilation and form part of the general make-up air volume requirements for the recirculating kitchen ventilation system.

A proportion of the treated air from the clean air side of the Reflow Tower will be redirected back to the canopy via capture jet supply spigots, creating a controlled airflow pattern across the canopy face to improve containment and assist with effective capture of cooking fumes.

Kitchen Extract / Recirculating Filtration System

A dedicated recirculating kitchen ventilation system will be installed, serving the main cooking canopy. Contaminated air will pass through canopy baffle filters as the initial grease filtration stage before entering the ductwork leading to the Purified Air Reflow Tower.

Within the Reflow Tower, the following filtration sequence will be applied:

1. Mesh Filters – Bulk grease and particulate capture
2. Panel Filters – Fine particulate and aerosol removal
3. HEPA Filtration – High-efficiency particulate treatment
4. Activated Carbon Filters – Odour and VOC adsorption

Following filtration, the treated air will be recirculated back into the kitchen space, with a controlled proportion of the cleaned air delivered directly into the canopy via capture jet supply spigots to enhance capture performance.

All interconnecting ductwork between the canopy and the Reflow Tower will be installed in accordance with DW172 & DW144, with access hatches provided every 3 metres and at changes in direction to facilitate cleaning and maintenance.

Level of Odour & Grease Control

The system is designed to provide a low to medium level of odour and grease control, appropriate for internal air recirculation applications. The staged filtration within the Reflow Tower provides effective treatment of grease, particulate matter and cooking odours prior to the air being returned to the occupied space.

System Components

- Main cooking canopy with baffle filters (first-stage grease control)
- Purified Air Reflow Tower, incorporating mesh, panel, HEPA & carbon filtration
- Recirculation fan assembly integrated within the tower
- Capture jet spigots supplying a controlled airflow back to the canopy
- General supply ventilation system providing 10 ACH of fresh air

Description of Operation

Cooking fumes are captured at source by the canopy. Baffle filters remove bulk grease before the contaminated air is conveyed to the Reflow Tower. The air then undergoes multi-stage filtration within the tower before being reintroduced into the kitchen space.

A controlled proportion of the treated air from the clean air side of the Reflow Tower is directed back to the canopy via dedicated capture jet supply spigots. This creates a localised airflow pattern which assists with containment of cooking fumes and improves canopy capture performance.

Fresh air introduced via the general ventilation system at 10 ACH supports dilution ventilation and thermal comfort conditions.

Analysis of Proposals

• Fully internal recirculation solution, eliminating the requirement for external discharge

• Staged filtration and air treatment contained entirely within the Reflow Tower

• Capture jet supply improves canopy efficiency and cooking fume containment

• Low to medium odour control suitable for internal return-air applications

• General supply air at 10 ACH supports dilution and comfort conditions

• System compatible with electrical cooking installations

APPENDIX:

EMAQ Calculation Criteria

Criteria	Risk Rating	Risk Score	Description	Comments
Dispersion	N/A	0	No external kitchen extract discharge associated with the cooking ventilation system.	The proposed kitchen ventilation strategy utilises a fully recirculating Purified Air Reflow Tower system, eliminating the requirement for external discharge of cooking fumes and odours.
Proximity to Receptors	N/A	0	No external kitchen extract discharge associated with the cooking ventilation system.	The proposed kitchen ventilation strategy utilises a fully recirculating Purified Air Reflow Tower system, with treated air returned internally following filtration. Therefore, proximity to external sensitive receptors is not applicable to the primary cooking odour control system.
Size of Kitchen	Medium	3	30-100 covers.	The venue comprises approximately 82 covers based on the available seating provision.
Cooking Type and grease loadings	Very High	10	Pubs (those serving a high level of fried food), fried chicken, burgers or fish and chips.	The proposed kitchen operation includes chargrilling and frying appliances, resulting in a high grease and odour loading. Electrical cooking appliances are proposed with no solid fuel or gas-fired appliances.
Total Rating	Low to Medium	13	Total Risk Score <20 = Low to Medium Risk	Low to medium level of odour control required.

A **low to medium** risk score has been calculated. The proposed fully recirculating kitchen ventilation system incorporates a Purified Air Reflow Tower with multi-stage filtration to provide the required level of odour and grease control for the proposed cooking operation.

Dispersion
The EMAQ risk rating for dispersion relates to the conditions under which kitchen extraction emissions are discharged. The relevant risk ratings described in the guidance are shown below. The risk score is shown in parentheses.

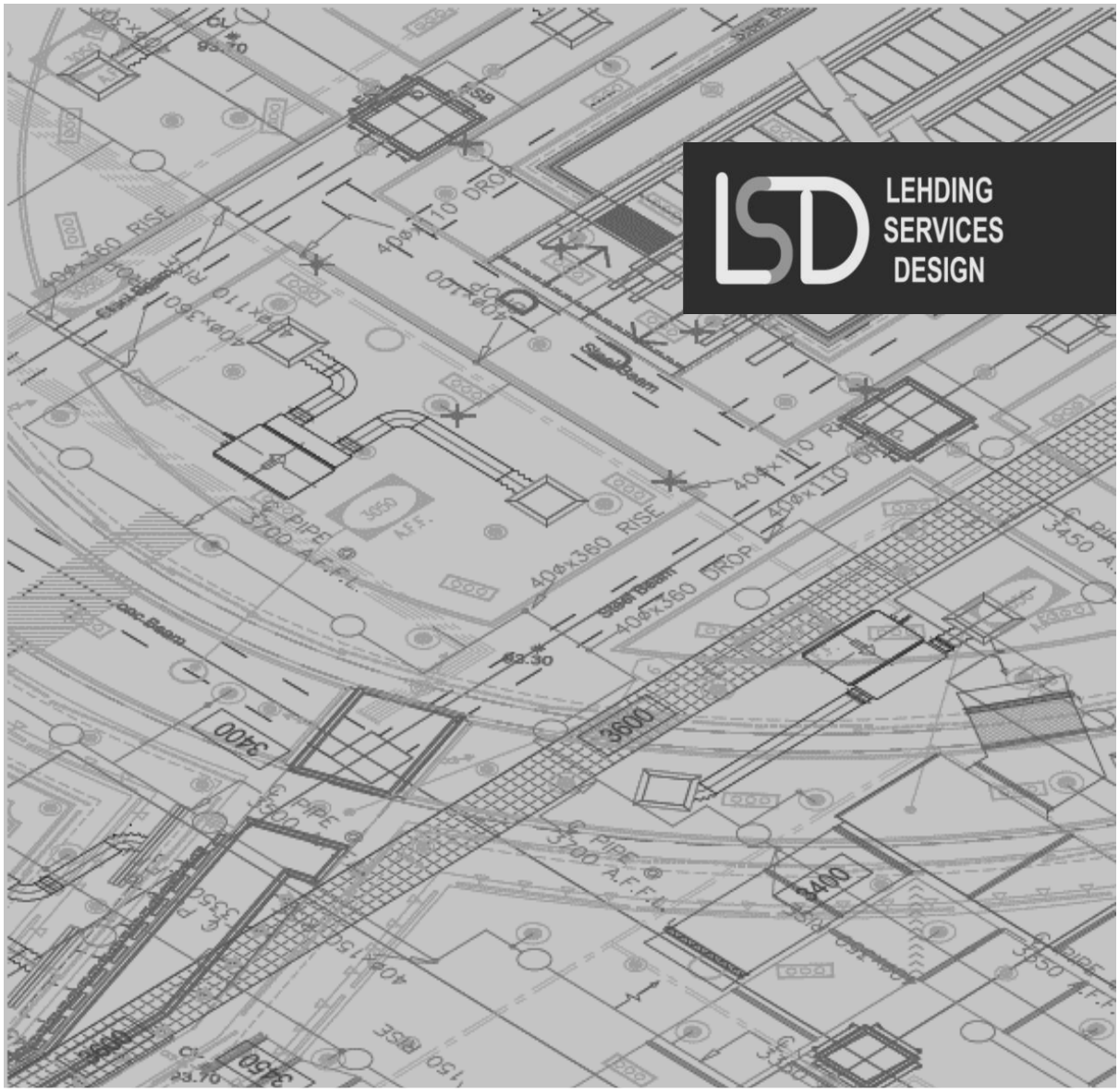
Dispersion	
VERY POOR (20)	Low level discharge, discharge into courtyard, or restriction on stack;
POOR (15)	Discharge not low level, but below eaves, or discharge rate below 10 m/s;
MODERATE (10)	Discharging 1 m above eaves at a rate of 10-15 m/s;
GOOD (5)	Discharging 1 m above ridge at a rate of 15 m/s or more.
Proximity	
CLOSE (10)	Closest sensitive receptor is less than 20 m from kitchen discharge;
MEDIUM (5)	Closest sensitive receptor is between 20 and 100 m from kitchen discharge;
FAR (1)	Closest sensitive receptor is more than 100 m from kitchen discharge.
Size of Kitchen	
LARGE (5)	More than 100 covers or a large-sized take-away;
MEDIUM (3)	**Between 30 and 100 covers or a medium-sized take-away;**
SMALL (1)	Less than 30 covers or a small take-away.
Cooking Type	
VERY HIGH (10)	**Pubs (those serving a high level of fried food), fried chicken, burgers or fish and chips;**
HIGH (7)	Kebab, Vietnamese, Thai or Indian;
MEDIUM (4)	Cantonese, Japanese or Chinese;
LOW (1)	Most pubs, Italian, French, Pizza or Steakhouse.

Total Risk Score of <20 = Low to Medium Risk, 20 to 35 = High Risk; and >35 = Very High Risk.

The design of the kitchen extraction installation is based on:

- Poor dispersion discharging at level 2.
- Closest sensitive receptor is less than 20m from kitchen discharge.
- Kitchen is serving more than 100 covers.
- Cooking type is very high.

Criteria	Score	Score	Details
Dispensation	N/A	0	No external kitchen extract discharge associated with the cooking ventilation system.
Proximity of receptors	N/A	0	No external kitchen extract discharge associated with the cooking ventilation system.
Size of kitchen	Medium	3	Approximately 82 covers.
Cooking type	Very High	10	The proposed kitchen operation includes chargrilling, plancha cooking and frying appliances, resulting in a high grease and odour loading. Electrical cooking appliances are proposed with no solid fuel or gas-fired appliances.



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