

ANNEX B DOCUMENT

PROPOSED VENTILATION SYSTEM AT

**Unit 2, Ice House Precinct,
The St.,
Long Stratton.
NR15 2XW**

C5354

First Issue 07/11/23

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INTRODUCTION

This document has been prepared with the addition of standard generic non-site-specific information previously provided by Summit Design Ltd who are specialists in HVAC Design, manufacture, and Installation.

The information contained within this document should be used as supporting information when applying for Change of Use Planning Approval and is based on the '*DEFRA Annex B – Guidance on the control of odour and noise from Commercial Kitchen Exhaust system – Jan 05*'. This follows feedback from various Local Authorities who use Annex B as a guide when referring to the extract system as part of the application process.

Annex B advises that the aim of any ventilation/extraction is to ensure that no nuisance, disturbance, or loss of amenity is caused by odour, fumes, food droplets or noise, to nearby properties. Additionally, the visual appearance of the flue may be important and the flue itself may require a separate planning permission. Enquiries should be made to the Local Authority Planning Department regarding this matter.

NB. THIS DOCUMENT IS FOR GENERAL GUIDANCE ONLY. A SUITABLY QUALIFIED AND EXPERIENCED PERSON WITH SPECIALIST KNOWLEDGE OF VENTILATION SCHEMES SHOULD UNDERTAKE THE DETAILED DESIGN AND INSTALLATION OF THE VENTILATION SYSTEM.

Designing and installing appropriate ventilation systems may involve considerable expense. In circumstances where the end user of the premises is unknown, or where the specific type of food to be cooked is unknown, the installation should be designed to achieve the highest level of odour control in order to cater for a worst-case scenario.

There are many different types of odour abatement available (carbon filters, electrostatic precipitation, high dilution, and high velocity extraction) however not all types are suitable for all cooking methods. In each case, grease filters must be installed.

Please note that any reference to minimum standards within this document is for guidance only and more stringent controls may be deemed appropriate.

PREAMBLE

Please note that the proposed cooking operation produces very little grease, and the extract system is predominately removing heat and gas combustion fumes. All work is carried out in accordance with the latest relevant British (or Irish regulations where applicable) and European Standards, statutory Regulation and Byelaws together with the following publications:

- CIBSE Codes and guides to current practice Water Authority By-Laws
- HVCA – DW143 Practical Guide to Ductwork Leakage Testing
- HVCA DW144 Specification for Sheet Metal Ductwork
- HVCA DW172 Guide to Good Practice for Kitchen Ventilation Systems
- HVCA – RUAG70 Guide to Good Practice Refrigeration
- The Building Regulations
- Gas Safety (Installation and Use) Regulations 1998

All plant, ducts, pipe cables etc. shall be adequately protected against accidental damage corrosion and external environment and shall be capable of safe decontamination and removal in the future without disturbing other services. Pipes and ducts shall be adequately sized, kept as short as practicable, leak-proof with a minimum number of joints and have provision for routine maintenance. All facilities shall be designed to prevent the ingress or egress of rodents, vermin, and insects.

The duct will be fixed to the shell of the unit using anti-vibration fixing mounts and under no circumstances will flexible ductwork be used other than for the fan connections.

The HVAC contractor shall supply the client with system design drawings, prior to manufacture and installation.

For projects in England and Wales, the HVAC contractor shall also demonstrate compliance with Building Regulations Approved documents L2A & L2B. This will include:

- (a) Provision of details of the efficiency and controls of heating , cooling, and ventilation systems in accordance with Non-Domestic Heating, Cooling and Ventilation compliance Guide (2006)
- (b) Provision of commissioning certificates including air leakage tests on the ductwork

Fire/smoke dampers shall be installed in all fire compartment walls to Building Control requirements.

The HVAC contractor shall ensure that externally the ductwork conforms to the supplied drawings in terms of its route, height, and termination. These drawings will have formed part of our Planning Approval and must not be deviated from without express permission from the Client.

Upon completion of the installation, all shall be fully tested and proved including airflows. The contractor shall produce an Operating and Maintenance Manual which shall contain details of all equipment supplied and a record drawing of the complete mechanical services installation and copies of all Test Certificates. It shall contain a Maintenance Schedule based on the manufacturer's recommendations.

1. INFORMATION ON PREMISES & TYPE OF OPERATION

The following information should be supplied:

- Number of meals to be served per day: - **The proposed operation will produce approximately 100 meals on average per day.**
- Method(s) of preparation and cooking: - **Hand preparation and dry baking.**
- Type(s) of meal served: - **Pizzas and associated side orders.**
- Proposed hours of operation of the business and any ventilation plant: - **Opening hours will be in accordance with the hours stated in the Change of Use Approval although staff will be in the premises outside of these hours to prepare for opening and to clean up after closing. With the exception of the cold room compressor, ventilation plant will generally be in use only whilst the store is open.**

2. PLANS AND DRAWINGS

Provide a scaled plan showing the internal arrangement of the premises and the dimensions/location of the ventilation system. The drawings should include external elevations of the buildings showing the dimensions, route, and exhaust characteristics (appearance) of the ductwork in relation to the building: - **Please refer to Hattrell LLPs' drawings nos. C5354-A5-05 and 06.**

The location of all filters and the fan should be clearly marked. Where the location of a filter is shown the type must be clearly identified and cross-referenced to the detailed product specification: - **A schematic drawing produced by the HVAC Designer will be provided at a later date.**

3. PRE-FILTERS

A copy of the manufacturer's product data sheet should be supplied clearly showing:

- Manufacturer's name: - **Jasun Filtration**
- Filter name and product code: - **Type 90**
- Dimensions of the pre-filter: - **45mm thick (rated airflow 2.0m/s) see data sheets**
- Nature of the filter media: - **Disposable glass fibre media**
- Manufacturer's recommendations on the frequency and type of maintenance of the pre-filter having regard to the conditions that it will be used under: - **Checked bi-monthly and changed 3 monthly**

4. **ELECTROSTATIC PRECIPITATORS (NOT REQUIRED ON THIS SITE)**

5. **CARBON FILTERS (NOT REQUIRED ON THIS SITE)**

6. **ODOUR COUNTERACTING OR NEUTRALISING SYSTEM**

The details and type of counteractant or neutralising system should be identified. A copy of the manufacturer's product data sheet should be supplied that clearly shows:

- Manufacturer's name: - **Ecovery Innovations Ltd.**
- Name of delivery system and product code: - **CMS/4000VM Monitored System.**
- Counteractant or neutralising chemical to be used: - **Ozone**

7. **COOKER HOOD**

The following information on the characteristics of the cooker hood should be supplied that clearly shows the hood will be made of: -

- Construction: - **Stainless Steel construction with all visible joints to be welded, ground and polished and incorporating a gutter around all edges with a plugged drain connection at the lowest point.**
- Length that the cooker hood overhangs the appliances: - **Minimum 250mm all round**
- Face velocity at the cooker hood, expressed in metres per second: - **0.25m³/sec**
- Dimensions of the opening of the cooker hood: - **2m x 3.5m**
- Hood filters: - **Hood is to include 6 no mesh type grease filters. Aluminium frame with steel mesh inserts. Mesh filters are efficient at removing any fine particles which may be caught in the airflow.**
- Manufacturer's name: - **Jasun Filtration**
- Filter name and product code: - **Model GF**

The proposed dry bake operation produces very little grease, and the extract system is predominantly removing heat and gas combustion fumes. There is no barrier to flame within the filter, and it is accepted that mesh / baffle filters cannot therefore be used on their own in applications where there is appreciable risk of fire. However, this does not apply in this operation which only uses hot air for baking, with no oil or grease being used.

8. **SYSTEM OPERATION**

In addition to the specification of the components the following must be provided about the system:-

- Extract rate (expressed as m³/s) at the proposed rate of extract: - **Calculated in accordance with DW172 Kitchen Designer's Manual, using the velocity of air across the face of the canopy method as per appended extract from DW172, the extract rate will be 1.5m³/sec**
- Dwell time of the gases in the carbon filtration zone: - **In excess of 0.1sec**
- Volume of the kitchen: - **based on average prep area size of 100 -150m³**
- Efflux velocity: - **12 to 15m/sec as per DW172 where possible but no lower than 11m/sec for a vertical discharge at high level or 6m/sec for horizontal discharge at low level via a louvred wall grille (whistling could occur at greater velocity but upturned louvres would be used to push the efflux in an upwards direction).**

Note: The system performance is dependent upon the extract rate of the air. Where the rate can be adjusted by the use of dampers or a variable speed fan, then the conditions under which the extract rate can be achieved must be described. = **Single speed Vent Axia BSC500-14 Black Sabre sickle fan – no adjustment. Fans are to be IP54 rated which is acceptable as the fan is installed internally.**

9. FLUE DESIGN

The height and velocity of the final discharge are the two important factors. Generally, the greater the flue height, the better the dispersion and dilution of odours. The discharge of air should be at a minimum height of 1m above the roof, especially if there are buildings nearby that may affect odour dispersion and dilution. Where this is not possible (e.g., because of ownership or structural constraints), additional techniques will be required in order to reduce odours, such as an increase in efflux velocity and additional filters, etc. The final discharge should be vertically upwards, unimpeded by flue terminals. The number of bends in the ducting should be minimised and the ducting should have a smooth internal surface. According to HVCA guidance (DW172) all ducting shall be low pressure Class A and be in accordance with HVCA specification number DW144.

It is proposed to run the extract duct to run at high level within ground floor and then through the rear wall, turning vertically to discharge a minimum 1.0m above the roof line.

The vertical duct riser will typically be supported by pairs of cantilever brackets at maximum 2.5m centres, each bracket to be fixed through 2 neoprene rubber VT/2 anti-vibration mounts @ 400mm centres – TBC by Structural Engineer and specialist ducting designer/installer.

The extract duct will terminate in a widened and tapered outlet which prevents the ingress of rain into the duct and without causing loss of efflux velocity.

10. NOISE

Data on the noise produced by the system as a whole should be provided including:

- Sound power levels or sound pressure levels at given distances (the assumptions to this calculation must be clearly stated).
- An octave band analysis of the noise produced by the system should also be provided, where possible.
- Hours of operation of the ventilation system (where this differs from the hours of opening) = **Hours of operation will be as the approved opening hours.**

This information is site dependent and can only be achieved once the system is installed. Please refer to Appendix 1 for data sheets regarding the fans and compressor(s) for noise levels of the proposed equipment.

REFER TO SPECIALIST'S PLANT NOISE ASSESSMENT REPORT for noise survey and full details of noise attenuation measures.

• The oven extract fan and dedicated air handling unit (AHU) will be positioned internally to minimize noise break out and will be supported on anti-vibration mountings, high performance spring type vibration isolation hangers having a nominal static deflection of a minimum of 15mm under the installed total weight of the fan and AHU and connected with flexible couplings to the extract ducting either side. The vibration isolators must incorporate rubber or neoprene noise stop pads. Four isolators are normally required, one for each corner of the fan and AHU. The flexible couplings are to be "loose" (not taut) when installed and will typically be formed using rubber or neoprene sheet material (not canvas). The hangers or mounts should only take the weight of the fan - ductwork either side of the fan is to be mounted using separate proprietary rubber or neoprene mountings.

• Extract Duct - A normal/standard type atmosphere side silencer type attenuator will be installed on the oven extract duct to meet the performance criteria listed in the Noise Report. This would be a circular unpodded silencer, (2D un-podded) with splitter elements plus spigots or transition pieces, with a melinex lining suitable for kitchen extraction use, located internally between the fan and external air. The inside of the kitchen extract silencer should be cleaned at least every 6 to 12 months depending on the level of deposit build up.

- **Fresh air intake duct – a normal/standard type atmosphere side silencer type attenuator will be installed on the air intake duct to meet the performance criteria listed in the Noise Report. This would have splitter elements plus spigots or transition pieces, located internally between the AHU and external air.**
- **Cold Room and Air-Conditioning compressor units are to be located externally at low level in the rear service yard and to be mounted using proprietary rubber or neoprene turret type vibration isolators. The isolators should be selected to each have a static deflection of not less than 3mm under the load of the unit. Suitable turret type vibration isolators are approximately 25-30mm high and are available in various load capacities. The isolators are colour coded to indicate the load capacity and four isolators are required per unit (one to each corner) – TBC by Structural Engineer and specialist designer/installer. Ceilings between the Hot Food Takeaway use and upper floor occupied by others are to be acoustically underlined, as noted on the drawings, to minimize noise transmission. Walls between the Hot Food Takeaway use and adjoining occupancies within the building will be similarly treated. The Noise Report provides details of suitable noise and vibration attenuation equipment and fixings. All proposed noise mitigation measures should be checked for acoustic performance by SPECIALIST prior to installation.**

11. MAINTENANCE

A schedule of maintenance must be provided including details for:

- **Cleaning of washable grease filters: - Weekly.**
- **Frequency of inspection and replacement of all filters (grease filters, pre-filters and carbon filters where proposed): - Monthly or bi-monthly inspections as required.**
- **Inspection and servicing of fans: - Bi-annually.**
- **Inspection and cleaning of ductwork: - Based on a light use (2-6 hours per day) ducting should be cleaned annually, increased to 6 monthly for moderate use (6-12 hours per day).**
- **If schedule is not based on manufacturer's instructions include the reasons why not: - Based on manufacturer's instructions**

Please note that the HVAC contractor will provide 12 months spare filters at each new store.

12. ADDITIONAL NOTES FOR GUIDANCE

- **The air inlets must not permit pests to enter the kitchen. Fly screens are an example of how this can be achieved: - All air intake and extract louvre grilles are to be fitted with screens to prevent the ingress of insects, birds, and vermin.**
- **Sufficient air must be permitted into the premises to replace air extracted. The method for supplying this make-up air should be detailed: - Fresh air is introduced via a louvred grille in the rear wall of the property. The dedicated air handling unit (AHU) will supply 80% of the extracted air. Fresh air filtered to EU4, tempered via a low-pressure hot water coil, will be introduced via ceiling mounted diffusers to the preparation, store, office, and wash-up areas.**
- **The route of the air into the kitchen must not result in its contamination, for example passage through a toilet. Separate provision must be made for ventilation of a toilet: - Toilets are separately ventilated and fresh air to the rest of the premises will not be drawn through the toilets.**
- **There must be sufficient access points to permit adequate cleaning of all the ductwork: - Access panels will be installed within the ducting at changes in direction and at maximum 3m intervals, but usually access door centres will be every 2 metres, as the ductwork cleaners find it difficult to access 1.5metres of ductwork. All access panels are to be grease tight.**

APPENDIX 1
DATA SHEETS

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| ○ Jasun Filtration PLC - Fresh Air Intake | Type 90 panel filters (45mm thick with 2m/sec rated airflow) |
| ○ Air Vent Technology - Fresh Air Intake | Water heated air handling units (model 5) |
| ○ Jasun Filtration PLC - Canopy Filters | Model GF mesh canopy grease filters |
| ○ Vent-Axia – BSC 50014 Extract fan | Slim case sickle fan |
| ○ Mitsubishi FDC100VNX | A/C compressor |
| ○ Danfoss Optyma 114X7084 | Cold Room compressor |
| ○ Ecovery Innovations CMS/4000VM | Ozone system |