

CAMEN LOCK VILLAGE BUILDING A FIT-OUT  
MECHANICAL, ELECTRICAL AND PUBLIC HEALTH SYSTEMS

U12 KITCHEN VENTILATION

Audit sheet

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#### U12 KITCHEN VENTILATION

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- 900     FIXING TO BUILDING “FABRIC”
- 1000   IDENTIFICATION OF MECHANICAL SERVICES
- 1100   TESTING AND COMMISSIONING
- 1200   SCHEDULE OF INSTALLER’S SUBMISSIONS

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##### 100 PERFORMANCE OBJECTIVES

To design, supply, install, test, commission and demonstrate ventilation to the Building A1 and A2 market areas, associated catering and dining areas to ensure a comfortable, odour free and safe environment.

The facility within Building A0 for a future tenant to install a kitchen ventilation system.

To maintain negative air pressure in the areas served, relative to the adjacent areas, to prevent the egress of odours.

To ensure a safe and satisfactory working environment within cooking areas, in accordance with The Workplace (Health, Safety and Welfare) Regulations.

To ensure an adequate supply of replacement fresh air to support combustion of fuel (if appropriate).

To ensure that vitiated air is not recirculated in the building nor enters adjoining areas.

To ensure that noise emanating from the ventilation system and exhaust air discharge is not a nuisance to occupants of the building or external parties.

The following descriptions indicate the design intent only for proposed Kitchen Ventilation systems.

The Design & Build Contractor shall be responsible for developing the design intent to provide a full services design, and for the supply, installation, testing, commissioning and putting to work of the services indicated within this section.

The Design & Build Contractor shall be responsible for undertaking all necessary site surveys and the noting of site constraints.

The services installations shall be installed complete with all necessary items including but not limited to plant, equipment, ancillaries, controls, fixtures, fittings, brackets, supports and identification.

The Design & Build Contractor shall be responsible for all necessary free issue of equipment between respective parties.

In particular services design shall meet the following objectives:

- ~ ensure that vitiated air is not recirculated in the building nor enters adjoining areas.
- ~ ensure that noise emanating from the ventilation system, fresh air intake and exhaust air discharge is not a nuisance to occupants of the building or external parties.
- ~ ensure that the strategy for kitchen exhaust has been agreed with the local authority.

##### 200 DESIGN PARAMETERS

Comply fully with the edition (including amendments, replacements and associated normative references) of each of the following, current at the time of tender:

The Building Regulations

The Control of Substances Hazardous to Health Regulations

The Gas Safety (Installation and Use) Regulations

The Health and Safety at Work etc Act

The Offices, Shops and Railway Premises Act

The Workplace (Health, Safety and Welfare) Regulations

ASFP Blue book              Fire resisting ductwork: Classified according to BS EN 13501 Parts 3 and 4

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BESA DW/144	Specification for sheet metal ductwork. Low, medium and high pressure/velocity air systems
BESA DW/172	Specification for kitchen ventilation systems
BESA TR/19	Guide to good practice. Internal cleanliness of ventilation systems
BS 476-6	Fire tests on building materials and structures. Method of test for fire propagation for products
BS 476-7	Fire tests on building materials and structures. Method of test to determine the classification of the surface spread of flame of products
BS 476-24	Fire tests on building materials and structures Method for determination of the fire resistance of ventilation ducts
BS 5925	Code of practice for ventilation principles and designing for natural ventilation
BS 6173	Specification for installation and maintenance of gas-fired catering appliances for use in all types of catering establishments (2 <sup>nd</sup> and 3 <sup>rd</sup> family gases)
BS 7671	Requirements for electrical installation. IET wiring regulations
BS 9999	Code of practice for fire safety in the design, management and use of buildings
BS EN 779	Particulate air filters for general ventilation. Determination of the filtration performance
BS EN 10029	Hot-rolled steel plates 3 mm thick or above. Tolerances on dimensions and shape
BS EN 13501-3	Fire classification of construction products and building elements. Classification using data from fire resistance tests on products and elements used in building service installation: fire resisting ducts and fire dampers
BS EN 13823	Reaction to fire tests for building products. Building products excluding floorings exposed to thermal attack by a single burning item
BS EN 15780	Ventilation for buildings. Ductwork. Cleanliness of ventilation systems
BS EN ISO 9445	Continuously cold-rolled stainless steel. Tolerances on dimensions and form
CIBSE Guide A	Environmental design
CIBSE Guide B	Heating, ventilating, air conditioning and refrigeration
CIBSE Guide C	Reference data
CIBSE TM13	Minimising the risk of Legionnaires' disease
CIBSE TM50	Energy efficiency in commercial kitchens
Gas Safe TB 140	Guidance on ventilation and extract requirements for commercial catering installations
HM Government	Approved Document B. Fire safety. Volume 2 - Buildings other than dwellinghouses
HM Government	Approved Document F. Ventilation
HSE ACOP L8	Legionnaires' disease. The control of Legionella bacteria in water systems. Approved Code of Practice and guidance
HSE CAIS10	Catering information sheet 10 Ventilation in catering kitchens
HSE CAIS23	Catering information sheet 23 Gas safety in catering and hospitality
HSE CAIS26	Preventing exposure to carbon monoxide from use of solid fuel appliances in commercial kitchens

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Hoare Lea Stage 3 Acoustics Report

Hoare Lea Stage 3 Fire Strategy

**The Contractor shall also refer to the Services Design Criteria Specification for further details.**

#### 300 SYSTEM DESCRIPTION

##### **Buildings A1 and A2 Market Areas**

Selected market units within Buildings A1 and A2 are to be served by Landlord kitchen extract systems as indicated on drawings and equipment schedules. Each system typically provides kitchen extract to a group of market areas on each level as generally indicated on the drawings.

Systems are to be constant volume extract only systems with make-up air taken through the open sided façade of the building.

Each system shall be installed complete with a dedicated extract fan unit mounted on a supporting platform at roof level, along with associated electrostatic air treatment/filter units, odour neutraliser units and attenuators.

Discharge of vitiated air from each system shall be to atmosphere via with discharge velocities in accordance with DEFRA guidelines.

From the extract units' ductwork shall route to serve respective kitchen areas, terminating with an open ended duct and volume control damper to serve each tenant demise ready for the tenant to install their extract canopy. The extract fan performance and the commissioning of the kitchen extract system shall allow for additional resistances resulting from tenant fit-out works.

The installation/ extension of ductwork from the volume control damper to serve canopies/ cooking hoods within the tenant demise shall be the responsibility of the tenant as part of their fit-out works. The supply and installation of extract ductwork, ancillaries, fixtures and fittings within each tenant kitchen area e.g. canopies, shall be the responsibility of the tenant.

Where ductwork passes through fire compartments this shall be fire rated in accordance with British Standard BS 9999 - Code of practice for the fire safety in the design, management and use of buildings.

It should be noted that the kitchen extract ductwork serving the market areas rises to the fans on the roof through other tenanted demises. Provide full door access to vertical ductwork risers and provide ductwork access doors for cleaning at 1.5 metre centres and all changes in direction across entire kitchen extract system.

##### **Buildings A1 and A2 Restaurant Units**

The restaurant units located on Level 3 of Buildings A1 and A2 shall have Shell & Core provisions made for future installation of kitchen ventilation systems as indicated on drawings.

The supply and installation of all kitchen ventilation systems, including air treatment/ filtration, within and external to the demise shall be the responsibility of the tenant.

##### **Buildings A0**

The type A3 unit located on the ground floor of Building A0 is to have the following provisions made for future tenant fit-out works.

1. 'Soft Spots' are to be provided within the structural slab as indicated on drawings, to permit the tenant to install kitchen extract ductwork from ground floor level to roof level.
2. A ventilation louvre is to be provided within the frontage of the tenant demise to permit intake of make-up air.

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The supply and installation of kitchen ventilation systems, including air treatment/ filtration, with in the demise and to the point of discharge at roof level shall be the responsibility of the tenant.

#### **400 CONTROL REQUIREMENTS**

##### **410 BMS control**

Read these clauses in conjunction with specification section W60.

##### **411 Remote control panel**

Provide the facility to control the kitchen extract fan serving each level via a local remote control panel within each service riser cupboard. Ensure it incorporates a firefighter's switch override facility, kitchen ventilation on-off switch, on-off indicator lights and a separate common fault light.

##### **412 Motorised backdraught dampers**

Prevent the fans from operating until the motorised backdraught damper is fully open. Additionally, fully close the backdraught damper on fan shut-down.

##### **413 Prove air flow**

Provide duct-mounted airflow switches the kitchen extract ventilation systems to prove airflow.

##### **414 Electrostatic filter unit**

Interlock the electrostatic filter units with the extract fan to prevent operation when the extract fan is shutdown or fails.

##### **415 Odour neutralising system**

Provide an odour neutralising system that incorporates an adjustable automatic spray sequence and manual override.

##### **420 Fan speed regulators**

Provide fan speed regulators for the kitchen extract systems for commissioning purposes.

Provide speed regulators in accordance with specification sections Y72 and Y92.

##### **430 Alarm indicators**

Provide alarm indicators for the following systems:

- ~ Kitchen extract fan common fault
- ~ Electrostatic / odour neutralising common fault
- ~ general fire alarm
- ~ fire damper closure
- ~ airflow "not proven"
- ~ Allowance for 3No. spare points per unit for any future tenant alarm /interfaces that landlord may wish to register

#### **500 SCOPE OF WORKS**

##### **510 Responsibilities**

The Design and Build Contractor shall be responsible for undertaking all necessary site surveys and noting of site constraints, and the full design, supply, installation, testing, commissioning and putting to work of all systems indicated within this specification.

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Co-ordinate all interfaces with existing shell and core installation ensuring no scope gaps as part of fit-out.

The systems shall be installed complete with all necessary fan units, air treatment/filters, louvres, grilles, ductwork, dampers, attenuators, anti-vibration mounts, pipework, valves, sensors, controls, ancillaries, fixtures, fittings, brackets, supports, labels and identification.

The Design and Build Contractor shall be responsible for all necessary free issue of equipment between respective parties.

#### **520 Detail coordination**

Agree all proposed methods of fixing systems to structure, roof, cladding, chimneys, equipment, etc with the Contract Administrator.

Agree the colours and finishes of all exposed materials of the systems with the Contract Administrator.

#### **530 Fixing of canopies**

By tenant as part of their future kitchen fit-out.

#### **600 SYSTEM COMPONENTS**

##### **610 Ductwork**

##### **611 General**

Ensure ductwork and ancillaries meet the requirement of specification sections Y30 and Y31 and the following requirements.

Where ducts from more than one canopy are jointed together, fit branch connections flush on the underside.

Do not use internal lining.

Do not use turning vanes unless otherwise indicated on the drawings.

Ensure all interior surfaces of the ductwork are accessible for cleaning and inspection. Unless otherwise indicated, install access panels at 1.5 metre centres and at every change in direction. Provide panels that are at least the same thickness material as the ductwork and which are grease tight using a heat-proof gasket or sealant without projection into the ductwork.

Locate access panels on the sides of horizontal ducts at least 40 mm from the underside of the duct.

Where ductwork is concealed within ceiling voids or builder's work shafts ensure that adequate access is provided within the builder's work fabric to provide easy access to the ductwork cleaning panel.

Install drains at the base of all vertical extract risers.

Site the termination point for the discharge of kitchen extracts from canopies so that it cannot present any risk to employees or occupants of neighbouring properties.

Locate kitchen extracts outside the building and terminate the discharge at a safe level.

##### **612 Flexible joint connections**

Do not use flexible joint connections within a kitchen extract ventilation system.

##### **613 Attenuators**

Provide attenuators in accordance with specification section Y45.



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In attenuators installed in extract ventilation systems, incorporate a protective membrane to protect the acoustic media from grease impregnation.

#### 614 Volume control dampers

Provide volume control dampers in accordance with specification section Y31 and the following requirements:

- ~ fabricate dampers from stainless steel where installed in kitchen extract and dishwasher extract systems
- ~ ensure damper operating mechanisms are outside the airstream where installed in kitchen extract ventilation systems and are capable of handling a minimum air temperature of 600°C

#### 615 Fire dampers

Provide fire dampers in accordance with specification section Y31 and the following requirements:

- ~ do not incorporate fire dampers in any kitchen extract ventilation system unless otherwise indicated on the drawings
- ~ when fire dampers are located in the vicinity of working equipment provide safe easy access

#### 616 Fire rating

Design extract ventilation ductwork systems to comply with the requirements of BS 9999.

Install ductwork systems that have been tested in accordance with BS 476-24 for:

- ~ fire inside (type B) rated for stability, integrity and insulation for the same period of time as the compartment through which the duct passes
- ~ additionally, ductwork tested for fire outside (type A) and the internal surface of the ductwork within the compartment meeting the insulation criteria

Ensure the design of fixings and supports associated with fire rated ductwork are suitable for the specified duration of fire protection.

Ensure the fire rating of kitchen extract ductwork includes insulation to ensure that a fire outside the duct does not cause any grease build-up inside the duct to ignite.

Provide the insulation to ensure that the temperature on the outside of the duct does not exceed 140°C average above ambient, or 180°C maximum above ambient, at any one point.

#### 620 Drainage

#### 621 Drainage from extract ventilation duct risers

Provide plumbed drainage at the base of extract ventilation duct risers where condensation is considered possible. Connect the drain, manufactured in grade 1.4301 stainless steel to a suitable foul water drain and incorporate a suitably sized trap.

#### 700 EQUIPMENT

#### 710 Canopies

By tenant as part of their future kitchen fit-out.

#### 720 Fans

#### 721 General

Provide fans in accordance with specification section Y41 and fan drive motors in accordance with specification section Y92.

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Comply with the following requirements:

- Fans are to be inverter controlled for commissioning purposes.
- Fans are suitable for catering extract and designed to allow ease of cleaning.

#### **722 Centrifugal fans**

Provide fans with backward curved impellers with a robust and open construction to facilitate cleaning and minimize the build-up of dirt and grease.

#### **723 Fan motors**

Fit thermistors to the motor windings and interlock with the controller to isolate the electrical supply in the event of overheating.

It is not possible to locate the fan motor external to airstream for the given fan duties. Therefore, special attention shall be given to provide a solution that allows for adequate cleaning.

#### **724 Electrostatic Filter and odour neutralising system**

Provide electrostatic filter and odour control units for each kitchen extract system as generally indicated on the drawings and schedules.

Both units shall be provided with volt free contacts for BMS common fault alarm.

#### **725 Filters**

Provide filters to meet the requirements of specification section Y42.

Provide grease extraction efficiency filters tested in accordance with the procedures published by the American Underwriters Laboratory (UL).

On all panel filter units incorporate monometers to indicate pressure drop and meet the requirements of specification sections Y42 and W60:

Tenant to provide extract canopies with integral grease baffles as part of their future kitchen fit-out.

#### **730 Safety systems**

#### **731 Proven air flow**

Provide airflow (not pressure differential) switches in the kitchen extract ventilation systems, such that the airflow is proved, before the kitchen gas automatic isolation valve on each floor can be electrically opened. De-energise the isolation valve if any of the airflow switches are not satisfied.

Proven air flow is the primary interlock for the automatic gas isolation valve.

#### **732 Automatic gas isolation valve**

Provide an automatic gas isolation valve with a remote reset button located in an easily accessible location. Arrange the control logic for the reset button such that the extract ventilation systems must be proved before the valve can be energised to open.

Provide a pipework integrity test system to operate in series with the primary interlock and prevent the automatic gas isolation valve opening until the integrity of the kitchen gas supply downstream of the valve has been proved by a test meeting the requirements of IGE/UP/1.

The automatic gas isolation valve will also be interfaced with the fire alarm system.

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##### 800 THERMAL INSULATION

###### 810 General

For the purposes of this specification designate thermal insulation applied to kitchen canopies, pipework, ductwork and equipment within the kitchen areas as wet areas. Comply with specification section Y50 and with the following requirements.

###### 820 Materials

Do not use mineral fibre insulation in kitchen areas.

Provide adhesives, vapour seals and joint cover materials that are non-flammable and are suitable for the range of temperature and humidity expected.

For insulation incorporated within plenums to avoid condensation use rigid foil-faced non-fibrous slabs with a Class 1 (National class) or C-s3, d2 (European class) or better surface spread of flame rating.

##### 900 FIXING TO BUILDING “FABRIC”

Comply with specification section Y90.

##### 1000 IDENTIFICATION OF MECHANICAL SERVICES

Provide identification of engineering systems associated with the kitchen supply and extract ventilation installation in accordance with specification section Y54 and the following requirements.

Fit each canopy with a performance rating plate to include the following data:

- ~ name, address and telephone number of the supplier
- ~ date of installation and serial number
- ~ design flow rates
- ~ design pressure drop

##### 1100 TESTING AND COMMISSIONING

Comply with specification sections Y51 and Y81.

Measure and record the extract flow rates through each canopy connection.

Measure and record the sound levels under each canopy and at the point of discharge.

##### 1200 SCHEDULE OF INSTALLER’S SUBMISSIONS

Submit technical details of the following to the Contract Administrator for comment:

- ~ extract ventilation fans
- ~ electrostatic filters
- ~ odour neutralising system
- ~ hoisting and support requirements
- ~ statement from ductwork cleaning specialist confirming that systems have been designed and installed with due regard to ease of cleaning.

Submit installation details of the following:

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- ~ prefabrication details of ductwork installations
- ~ equipment working drawings

**END OF SECTION U12**