

New Image Design

37-39 Conway Street, London, W1T 6ST

Building Services Engineering- Ventilation Report 6573-REP-003

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1 Introduction

This document has been prepared in support of the full planning application for the proposed conversion of the mezzanine floor of commercial property 37-39 Conway Street into 4 self-contained flats.

The site is fronting Conway Street, Euston Road and Warren Street. Currently 37-39 Conway Street is a commercial unit with ground floor, mezzanine floor and basement floor, total floor areas are about 945 sq meters. From 1st floor to top floor are flats, with one entrance from 41 Warren Street and another entrance from 365 Euston Road. foundation. This will entail some site investigations and discussions with local authority.

In this document we are looking to a specific ventilation design that meet not only the Building Regulation document Part F but also The Air Action Plan 2019-2020.

2 Compliance Documents

This report is having been compiled to meet the following documents & standards:

1. Building Regulation Ventilation Document Part F 2010 amended 2013. (F1 – Means of ventilation)
2. Camden Clean Air Action Plan 2019-2020.

3 Changes in Legal requirements

All fixed mechanical ventilation systems, where they can be tested and adjusted, shall be commissioned and a commissioning notice given to the Building Control Body.

For mechanical ventilation systems installed in new dwellings, air flow rates shall be measured on site and a notice given to the Building Control Body. This shall apply to intermittently used extract fans and cooker hoods, as well as continuously running systems.

The owner shall be given sufficient information about the ventilation system and its maintenance requirements so that the ventilation system can be operated to provide adequate air flow.

4 Changes in Technical Guidance

1. Ventilation provisions have been increased for dwellings with a design air permeability tighter than or equal to 5 m³/(h.m²) at 50 Pa.
2. For passive stack ventilators, the stack diameter has been increased to 125 mm for all room types. Use of passive stack ventilation in inner wet rooms has been clarified.
3. The guidance for ventilation when a kitchen or bathroom in an existing dwelling is refurbished has been clarified.
4. Reference is made to a new Domestic ventilation compliance guide for guidance on installing, inspecting, testing and commissioning ventilation systems in dwellings. Guidance in Appendices D and E of the 2006 edition of Approved Document F, on installing passive stack ventilators and fans in dwellings, as per Section 2 of the new guide.

5 Building Ventilation specific Requirements

As per the email communications between New image Design and Camden Town Planning department, the main concern is with the transport emissions from the busy main road adjacent, amongst other contributors such as freight, building emissions etc.

Jacobs Bond Pascoe as consulting engineers will be looking to mitigate external pollution entry to these new proposed domestic dwellings, namely 37-39 Conway Street. London, W1T 6ST.

- Building Regulation requirements:
- Background ventilation
- Purge Ventilation requirements
- Kitchen Extract system
- Bathroom extract systems
- Local Pollutants control (NOx Control).

5.1 Challenges

Since this development is 3.5-4m above street level and adjacent to a busy 'A' road, the pollutant levels generated can be considerable.

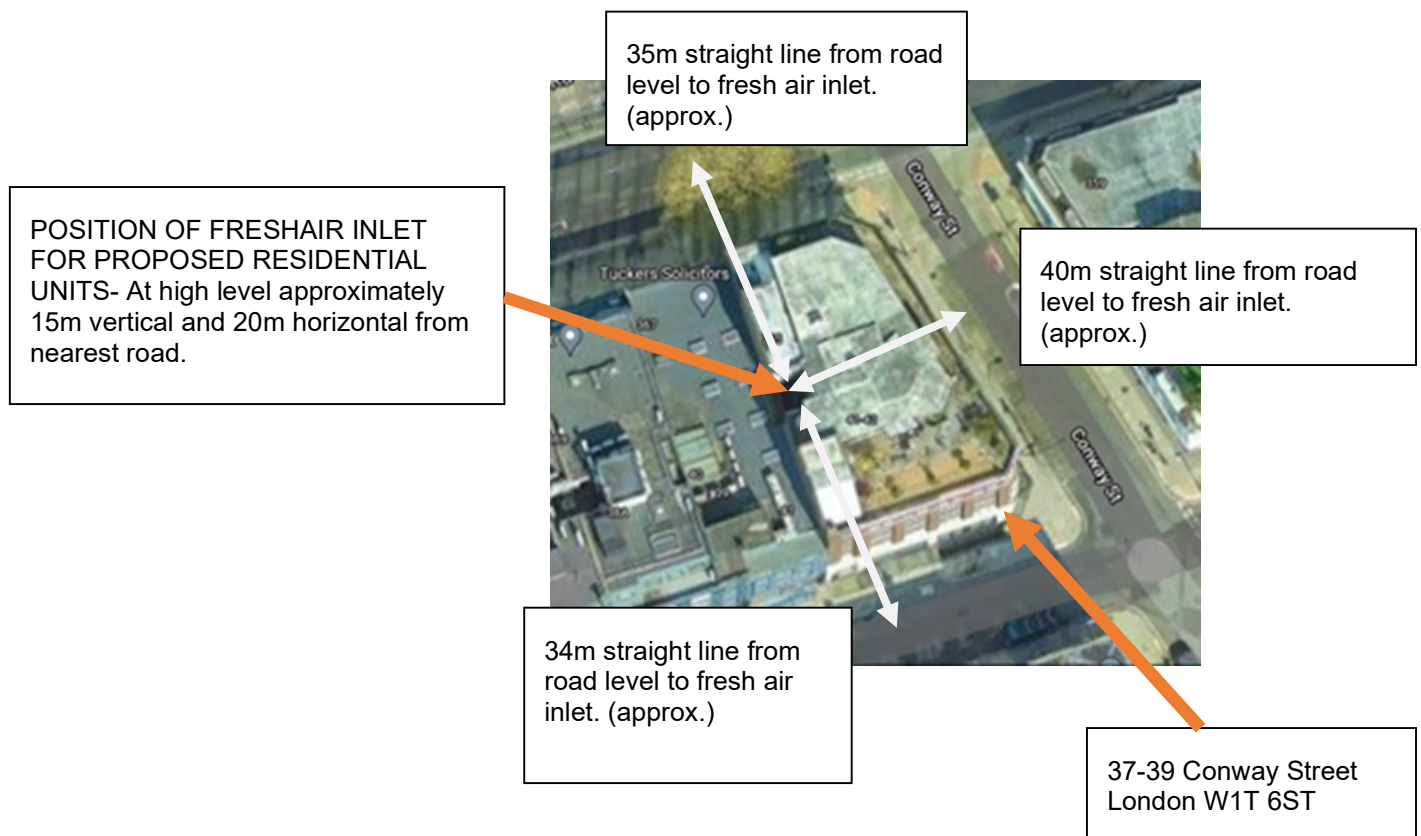
Option is available to take fresh air at street level for background ventilation, but due to high contamination we have not opted for this option.

Our design considers the input fresh air from roof level, with inlets at approximately 20m from road level.

5.2 Location of fresh air inlet

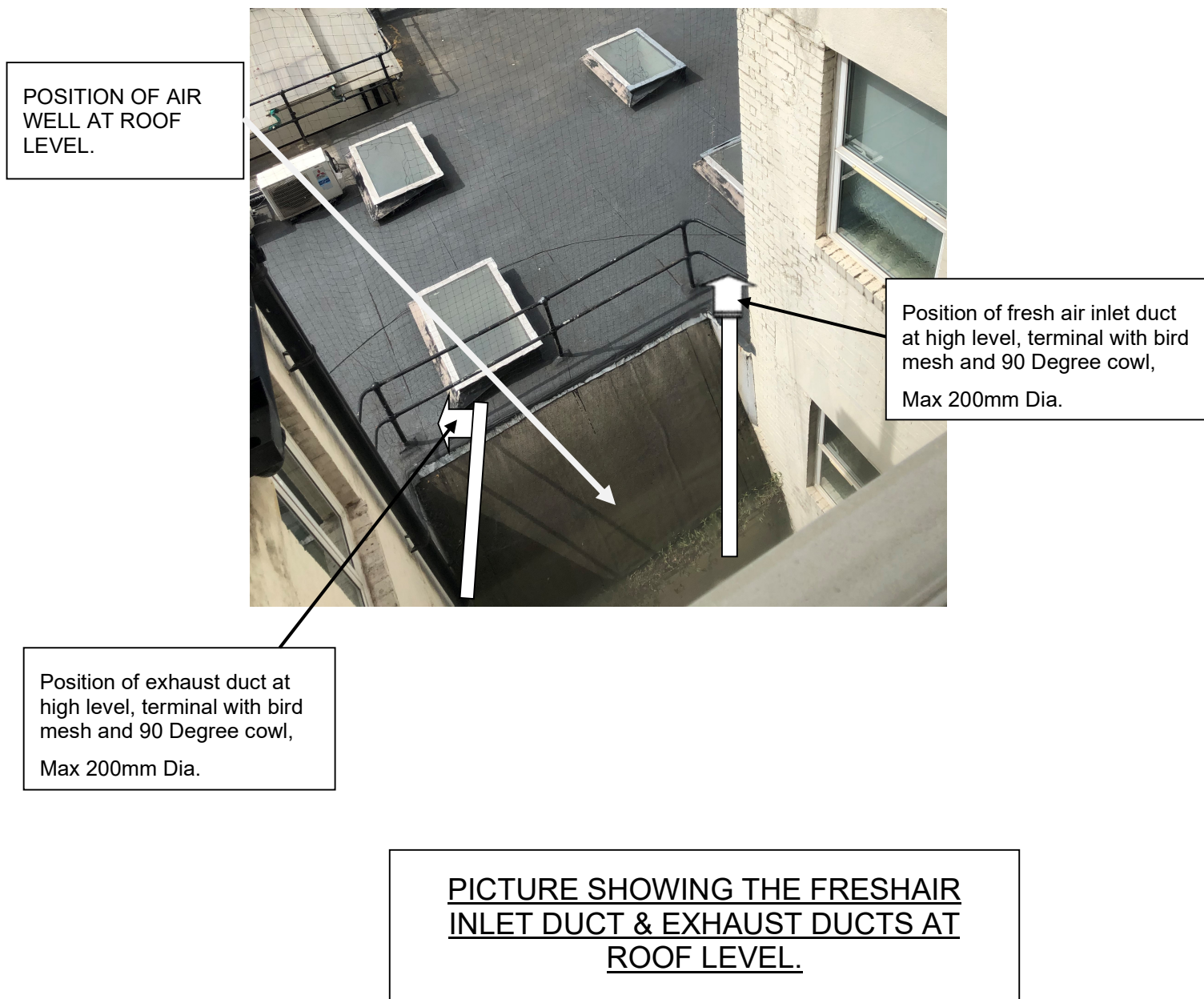
See diagram below No. 1.1.

Position of fresh air inlet at Roof level.



See diagram below No. 1.2.

Position of fresh air inlet and outlet at roof level



5.3 The Purpose of Internal Ventilation

Ventilation is required to remove 'stale' indoor air from a building and its replacement with 'fresh' outside air. The outside air shall be taken from roof level.

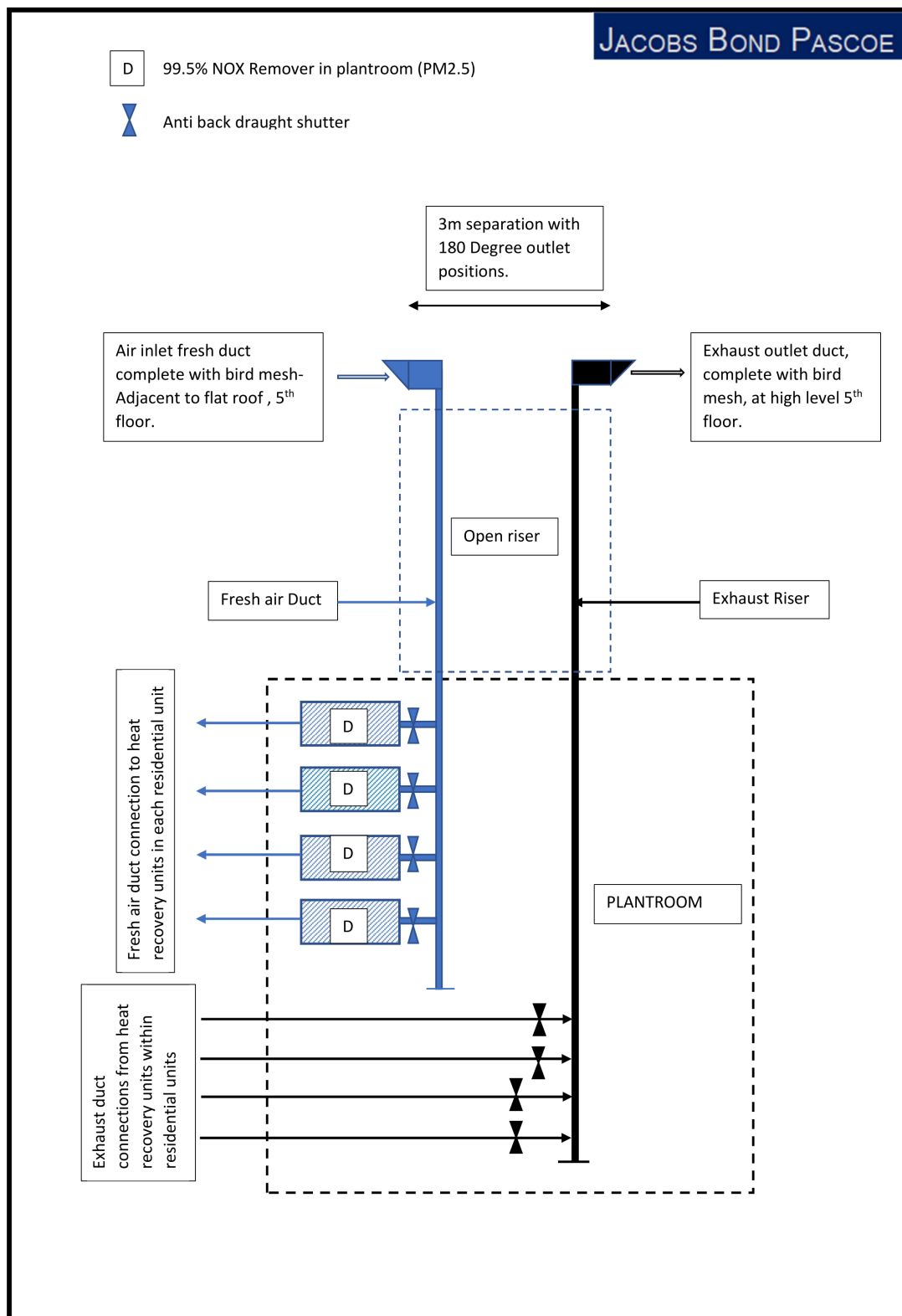
Ventilation will be required for the following purposes:

- a. Provision of outside air for breathing.
- b. Dilution and removal of airborne pollutants, including odours;
- c. Control of excess humidity (arising from water vapour in the indoor air);

In this incidence we are proposing mechanical ventilation plant.

Diagram below shows the methodology in bringing in Fresh air to the space:

5.4 Fresh air inlet schematic



DRAWING NO. 1002

5.5 Equipment Selection

The equipment shown under item D above is IAQ Box with the following specification:

The IAQBOX-S comprise of the Q-Aire IAQBOX range and shall be manufactured in sheet metal, with an integral foam lining to reduce noise & provide internal sealing. Each inline filter shall have a **PM2.5 pre-filter** inserted into the filter box to be capable of additional particulate filtration; particularly from diesel vehicle fumes.

The IAQBOX shall come complete with a removable mounting bracket.

The double size IAQBOX range of units have the option to be configured using a single or double spigot on the outlet. Double spigot on the outlet shall provide lower air resistance and further ducting options.

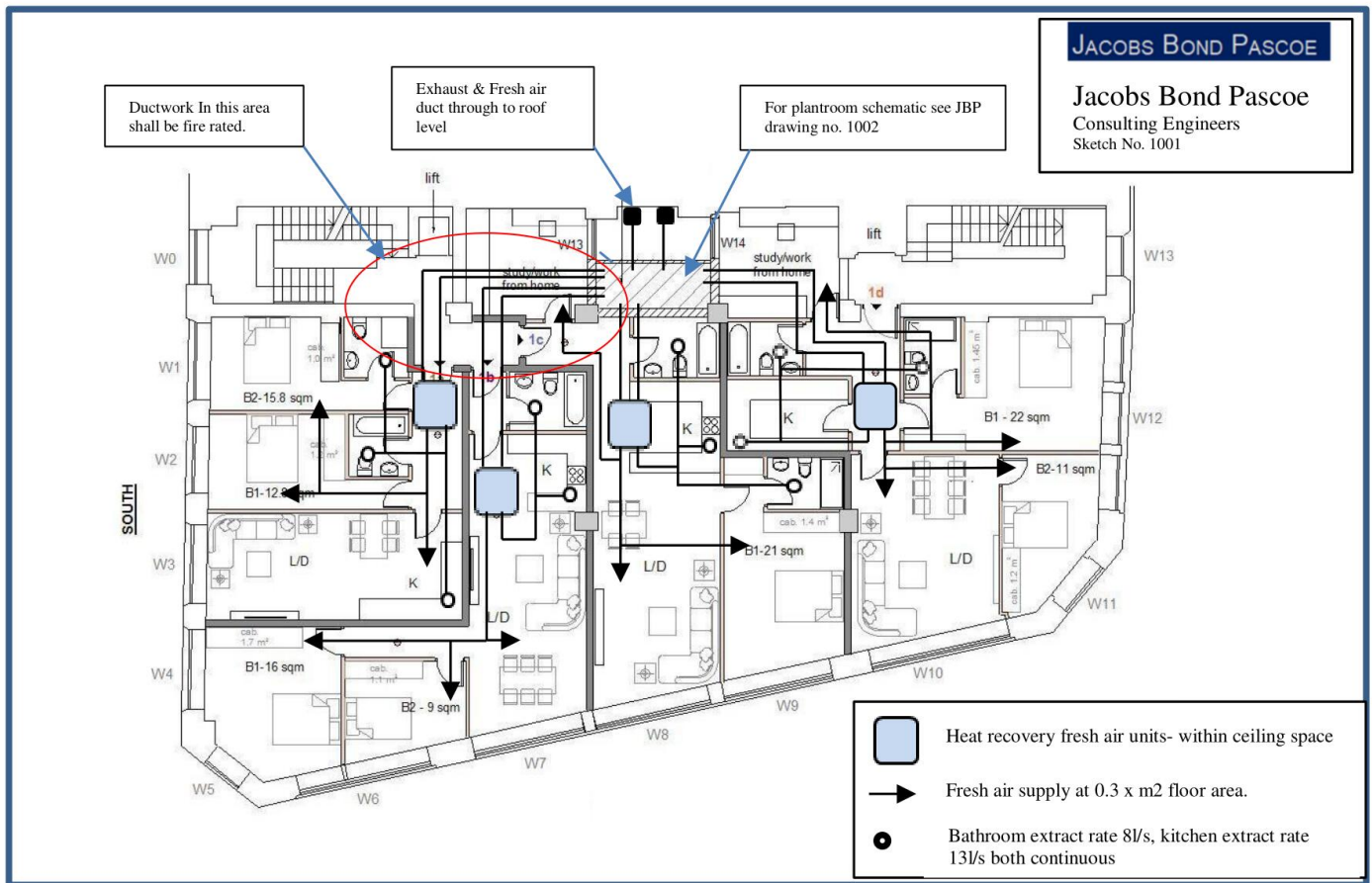
The IAQBOX shall come complete with a plastic construction carbon filter, containing two 30mm (approx.) beds of activated carbon pellets providing a large surface to filter the airflow. The filters shall be easily removed and replaced when required. The filter shall have a minimum efficiency of between **96% and 99.5% effectiveness in the removal of Nitrogen Dioxide**.

The unit efficiency shall be confirmed and independently verified by a BRE (Building Research Establishment) test method and the information shall be provided by the filter manufacturer for approval.

- Bulk density kg/m³ 480 (+/-5%)
- Nominal diameter of cylindrical pellets mm 4.0
- Nominal length of cylindrical pellets mm 8.0
- Moisture content (approx.) % 3
- Crush strength (minimum) kg 2
- Removal capacity for Cl₂ of own weight % 10
- Minimum design efficiency % 99.5
- Typical air velocity m/s 0.3 - 2.5
- Suitable for relative air humidities % 10 - 95
- Temperature range 0 -20 - +51

Each supply and exhaust air connection to the main duct header shall incorporate anti back draft shutters.

5.6 Internal fresh air distribution system



5.7 Fresh air inlet methodology

5.7.1 Heat recovery units shall be to the following specification:

The unit shall be fully insulated providing excellent thermal and acoustic characteristics and shall be complete with a multi plate, counter-flow, high-efficiency heat exchanger block with a **efficiency of up to 95%**. The heat exchanger shall be protected by **G3 grade filters** on fresh air inlet and system extract. The heat exchanger and filters shall be accessible via the front access panel, enabling quick and easy maintenance. The unit shall have low energy, high-efficiency EC fan/motor assemblies with sealed for life bearings, the impellers shall be backward curved centrifugal type. The motors shall be suitable for an ambient temperature of 40°C. The unit shall be supplied complete with a condensate drip tray and 32mm drain connection. The unit shall be suitable for rectangular ducting. Note: The unit is also available in opposite handed format, refer to spigot configuration for set up. The breakout noise level and power requirements shall be as detailed by the unit manufacturer and in accordance with the ventilation equipment schedule.

5.7.2 OPERATION

The supply and extract system shall be positioned as indicated on the drawing under section 5.6 and shall be in accordance with the particular fan schedule. The combined supply/extract with heat recovery unit shall supply filtered fresh air to each of the habitable rooms and moisture-laden air shall be extracted from all areas, e.g. bathroom, en suite, w.c, kitchen etc. The supply air shall be pre-heated by the warm extract air via the integrated counter-flow heat exchanger element. The extracted air shall also be filtered before it reaches the heat exchanger block. The ventilation unit shall vary its speed and therefore the ventilation rate, as it receives signals from one of the following:

- Switched live signal from light/remote switches.
- When signals are received, the fan shall alter its speed to adjustable, normal and boost rates.

The unit shall have the facility to commission the supply and extract fans independently on minimum speed (continuous background ventilation) and boost speed via inbuilt minimum and maximum speed adjustment. The fans shall have infinitely variable speed control.

The bypass damper shall open automatically via a wax actuator, allowing the air to bypass the heat exchanger to deliver fresh filtered air during the warmer months. The automatic bypass diverts 100% airflow around the heat exchanger with no reduction in airflow as independently tested by the BRE.

The controller shall be complete with commissioning and end user functions. The display will be a 3.5" LCD display and will remain on standby until such time the screen is touched.

The initial display will show the MVHR system status as listed below:

- Current fan speed.
- Current indoor/outside temperature.
- Indicate when the Summer bypass is activated.
- Indicate when frost protection is activated.
- Indicate when the filters require cleaning/changing.

*Note: Return air by under cut doors.

6 Purge Ventilation

As per the Building Regulation part F, the dwellings will require a facility for Purge ventilation. This is necessary for:

- To rapidly dilute pollutants and/or water vapour

Purge ventilation is required throughout the building to aid removal of high concentrations of pollutants and water vapour released from occasional activities such as painting and decorating or accidental releases such as smoke from burnt food or spillage of water.

Purge ventilation is intermittent, i.e. required only when such occasional activities occur.

The total ventilation should be sufficient to reduce pollutants to an acceptable level before the space is occupied. The purged air should be taken directly to outside and should not be re-circulated to any other part of the building.

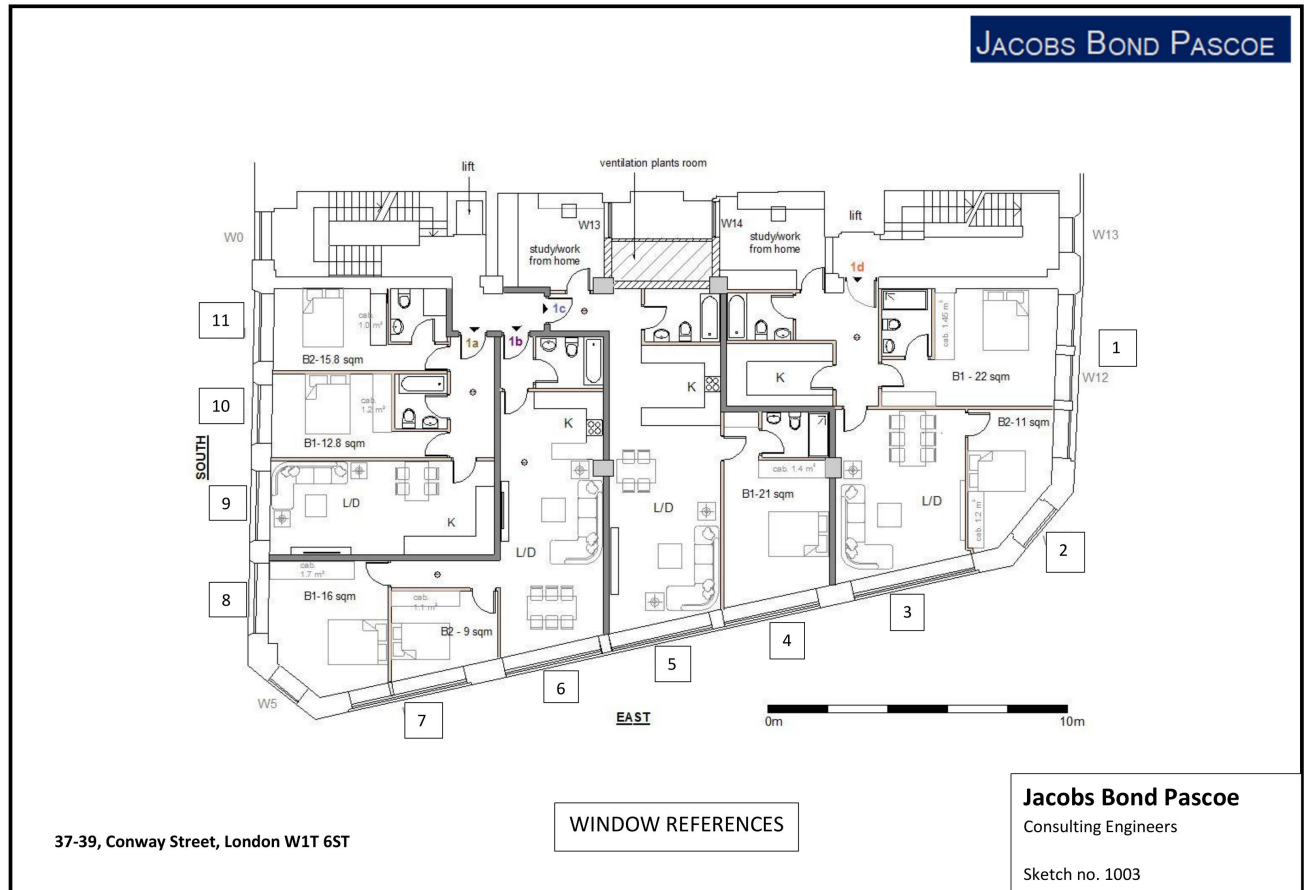
6.1 Purge Ventilation – Options.

Purge ventilation can be achieved by the following methods:

- A mechanical fan extracting at 4 ach to outside.
- Openable windows with free area of at least 1/20th of the floor area.

6.2 Option adopted for purge ventilation.

Hinged window that will open 60° or more with the opening part to be at least 1/20th of the floor area of the room.

Drawing No. 1003**WINDOW REFERENCES DRAWING NO. 1003****New Window opening specification:**

All windows are going to be 1.3m high and at least 2/3rd of the panels shall be fully openable with 60 Degree hinged connections.

Window Reference	Floor Area (m2)	Required Window opening (1/20th Of floor area)	Actual window opening (m2)
1	22	1.1	2.7
2	11	0.55	2.6
3	55	2.75	3.44
4	21	1.05	2.6
5	55	2.75	2.9
6	40	2.0	2.6
7	9	0.45	2.1
8	16	0.8	3.8
9	35.4	1.77	1.9
10	12.8	0.64	1.9
11	15.8	0.78	1.9

Information within the above table confirms that proposed dwelling upgrade meets the purge ventilation criteria of window opening of 1/20th of floor area.

7 Summary

Defining statements.

- Freshair shall be provided by mechanical system to each space at the rate of 0.3 x m2 floor area.
- Kitchen extract rate shall be 13l/s. Continuous adjacent to Cooker hob.
- Bathroom extract rate shall be 8l/s continuous.
- Inlet air to Heat recovery units shall be at PM2.5 and between 96% and 99.5% Nitrogen Dioxide free.
- Purge ventilation shall be provided by openable windows at the rate of 1/20th of floor area.
- We can confirm that all fixed mechanical ventilation systems, will be tested and adjusted, shall be commissioned and a commissioning notice given to the Building Control Body.
- For mechanical ventilation systems proposed in this dwelling, air flow rates shall be measured on site and a notice given to the Building Control Body. This shall apply to continuous running system used extract fans and cooker hoods, as well bathroom extract.
- The owner shall be given sufficient information about the ventilation system and its maintenance requirements so that the ventilation system can be operated to provide adequate air flow.