VENTILATION AND EXTRACTION STRATEGY

Trout Road

Produced by XCO2 for Troutbourne LLP

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TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY

This report has been produced to form part of the planning application for the development of Trout Road in the London Borough of Hillingdon. This report will demonstrate the proposed development's compliance with Building Regulations Approved Document F (ADF), which sets out the minimum requirements to ventilate buildings adequately. Smoke control ventilation has also been considered in this report in line with Building Regulations Approved Document B (ADB) and the building's fire strategy. The final smoke control strategy will require confirmation from Building Control and input from smoke ventilation specialist post-planning.

The scope of the report is to outline the ventilation strategy for the residential dwellings, commercial units, cycle parking, refuse stores, and plant rooms, as well as to discuss associated ventilation intake and exhaust locations.

An overview of the ventilation strategy is provided below

- Each dwelling is proposed to have a local mechanical ventilation with heat recovery (MVHR) unit with fresh air and exhaust terminations on the external façade.
- The commercial units are designed as "shell and core" under the scope of current works. The ventilation systems for these units will be designed as part of a future internal fit-out to the tenants' requirements. Louvres shall be provided at high level on the façade of each unit for future connection to its ventilation system's fresh air and exhaust terminations. There is no riser provision for tenants to route exhaust duct work to roof level. If commercial kitchens are installed a local pollution control system (e.g. ecology unit) or recirculating type ventilation system should be incorporated.
- Back of house (BOH) and facility spaces with an external wall are naturally ventilated via louvres.
- For refuse stores, post rooms, and spaces with no external walls, mechanical extract is required with louvres or transfer grilles to adjacent spaces providing a make-up air path.
- Generator room requires both natural cross-ventilation from louvres on multiple walls to dissipate heat and a flue to roof level to exhaust combustion fumes.
- Electrical substations shall be naturally ventilated through louvres on the façade of each room in line with statutory requirements.

The ventilation strategy described within this report is designed in accordance with the information available at RIBA Stage 2 design. The strategy will be detailed as the overall building design progresses and, therefore, future updates of this report may be necessary.

2.0 INTRODUCTION

2.1 DESCRIPTION OF DEVELOPMENT

The Site comprises the Rainbow and Kirby Industrial Estates, Trout Road, Yiewsley, UB7 7XT, which accommodate an approximately 2.3 hectare plot within the London Borough of Hillingdon. Parts of the Site front the south side of Trout Road, the western side of Yiewsley High Street, and the northwest side of St Stephen's Road, with the entire southwest boundary bordered by the Grand Union Canal. The Site largely accommodates a range of single-storey and two-storey industrial buildings, many of which were in a poor state of repair, particularly those fronting Trout Road.

The surrounding area comprises a mix of industrial uses, commercial uses and residential properties, with building heights ranging from two storeys up to five storeys. Both the former church immediately opposite the Site's High Street frontage and the George & Dragon Public House to the north are locally listed buildings. The Site is not located within a conservation area and does not contain any statutory listed or locally listed buildings. Figure 1 shows the site location and surrounding context.

The proposed development is a mixed-use, comprising of 433 apartments of privately rented, socially rented, shared ownership and privately owned dwellings split across 10 residential buildings (Block A, B1, B2, B3, D1, D2, D3, E, F, and G). There are also 3 Townhouses (Block H), a three-storey 'Makerspace' building (Block J), offices, commercial units, and car parking spaces. This is shown in Figure 2 below.

The development works require the demolition of the existing site structures and comprehensive redevelopment of the land. The Site will be publicly accessible from Trout Road, West Drayton High Street and St Stephen's Road, with a landscaped central park and activated ground floor uses.

Figure 1: Site Location and red line boundary

Figure 2: Proposed development and red line boundary

2.2 SCOPE

The scope of this report is to provide a ventilation statement for planning. The ventilation systems design of the proposed development shall be in full compliance with the relevant requirements as set out within Building Regulations Approved Document B (ADB), Approved Document F (ADF), Approved Document J (ADJ), and Approved Document L (ADL). Smoke control requirements will need final confirmation from Building Control and the smoke control specialist post-planning.

3.0 VENTILATION STRATEGY

This section outlines the ventilation strategy proposed to serve the residential apartments, commercial units, back of house (BOH), and site facility spaces.

3.1 RESIDENTIAL APARTMENTS

The ventilation in each apartment will be designed in accordance with ADF System 4 – Continuous mechanical supply and extract with heat recovery (MVHR). The table below is extracted from ADF and states the minimum performance requirements for continuous ventilation systems for dwellings and to which the development shall comply.

The specific fan power for all mechanical ventilation equipment shall be in compliance with the ADL.

Table 1: Approved Document F – Continuous Extract Ventilation Rates

Room	Minimum high rate	Minimum low rate
Kitchen	13 l/s	Total ventilation rate should be at least 13 L/s for a 1-bedroom dwelling[a,b]
Utility room	8l/s	
Bathroom	8l/s	
Sanitary accommodation	6l/s	

Notes:

a. In addition, the minimum ventilation rate should be not less than 0.3 l/s per m^2 of internal floor area.
b. This is based on two occupants.

For MVHR intake and exhaust, louvres will be located on the façade at high level within the apartment. Intake and exhaust terminations are positioned to minimise intake of pollutants, re-entry of exhaust air, and harmful effects on surrounding area.

Figure 3 presents the ventilation strategy of the residential apartments in a simplified sketch.

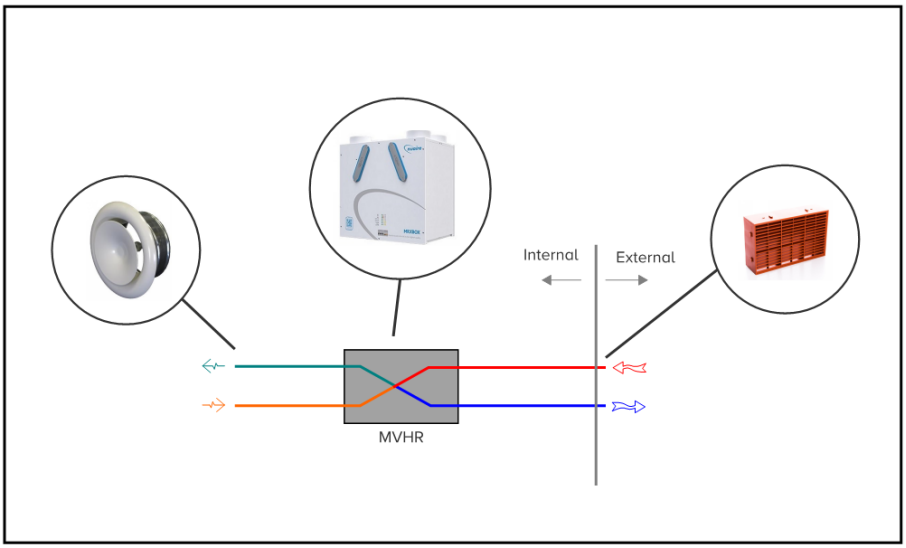

Figure 3: Ventilation strategy of residential apartments (termination will be via louvres or air bricks in the façade depending on architectural preferences)

Air will be supplied into the living room and bedrooms and extracted from bathrooms, kitchens, and utility cupboards. MVHR units will run continuously in the trickle mode operation and will be boosted in wet rooms on demand or via a humidity sensor and light switch. The ventilation rates will meet the ADF requirements. Acoustic measures, including ductwork attenuators, will be adopted if required at the detailed design stage to mitigate potential noise impacts within the apartments and to neighbouring sensitive receptors.

The MVHR units are proposed to be located in the utility cupboard of each apartment and will be accessible. Ductwork inside the apartments will run horizontally in ceiling voids to serve the spaces via air valves. A recirculation hood is proposed for the kitchen to filter grease from cooking.

Smoke exhaust & environmental control on residential floors

The smoke clearance for the residential floors will be provided via vertical smoke extract and make-up shafts that will ventilate the lobbies and corridors. For buildings with height < 18m (Blocks A, C, D1-3, and E) smoke extract shaft is ventilated naturally with automatic opening vents AOV at roof level. For buildings with height > 18m (Blocks B1-3, F, and G) the smoke extract shaft is ventilated mechanically with fans at roof level, an additional 'environmental' fan will also serve these shafts. For all building heights make up air shafts and staircases will be ventilated naturally with AOVs at roof level which open to atmosphere on receipt of a fire alarm. AOVs on each floor enable smoke extract from corridors and make-up air into lobbies. The smoke shafts, 'Environmental' fans (for buildings > 18m), and AOVs will also function to provide day-to-day ventilation, mitigating the risk of overheating.

The dimensions of the smoke shafts, AOVs and all ventilation openings shall meet the requirements from ADB and the fire strategy report.

The final smoke control strategy will be confirmed by Building Control and smoke control specialist at detailed design stage.

3.2 COMMERCIAL UNIT

Under the current scope of works, the provision of services to the commercial units is “shell and core” only. The ventilation systems will be designed at a later stage for the internal fit-out works to the tenant’s specific requirements.

High-level louvres will be provided on the façade for future connection to the tenant’s ventilation system. Intake and exhaust terminations shall be positioned to minimise intake of pollutants, re-entry of exhaust air, and harmful effects on surrounding area.

There is no riser provision for commercial tenants to route exhaust ductwork to roof level. Instead, if commercial kitchens are installed a local pollution control system (e.g. ecology unit) or recirculating type ventilation system should be incorporated.

The design of the ventilation system in the commercial unit shall be in compliance with ADF.

Table 2 outlines the minimum performance requirements for ventilation systems for buildings other than dwellings required by ADF.

The specific fan power for all mechanical ventilation equipment shall also be in compliance with the ADL and the project’s energy strategy.

Table 2: Ventilation requirements for buildings other than dwellings

Part F - Extract Ventilation Rates	
Room	Extract rate
Food and beverage preparation areas (not commercial kitchens)	Intermittent air extract rate of: 15 l/s with microwave and beverages only 30 l/s adjacent to the hob with cooker(s) 60 l/s elsewhere with cooker(s) All to operate while food and beverage preparation is in progress
Rooms containing printers and photocopiers in substantial use (greater than 30 minutes per hour)	Air extract rate of 20 l/s per machine during use. Note that, if the operators are in the room continuously, use the greater of the extract and whole building ventilation rates
Office sanitary accommodation and washrooms	Intermittent air extract rate of: 15 l/s per shower / bath 6 l/s per WC/ urinal

Part F - Whole building ventilation rate for air supply to offices	
	Air supply rate
Total outdoor air supply rate for offices (no smoking and no significant pollutant sources)	10 l/s per person

Acoustic measures, including ductwork attenuators and anti-vibrational mounts, should be adopted where required at the detailed design stage to mitigate potential noise impacts within the commercial spaces, to the residential tenants and to neighbouring sensitive receptors.

3.3 MAKERSPACE (BLOCK J)

Staff toilets and WCs on each level require intermittent mechanical extract with fans at high level extracting from each cubicle. Make up air will enter via the cubicles from adjacent ventilated spaces via door under cuts or transfer grilles.

The staff kitchen will be provided with a mechanical extract fan at high level and a recirculation hood local to cooking appliances for grease filtration.

High-level louvres will be provided on the façade for future connection to the tenant's ventilation system. The fresh air and exhaust terminations shall be located to ensure a minimum separation distance, preventing undesirable recirculation of exhaust air.

The design of the ventilation systems in Block J shall be in compliance with ADF.

3.4 BACK OF HOUSE AND FACILITIES

Back of house (BOH) and facility spaces (e.g. plantrooms, cycle stores, post rooms, etc.) within each bock shall be provided with adequate mechanical or natural ventilation as described in the below paragraphs.

3.4.1 NATURAL VENTILTION

Plantrooms and cycle stores with an external wall or door will be naturally ventilated via louvres of sufficient free area, see Figure 3. Where BOH spaces have multiple external walls, louvres shall be located to encourage cross ventilation.

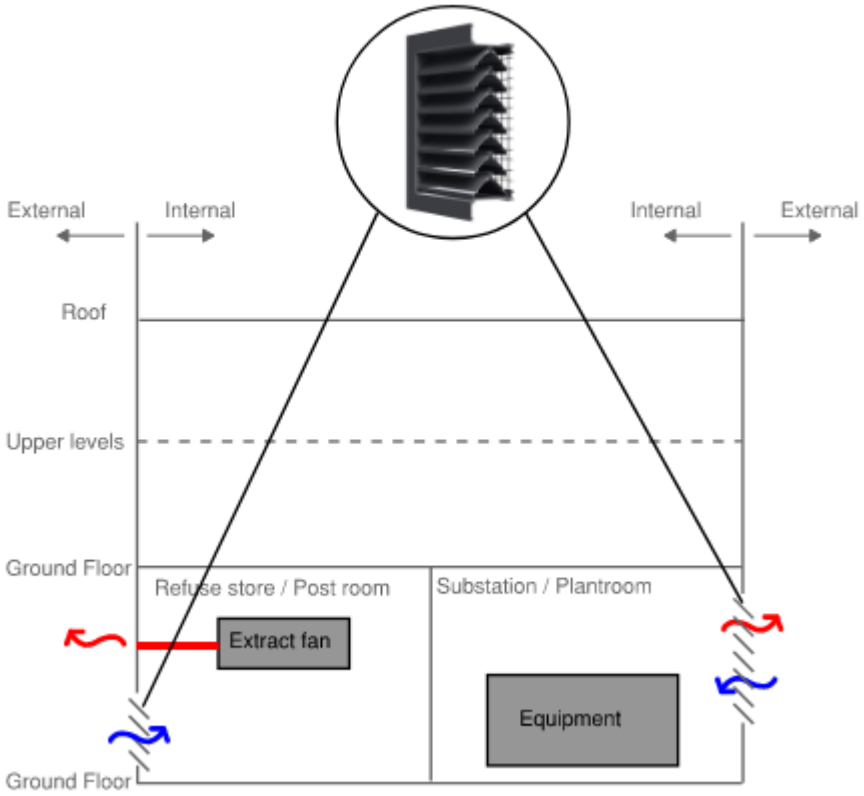

Figure 2: Ventilation strategy of back of house and facility spaces

3.4.2 MECHANICAL VENTILATION

BOH and facilities spaces without any external walls require mechanical extract via a fan at high level ducted to the façade. Transfer grilles allow for make-up air path from adjacent ventilated spaces. The BOH and facility spaces requiring this mechanical ventilation strategy are:

- Cleaners' cupboards
- Security rooms
- Post rooms
- Block B3 cycle store
- Block J WC

The refuse stores shall be mechanically ventilated and discharged through the façade. Make-up fresh air shall be supplied into the room through louvred doors, see Figure 3.

3.4.3 GENERATOR ROOM AND ELECTRICAL SUBSTATIONS

The generator is located at ground level. Louvred walls provide cross ventilation to dissipate heat during operation, see Figure 4. The generator will be flued to roof level as per manufacturer's requirements and Approved Document J.

The electrical substation ventilation shall be strictly in-line with the SSEN Connection Provider instructions which require natural ventilation through its façade, see Figure 3.

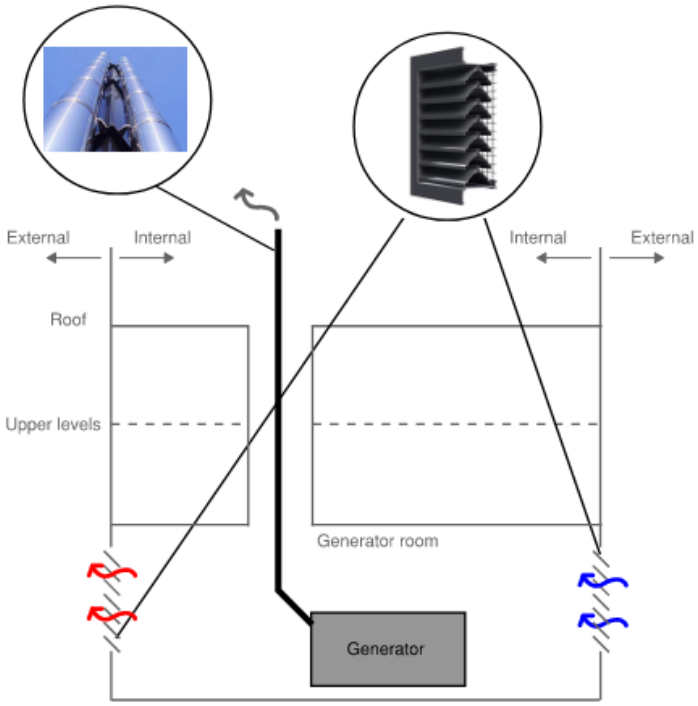

Figure 4: Ventilation strategy of generator room

4.0 CONCLUSION

The ventilation strategy for the Trout Road development shall be in line with ADB, ADF and ADJ of the Building Regulations as well as the domestic and non-domestic compliance guide documents. The strategy will comprise of the following:

- *Residential Apartments:* The apartments are proposed to be mechanically ventilated via a local mechanical ventilation with heat recovery (MVHR) units. Louvres for fresh air intake and exhaust will be located on the façade at high level within each apartment. Mechanical smoke ventilation is to be provided to the residential corridors via dedicated mechanically and naturally ventilated shafts (determined by building height), with AOVs providing extract and make-up on each floor.

- *Commercial Units: The provision of services to the commercial unit is "shell and core" only under the current scope of works. The ventilation system will be designed to the tenant's specific requirements during the internal fit-out works. Louvres will be provided at high-level on the façade for the future connection of fresh air and exhaust terminations. There is no riser provision for tenants to route exhaust duct work to roof level.*

- *Makerspace: Sanitary accommodation requires mechanical extract with make-up air entering cubicles from adjacent ventilated spaces. The Staff kitchen will be provided with mechanical extract fan and recirculation hood (there is no riser provision to route kitchen exhaust duct work to roof level). Louvres will be provided at high-level on the façade for the future connection of fresh air and exhaust terminations.*

- *BOH and facilities: Where spaces have an external wall, louvres provide natural ventilation. For refuse stores, post rooms, and spaces (with no external walls), mechanical extract is required with louvres or transfer grilles to adjacent spaces providing a make-up air path. Generator room requires both natural cross-ventilation from louvres on multiple walls to dissipate heat and a flue to roof level to exhaust combustion fumes. Electrical substations shall be naturally ventilated through louvres on the façade of each room in line with statutory requirements.*

Final smoke control strategy will be confirmed by Building Control and smoke control specialist Consultant at next design stage.

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