

**Technical Note on
Ventilation
Strategy**

New Hotel
Development
Laystall Street
Manchester

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AUDIT SHEET

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1.0 Executive Summary

The proposed development project at Laystall Street involves the re-development of the existing vacant site to create a new landmark, 20 storey hotel development and associated facilities.

This report is produced to form the planning application for the above project and demonstrate the proposed development's compliance with Building Regulations Part F published 2010 and updated 2022, which sets out the minimum requirements to ventilate buildings adequately. Smoke control ventilation has also been considered in this report in line with Fire Strategy and Part B of the Building Regulations published 2010 and updated 2022. Final smoke control strategy would require confirmation from Building Control post planning.

The scope of the report is to outline a ventilation strategy for the hotel rooms, define FOH space, and kitchen spaces, and discuss associated service zones required to accommodate ventilation ductwork. All assumptions are based on industry rules of thumb and should be checked during the detail design stages.

Sketches: included in the Appendix 1, which can be found at the back of this report highlight ventilation requirements.

Each hotel room has been designed to have centralised mechanical extract ventilation from roof mounted extract fan. The make up air will be provided via windows trickle vents which are carefully selected to respond to visual and acoustic requirements. A clear ceiling void of 250mm is expected within the hotel room bathroom and lobby to accommodate centralised extract.

Front of House (FOH) spaces at the Ground Floor, Mezzanine Floor and First Floor will have localised HRUs located within the area itself. A clear ceiling void of 500mm is expected. Ground floor and basement toilets will be ventilated via dedicated ceiling mounted extract fans. A clear ceiling void of 300mm is expected. Refuse Store will have dedicated extract system

First Floor Prep Kitchen will have a dedicated kitchen extract fan on the roof of the hotel. A clear ceiling void of 600mm is expected in the kitchen. A ventilation riser is provided from FF floor to the roof.

The basement ventilation system is sized based on smoke extraction requirements.

Mechanical extract ventilation system shall be provided to the basement areas. The system is sized to provide 10ACH from the largest fire compartment (plantroom at level B2). High-level supply and extract fans shall be installed in the basement plantroom for extract of air in accordance with Part F and Part B requirements. Considering the design information available to date, the required ventilation service zone is anticipated to be 500mm assuming no major crossovers within the basement.

Fire Fighting Lobby mechanical smoke extract is provided in line with the Fire strategy with smoke fans located at the roof level. As fire fighting lifts does not serve basement levels the ventilation of the basement lobby is not required in line with agreed fire strategy

2.0 The Site & Proposal

The proposed site at Laystall Street is bounded by Lomax Street to the south and overlooks Great Ancoats Street to the east and Laystall Street to the north.

The site is a vacant plot of land the abuts an existing Serviced Apartments.

The site is approximately 5 metres to the south of Great Ancoats St (A665), to the south of Urban Exchange, a retail area, with a light industrial area to the south. The A665 is a busy main road, with road traffic determining the noise climate.

A google image of the site location is shown in the figure below.

Figure 2: Site Location



The proposal seeks to redevelop the site for a (circa) 150 bed hotel arranged over 20 floors and two levels of basement including plant spaces, cycle storage and a café/bar area.

2.1 SCOPE

The scope of this report is to provide a ventilation statement for planning. The proposed development's ventilation system design will meet the requirements set out within Part F and Part B of the Building Regulations. Smoke control requirements will need final confirmation from Building Control.

3.0 Performance Standards

3.1 Building Regulation Part F

Approved Document Part F of 'The Building Regulations' (2010 edition incorporating 2010 and 2022 amendments) states that 'ventilation systems in buildings result in energy being used to heat fresh air taken in from outside and, in mechanical ventilation systems, to move air into, out of and/or around the building'. The mechanical services design has been developed in accordance with this document.

Building Regulations Part F sets out the minimum requirements to ventilate buildings adequately. These regulations will be followed throughout the services design for the project. These regulations have been seen by some to be in conflict with the general requirement to reduce energy; as increasing ventilation rates for fresh air purposes can lead to increased energy to heat or cool incoming air for comfort requirements. However, with modern servicing strategies that incorporate high efficiency heat recovery equipment, the potential conflict between these two requirements can be reduced. Wherever a significant volume of used air is being exhausted to atmosphere, the use of heat recovery will be considered to remove heat energy from outgoing air streams for transfer into incoming fresh air supplies, thereby saving significant primary energy demands for buildings.



3.2 Part F Rates for Buildings other than dwellings

The tables below outline the minimum performance requirements for ventilation systems for buildings other than dwellings and are extracted from Approved Document Part F of the Building Regulations.

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

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

Whole building ventilation rate of other buildings and spaces	
Building / Space / Activity	Regulations and guidance
High-rise (non-domestic buildings)	CIBSE Guide B:2005, Section 2.3.12 and CIBSE AM10: 2000 if naturally ventilated and CIBSE AM13:2000 if mixed-mode ventilation

3.3 Part B Fire Safety for Buildings other than dwellings

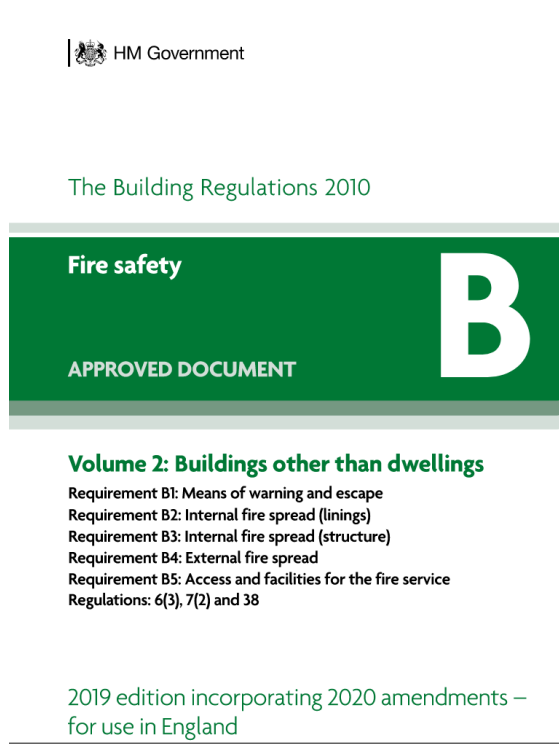
Part B of Building Regulations outlines the following key requirements in Section 18, Venting of heat and smoke from basements:

"18.3 Where practicable each basement space should have one or more smoke outlets, but it is not always possible to do this where, for example, the plan is deep and the amount of external wall is restricted by adjoining buildings. It is therefore acceptable to vent spaces on the perimeter and allow other spaces to be vented indirectly by opening connecting doors.

However, if a basement is compartmented, each compartment should have direct access to venting, without having to open doors etc into another compartment.

18.4 Smoke outlets, connected directly to the open air, should be provided from every basement storey, except for any basement storey that has: a. a floor area of not more than 200m² and b. a floor area not more than 3m below the adjacent ground level

18.5 Strong rooms need not be provided with smoke outlets"



Where mechanical extraction for smoke is adopted, the following requirements are set out within Part B of the Building Regulations:

"18.13 A system of mechanical extraction may be provided as an alternative to natural venting to remove smoke and heat from basements, provided that the basement storey(s) are fitted with a sprinkler system in accordance paragraph 0.16 (it is not considered necessary in this particular case to install sprinklers on the storeys other than the basement(s) unless they are needed for other reasons.)

18.14 The air extraction system should give at least 10 air changes per hour and should be capable of handling gas temperatures of 300°C for not less than one hour. It should come into operation automatically on activation of the sprinkler system; alternatively, activation may be by an automatic fire detection system which conform to BS 5839-1:2000 (at least L3 Standard). For further information on equipment for removing hot smoke refer to BS EN 12101-3:2002.

18.15 Outlet ducts or shafts, including any bulkheads over them (See Diagram 18.1) should be enclosed in non-combustible construction having not less fire resistance than the element through which they pass.

Mechanical smoke extract

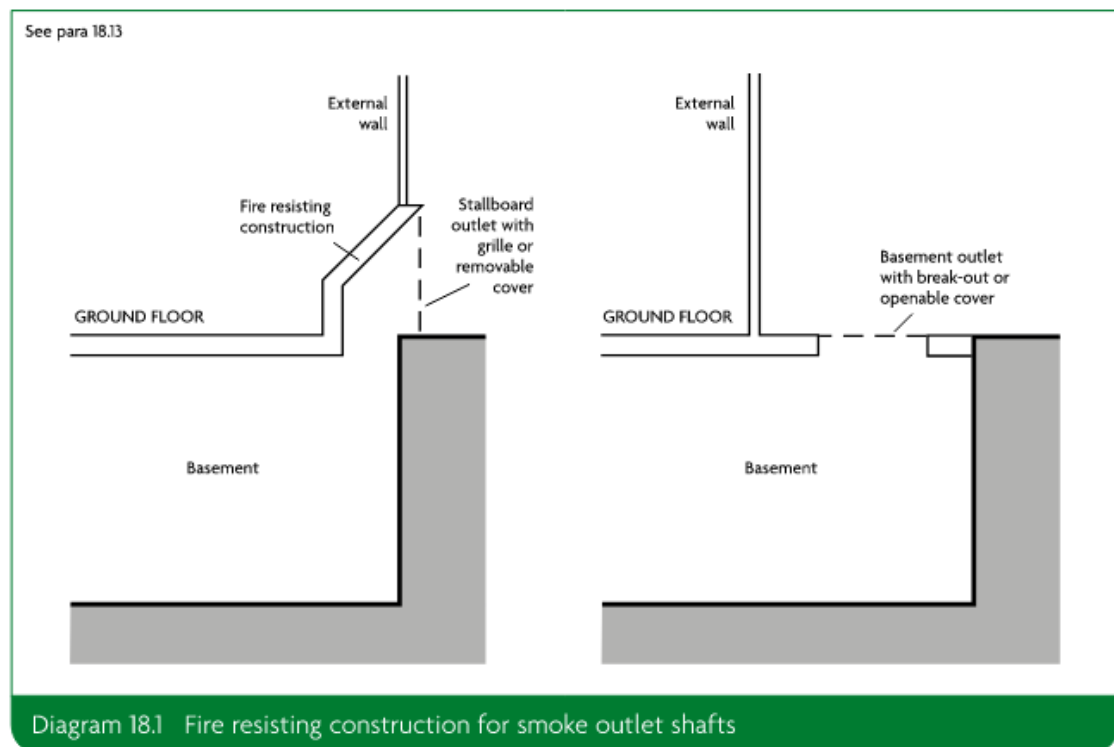
18.11 If **basement storeys** are fitted with a sprinkler system in accordance with Appendix E, a mechanical smoke extraction system may be provided as an alternative to natural venting. Sprinklers do not need to be installed on the other **storeys** unless needed for other reasons.

Car parks are not normally expected to be fitted with sprinklers (see Section 11 for guidance on car parks).

18.12 The air extraction system should comply with all of the following.

- a. It should give at least 10 air changes per hour.
- b. It should be capable of handling gas temperatures of 300°C for not less than one hour.
- c. It should do either of the following.
 - i. Be activated automatically if the sprinkler system activates.
 - ii. Be activated by an automatic fire detection system that conforms to **BS 5839-1** (minimum L3 standard).

Further information on equipment for removing hot smoke is given in **BS EN 12101-3**.



4.0 Ventilation Strategy

The ventilation strategy for the hotel rooms, FOH space, and kitchen spaces of the proposed development will seek to follow the recommendations as found within Part F Building Regulations Section 6: New buildings other than dwellings and Part B: Fire Safety – Buildings other than Dwelling houses.

Drawings in the appendix 1 highlighting ventilation requirements.

4.1 Hotel Rooms

It is expected that hotel bedrooms will be served by a dedicated air handling extract fan located on the roof. The fresh air supply will be provided via windows trickle vents. Extract air shall be routed horizontally from each hotel bathroom, and vertically through mechanical risers to the roof level extract system. A clear ceiling void depth of 250mm is expected within the hotel room corridor and bathroom, and 300mm in the hotel communal corridors

4.2 Front of the house spaces

The following front of the house spaces are expected to be ventilated via dedicated mechanical ventilation with heat recovery units (MVHRs) located within ceiling voids:

Dining/Lounge/Bar (Level 1)
Lobby and Reception, Language Room (Ground Floor)
Staff Room (Basement 1)
Gym and meeting rooms (mezzanine Floor)

Access hatches will be required. The fresh air supply will be routed to supply grilles in the ceiling. Extract air shall be via from extract grilles in the ceiling. A clear ceiling void of 600mm is expected within each FOH space.



Figure 4: Mechanical ventilation unit with heat recovery

Fresh air supply and exhaust ductwork is proposed to be well insulated and to be routed horizontally via ceiling voids to terminate at external façade of each space. Louvres for fresh air intake and exhaust will be located on the façade at high level within the space.

The ground floor and basement toilets will be ventilated via dedicated extract fans located within ceiling voids. Access hatches are expected. The make-up air will be from adjacent spaces. Extract air shall be via from extract grilles on the ceiling. A clear ceiling void of 500mm is expected within the toilet.



Figure 5: Ceiling Mounted Extract Fan

The extract ductwork from the basement toilets will be routed within mechanical riser, and rise vertically via the riser to terminate at the back of the house facade.

4.3 F&B Kitchen

The mechanical ventilation system in the F&B kitchen will be served by an AHU and a kitchen extract fan located on the roof of Block 5. Kitchen exhaust air will be extracted from the kitchen hoods by ceiling mounted extract ductwork to the kitchen extract fan. Kitchen filtration requirements to be confirmed by the kitchen specialist.

It is expected the fresh air will be routed to the kitchen area at 85% of kitchen extract rate. A clear ceiling void of 700mm is expected within the F&B kitchen. A supply unit shall be provided within kitchen demise and would require 700mm ceiling void. A ventilation riser is expected to distribute the extract ductwork from the roof. A clear roof space is expected for the F&B kitchen extract fan and AHU, please refer to the sketches for the expected location.



Figure 6: Kitchen Extract Fan

4.4 Basement Smoke Clearance

Dedicated smoke extract fan and make up air fans will be located at the ground floor (ceiling void). The ductwork will be routed via dedicated risers to provide supply and extract from the basement 1 and 2. Ductworks will be fire rated and sized for at least 10 air changes per hour and should be capable of handling gas temperatures of 300°C for not less than one hour. The smoke extract fan shall get into smoke mode automatically on activation of the sprinkler system; or by an automatic fire detection system which conform to BS 5839-1; whichever react first.

5.0 Conclusion

The ventilation strategy for Laystall Street Development will incorporate mechanical ventilation for all of the occupied spaces. Acoustic attenuation will be advised, if required, at detailed design stage. The mechanical ventilation system would be located either within the ceiling service zone or within dedicated plant space. Fresh air intakes and exhaust air terminations are proposed to be located at ground level and roof where possible in order to minimise ingress of air pollutants from the main road.

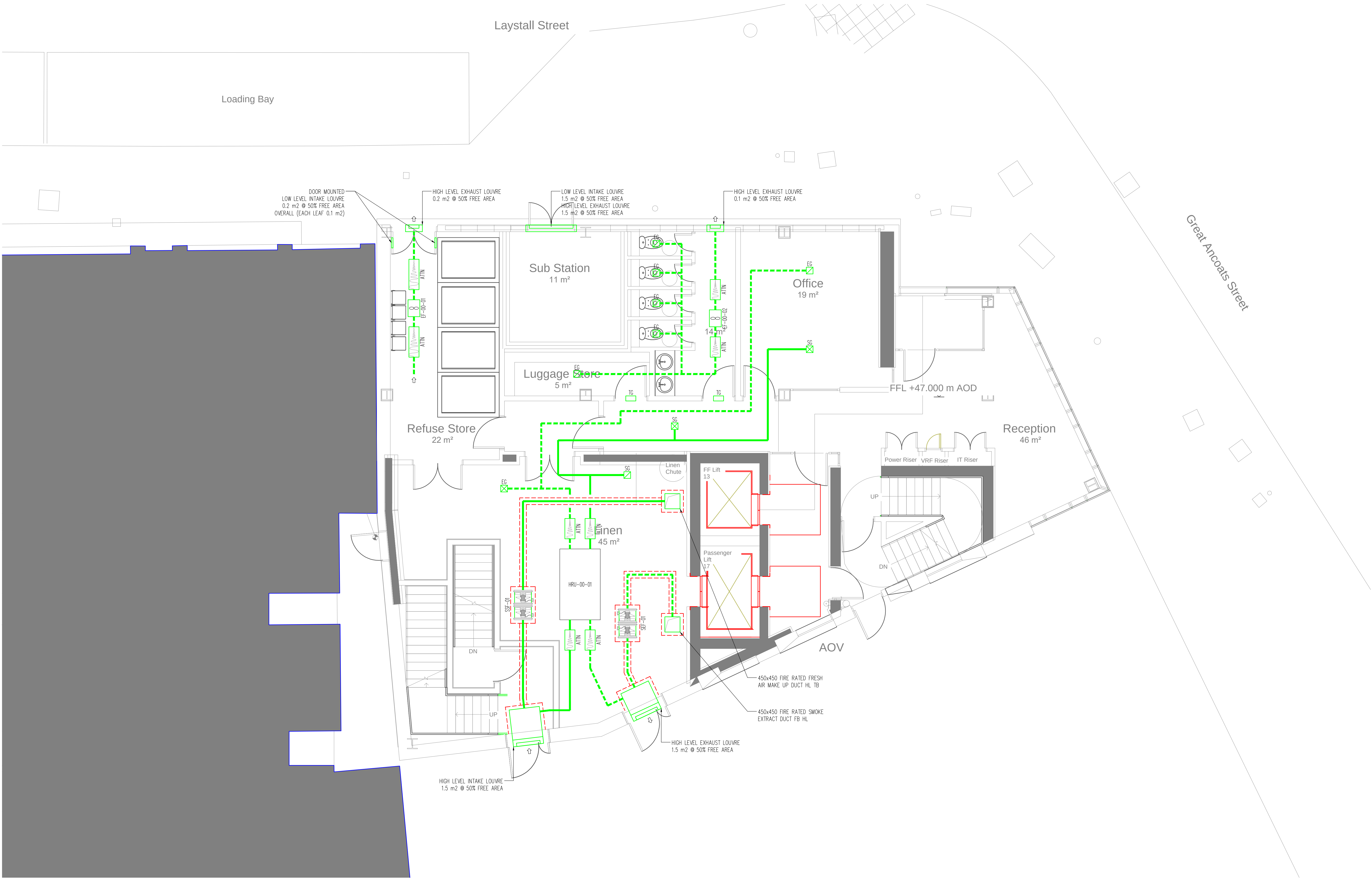
Bedrooms make up air will come from trickle vents built in windows

Coordination of services within the ceiling void (or service zone) is subject to detailed design. Taking into account the design information available to date, the service zone is anticipated to range between:

- Basement level: 500mm assuming no major crossovers.
- Ground floor FOH spaces and WCs: 600mm clear assuming no major no crossovers.
- Hotel room: 250mm clear within the entrances and bathroom, 300mm within communal corridors.

The proposed strategy is compliant with both Part F and Part B documents of Building Regulations

Appendix 1 - Ventilation Strategy:



SK3	SKETCH ISSUE	NM	SSBA	NOV 21
SK2	SKETCH ISSUE	NM	SSBA	AUG 22
SK1	SKETCH ISSUE	NM	SSBA	JULY 22
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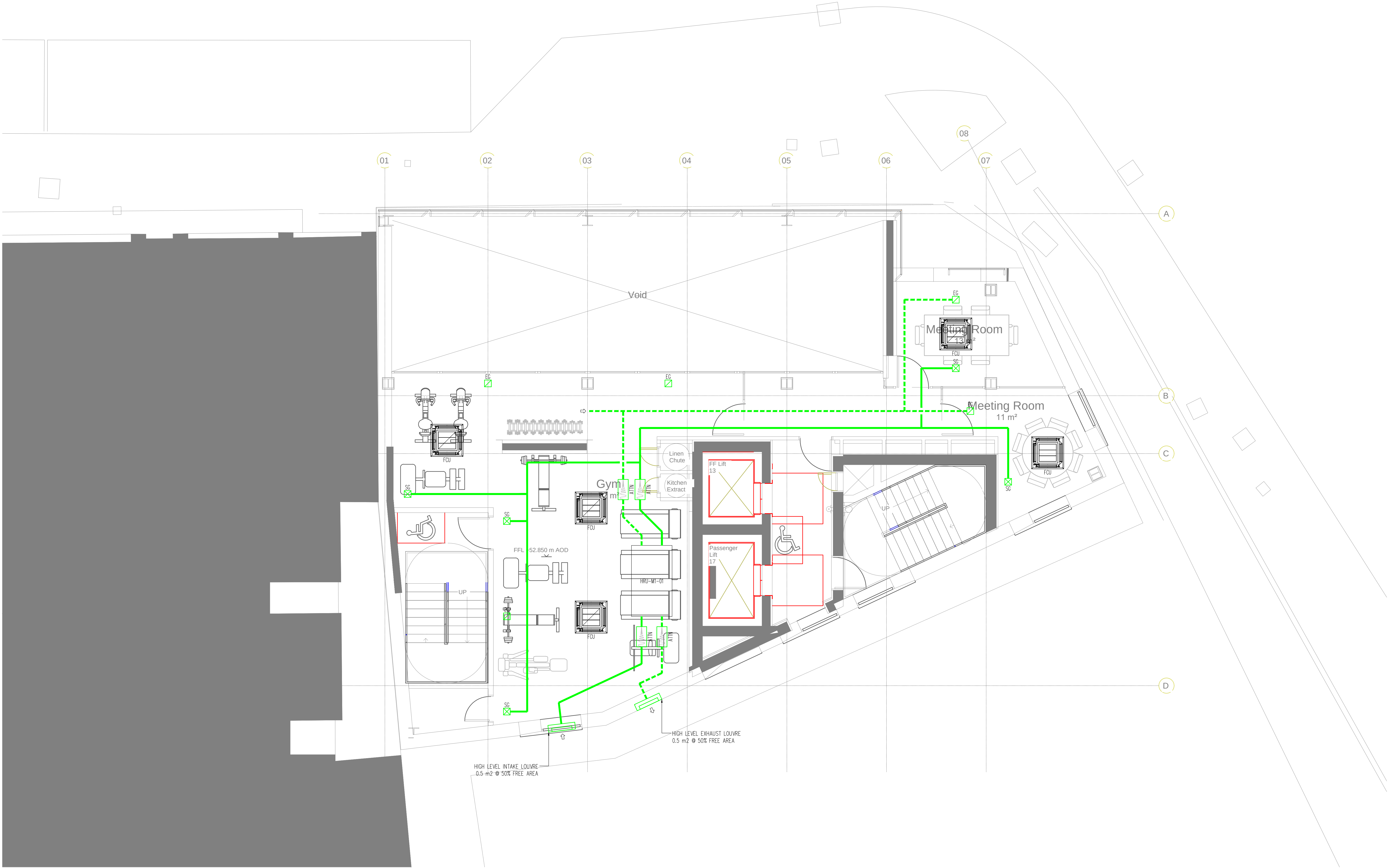
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**MEP INSTALLATIONS
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MEP SPACE AND
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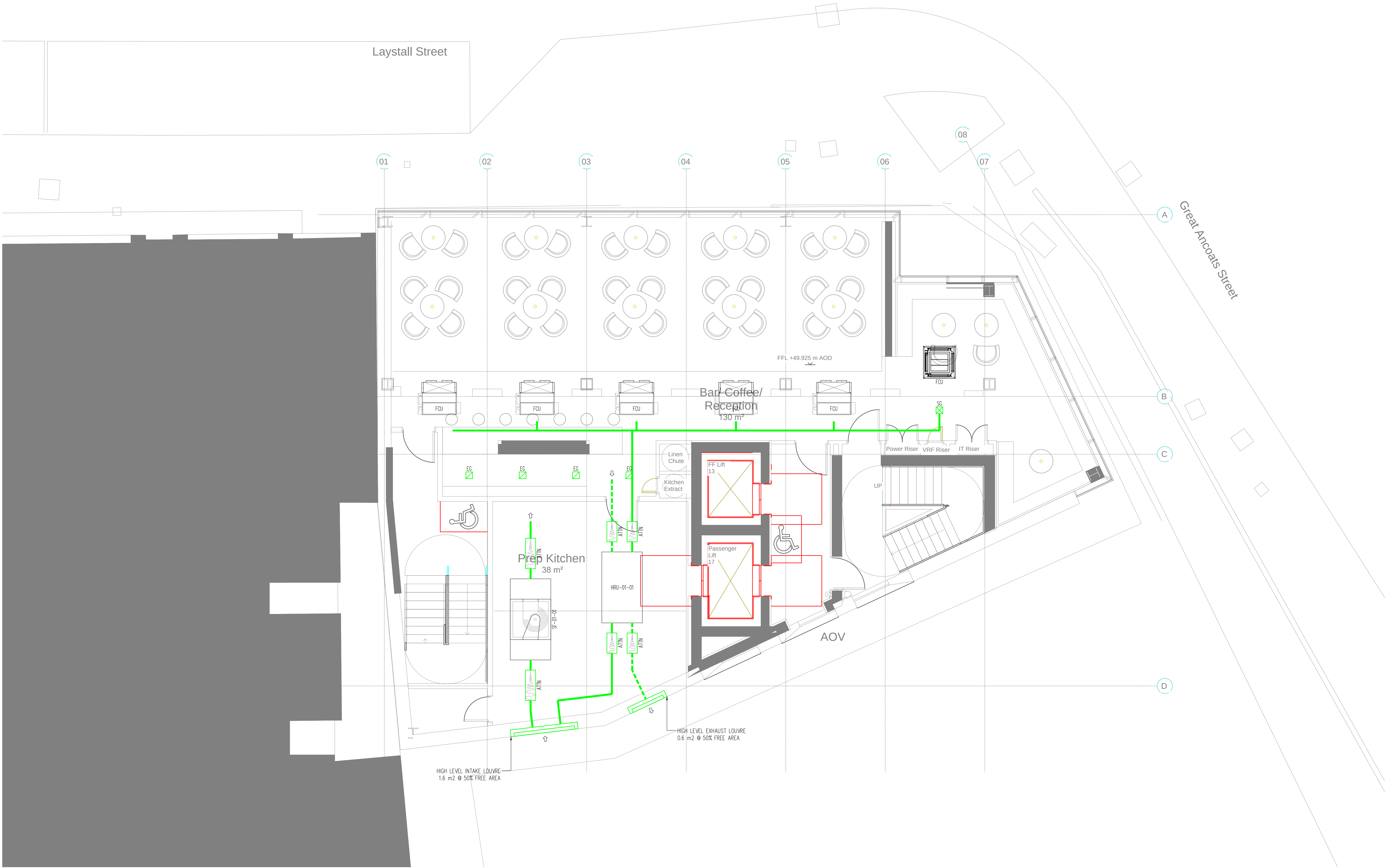
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PRELIMINARY ISSUE

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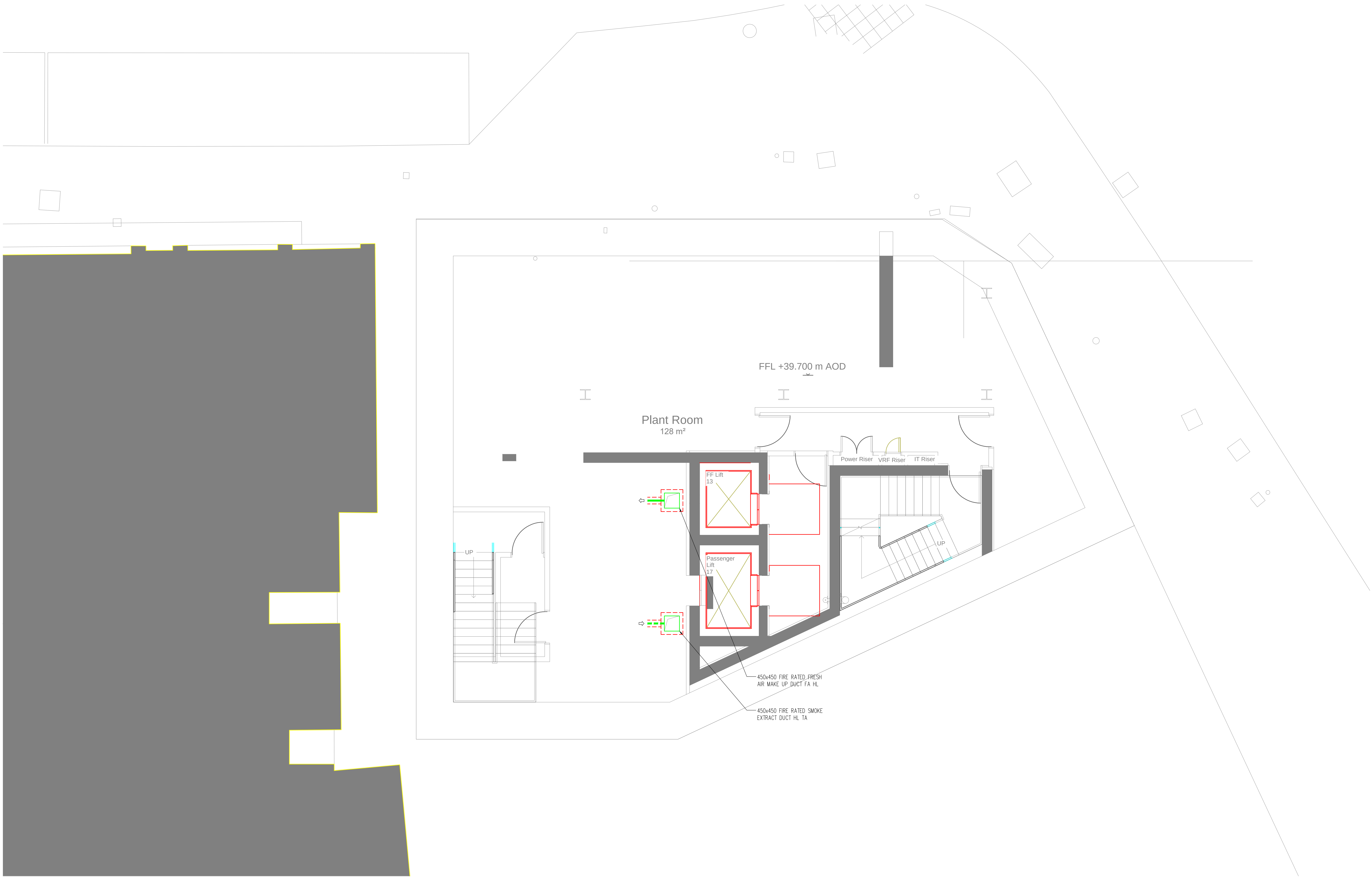
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**MEP INSTALLATIONS
LEVEL 1 LAYOUT
MEP SPACE AND
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MEP INSTALLATIONS
BASEMENT -2 LAYOUT
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