

NXQ

Lever Street, Manchester

Ventilation Statement

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Howells

SOLLER

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Executive summary

This Ventilation Statement has been prepared by Atelier Ten on behalf of Soller Nine in support of the planning application for The NXQ Building, Manchester, to provide details of the proposed ventilation and extraction strategy.

The office facilities proposed for The NXQ Building will be served by landlord's primary air handling units (AHU) plant, which will be in dedicated roof plant enclosures. The landlord's AHU plant will serve the office accommodation, with separate, dedicated AHUs serving the basement and localised mechanical ventilation heat recovery units (MVHR) serving the WC cores.

The primary ductwork serving the building will be installed in the central risers within the core; the secondary ductwork will be installed at high level within the tenancies as part of the CAT-A fit out, with potential for modification by the tenant as part of CAT-B works. The plant and associated distribution ductwork will be split into two systems, routing either side of the core to serve half the floor plate each, enabling a two-tenant split on each floor level.

Alongside the office, there will be a three-storey restaurant with one level of basement. This will include a commercial kitchen on the ground floor. In line with DW/172 and the Health and Safety Executive 'Ventilation in Catering Kitchens' a dedicated kitchen extract ventilation system will be installed which will remove fumes, odours, and excess hot air from the working environment. To reduce the risk of pollutants being entrained back into the office block due to the proximity, an electrostatic precipitator filtration system will be installed, this will remove oil, grease and smoke particles from the exhaust air, ensuring the air is purified before the point of discharge.



Figure 1-1 Proposed Development CGI

1 Introduction

This Ventilation Statement is prepared by Atelier Ten on behalf of Soller Nine in support of a planning application for The NXQ Building development, the architects are Howell Architects.

This report provides details of the proposed ventilation and extraction strategy, which has been designed in accordance with the requirements of the Building Regulations Approved Document F, BCO guidelines, and pertinent CIBSE guidance documents.

1.1 Project Description

The site is located in Manchester's Northern Quarter on land bound by Lever Street, Great Ancoats Street, Little Lever Street, and Houldsworth Street. The development will create 11,308 m² of office space (NIA) across 18 storeys, with additional space provision for cycle storage, amenity space, and back of house facilities. There will also be a three-storey restaurant/bar with a commercial kitchen, creating active frontage onto Lever Street.



Figure 1-1 Satellite View of Site Location

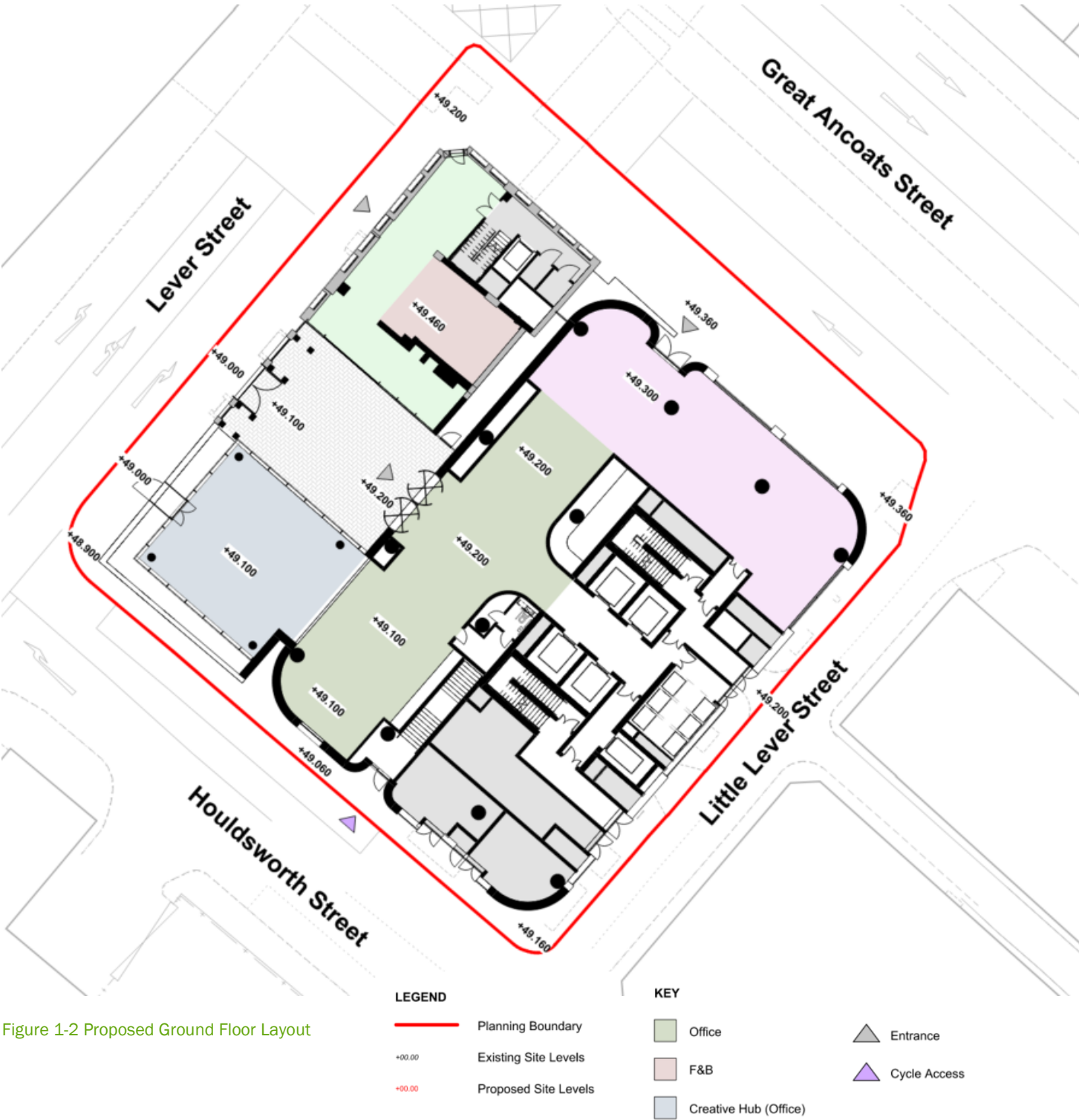


Figure 1-2 Proposed Ground Floor Layout

2 Ventilation Strategy

2.1 General Ventilation

The following ventilation rates will be provided to the following space types:

Table 2.1 Space Ventilation Rates

Space Type	Ventilation Rate
Office Tenant Space	14 l/s/person @ 10m ² /person
Office WCs	10 ACH ⁻¹ extract, supply provision = 85% of extract provision
Office Basement	Various to Suit Room Function
Basement Smoke Extract	10ACH
Restaurant Dining Area	10 l/s/person @ 2m ² /person
Restaurant Kitchen (Commercial)	60ACH ⁻¹ (TBC by Specialist)

Each space type listed in Table 2.1 is served by a dedicated ventilation system, discussed herein. Further to these, two smoke extract systems are proposed for the building, one to serve the basement and one to serve the firefighting lobby on every floor; this is discussed in Section 2.4.

2.2 Office Ventilation

The office tenancies will be served by two Air Handling Units (AHUs) systems, one serving each side of the building.

The toilet core will be served locally on each level by a Mechanical Ventilation Heat Recovery (MVHR) unit.

The two levels of basement will be served by a dedicated AHU.

It is proposed that the internal circulation spaces will not be directly ventilated. These areas will benefit from make-up air resulting from ventilation provided to the occupied spaces, then partially extracted via the WC areas, at each floor level. The make-up air in these areas will be equal to/ greater than the minimum ventilation rate stated in Approved Document Part F '0.5 l/s/m².

2.2.1 Tenant Space

General operation

The internal spaces within will be served with fresh air by means of mechanical ventilation, supplemented with natural ventilation via actuated openable windows (complete with sensors linked to the cooling system) providing a hybrid ventilation strategy. During the winter months, the fresh air requirements will be met from the centralised AHU. During the summer months, additional ventilation will be provided via actuated openable windows to help maintain internal thermal comfort conditions. When the external air temperature is greater than 24°C and the external air temperature is greater than the internal, the actuators will close the natural openings to allow the cooling system to take over and maintain suitable internal environmental conditions.

Mechanical strategy

A centralised ventilation strategy using 2No. dedicated, landlord AHUs will provide fresh tempered air to office areas via a supply and extract ductwork distribution systems. One AHU will serve each side of the building, enabling a two-tenancy split on each floor. The AHUs will be located at roof level and will be double stacked type which will be easily accessible for maintenance purposes. Intake and exhaust to each AHU will be located at low level on the roof. The 2No. landlord AHUs will be capable of providing heat recovery via a thermal wheel. This energy efficiency principle will provide the benefit of recovering heat from the internal spaces from each floor level to pre-heat the external fresh air being introduced into the space.

The air handling units located on the roof will be provided with following key components:

- Noise attenuators (4 No per AHU) to comply with the local planning guidance for noise breakout from roof top plant
- DX coil for heating and cooling
- Heat recovery (thermal wheel with purge section and by-pass section)
- Bag/Panel filters

- BMS control panel linked to AHU module
- Motorised dampers and variable speed fans
- Access walkway to maintain each air handling unit and associated plant
- All ductwork at roof level will be fully insulated and acoustically lined

The ductwork system will be distributed vertically within the service risers located centrally on each side of the core. Distribution ductwork branches serving each floor level will be provided with a VAV box, duct mounted attenuator and fire damper, with high level distribution within the tenant area installed to supply to the back of all Fan Coil Units (FCUs). This distribution within the floor plate will be open to modifications by tenants as part of CAT-B works. The VAV boxes will be linked to CO₂ sensors on the floor plate to enable ramping of fresh air supply in line with the occupancy. It is currently assumed that each tenant may wish to install a tea-prep or kitchenette area within their demise. This is anticipated to be dealt with via the general ventilation system, subject to client confirmation.

Appendix A shows the location of the AHUs.

2.2.2 Toilet Core

WC facilities are located within the building core on every floor. These will be provided with mechanical supply and extract via a local MVHR unit providing the air change rate based on the value given in Table 2.1. MVHRs will be located in the lobby ceiling void. The units will be installed with attenuators to minimise noise breakout externally and internally, in line with the project's acoustic requirements. Ducted connections will be provided to architectural weatherproof louvres installed within the façade for intake and exhaust.

Supply air will be sized at 85% of the extract flow rates to ensure the toilet core is negatively pressurised and the escape of odours into the neighbouring corridors is minimised. Supply ventilation ductwork will distribute at high level and will introduce tempered air into the WC lobby spaces via ceiling grilles; extract air will be ducted from grilles above the individual cubicles to minimise cross-contamination between spaces.

2.2.3 Basement

The office basement areas will be provided with a dedicated AHU located on the lower basement level. This will include largely the same components as the office AHUs, with the exception of the DX coil and use a plate heat exchanger. The ventilation rates being provided to the various spaces will vary depending on their function to align with, or exceed, CIBSE Guidance.

2.3 Restaurant Ventilation

Alongside the office will be a three-storey restaurant with one level of basement. This will include a commercial kitchen on the ground floor alongside café/bar space; the 1st and 2nd floors will be dining areas featuring a terrace. The basement area is in abeyance pending input from an operator or restaurant specialist; the ventilation strategy for the basement will be developed as information is available. However, as a minimum it will be designed in line with CIBSE guidance and DW/172.

2.3.1 Dining Area

A centralised ventilation strategy using an AHU will provide fresh air to the dining areas via a supply and extract ductwork distribution system. The AHU will be located at roof level and will be double stacked type which will be easily accessible for maintenance purposes. The air handling unit components will include attenuators, filters, BMS controls, and a plate heat exchanger. The ductwork system will be distributed vertically within a service riser located locally to the core.

2.3.2 Kitchen (Commercial)

The restaurant kitchen will be served by a dedicated commercial kitchen extraction system with filtration and odour control. This will be mounted at high level and connect to atmosphere via an architectural weatherproof louvre installed in the façade. It is proposed that makeup air will be drawn in naturally (subject to specialist ventilation requirements). The air change rate will be determined by the specialist once on board. The type of cooking will determine the extent of filtration required to control the dispersion of odour and grease. Once more is known about the operation of the kitchen, a more detailed evaluation of the filtration required will be undertaken.

Likely components include:

- A bifurcated extract fan
- Panel and bag filters or panel and UV-C module

- Activated carbon filters
- Vertically discharging high velocity cowl
- Canopy grease filter
- Electrostatic precipitator

The kitchen extract system shall comply with the requirements of DW/172 and BS 9999, with fire-rated ductwork provided from canopy to atmosphere. The kitchen extract system shall also comply with the requirements of Approved Document B, with the fire rating of the ductwork (i.e. 60/90/120mins) to be confirmed by the fire consultant within the fire strategy report. The kitchen extract ductwork will include access panels either side of every bend, with access provided to the riser at every level. Similarly access panels will be provided in the horizontal ductwork at regular spacings to facilitate manual cleaning. All access panels will be in accordance with the requirements of DW/144, DW/172 & TR/19.

2.4 Smoke Ventilation

The office will include smoke ventilation systems to both the basement and the firefighting lobbies on each floor. These systems are specialist design and information regarding them herein is indicative, to be confirmed by a specialist.

2.4.1 Firefighting Core

Located on top of the core and connected to a smoke shaft, a dedicated landlord's smoke extract system will be installed complete with attenuators. The smoke shaft will be installed with mechanical actuated grilles at high level on each floor level, which will open when the smoke extract system is activated to provide smoke protection to the protected firefighting lobby on each floor.

2.4.2 Basement

Smoke extract will be provided to all areas of the basement. This will utilise the same distribution ductwork that the basement ventilation system uses with ducts sized to provide 10ACH⁻¹ to a room. All ductwork will be fire rated to standards identified by a smoke specialist. 2No. smoke fans will be located in the basement to provide resilience. Exhaust connections to atmosphere will be above the pedestrian zone and away from escape routes.

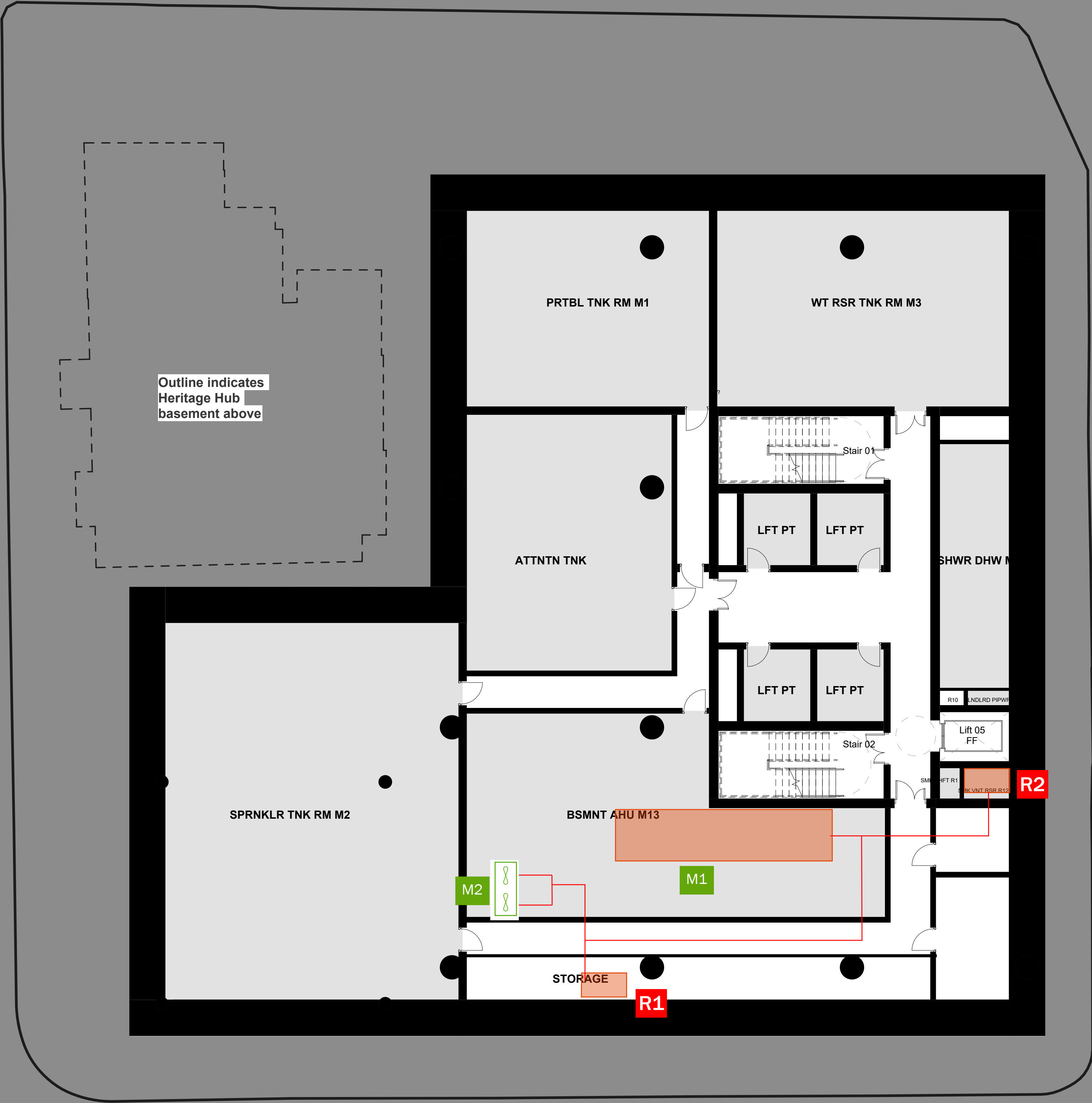
Appendices

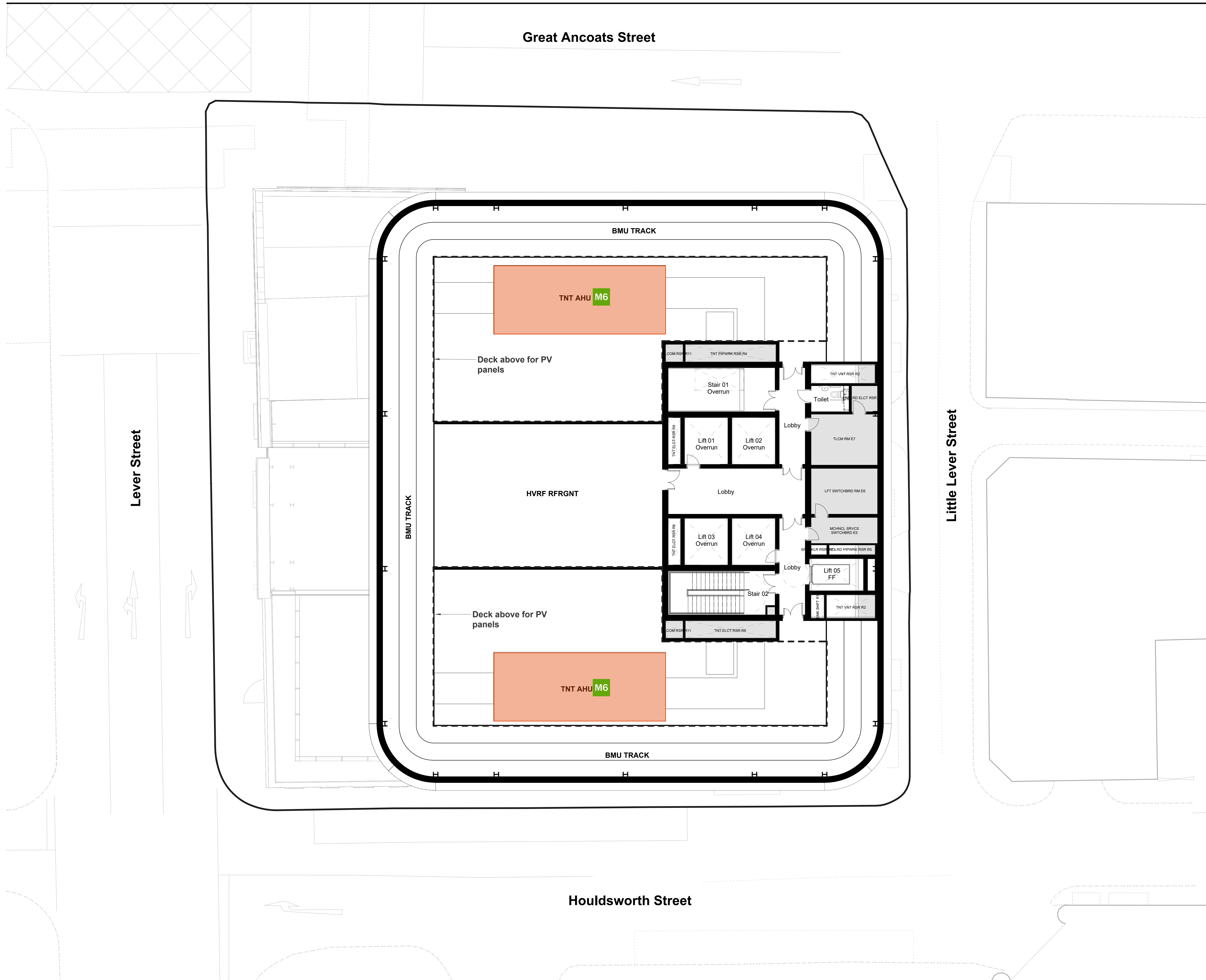
Ventilation Equipment Location

Appendix A Ventilation Equipment Location



- M1 BASEMENT AHU
- M2 Basement Smoke Extract (Duty/ Standby)
- R1 Basement AHU/ Smoke Extract Riser
- R2 Basement AHU Fresh Air Inlet Riser





M4 Roof Mounted Smoke Extract Fans (Duty/ Standby)

R3 Smoke Extract Riser

