

1.0 Introduction

This report summarises the proposals associated with the tenant fume extract systems to be provided at Project Ultra Manchester (PUM), a speculative life sciences building located on Upper Brook Street, Manchester.

The building is staggered in height with the Upper Brook Street elevation at the front being Ground + 7-storey and the rear Kincardine Road section being Ground + 4-storey. Roof plant areas are located at L08 to the front and L05 to the rear. Tenancies are arranged around a central atrium and served from 4 cores comprising stairs, service risers and toilet facilities.

The building comprises tenancy spaces comprising flexible laboratory, and ancillary write up / offices (Class E(g)).

This proposal summarises inclusion of future fume extract flues by tenants as part of their respective fit-out works to suit their individual requirements.

2.0 Strategy

Each notional tenancy has spatial allocation within their respective common service riser to install a common dedicated fume extract system from their demise to roof level.

The provision and installation of these fume extract systems, including ductwork, fans and flue arrangements will be the responsibility of the tenant as part of their fit-out works.

The extract systems will remove process contaminants from individual cabinets/fume cupboards within a tenancy and combined into a dedicated rising duct discharging direct to atmosphere at roof level.

A total of up to 18No. flues have been allocated and identified on the Sheppard Robson planning drawings. This is based on the notional tenancy split identified as part of the Client brief.

10No. flues are provided to the front Upper Brook Street elevation of the building terminating above the L08 roof and 8No. to the rear portion of the building terminating above the L05 roof. Flues have been grouped as identified in Figure 1.

The requirements of the final end-uses occupying the proposed development are currently unknown and therefore the specific chemical types or other process elements producing volatile organic compounds (VOC) being used cannot be determined.

It is expected that laboratory spaces will be arranged on medium-high risk containment settings and as such the end users will be required to ensure that their operations will not lead to any impacts to air quality and odour, by ensuring that fume cupboards design are compliant with BS EN 14175, and that mitigation measures are implemented, where required.

Based on the end-users targeted for the development, the most likely connections to the specialist extract systems will be from fume cupboards or micro-biological safety cabinets. As such, tenants will be required to design and install their equipment in accordance with BS EN14175.

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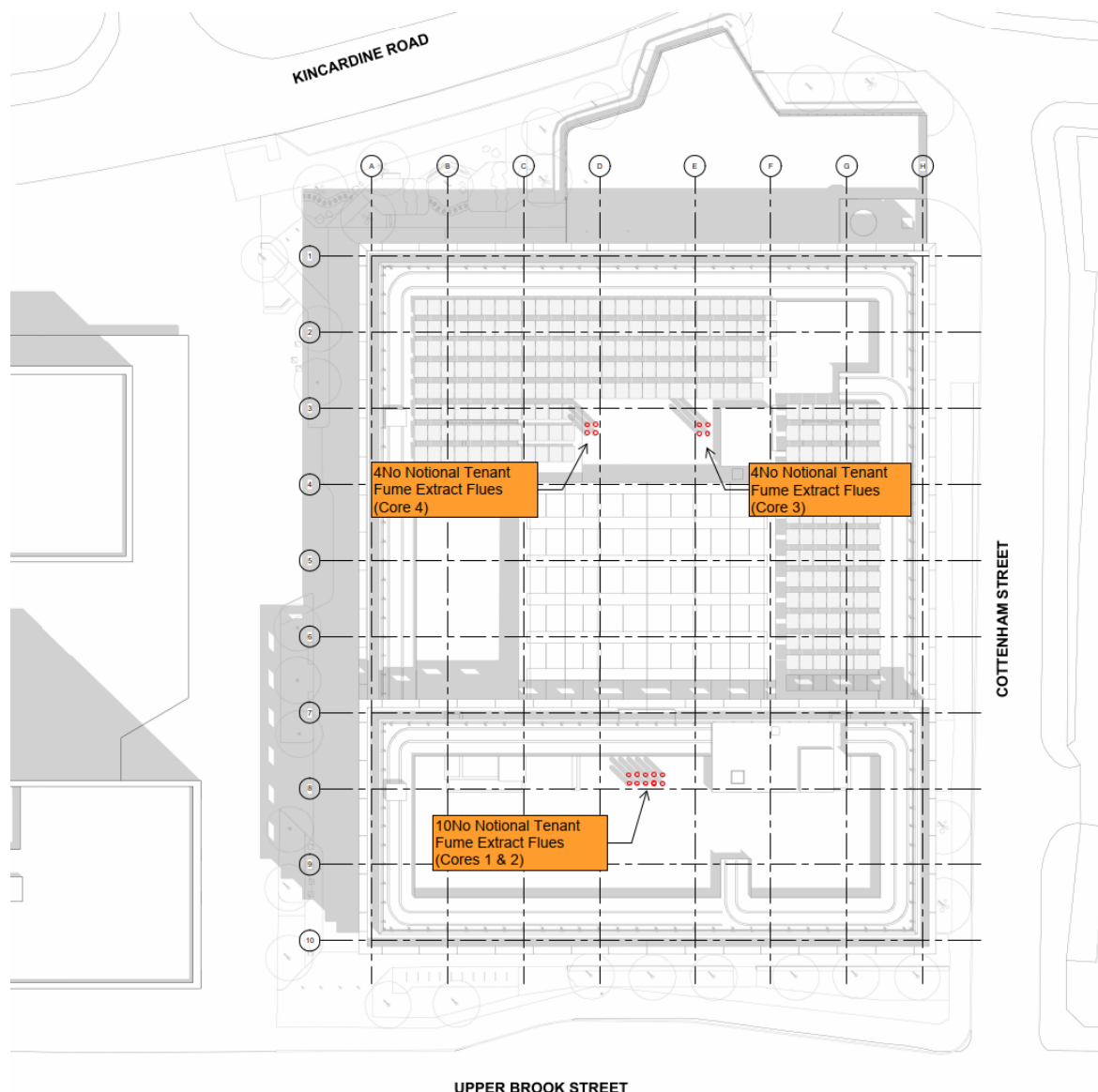


Figure 1 – Site Plan and Flue Location Detail

In accordance with BS EN 14175, the discharge velocity from fume cupboard extract flues should be at least 7m/s, but 10m/s is preferable to ensure the discharge gases will not be trapped in the aerodynamic wake of the stack. As such the design will ensure that a minimum velocity of 10 m/s is utilised.

The flues will discharge to atmosphere at least three metres above the height of the current plant screen to ensure the dispersal of any contaminants.

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3.0 Fume Systems

Each fume extract system will be designed to discharge a constant volume of air to atmosphere at a velocity of at least 10m/s in accordance with BS EN 14175.

Given the variable air flow rate operational nature of the fume cupboards, an in-bleed damper will be provided on the inlet to the fans to help dilute the concentration of contaminants in the flue and ensure the discharge rates will be constant while maintaining the high design velocities maintained within the stack.

Further concentric reductions at the discharge point will ensure efflux velocities of 12-15m/s are achieved to prevent stagnation around the terminals.

Systems will be run in plastic ducting to avoid potential corrosion issues. Centrifugal fan components will also be provided in an anti-corrosive plastic material. A typical fan is indicated in Figure 2.

Fans will discharge via a suitably lined attenuator (such as Melonex) to ensure the noise criteria of the site is maintained.

A shut-off damper will be provided on the inlet to each fan to prevent the backflow of air when not in use.



Figure 2 – Typical Plastic Fan Arrangement

A typical arrangement of individual tenant flues and fans at roof level are indicated in Figure 3 below.

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Figure 3 – Typical Fan Arrangement at roof level

4.0 Flue Heights

In line with the requirements of BSEN 14175, flues have been indicated on the Sheppard Robson planning elevations, terminating at 3m above the plant screen around the Level 08 flat roof and 7m above the plant screen on the L05 flat roof. This is due to the proximity of the central atrium and associated opening smoke vents. Figures 4 and 5 below indicate these stack heights.

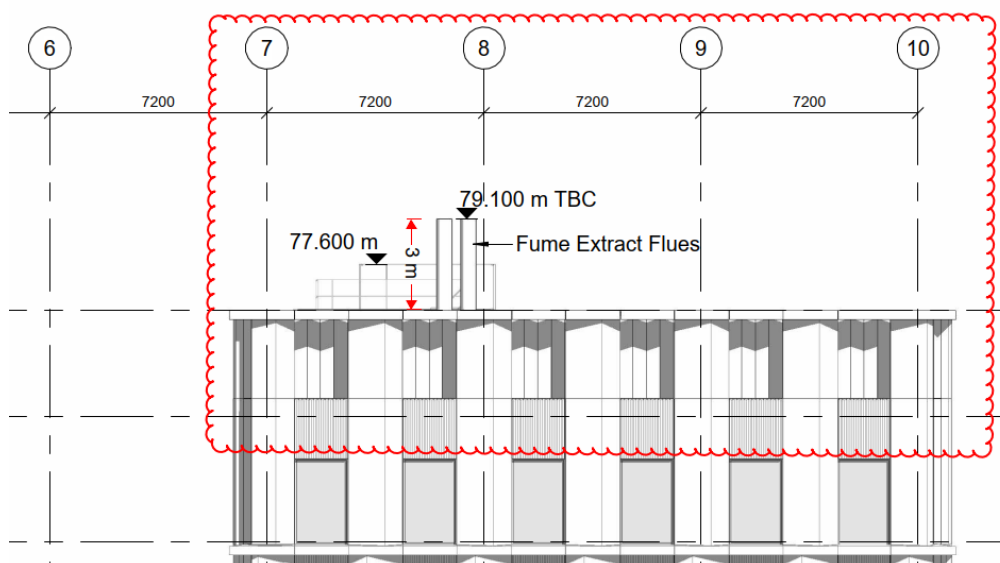


Figure 4 – Part Elevation Plan L08 (Upper Brook Street) Flue Heights

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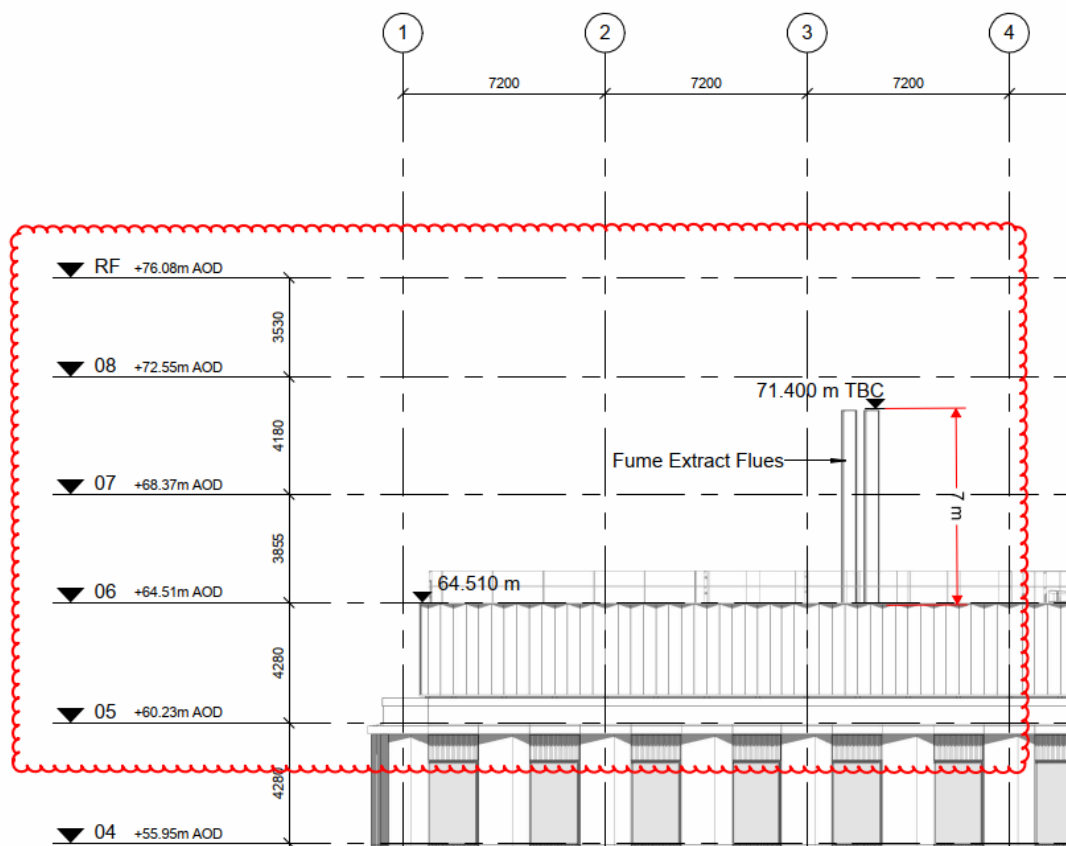


Figure 5 – Part Elevation Plan L05 (Kincardine Road) Flue Heights

Heights indicated on the planning drawings are based on the aerodynamic wake of the building typically extending 125% of the building height above ground level. The final positions of flue terminals have been considered with respect to the location of air handling equipment intake points, opening vents and adjacent buildings.

It is noted that with the chemicals being unknown, Kadans will ensure that good practices and assessments are adopted by the end-users as required when the information is available.

To ensure that the development maintains good air quality within the surrounding area, it is proposed that the following mitigation measures will be considered and implemented where required to ensure compliance with BS EN 14175.

- Dilution of the chemical
- Handling limits of the chemical
- Filtration of the air
- Dilution utilising additional outside air at the fan.

These will be reviewed with each end user and Kadans on a tenant-by-tenant basis.

At this stage it is not proposed that an increase of stack height to aid dispersion will be provided as this would not be deemed appropriate. However, this would be reviewed following any future Tenant discussions.

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