

## FUME EXHAUST FLUE STACK HEIGHT TECHNICAL SUMMARY

### 1.0 INTRODUCTION

This paper provides a summary of the proposals for the laboratory fume exhaust flue stack and the technical justification of the proposed design. The paper has been prepared in response to initial comments from the Planning Officer at Camden Council where concerns were raised over the proposed height of the flue.

### 2.0 FLUE STACK PROPOSALS & ANALYSIS

The project involves the speculative redevelopment of the existing building to provide a mix of laboratory and office space. The building will be designed to accommodate multiple tenants, with potentially a different laboratory tenant on each floor. The building will initially be fitted out to Shell & Core standard with the laboratories and offices fitted out as part of the Tenant works.

Provision is being made for laboratory tenants to install ducted containment devices, e.g. fume cupboards, within the lab spaces. As part of the shell & core works, the flue stacks will be installed with the remainder of the fume exhaust systems (ducts, risers, fans, etc.) installed as part of the fit out works.

A technical design review has been carried out by the project Design Team, including fume exhaust dispersal specialists RWDI, in order to evaluate the potential for fumes from the laboratory extract flues to impact air intakes and openable windows located on the project building and nearby surrounding existing buildings.

RWDI have carried out a design review and produced a report detailing their findings. This report summarises the relevant findings from the RWDI design review and report.

The design review assessed fume stack location, height and configuration with a view to achieving a minimum target exhaust dilution at the surrounding sensitive receptors, i.e. outside air intakes, openable windows and outdoor pedestrian areas. The dilution criterion addresses occupational and odour thresholds for the majority of commonly used research chemicals. Due to the unknown future use of the fume cupboards by prospective tenants, the criteria allows the greatest range of future chemical use. The design review also considered the wind climate, including the prevailing wind direction and the estimated wind conditions at the site.

The buildings surrounding 85 Gray's Inn Road were assessed and are generally lower, with the exception of the ITN Building to the East across Gray's Inn Road. The sensitive receptor locations on the lower buildings are not of significant concern from an exhaust dispersion perspective as the flue design will be optimised to achieve the minimum dilution criteria on the air intakes on 85 Gray's Inn Road and are therefore expected to also meet the target at receptors on lower surrounding buildings.

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For the taller surrounding buildings, and the ITN Building in particular, the exhaust flue design recommendations are focused on optimizing dispersion levels to the extent possible. Strategic placement of the flues such that they are as far as possible from the ITN Building will allow for additional dispersion before the exhaust plume reaches the receptors on the ITN Building.

The flue stack is therefore proposed to be located to the West side of the 85 Gray's Inn Road roof, i.e. the farthest point from the ITN building. This location also benefits from less influence on the plume dispersal by rooftop recirculation for the prevailing west and south westerly winds.

The flue stack height will have less influence on the ITN Building, however it will have an impact on the dispersion levels achieved at the proposed air intakes and the rooftop terrace area on 85 Gray's Inn Road. The RWDI analysis identified that the original proposed 9m flue height can be reduced to 8m above the roof.

Other design considerations have been implemented to optimise flue dispersion and limit, including clustering together of individual flue stacks and the design of the shroud around the flue stacks.

Further analysis will be carried out in future to optimise the fume exhaust system design. This will comprise wind tunnel modelling and requires the detailed design of the fume exhaust system to be completed, which cannot be done until known Tenants and their use requirements are known.

### **3.0 SUMMARY**

The design of the fume exhaust flue stacks has been analysed by fume dispersal specialists in order to optimise the performance of the system and achieve minimum dilution targets at sensitive receptors on 85 Gray's Inn Road and surrounding buildings. This has determined the proposed flue location, height and arrangement.

The exact use of the fume exhaust system is not known at time of writing and requires Tenants to be in place in order to define their requirements. The analysis has therefore been carried out based on the team's expertise and knowledge of typical laboratory use. Further detailed analysis will be carried out at the appropriate time in future when Tenant requirements are known.

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