

## PROJECT ANATOMY

DOCUMENT CONTROL			
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PROJECT NAME	PROJECT ANATOMY	AUTHOR	SG
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ISSUED TO	CLIENT	PASSED	SG

### INTRODUCTION

- 1.1. This Technical Note (TN) has been prepared by Vanguardia in response to comments raised by the London Borough of Camden in respect to an Air Quality Assessment, undertaken by Vanguardia (ref: Project Anatomy – Air Quality Assessment dated August 2021) submitted in support of the planning application (ref: 2021/3673/P) for a:

*“Three storey infill extension at first floor to fourth floor level, installation of fume extract and mechanical plant at roof level, installation of terrace at fifth floor level, erection of a front entrance canopy and associated internal and external alterations.”*

- 1.2. The comments were received from London Borough of Camden (received 17/12/2021) and the responses to these comments (where appropriate) are set out below.

### CONSULTATION RESPONSES

***It is not clear from the information provided how far above the top of the building the top of the flue is (1.2 refers to 9m and table 5 refers to 27.7m), the prevailing wind direction (particularly in relation to the roof terrace), and exactly what the fumes may contain. Figure 2 does not show both flues indicated on Figure 6. Therefore it is not possible to determine if the proposals are sufficient to protect the amenity of residents in accordance with London Borough of Camden Local Plan Policy CC4 and London Plan policy SI 1. In particular the location of the roof terrace in close proximity to the Flue shown in figure 2 and unknown location of the fresh air inlets for the building are a concern. As a result further information is required.***

- 1.3. The exit point of the stack (z height) has been taken from the application drawing of, and is 27.7m (minus ground floor level). For individual flues exhausting 1 no. fume cupboard per floor,

the currently designed 9m height is a good starting point at this stage – Therefore stack height is 9m above the roof line has been used in the assessment. KJ Tait Engineers have provided the appended TN (ref: *Fume Exhaust Flue Stack Height Technical Summary*) which sets out the site constraints, and concludes:

*“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.”*

- 1.4. To note, the prevailing wind direction is set out in Appendix D and shows wind direction data for a period of 5 years. The data has been taken from the Heathrow Airport meteorological station.
- 1.5. We have used reasonable worst-case assumptions which are based upon our professional experience of similar schemes the project team have worked on, as well as making assumptions, which are set out in the report.
- 1.6. Figure 6 illustrates the location of the fume cupboard stack and the indicative location of a future generator (being either diesel or alternative).
- 1.7. The discreet receptors, as outlined in Table 2 and Figure 2, have been assessed within the report which has concluded that no significant adverse impacts are predicted.
- 1.8. We have been informed where the air intakes on the roof are located, and this information has been appended to this TN, and discussed further in the *Operational impact on occupants* comments below.

#### **Diesel Generator**

***Section 1.4 states “In addition to the proposed fume cupboards the client has advised there is the potential for a backup diesel generator. At the time of writing as an end user for the scheme is not known, it is unknown if this will be required. However, for completeness an assessment been undertaken to consider the potential impacts.***

***Particularly given the poor air quality in the area, the applicant should justify the use and size of the generators and alternative technologies to diesel should be fully considered. If still relevant further information is required on the location of the flues and dispersion of any emissions. As a result, further information is required.***

- 1.9. The use of any generator would only be as a back-up should the main supply fail and so the potential impacts would be limited to these periods. The duration of any use would also be limited to the period of the main supply failure.
- 1.10. Can this be conditioned? We still do not know if an end user will require a back up diesel generator. And the condition would seek to ensure that the specific generator that was selected was as clean as possible in terms of emissions and full details will be submitted and approved prior to installation.
- 1.11. We carried out a reasonable worst case assessment of a back-up diesel generator assessment within the report. This assessment was for a back-up generator (assumed to be tested two hours a month) and only used when power fails. It is unknown at this stage if this diesel generator will actually be required / the route the end occupier would take.

**Operational impact on occupants**

***The relevant air quality standards identified in the assessment in section 2.8 do not refer to the WHO standards for Particulate Matter as set out in the London Plan 2021. The WHO standards at the time of writing of the London Plan were  $20\mu\text{g}/\text{m}^3$  for  $\text{PM}_{10}$  and  $10\mu\text{g}/\text{m}^3$  for  $\text{PM}_{2.5}$ . These standards should be considered when assessing if the proposals are in an area of poor air quality as set out in section 9.1.4 of the London Plan 2021. If appropriate suitable mitigation should be considered such as MVHR with inlets located away from busy roads and the generator /fume cupboard flue stack or any other emission sources and as close to roof level as possible, to protect internal air quality (also see below). As a result further information is required.***

- 1.12. The government 'Air emissions risk assessment for your environmental permit' guidance advises that if the Process Contribution (PC) the following:
- 1.13. To screen out a PC for any substance so that you do not need to do any further assessment of it, the PC must meet both of the following criteria:
- the short-term PC is less than 10% of the short-term environmental standard
  - the long-term PC is less than 1% of the long-term environmental standard.
- 1.14. If you meet both of these criteria you do not need to do any further assessment of the substance.
- 1.15. The assessment never got to the stage of assessing the overall concentrations as it did not exceed the PC criteria.
- 1.16. We can further consider the potential  $\text{PM}_{10}$  and  $\text{PM}_{2.5}$  concentrations at the air inlet locations on the roof line (drawing is appended to this TN). The first method would be to undertake

further air quality dispersion modelling. However, in order to quantify the overall concentrations to assess against the WHO guidance, we would have to utilise Defra background mapping to get the background concentrations. It should be noted that this background data has some inaccuracies, including assuming the same concentration over a 1 km square grid.

- 1.17. As previously mentioned in this TN, the air inlets will be located at roof level while the background mapping is based upon a receptor height at an averaged height in the standard “living zone.” As such the background mapping concentrations would not be representative at the proposed roof top height.
- 1.18. After consulting with Local Air Quality Management (LAQM) (Correspondence appended to this TN), it has been noted that the concentrations are *“averaged over a number of heights within the standard “living zone.” Whilst there is no specific height to be quoted, it is important to consider what the use of the background map concentrations is for. For example, if it is to be used in determining the air quality at the first floor of a house, then no additional considerations will be required, but some additional assumptions may be required if it was at the top of a skyscraper.”*
- 1.19. Due to the uncertainties of the approach above it would be more appropriate to undertake a PM<sub>10</sub> and PM<sub>2.5</sub> monitoring exercise at the inlet location on the roof to quantify the overall concentration. If the WHO guidelines are not met, a mitigation strategy (including the proposal of a filtration system) could be suggested to mitigate potential occupier exposure. I would propose this could be conditioned.

**Section 7.9 states “To ensure no recirculation of emissions in the building from the fume cupboards or the combustion plant, it is recommended that ventilation air handling unit intakes are distanced from flue openings.”**

**The location of the fresh air intakes has not been specified and the minimum required distance has not been set out. As a result further information is required**

- 1.20. The proposed inlet locations are set out in the appended drawing. It is recommended that the monitoring approach / mitigation above would cover this comment (via planning condition).

**Construction impacts risk assessment**

**There is a medium risk from dust during demolition and therefore at least two MCERTS dust monitoring devices will be required, in accordance with GLA and IAQM guidance. As a result, a condition is recommended.**

- 1.21. Standard condition which we would accept.

**Recommended condition- Construction related impacts – Monitoring**

**Air quality monitoring should be implemented on site. No development shall take place until**

- a. prior to installing monitors, full details of the air quality monitors have been submitted to and approved by the local planning authority in writing. Such details shall include the location, number and specification of the monitors, including evidence of the fact that they will be installed in line with guidance outlined in the GLA's Control of Dust and Emissions during Construction and Demolition Supplementary Planning Guidance;**
- b. prior to commencement, evidence has been submitted demonstrating that the monitors have been in place for at least 3 months prior to the proposed implementation date.**

**The monitors shall be retained and maintained on site for the duration of the development works in accordance with the details thus approved.**

**Reason: To safeguard the amenity of adjoining premises and the area generally in accordance with the requirements of policies A1 and CC4 of the London Borough of Camden Local Plan Policies.**

- 1.22. The aim of the three months of baseline monitoring is normally to set the current baseline position in terms of air quality. However, based upon working on other commercial and residential schemes in London, rather than undertaking baseline monitoring (this has never been enforced), 'Site Action Levels' (SALs) have been agreed as part of an Air Quality and Dust Management Plan built into a Construction Environmental Management Plan. I propose the same route is taken for this project too, based upon below.
- 1.23. To note, the GLA (2014) guidance recommends that two MCERTS monitors are set up – one upwind of the site and one downwind of the site, based on the number of sensitive receptors in the local area. Two Turnkey Osiris Particulate Matter (PM) monitors are recommended for this site, as these are widely used in industry and are MCERTS, but will require a constant mains power source.
- 1.24. The GLA (2014) guidance recommends that a limit of 250 µg/m<sup>3</sup> (15-minute mean) is set for construction sites. However, as outlined in the Institute of Air Quality Management (2018) Guidance on Monitoring in the Vicinity of Demolition and Construction Sites guidance, this figure was based on a single construction site, with the research carried out by Kings College between 1999 – 2001. Therefore, the IAQM (2018) guidance recommends a site threshold

trigger alert level of  $190 \mu\text{g}/\text{m}^3$  (one hour mean) for concentrations of  $\text{PM}_{10}$  close to construction sites based on more recent research carried out by Kings College from nine construction sites. Therefore, the IAQM (2018) recommended trigger levels are proposed for this Site.

- 1.25. Where the site threshold for  $\text{PM}_{10}$  is being significantly breached, developers should stop work immediately and ensure best practice measures are in place before restarting. An internal amber  $\text{PM}_{10}$  alert will be set at  $150 \mu\text{g}/\text{m}^3$  (1-hour mean) to provide a warning that the highest trigger level could be breached. Action in the event of an alert occurs is set out in the following table:

**Table 1: Proposed Dust Monitoring Alerts**

Alert level	Time Period	$\text{PM}_{10}$ Concentration ( $\mu\text{g}/\text{m}^3$ )
<b>Red</b> (at this level all works to cease immediately, investigate cause of exceedance and use alternative methods where appropriate)	1-hour average	>190
<b>Amber</b> (continual monitoring and investigation of alternative methods where appropriate)	1-hour average	>150
<b>Green</b> (early warning/no action required)	15-minute average	>150

- 1.26. When the red alert for  $\text{PM}_{10}$  is exceeded, the contractor will stop work immediately and ensure best practice measures are in place before restarting to avoid any risk of nuisance complaints.
- 1.27. If the cause of alert relates to a site activity, mitigation will be put in place immediately to reduce impacts. Similarly, if the mitigation is identified as insufficient then activities causing the elevated dust/ particulate levels will cease.
- 1.28. Should the SAL be exceeded, automatic alerts will be sent via email and/or text message to nominated individuals. The alerts will include the following information:
- The location of the exceedance;
  - The time of the exceedance; and
  - The recorded  $\text{PM}_{10}$  concentration.
- 1.29. Within 15 minutes of receiving an email alert, the Site Manager will investigate the exceedance, undertaking a visual inspection of construction activities to ensure mitigation

measures are being employed. The Site Manager will then take corrective measures if required according to protocol.

- 1.30. An incident form will be completed for all Amber / Red Alert activations and kept on record, and appended to a monthly compliance report, which is to be issued to the local authority.
- 1.31. I trust this approach is acceptable and the proposed condition can be removed / adjusted in line with the proposed methodology set out above.

## 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.

Suitability	Revision	Date	Details	By	Chkd	File Ref	Page
S2	P01	27 August 2021	1 <sup>st</sup> issue	BH		L0721-KJT-ZZ-XX-RP-ME-0005-Fume Exhaust Flue Technical Summary	1



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.

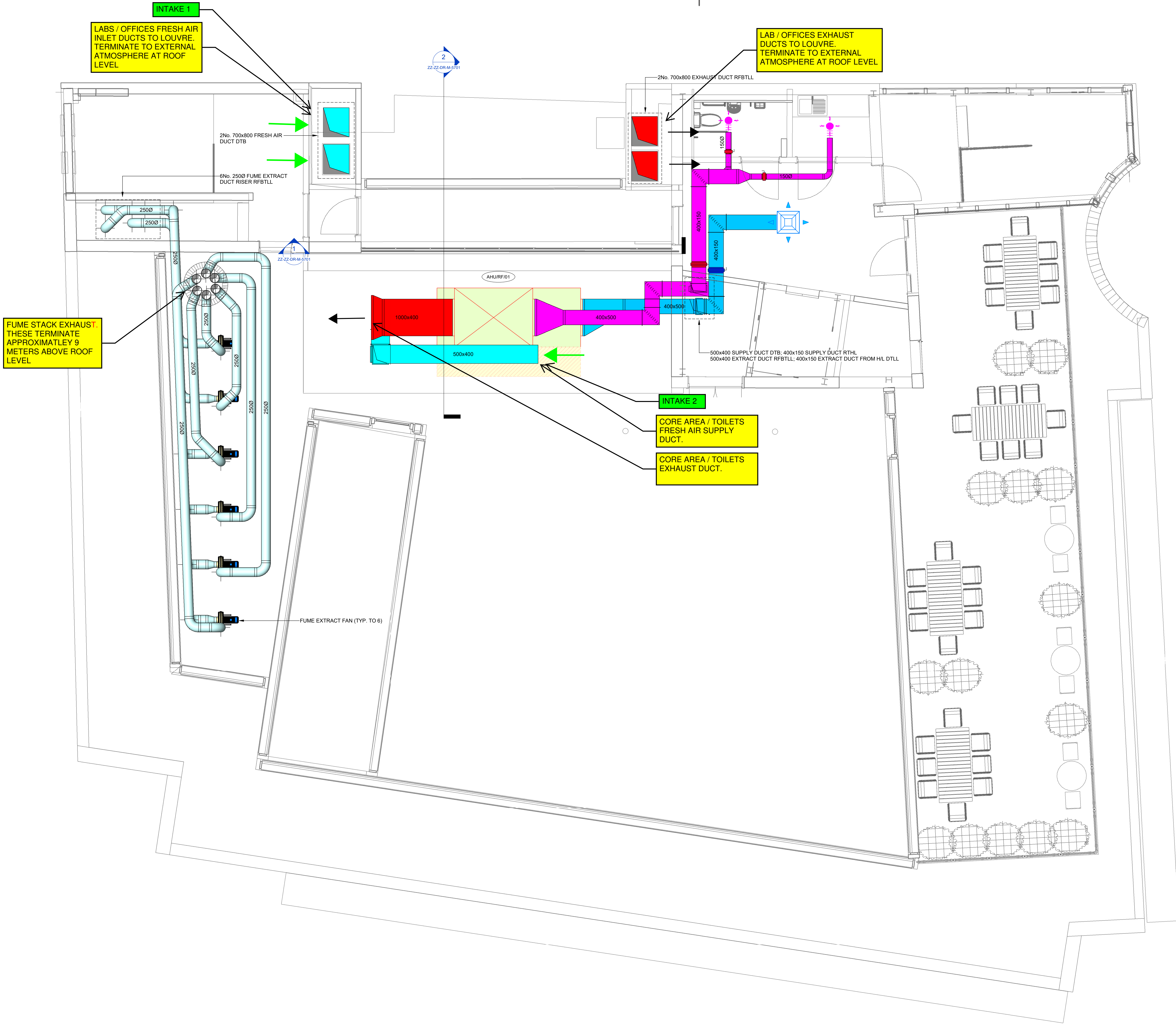
Further analysis will be carried out in future to optimise the fume exhaust system design. This will comprise wind tunnel modelling and requires the detailed design of the fume exhaust system to be completed, which cannot be done until known Tenants and their use requirements are known.

### **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.

Suitability	Revision	Date	Details	By	Chkd	File Ref	Page
S2	P01	27 August 2021	1 <sup>st</sup> issue	BH		L0721-KJT-ZZ-XX-RP-ME-0005-Fume Exhaust Flue Technical Summary	2



- NOTES:**
1. SUPPLY & EXTRACT DUCTWORK SYSTEMS SHALL BE IN ACCORDANCE WITH DW 144 & TESTED IN ACCORDANCE WITH DW 143.
  2. CONTRACTORS SHALL CHECK THE ARCHITECTS DRAWINGS FOR FINAL POSITIONING OF FIRE BARRIERS. FIRE DAMPERS SHALL BE FITTED WHERE ALL DUCTWORK PASSES THROUGH FIRE COMPARTMENT WALLS, FLOORS & CEILINGS. FIRE DAMPERS SHALL BE INSTALLED IN ACCORDANCE WITH DW 145.
  3. AS REQUIRED, VOLUME CONTROL DAMPERS SHALL BE INSTALLED IN ALL BRANCHES TO PROVIDE PROPORTIONAL BALANCING TO MEET THE REQUIREMENTS OF C.I.B.S.E COMMISSIONING CODES.
  4. ACCESS DOORS SHALL BE INSTALLED AS REQUIRED BY THE ABOVE DW GUIDES AND HVCA TR-19.
  5. ALL GRILLES & DIFFUSERS SHALL HAVE OPPOSED BLADE VOLUME CONTROL DAMPERS TO ENABLE FINAL VOLUME TRIMMING. THESE DAMPERS SHALL NOT BE USED FOR SYSTEM PROPORTIONAL BALANCING.
  6. ALL SUPPLY & EXTRACT DUCTWORK SHALL BE INSULATED.

- LEGEND**
- AIR CONDITIONING DUCTWORK
  - GENERAL SUPPLY DUCTWORK
  - GENERAL EXTRACT DUCTWORK
  - FRESH AIR DUCTWORK
  - EXHAUST DUCTWORK
- DFA DROP FROM ABOVE  
RTA RISE TO ABOVE  
RTHL RISE TO HIGH LEVEL  
DFATHL DROP FROM ABOVE TO HIGH LEVEL  
DFATB DROP FROM ABOVE TO BELOW  
RFBTHL RISE FROM BELOW TO HIGH LEVEL  
RFBTLL RISE FROM BELOW TO LOW LEVEL  
RFBTA RISE FROM BELOW TO ABOVE  
DTLL DROP TO LOW LEVEL

S4-P01	08/10/2021	STAGE 3 ISSUE	JW	JP
SUIT-REV	DATE	DESCRIPTION	DRN	CHK
3/3/10/21				

**STAGE 3**

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THE CONTRACTOR AND THEIR SUB-CONTRACTORS ARE TO VERIFY ALL DIMENSIONS  
ON SITE BEFORE MAKING SHOP DRAWINGS OR COMMENCING MANUFACTURE.

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PROJECT INFORMATION			
CLIENT	CLEARBELL CAPITAL		
PROJECT	PROJECT ANATOMY 85 GRAY'S INN ROAD, LONDON		
DRAWING INFORMATION			
DRAWING TITLE	ROOF LEVEL VENTILATION LAYOUT		
DESIGNED BY	JW	DATE	JUN.2021
DRAWN BY	BM	KJT JOB No.	
SCALE	1 : 50 @ A1		L0721
JOB CODE	ORIGIN-VOL-LEVEL-TYPE-ROLE-CLASS NUMBER		SUIT-REV
L0721	KJT-ZZ-RF-DR-M-5701		S4 - P01

## Simon Grubb (Air and Acoustics Consultants Ltd)

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**From:** LAQMHelpdeskmail <LAQMHelpdesk@bureauveritas.com>  
**Sent:** 19 January 2022 16:32  
**To:** Simon Grubb (Air and Acoustics Consultants Ltd)  
**Subject:** #7713 RE: Defra Background Maps

**\*\*External Email. This email originated from outside Buro Happold.\*\***

Good afternoon Simon,

*Thank you for contacting the LAQM Helpdesk. Your query has been allocated the unique reference code **7713** and you should use this as a reference for any further follow up regarding the below response.*

The background maps provide averaged concentrations over a 1km x 1km area. Because of this it can be assumed that the concentrations are also averaged over a number of heights within the standard "living zone". Whilst there is no specific height to be quoted, it is important to consider what the use of the background map concentrations is for. For example, if it is to be used in determining the air quality at the first floor of a house, then no additional considerations will be required, but some additional assumptions may be required if it was at the top of a skyscraper.

Kind regards,  
Andy Smith (He/Him)

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**From:** Simon Grubb (Air and Acoustics Consultants Ltd) <Simon.Grubb@BuroHappold.com>  
**Sent:** 19 January 2022 13:02  
**To:** LAQMHelpdeskmail <LAQMHelpdesk@bureauveritas.com>  
**Subject:** Defra Background Maps

Good afternoon,

I was hoping to clarify a point regarding the Defra Background Mapping assumed model height.

Am I right in assuming the 1 km x 1 km output concentrations are based upon a ground floor level?

Kind regards,

**SIMON GRUBB**  
ASSOCIATE

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