
20-24 Kirby Street, Farringdon, London, EC1N 8FA

Air Quality Dust Monitoring – Proposed Monitoring and Reporting Methodology

784-B049852

Colgold Limited

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**Document prepared on behalf of Tetra Tech Group Limited. Registered in England
number: 6595608**



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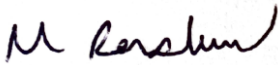
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1.0 OVERVIEW

This document has been prepared to discharge Condition 11a of pre-commencement planning permission ref: 2021/4482/P.

Description of development (ref: 2021/4482/P)

Refurbishment and extension of the existing office building (Class E), involving: demolition of existing fifth floor; erection of enlarged fifth floor to create additional office floorspace with associated roof terrace (with plant area above); creation of affordable jewellery workspace at lower ground floor level; internal and external alterations, and other associated works.

Condition 11 (Air Quality Monitoring)

No demolition or development shall commence until all of the following have been complied with:

- a. Prior to installing monitors, full details of the air quality monitors have been submitted to and approved in writing by the local planning authority. 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; and
- b. A confirmation email should be sent to airquality@camden.gov.uk no later than one day after the monitors have been installed with photographic evidence in line with the approved details; and
- c. Prior to commencement, a baseline monitoring report including evidence that the monitors have been in place and recording valid air quality data for at least 3 months prior to the proposed implementation date shall be submitted to the Local Planning Authority and approved in writing.

The monitors shall be retained and maintained on site in the locations agreed with the local planning authority for the duration of the development works, monthly summary reports and automatic notification of any exceedances provided in accordance with the details thus approved. Any changes to the monitoring arrangements must be submitted to the Local Planning Authority and approved in writing.

Overview of monitoring

Tetra Tech proposes to install two real-time unattended MCERTS indicative particulate monitors on the boundary of the site, representative of the sensitive receptors closest to site.

Particulate matter monitoring will be undertaken during a 3-month baseline period prior to demolition and construction works commencing, to comply with the pre-commencement condition 11, relating to planning permission ref: 2021/4482/P and London Borough of Camden: *‘Requirements for real-time dust monitoring on demolition and construction sites April 2021’*.

Monitoring will be undertaken during the demolition and construction periods to comply with Greater London Authority *‘Control of Dust and Emissions: During Construction and Demolition: Supplementary Planning Guidance’*.

The Air Quality Assessment (ref: A4944, dated: 20th January 2022) submitted as part of the planning application (ref: 2021/4482/P) included a dust risk assessment, which determined that the site is of ‘medium’ risk with regards to dust soiling during demolition and construction, and a ‘low’ risk with regards to earthworks and construction. The site was determined as ‘low’ risk with regards to PM₁₀ concentrations during demolition, earthworks and construction.

2.0 MONITORING EQUIPMENT SPECIFICATION/SET-UP

Two EarthSense Zephyr monitors will be installed on-site using solar panels or batteries. EarthSense Zephyrs are compliant with the ‘Performance Standards for Indicative Ambient Particulate Monitors’.

Monitors will be set-up as free-field as possible and will be serviced regularly by a Tetra Tech technician on-site. Monitors will have clearly identifiable Tetra Tech contact labels attached.

The monitors will measure PM₁₀ and PM_{2.5} in real-time continuously throughout the duration of the monitoring period. Data will be measured in 15-minute intervals and will be downloaded on a monthly basis (or at greater frequency if needed, due to exceedances of set trigger levels).

Figure 2-1 - Typical Zephyr Set-up Example



3.0 MONITORING LOCATIONS

The two monitors will be installed representative to the nearest sensitive receptors to the site. It is proposed that one monitor will be installed at the northwest corner of the site, located opposite sensitive residential receptors at 14 Munro House, St Cross Street (to also be representative of the mixed-use properties 26, 30, 31-35 Kirby Street and 9-12 St Cross Street). Another monitor is proposed to be installed at the southeast corner of the site, bordering the mixed-use property 104-105 Saffron Hill Flats, Saffron Hill and opposite the residential property 44 Saffron Hill (to also be representative of the mixed-use properties 41-43, 106-109 Saffron Hill, and the residential property 1 Lily Place, Saffron Hill). The proposed monitoring location plan is presented below (blue ovals: real-time unattended MCERTS indicative particulate monitor locations).

Figure 3-1 - Proposed Particulate Matter Dust Monitoring Location Plan



During the 3-month baseline monitoring period prior to demolition and construction works, the monitors will be set-up on the roof of the existing site building at the proposed monitoring location. During the demolition and construction phase the monitors will be kept in place and maintained at the same location where reasonably practicable to do so. The roof locations are considered worst-case positions for dust emissions at the site relative to the activities undertaken on site (including construction on 5th floor) and the

location of sensitive receptors around the site. The proposed monitoring locations are outlined in the photos below (red ovals: real-time unattended MCERTS indicative particulate monitor locations).

Figure 3-2 - Southeast Monitoring Location



Figure 3-3 - Northwest Monitoring Position



4.0 TRIGGER LEVELS

The IAQM ‘Guidance on Air Quality Monitoring in the Vicinity of Demolition and Construction Sites’ (2018) guidance outlines the onsite action levels for PM₁₀. The action levels for this site are set at a PM₁₀ concentration of over 250 µg/m³ for a 15-minute period, a PM₁₀ concentration of over 190 µg/m³ for a 1-hour period, and a PM_{2.5} concentration of over 48 µg/m³ for a 15-minute period.

A traffic light approach based on sections 4.41 of the IAQM document ‘Guidance on Air Quality Monitoring in the Vicinity of Demolition and Construction Sites’ (2018) is considered appropriate and is proposed in Table 4.1 below. Given the proximity of nearby receptors and the possibility for exposure to PM₁₀ the following criteria is proposed.

15 Minute Monitoring Criteria

Table 4-1 - 15-minutes PM10 Level Criteria – Levels at Boundary

Alert Levels	Time Period	Maximum Permissible PM ₁₀ 15-Minute Average (ug/m ³)
Red (at this level all works to cease immediately, investigate cause of exceedance and use alternative methods where appropriate)	15-minute average	>250
Amber (continual monitoring and investigation of alternative methods where appropriate)	Two consecutive 15-minute averages	>150
Green (no action required)	15-minute average	>150

The below criteria is proposed PM_{2.5} at the boundary of the site.

Table 4-2 - 15-minutes PM10 Level Criteria – Levels at Boundary

Alert Levels	Time Period	Maximum Permissible PM _{2.5} 15-Minute Average (ug/m ³)
Red (at this level all works to cease immediately, investigate cause of exceedance and use alternative methods where appropriate)	15-minute average	>48
Amber (continual monitoring and investigation of alternative methods where appropriate)	Two consecutive 15-minute averages	>38
Green (no action required)	15-minute average	>38

1hr Monitoring Criteria

In addition to the above detailed 15-minute traffic light criteria, TetraTech have undertaken works to devise a 1-hour average of particulate matter on site, as recommended by the document published by the London Borough of Camden, 'Requirements for real-time dust monitoring on demolition and construction sites' (updated April 2021). A traffic light system will be used to classify 1-hourly-averages, as per the table below.

Table 4-3 - 1-Hour PM₁₀ Level Criteria – Levels at Boundary

Alert Levels	Time Period	Maximum Permissible PM ₁₀ 1-Hour Average (ug/m ³)
Red (<i>at this level all works to cease immediately, investigate cause of exceedance and use alternative methods where appropriate</i>)	15-minute average	>190
Amber (<i>continual monitoring and investigation of alternative methods where appropriate</i>)	Two consecutive 15-minute averages	>80
Green (<i>no action required</i>)	15-minute average	>80

24hr Monitoring Criteria

Tetra Tech have devised an additional 24-hour criterion to determine whether particulate matter onsite is being distributed in the same pattern as particulate matter monitored at the nearest urban background site. This criterion is non-statutory and has been devised to be utilised as a general guide to inform overall dust management at the site by identifying peak episodes with regards to particulate matter.

Table 4-4 - 24-Hour Traffic Light Criteria

Alert Levels	Time Period	Percentage Difference from Monitoring Background Concentration (%)
Red	24-hours	>+100
Amber	24-hours	+50 to +100
Green	24-hours	< +50

5.0 RESPONSE PROTOCOL

Automatic alerts will be sent through to Tera Tech staff in real-time when designated boundary particulate matter trigger levels are breached or near to exceedance. Tetra Tech staff will immediately remotely analyse air quality data and inform the site manager of the situation to gather more details. Mitigation will be advised in real-time to reduce dust emissions and bring the air quality level to an acceptable level. Alerts can be set-up to be sent to site representatives if required.

6.0 REPORTING

Results will be reported with reference to site boundary limits and red, amber, green traffic light criteria.

During the demolition and construction phases reports will be issued on a monthly basis. Elements to be reported include the following:

- Monitoring equipment specifications and serial numbers.
- Monitoring location plan.
- Site photographs.
- Exceedance details and response taken.
- Month average PM10 and PM2.5 concentrations.
- Daily average PM10 and PM2.5 concentrations.
- Time History Graphs of PM10.
- Data Capture details.
- Descriptions of works being undertaken on site.
- Dust Mitigation measures used.

APPENDICES

APPENDIX A – REPORT CONDITIONS

This Report has been prepared using reasonable skill and care for the sole benefit of Iconic Build Ltd (“the Client”) for the proposed uses stated in the report by [Tetra Tech Limited] (“Tetra Tech”). Tetra Tech exclude all liability for any other uses and to any other party. The report must not be relied on or reproduced in whole or in part by any other party without the copyright holder’s permission.

No liability is accepted, or warranty given for; unconfirmed data, third party documents and information supplied to Tetra Tech or for the performance, reliability, standing etc of any products, services, organisations or companies referred to in this report. Tetra Tech does not purport to provide specialist legal, tax or accounting advice.

The report refers, within the limitations stated, to the environment of the site in the context of the surrounding area at the time of the inspections'. Environmental conditions can vary, and no warranty is given as to the possibility of changes in the environment of the site and surrounding area at differing times. No investigative method can eliminate the possibility of obtaining partially imprecise, incomplete or not fully representative information. Any monitoring or survey work undertaken as part of the commission will have been subject to limitations, including for example timescale, seasonal and weather-related conditions. Actual environmental conditions are typically more complex and variable than the investigative, predictive and modelling approaches indicate in practice, and the output of such approaches cannot be relied upon as a comprehensive or accurate indicator of future conditions. The “shelf life” of the Report will be determined by a number of factors including; its original purpose, the Client’s instructions, passage of time, advances in technology and techniques, changes in legislation etc. and therefore may require future re-assessment.

The whole of the report must be read as other sections of the report may contain information which puts into context the findings in any executive summary.

The performance of environmental protection measures and of buildings and other structures in relation to acoustics, vibration, noise mitigation and other environmental issues is influenced to a large extent by the degree to which the relevant environmental considerations are incorporated into the final design and specifications and the quality of workmanship and compliance with the specifications on site during construction. Tetra Tech accept no liability for issues with performance arising from such factors.

APPENDIX B – EARTHSENSE ZEPHYR SPECIFICATION

Zephyr® Air Quality Monitor

Specification Sheet



Key

- * - accuracy may be diminished where Zephyrs are exposed to direct sunlight
- ^b - lowest tested concentrations are background
- ^c - estimates of range are based on the theoretical limits of the electronics

Mechanical		
Size	235mm (h) x 160mm (w) x 114mm (d)	
Weight	1750g - 2000g (dependent on cartridge)	
Operating Parameters	Operating Range: -20°C to +45°C ambient. Relative Humidity range: 15 - 85% continuous* *prolonged exposure outside of this range may irreparably damage the gas sensors.	
Construction	Extruded aluminium body, hard anodised with ASA-PC end mouldings. Stainless steel mounting brackets for 80-140mm diameter poles.	
Electrical		
Power Inputs	12-32V DC (~13.8V for cars and LCV, ~27.6V for HGV) or solar powered applications (~18-20V)	
IP Rated Zephyr® Monitor	IP64	
IP Rated Power Supply Unit (Optional)	IP67	
IP Rated Power Supply Unit (Indoor use only)	IP2X	
Solar Panel (Optional)	50WP output Bracket, mount and straps included Dimensions: 530mm (h) x 670mm (w) x 25mm (d) Weight: 5.5kg	
Power Draw	Max: 19W at 19V Nominal: ~ 0.2W at 19V Elexon charge code: 8300003002100* *Standard cartridge configuration only	
Internal Battery	Li-Ion ~55 Whr. Charged by MPPT battery charging controller to maximise solar panel output. Increase battery capacity option available	
Battery Run Time	Normal mode: 3 days, 17 hours* *with 1 standard cartridge	Low Power/Winter Mode: 7 days, 18 hours* *with a standard cartridge

Cartridge Options - all Zephyrs come with a cartridge based system that uses active sampling						
Measure	Standard Cartridge	Standard + Cartridge	Enhanced Cartridge	Enhanced + Cartridge	Enhanced ++ Cartridge	
Nitrogen dioxide (NO ₂)	•		•	•	•	
Nitric oxide (NO)	•		•	•	•	
Ozone (O ₃)	•		•	•	•	
Particulate Matter (PM ₁₀)	•		•	•	•	
Particulate Matter (PM _{2.5})	•		•	•	•	
Particulate Matter (PM _{10-2.5})	•		•	•	•	
Carbon monoxide (CO)			•	•	•	
Sulphur dioxide (SO ₂)			•	•	•	
Hydrogen sulphide (H ₂ S)			•	•	•	
Carbon dioxide (CO ₂) (optional)		•		•	•	
Total Organic Volatile Compounds (TVOCs) (optional)		•			•	
Pressure	•		•	•	•	
Temperature	•		•	•	•	
Relative Humidity	•		•	•	•	
Estimated Accuracy, Range and Limits of Detection						
Measure	Estimated Accuracy		Range		Limits of Detection	
	µg/m³ mg/m³	ppb ppm	µg/m³ mg/m³	ppb ppm	µg/m³ mg/m³	ppb ppm
Nitrogen dioxide (NO ₂)	10 µg/m³	5.2 ppbV	0 - 20,000 µg/m³ ^a	0 - 10,000 ppbV ^a	1.5 µg/m³	0.78 ppbV
Nitric oxide (NO)	10 µg/m³	8 ppbV	0 - 6,000 µg/m³ ^a	0 - 5,000 ppbV ^a	1.5 µg/m³	1.20 ppbV
Ozone (O ₃)	15 µg/m³	7.5 ppbV	0 - 15,000 µg/m³ ^a	0 - 7,500 ppbV ^a	1.5 µg/m³	0.75 ppbV
Particulate Matter (PM ₁₀)	5 µg/m³		0 - 20,000 µg/m³ ^a		0.2 µg/m³	
Particulate Matter (PM _{2.5})	5 µg/m³		0 - 20,000 µg/m³ ^a		1.3 µg/m³	
Particulate Matter (PM _{10-2.5})	5 µg/m³		0 - 20,000 µg/m³ ^a		1.4 µg/m³	
Carbon monoxide (CO)	0.3 mg/m³	0.3 ppmV	0 - 40 mg/m³ ^a	0 - 35 ppmV ^a	0.03 mg/m³	0.02 ppmV
Sulphur dioxide (SO ₂)	20 µg/m³	7.6 ppbV	0 - 6,500 µg/m³ ^a	0 - 2,500 ppbV ^a	1.5 µg/m³	0.57 ppbV
Hydrogen sulphide (H ₂ S)	5 µg/m³	3.6 ppbV	0 - 1,500 µg/m³ ^a	0 - 1,000 ppbV ^a	1.5 µg/m³	1.08 ppbV
Carbon dioxide (CO ₂) (optional)	30 ppmV		0 - 5,000 ppm		-	
Total Organic Volatile Compounds (TVOCs) (optional)	-		0 - 15,000 ppbV ^a		1 ppbV	
Pressure	1.2 hPa		300 - 1,100 hPa		-	
Temperature	5°C ^a		-20°C - 45°C ambient		-	
Relative Humidity	5% ^a		15 - 85% continuous ^a *prolonged exposure outside of this range may irreparably damage the gas sensors.		-	
Location Sensing						
High Sensitivity GNSS	GPS, GLONASS, Galileo and Beidou module with internal active antenna.					
Internal Storage						
16GB SD Card	Sufficient for 32 million measurement sets.					
Data Handling						
Web Services Infrastructure	Data infrastructure is hosted in the cloud to give high service availability, resilience, and regional selection					
Communication Technologies	Wi-Fi (802.11 b/g/n 2.4GHz) Bluetooth (2.4GHz v4.2 BR/EDR + BLE compliant) GSM 2G 4G (NB-IoT and LTE Cat-M1)* RS232*, RS485* *Optional					

Data Access		
MyAir® Web App	View and download data via a URL link to the MyAir web app. MyAir functionality includes: - Mapped Zephyr® locations - Data charting and download via KML or CSV - Additional data overlays including global MappAir and 3rd party data - Satellite, AURN and Air Quality Management Area map overlays - Source apportionment - Historic and forecast data Our server via the customer username & password will hold collected Zephyr® data until the end of the subscription.	
Zephyr® API	Data can be integrated into existing systems such as traffic management, environmental reports and GIS.	
		
Default Sensing Programme		
	Normal Mode	Low Power/Winter Mode
Sample Rate:*	10 seconds	1 minute
Upload Rate:*	15 minutes	60 minutes
*for standard cartridge. Custom modes can be configured		
Data Integrations		
Stratos Traffic Management System	Compatible with Yuxux Traffic (formerly Siemens Mobility) traffic management system	
MindSphere	Integrated with Siemens MindSphere Industrial IoT Solution	
Third Party Device Integrations		
RS232 / RS485	Zephyr® input power can be passed through to the connector (9-30V) to supply the auxiliary hardware with up to 1A. We are able to configure data connections for a wide range of additional hardware, please contact us if your proposed device is not listed below.	
Other Sensor Providers that Work with the Zephyr®	Gill MaxiMet range - GMX100, 101, 200, 240, 300, 301, 400, 500, 501, 531, 541, 550, 551 and 600. Any other integrations are available upon application.	
Warranty		
Warranty	Full warranty on manufacturer faults	