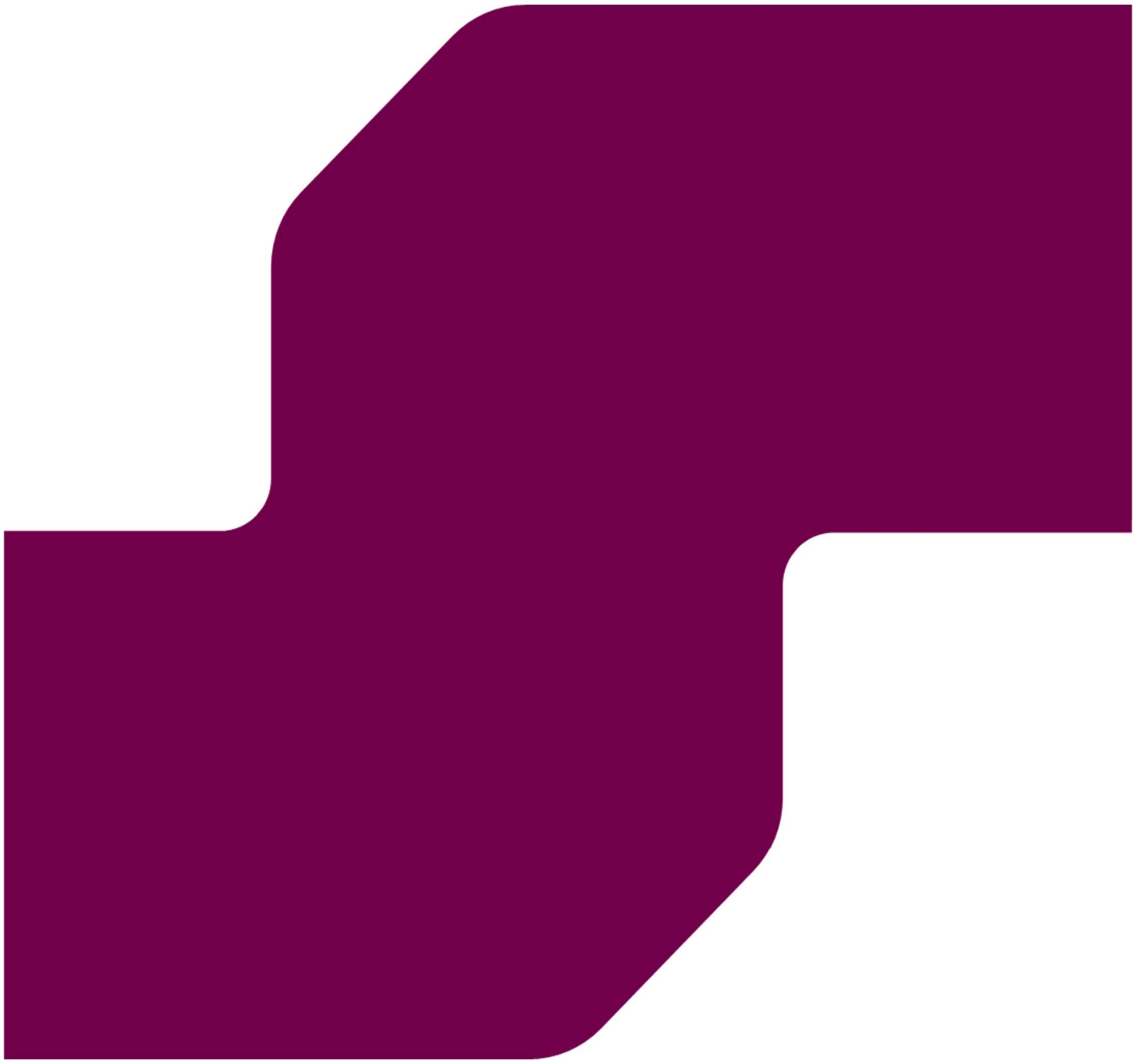
Dust Monitoring Strategy

Alpha House, 24-27 Regis Road

For The Big Yellow Construction Co. Ltd



Quality Management

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Revision History

Rev	Date	Status	Reason for revision	Comments
0	06/08/2024	Draft	-	-
1	07/08/2024	Final	-	-

1. Introduction

1.1 RPS was instructed by The Big Yellow Construction Co. Ltd to prepare an ambient particulate matter monitoring strategy for the Alpha House, 24-27 Regis Road site to discharge the condition from the London Borough of Camden.

1.2 Condition 4 states:

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

a) prior to their installation full details of two air quality monitors shall have been submitted to and approved in writing by the Local Planning Authority. Such details shall include the location 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 of development, 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 Panning Authority for the duration of the development works, monthly summary reports and automatic notification of any exceedances shall be 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."

1.3 This monitoring strategy takes account of published guidance on good practice for ambient air quality monitoring; in particular, the IAQM (2018) "*Guidance on Monitoring in the Vicinity of Demolition and Construction Sites"* and the GLA's *"Control of Dust and Emissions during Construction and Demolition Supplementary Planning Guidance"*.

1.4 Dust is a generic term used to describe a wide range of particulate materials that are generated from the disintegration of solids. The presence and exposure to suspended particulates may result in adverse health effects. When suspended particulate matter (PM) is monitored, normally the PM_{10} fraction (particles with a mean aerodynamic diameter less than 10 microns) that can be breathed in are measured.

1.5 The statutory air quality limit values, target values and objectives that relate to PM_{10} are summarised in Table 1.1 below. The parameters for suspended particulates are concentrations averaged either over a year or a 24-hour period.

Table 1.1 Summary of Relevant Air Quality Limit Values and Objectives

Pollutant	Averaging Period	Objectives/ Limit Values	Not to be Exceeded More Than
Particulate Matter (PM_{10})	24 Hour	50 $\mu g.m^{-3}$	35 times per calendar year
	Annual	40 $\mu g.m^{-3}$	-
Particulate Matter ($PM_{2.5}$)	Annual	20 $\mu g.m^{-3}$	-

1.6 Much shorter-term Action Levels may be set, on a site-specific basis, to provide a quick indication of when there is a need for the construction site to take further actions to manage dust releases. For monitoring PM_{10} around construction and demolition sites, the IAQM guidance (published in October 2018) recommends a Site Action Level of 190 $\mu g.m^{-3}$ averaged over a 1-hour period. Baseline monitoring will be carried out for three months prior to any demolition or construction works to determine if the 190 $\mu g.m^{-3}$ site action level is appropriate.

2. Methodology

Equipment

2.1 Airborne concentrations of PM_{10} will be measured using Airly PM monitors, which gives a real-time measurement.

2.2 The Airly PM monitor has MCERTS approval as an indicative PM monitor and will be calibrated in accordance with the manufacturer's recommendations.

2.3 Data from the Airly PM monitor will be downloaded automatically to a dedicated website.

2.4 The Airly PM monitors will be housed in a secure and locked container and only suitably qualified air quality professionals will be permitted to open the container to check and maintain the instrument.

Maintenance and Calibration of Equipment

2.5 Installation and maintenance of the Airly PM monitor equipment will be provided by suitably qualified persons.

2.6 The Airly PM monitors automatically recalibrate themselves for sensor accuracy over time (and drift removal). Weather conditions and sources of pollution change over time, requiring adjustment to local calibration factors. Airly performs ongoing remote calibration to maintain the accuracy of the sensor network and mitigate drift. For PM measurements the procedure described in paragraph 2.7 is repeated monthly to dynamically update calibration factors as seasons change.

2.7 In every region of the world there are different sources of PM and weather conditions ("local conditions") that influence the shape, density and albedo of PM. These characteristics influence the assumptions an optical sensor should use to interpret particle count in predefined size bins when calculating final concentrations - so sensors require geographically unique calibration factors, developed through co-location with local reference analysers. Airly has a proprietary process to optimise geographically unique calibration factors. Using their pre-existing network of co-location with a reference analyser, Airly's calibration process removes local outliers to get the background signal that's consistent between the Airly sensor and co-located reference analyser. The local factors to be applied to measurements are calculated with regression.

2.8 The Airly PM monitor measurements will be checked regularly remotely via a dedicated website. Email alerts will be sent by the dedicated website to the site so that appropriate can be taken.

Sampling Location

2.9 The location for the monitor has been selected in accordance with the IAQM guidance, which states that*: "in most cases, the principal aim of monitoring will be to ensure that the agreed mitigation measures are being applied, and that impacts on the community are minimised. In such circumstances, monitoring at, or close to, the site boundary is recommended as this will record the highest dust emissions. It is also usually more convenient (for reasons of power supply, security and access) to locate the sampling equipment at the construction site boundary."*

2.10 The Airly PM monitors will be located approximately 1.5 - 1.8 m above the ground in a weatherproof box.

2.11 The proposed locations (subject to practicality) of the monitors are to the northeast of the site (nominally downwind) and the second monitor in the southwest (nominally upwind). This will ensure representative data for the site is collected and is in compliance with the GLA's guidance for medium risk sites.

2.12 The proposed monitoring locations at the site are shown in Figure 2.1 below

Figure 2.1 PM Monitoring Locations

Delivery of Air Quality Monitoring Data

2.13 Data collected by the Airly PM monitors in real-time will also be accessible to The Big Yellow Construction Co. Ltd via a dedicated website. A login and password will be provided so that the data can be accessed.

2.14 The Airly PM monitors will automatically send out email alerts to a nominated person at The Big Yellow Construction Co. Ltd if exceedances of the 1-hour Site Action Level for PM_{10} occur so that immediate action can be taken to minimise dust impacts. airquality@camden.gov.uk can also be added to the alert system to comply with condition 4.

3. Overall Quality Assurance and Quality Control (QA/QC)

3.1 This Monitoring Strategy has been designed by RPS. RPS has ISO9001, ISO14001 and BSOHAS18001 certifications for its Quality Management System and Environmental Management System, respectively.

3.2 Organisations engaged in assessing the significance of air quality impacts should hold relevant qualifications and/or extensive experience in undertaking air quality assessments. The RPS air quality team members have multiple professional affiliations and have the required academic qualifications for these professional bodies.

3.3 The Airly PM monitors are certified by MCERTS Performance Standards for Indicative Ambient Particle Monitors. The MCERTS certification for this monitor is shown in Appendix A.

APPENDIX A: MCERTS Certification

PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

Airly Air Quality Sensor PM+Gas

Manufactured by:

Fideltronik Poland Sp. Z o.o.
Beniowskiego 1
34-200 Sucha Beskidzka
Poland

has been assessed by CSA Group
and for the conditions stated on this certificate complies with:

MCERTS Performance Standards for Indicative Ambient Particulate Monitors, Environment Agency, August 2017, version 4

Certification ranges:

$PM_{2.5}$ 0-1,000 µg/m^3
PM_{10} 0-1,000 µg/m^3

Project No.:	80153474
Certificate No:	CSA MC230420/00
Initial Certification:	17 August 2023
This Certificate issued:	17 August 2023
Renewal Date:	16 August 2028

Andrew Young
Environmental Team Manager

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CSA GROUP™ mCERTS Environment Agency

Certificate Contents

Approved Site Application

Any potential user should make sure, in consultation with the manufacturer, that the monitoring system is suitable for the intended application. For general guidance on monitoring techniques refer to the Environment Agency guidance available at www.mcerts.net

The indicative dust monitoring analyser(s) can be operated in one of two ways:

For qualitative measurements: Providing qualitative measurement data for the analysis of particulate pollution trends, and source identification studies based for example on pollution roses etc. Such application can rely on instrument factory calibration only.

For quantitative measurements: Providing measurement data with the uncertainty defined for indicative instruments (+/- 50%). This can be achieved on condition that each instrument used for measurement has been calibrated on the specific site where monitoring is taking place against a standard reference method for a period of two weeks and the resulting slope and intercept have been used for instrument calibration. Using non-standard filters and procedures for this purpose is not acceptable. To maintain the validity of data this calibration has to be repeated at least every twelve months or when the instrument is moved to a different site.

They **cannot** be used on national automatic monitoring networks for compliance reporting against the Ambient Air Quality Directives.

The field tests were carried out from the 1st January 2023 to the 31st March 2023 on two candidate 'Airly Air Quality Sensor PM+Gas' systems, collocated with a Palas Fidas 200 (the reference method). The location of the field test was Ladywood, Birmingham, UK. The serial numbers of the two 'Airly Air Quality Sensor PM+Gas' systems were 'PM 9437' and 'PM 13055'.

Basis of Certification

This certification is based on the following test report(s) and on CSA Group's assessment and ongoing surveillance of the product and the manufacturing process:

Bureau Veritas, test report ref. AIR18443191, dated May 2023, "Airly - Test of the Airly PM and PM+Gas Sensor Systems for use as an Indicative Monitor for PM_{10} and $PM_{2.5}$"

Product Certified

The 'Airly Air Quality Sensor PM+Gas' measuring system *(note 1)* consists of the following parts:

- Airly PM+Gas Sensor unit
- 5V power supply
- solar panels (optional)

Sensor type and firmware version
Plantower PMS5003, firmware version 2.3

Firmware and Algorithm Version
Firmware version 2.1.1.39, algorithm version 2.1

This certificate applies to all instruments fitted with serial number PM13055 onwards.

Certificate No: CSA MC230420/00
This Certificate issued: 17 August 2023

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Certified Performance

Test (***Laboratory***)	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Constancy of the sample volumetric flow					Not applicable *Note 2*	To remain constant within ± 3%
Tightness of the sampling system			1.54%			Leakage not to exceed 2% of sampled volume

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Test (**Field**)	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Intra-instrument uncertainty for the reference method						
PM_{10}					0.33µg/m³	≤2.5µg/m³
$PM_{2.5}$					0.25µg/m³	≤2.5µg/m³
Intra-instrument uncertainty for the candidate method						
PM_{10}						
All data (n=80)					0.63µg/m³	≤5µg/m³ for all data as well as for the subsets: < or ≥ 30 µg/m³
≥ 30 µg/m³ (n=1)					1.01µg/m³	
< 30 µg/m³ (n=79)					0.64µg/m³	
$PM_{2.5}$						
All data (n=80)					0.26µg/m³	≤5µg/m³ for all data as well as for the subsets: < or ≥ 30 µg/m³
≥ 18 µg/m³ (n=5)					0.49µg/m³	
< 18 µg/m³ (n=75)					0.25µg/m³	
Highest resulting uncertainty estimate comparison against data quality objective (Measurement Uncertainty)						W_{CM}≤50% $W_{CM} \leq W_{dpo}$ (W_{dpo} Measurement uncertainty defined as 50% for indicative instruments)
PM_{10}						
All data (n=80)					21.5%	
≥ 30 µg/m³ (n=1)					24.4%	
$PM_{2.5}$						
All data (n=80)					23.8%	
≥ 18 µg/m³ (n=5)					20.3%	
Maintenance Interval					≥2weeks *Note 3*	≥2 weeks

Note 1 - The Airly PM + Gas Sensor system has additional gas monitoring sensing cartridges fitted to the base of the standard Airly PM sensor. This certification is only applicable to the PM sensor for the parameters $PM_{2.5}$ and PM_{10}. PM monitoring was found to be unaffected by the additional gas sensors. This was demonstrated by additional testing using two Airly Air Quality PM sensor systems and two Airly Air Quality PM+Gas sensor systems. The serial numbers were PM7672 and PM 7690 and PM7201 and PM7803, for the Airly Air Quality PM sensor and Airly Air Quality PM+Gas sensors, respectively. The two variants were found to agree well, with $R^2 = 0.998$ and slopes close to 1 for both $PM_{2.5}$ and PM_{10}.

Note 2 - This test was not applicable because the 'Airly Air Quality Sensor PM+Gas' has a fan rather than a pump.

Note 3 - Maintenance - during the 12-week field trial no maintenance was required.

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Description

The Airly Sensor PM + Gas offers a plug & play solution for air quality monitoring. It provides monitoring on particulate matter, including PM1, PM2.5, and PM10, while also keeping track of ambient conditions such as temperature, humidity, and atmospheric pressure. The Airly hardware design accounts for humidity effects on the measurements.

The device not only ensures data transmission but also supports bi-directional communications. This communication capability allows for remote configuration, firmware updates, and sensor calibration through the Airly web platform.

General Notes

1. This certificate is based upon the equipment tested. The Manufacturer is responsible for ensuring that on-going production complies with the standard(s) and performance criteria defined in this certificate. The manufacturer is required to maintain an approved quality management system controlling the manufacture of the certified product. Both the product and the quality management system shall be subject to regular surveillance according to 'Regulations Applicable to the Holders of CSA Group Testing UK Ltd Certificates'.

2. The design of the product certified is defined in the CSA Group design schedule V00 for certificate no. CSA MC230420/00.

3. If a certified product is found not to comply, CSA Group should be notified immediately at the address shown on this certificate.

4. The certification marks that can be applied to the product or used in publicity material are defined in 'Regulations Applicable to the Holders of CSA Group Testing UK Ltd Certificates'.

5. This document remains the property of CSA Group and shall be returned when requested by CSA Group.