External Air Quality Monitoring Survey Report

at

60-70 Shorts Garden
London
WC2H 9AU

For

Cundall
One Carter Lane
London
EC4V 5ER

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Survey date: 1st February 2017

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EXECUTIVE SUMMARY

As part of a commitment to comply with the WELL Performance Verification Guidebook, Kavita Kumari of Cundall commissioned Green Air Monitoring Ltd to carry out a preconstruction air quality monitoring survey at 60-70 Shorts Garden, London, WC2H 9AU. The external monitoring was conducted in three external areas, one in the morning, one in the noon and one in the afternoon.

The study was undertaken by Keith Harrison of Green Air Monitoring Ltd on 1st February 2017.

The scope of the survey was to monitor background levels of ozone, $PM_{2.5}$, PM_{10}, carbon monoxide and nitrogen dioxide in compliance with the following guidelines given in the WHO '*Air Quality Guidelines for particulate matter, ozone, nitrogen dioxide and sulfur dioxide',* (2005)

Building Description

60-70 Shorts Garden is part of a multi-tenanted, early 20th Century building, believed to have been originally of industrial usage. The main building comprises three upper floors and a basement. This survey was conducted on the ground and basement floors of the building. The building was occupied at the time of the survey, one side by a Yoga Studio (occupying ground and basement floors), and the other by an architect's practice (ground floor only). The remaining basement area, below the architect's practice, is unoccupied and awaiting renovation. The nature of the current building usa is very likely to have had an impact upon the air quality test results.

Findings

Ozone

External ozone levels did not exceed 10 ppb.

PM_{10} Particulate

External PM_{10} particulate level did not exceed 47 µg/m^3.

$PM_{2.5}$ Particulate

Three external areas were tested for $PM_{2.5}$ and the results of 16 µg/m^3, 41.5 µg/$m^3$and 28 µg/m^3, were recorded.

Carbon Monoxide

Carbon monoxide levels were less than 1ppm.

Nitrogen Dioxide

External nitrogen dioxide levels (NO_2) were measured at <15 ppb. There is no WELL standard for nitrogen dioxide.

1. INTRODUCTION

As part of a commitment to comply with the WELL Performance Verification Guidebook, published by the International WELL Building Institute, Kavita Kumari of Cundall commissioned Green Air Monitoring Ltd to carry out an air quality monitoring survey at 60-70 Shorts Garden, London, WC2H 9AU. The external monitoring was conducted in three external areas, one in the morning, one in the noon and one in the afternoon.

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2. METHODOLOGY

General

Sampling was conducted at prescribed times and located at strategic positions to comply with the WELL Performance Verification Guidebook, published by the International WELL Building Institute. All samples were analysed in a third party accredited laboratory.

Sampling was undertaken as follows:

- Carbon monoxide was monitored real time utilising a direct reading instrument.
- Ozone was monitored real time utilising a direct reading instrument.
- $PM_{2.5}$ was monitored real time utilising a direct reading instrument.
- PM_{10} was monitored real time utilising a direct reading instrument.
- Nitrogen dioxide (NO_2). Active pumped sampling was conducted for NO_2 employing NIOSH 6014 method, with an SKC tube 226-40

3. EVALUATION CRITERIA

Contaminant	WELL Standard
Ozone	100 µg/m^3 1-hour mean
PM_{10} particulate	50 µg/m^3 24-hour mean
$PM_{2.5}$ particulate	25 µg/m^3 24-hour mean
Nitrogen Dioxide	200 µg/m^3 1-hour mean

4. RESULTS AND CONCLUSIONS

Contaminant	Sample Period One – External a.m (5 mins + 10 mins)		Sample Period Two – External Mid-day (5 mins + 10 mins)		Sample Period Seven – External p.m (5 mins + 10 mins)	
	Sampling Result	Standard Achieved	Sampling Result	Standard Achieved	Sampling Result	Standard Achieved
Part 2: Standards for Particulate Matter and Organic Gases						
Carbon Monoxide	<1 ppm	External Result	<1 ppm	External Result	<1 ppm	External Result
PM_{10}	18 µg/m^3	External Result	47 µg/m^3	External Result	32 µg/m^3	External Result
$PM_{2.5}$	16 µg/m^3	External Result	41.5 µg/m^3	External Result	28 µg/m^3	External Result
Nitrogen Dioxide	0.029mg/m^3	External Result	-	-	-	-
Ozone	<1 ppb	External Result	<1 ppb	External Result	10 ppb	External Result

CONCLUSIONS

Most of the air quality tests produced satisfactory results, but a high $PM_{2.5}$ can be from some high congestions contaminants produced by traffic or by nearby building construction.

According '*WHO Air Quality Guidelines for particulate matter, ozone, nitrogen dioxide and sulfur dioxide',* (2005) published by World Health Organisation, the external air quality must be in certain levels in order not to harm human health and these levels are as follows:

	Actual Average result	WHO Results	WHO Result
PM $_{10}$	0.033 µg/m^3 15min mean	0.26 µg/m^3 (15min TWA)	50 µg/m^3 24-hour mean
PM $_{2.5}$	0.029 µg/m^3 15min mean	0.56 µg/m^3 (15min TWA)	25 µg/m^3 24-hour mean
Ozone	0.01 µg/m^3 15min mean	3.125 µg/m^3 (15min TWA)	100 µg/m^3 8-hour mean
Nitrogen dioxide	29 µg/m^3 2hr mean	400 µg/m^3 (2hr TWA)	200 µg/m^3 1-hour mean

According to the above table, one can see that the external air quality complies with the WHO Air Quality Guidelines as all of them were found to be present below the appropriate limit.

The sulphur dioxide sample collected was destroyed at the laboratory during the analysis process.

APPENDIX 1

Active Sampling Monitoring Record

MONITORING RECORD FORM FOR ACTIVE PUMPED SAMPLES

Site: **60-70 Shorts Garden** **Date:** **1st February 2017**

Sample Number	Sample Location	Sample rate in mls/min	Sample Duration (Minute)	Sample Volume (l)	Analyte for Analysis	Amount detected µg	Airborne Concentration µg/m³	Airborne Concentration ppb
01	External	100/200	120	17.24	Nitrogen Dioxide	<0.5	<29	<14.3

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