



INDOOR AIR QUALITY ASSESSMENT DURING
CONSTRUCTION
August, 2014

WINCHESTER HIGH SCHOOL
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1. EXECUTIVE SUMMARY

BACKGROUND

Consigli retained Cashins & Associates, Inc., to perform an indoor air quality (IAQ) assessment at areas adjacent to Phase I of the project at the Winchester High School in Winchester, Massachusetts. This testing was conducted in order to determine whether various IAQ parameters were in compliance with the project's Indoor Air Quality Management Plan.

SCOPE OF WORK

On August 29, 2014, a Senior Indoor Air Quality Consultant from Cashins & Associates performed air sampling as required by the Indoor Air Quality Management Plan developed by Cashins & Associates.

Measurements were taken for the following:

- Carbon Dioxide
- Temperature
- Relative Humidity
- Carbon Monoxide
- Volatile Organic Compounds (VOCs)
- Dust

FINDINGS

Real-time readings for CO, VOCs, and CO₂ were all below upper limits set forth in the IAQ Management Plan.

Dust levels were also very low. One reading, taken in the Library, was found to be 222 $\mu\text{g}/\text{m}^3$, slightly above the 150 $\mu\text{g}/\text{m}^3$ upper limit value. However, within one minute this level had reduced to below 150 $\mu\text{g}/\text{m}^3$; therefore, no corrective action was deemed necessary.



2. INTRODUCTION

Cashins & Associates, Inc. was retained by Consigli to provide professional industrial hygiene consulting services. Our scope of work consisted of measuring various basic indoor air quality parameters during construction activities at Winchester High School in Winchester, Massachusetts. This assessment took place on August 29, 2014, and focused on areas adjacent to Phase I of the project.

3. INDOOR AIR QUALITY PARAMETERS

The following is a breakdown of upper limits related to indoor air quality as stipulated in section 01 81 19 of the Project Specification:

Analyte	Upper Limit
Airborne dust	150 $\mu\text{g}/\text{m}^3$ (Occupied), 500 $\mu\text{g}/\text{m}^3$ (Work Area)
Volatile Organic Compounds (VOCs)	5 ppm (5,000 ppb)
Carbon Monoxide (CO)	9 ppm

4. METHODOLOGIES

A TSI Q-Track indoor air quality meter was used to measure carbon dioxide, carbon monoxide, temperature, and relative humidity in the space. The range of measurements obtained is reported in Table 1.

A RAE Instruments part per billion photo-ionization detector (PID) was utilized to screen the school building for the presence of TVOC. The PID is a screening tool that provides information as to total volatile organic compound loading in the space. The instrument does not provide information pertaining to which specific compounds are present in the air.

Dust concentrations were measured using a MIE pDR-1000AN passive air sampler. This real-time aerosol monitor measures both respirable and thoracic fractions, with optimal responses to particles in the 0.1-10 micron size range. The monitor was zeroed on June 19, 2014 prior to the monitoring event by using a hand-inflatable “zero air” pouch in conjunction with an inlet filter cartridge.

5. FINDINGS

5.1 Findings: Basic IAQ Parameters

We have listed in Tables 1 through 3 the results of the real-time air sampling. Three rounds of sampling were conducted at various times of the day in order to gain a more representative data set.

Table 1: Real-time Air Quality Readings

<i>Location</i>	<i>CO₂ (ppm)</i>	<i>CO (ppm)</i>	<i>TVOC (ppb)</i>	<i>Dust (µg/m³)</i>
1st floor				
@ Main office	393	<0.1	43	30
@ Computer Ed	346	<0.1	18	76
@ WOMEN'S Room	347	<0.1	113	44
@ B102	343	< 0.1	34	22
B105	325	<0.1	1	15
@ Photography	348	<0.1	52	71
@ B105	450	<0.1	39	42
photography	475	<0.1	55	47
Library	337	<0.1	2	222
2nd floor				
@C212	367	<0.1	11	50
B209	374	<0.1	192	59
B208	388	<0.1	354	22
SW stairwell	380	<0.1	369	116
@ B23	348	<0.1	12	20
@C202	332	<0.1	9	12
@C201	343	<0.1	17	111
Temp. Offices	347	<0.1	16	35
@B201	342	<0.1	10	27
A211	322	<0.1	13	17
A208	315	<0.1	4	19
Social Studies	333	<0.1	21	31
@201	345	<0.1	25	24
@A205 hall	348	<0.1	31	50
3rd Floor				
Stairwell	523	<0.1	120	113
A302	354	<0.1	121	39
@ Science Lecture	335	<0.1	1912	68
@306	330	<0.1	65	17
@B301	348	<0.1	378	109
@B308	334	<0.1	378	109
@B306	346	<0.1	164	11
@C301	357	<0.1	109	105
Hall @ Math	363	<0.1	64	40
@ Teachers' Room	384	<0.1	136	144



6. DISCUSSION

Real-time readings for CO, VOCs, and CO₂ were all below upper limits set forth in the IAQ Management Plan.

Dust levels were also very low. One reading, taken in the Library, was found to be 222 µg/m³, slightly above the 150 µg/m³ upper limit value. However, within one minute this level had reduced to below 150 µg/m³; therefore, no corrective action was deemed necessary.

No significant construction-related odors were detected at the time of this assessment.

Indoor air quality will be monitored on a regular basis by Cashins & Associates throughout this project in order to ensure that concentrations of various airborne contaminants remain at acceptable levels.

Please call if you have any questions or if we can be of further assistance.

Sincerely,
Cashins & Associates, Inc.



Zachary Keefe, CIE
Senior Indoor Air Quality Consultant

