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Indoor Air Quality Evaluation

at

150 Williams Street
New York, New York

Adelaide Project #ACC-HQ01160-AQ

Field Work Performed By:

John Soter
September 23, 2001

Report Prepared By:

John Soter
September 24, 2001

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Scope of Services:

Adelaide Associates was contacted by Mr. Mindy Gordetsky of Asbestos Abatement Corporation (AAC) to do Indoor Air Quality testing on three floors and the main lobby of 150 Williams Street, New York, New York. Our site contact was Luis Cortes, and the investigation took place on September 23, 2001.

The site is currently occupied by the New York City Administration for Children Services. The request for Air Quality testing came due to complaints arising from the World Trade Center bombings.

Sampling Methodology

Real-Time Evaluations:

Temperature and Humidity are measured using a Testo 451 electronic Thermometer/Hygrometer.

Carbon Monoxide samples were taken using a Kane-May direct reading instrument, electronically zeroed, and sensitive to 1 ppm of CO.

Levels measured throughout the facility were at or below 1ppm. The OSHA (workplace) Permissible Exposure Limit is 50 ppm. The Federal Government's Public Building Service recommends a limit of 9 ppm in "non-Industrial" areas, including general offices and day care centers. Therefore, the facility is acceptable.

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Carbon Dioxide samples were taken using a Telaire D - 2000 ppm infrared direct-reading instrument, sensitive to 1 ppm.

Levels measured throughout the facility were below 1000 ppm. The OSHA (workplace) Permissible Exposure Limit is 5000 ppm. The Federal Government's Public Building Service recommends a limit of 1000 ppm in "non-industrial" areas, including general offices and day care centers. Therefore, the facility is acceptable. It should be noted that once the building systems are turned on, the levels of Carbon Dioxide will fall from their present levels since more fresh air will be introduced to the building.

Sampling Locations:

The following areas were sampled for the various agents as listed below.

Location 1: Outside Main Entrance - CO₂, CO, VOCs and Temperature/Humidity

Location 2: 5th Floor Corner of Ann & Gold Street - CO₂, CO, VOCs, Temperature/Humidity, Lead and Asbestos

Location 3: 11th Floor Corner of Ann & Williams Street - CO₂, CO, VOCs, Temperature/Humidity, Lead and Asbestos

Location 4: 18th Floor Corner of Fulton & Gold - CO₂, CO, VOCs, Temperature/Humidity, Lead and Asbestos

Location 5: Lobby - CO₂, CO, VOCs, Temperature/Humidity, Lead and Asbestos

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Interpretation of results:

Measurements of Carbon Dioxide were taken at all interior room sample locations. Carbon dioxide measurements indicate whether there is sufficient air exchange within an occupied space. By comparing the outdoor spot readings to the interior readings, you can estimate a "lag time".

Also, ASHRAE, NIOSH and GSA FPMR standards are NOT law. Only the OSHA PEL is a "legal" requirement. However the "spirit" of an indoor air quality evaluation is to evaluate the indoor environment from both a comfort and health perspective and provide recommendations which will improve the environment.

Both ASHRAE Standard 62-1999 (The American Society of Heating, Refrigeration, and Air Conditioning Engineers) and the GSA FPMR (Federal Property Management Requirements) recommend levels below 1000 ppm for comfort and general purging of natural and artificial irritants.

We found the levels of carbon dioxide to be below 1000 ppm at all locations, showing sufficient air exchange.

Carbon Monoxide readings were taken using a Kane-May direct reading instrument, electronically zeroed, and sensitive to 1 ppm of CO. Levels measured throughout the facility were at non-detected (less than 1 ppm). This indicates vehicular traffic exhaust is not directed into the air distribution system, and since there were no other sources of combustion or heating, carbon monoxide is not a concern in this suite.

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Temperature and humidity are simple physical factors to measure and understand. However, they are also the source of over 35% of indoor air quality complaints! Though simple in principle, the control of temperature and humidity is key to actual good indoor air quality and the perception of good air quality.

Low humidity increases surface static charges which either repel or attract particulate. The charged dust particles can remain suspended longer in air. This creates the condition where the total number of particles in a room may not have changed, just the number airborne. These particles are also of a size and concentration that are usually unmeasurable, in either case. Low humidity also dries sinus cavities, changes mucous production rates, creates a feeling of pressure in the head (sinus headaches/pressure), and creates dry skin, eye irritation (especially in contact lens wearers), and dehydration.

Elevated humidity decreases surface static charges, and rough surfaces can act as collectors of particles. Elevated humidity also creates the ability for increased microbial growth (mold, fungi and bacteria). Condensation can occur on cold surfaces or cold interfaces (such as uninsulated ductwork, suspended ceiling metal grids, etc.) and create water damage. Odors are more pronounced, and a perception of "not enough fresh air" or "stuffiness" is common.

We found the humidity levels varied throughout the building, between 40 and 65% at all interior locations. Outdoor humidity ranged from 47 to 49%.

Temperature levels within the tested areas varied between 80 to 85 °F .

Both temperature and humidity levels were elevated, but as mentioned previously once the building systems (HVAC system) are turned on these levels will change.

Photoionizable VOCs were non-detected both indoors and outdoors, and there were no obvious chemical supplies or containers within the space

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(including no paints or glues).

Lead Air Sampling

The ambient and personnel air sampling levels set by OSHA need to be below the permissible exposure limit (PEL) of 50 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$). If workers are exposed to levels above this limit, certain medical surveillance monitoring, as well as appropriate engineering controls and personnel protective equipment (PPE) are required. Several samples were above the PEL during this project.

Ambient air sampling was conducted in accordance with OSHA recommended guidelines. A personal low volume air pump was placed in the breathing zone (4-6 feet) and the air was collected onto a 0.8 micron 37 millimeter cassette. The cassettes were sent to a laboratory for analysis.

Asbestos Air Sampling

Air sample collection and analysis was conducted throughout the abatement project. The purpose was to document the effectiveness of the contractor's efforts at confining asbestos to the work zone. The program included air sampling and analysis by PCM [National Institute for Occupational Safety and Health (NIOSH) Method 7400].

NIOSH Method 7400 involves the analysis of all airborne particulate contaminants captured on a filter medium utilizing vacuum pumps. Sampling cassettes were pre and post calibrated for flow rate in the field utilizing hand held rotometers, which in turn are calibrated against a primary standard in the laboratory. Air samples are then transmitted to the laboratory with a Chain of Custody where, after preparation, they are examined under PCM. Criteria specified for fiber counting is fiber length, length to width ratio, and morphological characteristics.

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Conclusions / Recommendations

The air samples show that airborne levels of asbestos and lead are all below EPA and NYS Department of Labor (asbestos) levels. All other parameters tested for were also within recommended guidelines. As mentioned earlier, once the building systems are turned on these conditions may change.

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