EnvironmentalSafetyHealthGeotechnical

O'Reilly, Talbot & Okun ENGINEERING
[ASSOCIATES]

293 Bridge Street
Suite 500
Springfield, MA 01103
Tel 413 788 6222
Fax 413 788 8830
www.oto-env.com

December 23, 2013
J0325-06-02

Mr. Ed Cenedella
Director of Facilities & Maintenance
Hampden Wilbraham Regional School District
621 Main Street
Wilbraham, Massachusetts 01095

RE: Industrial Hygiene Assessment Services Report
Wilbraham Middle School - Lower Level Rooms

Dear Ed,

This letter conveys the results of industrial hygiene assessment services that were performed in the lower level rooms of the Wilbraham Middle School located in Wilbraham, Massachusetts. Specifically indoor air quality testing (including collection of air samples to be analyzed for mold) was conducted in the various lower level rooms (Rooms 5, 6, 14, 15 and 16), and from outside (ambient) conditions for comparison.

It has been reported to OTO that in some areas of the lower level of the Wilbraham Middle School occupants have conveyed concerns regarding the quality of air. It has been reported to OTO that the lower level has experienced minor water incursion and elevated moisture. Occupants have expressed concerns regarding the potential of mold growth associated with the elevated moisture levels and the possible impact on air quality.

The results of our assessment indicate the most air quality results (relative humidity, carbon monoxide, and volatile organic compounds) are generally within the indoor air quality criteria recommended by the American Society of Heating, Refrigeration Air Conditioning Engineers (ASHRAE), Occupational Safety & Health Administration (OSHA), and the National Institute for Occupational Safety and Health (NIOSH). The temperature in the areas assessed averaged 68° and was slightly lower than the recommended range of 70-73°. Carbon dioxide levels throughout the space were elevated above the recommended range and averaged 1,133. Elevated carbon dioxide levels may indicate the need for additional fresh air to be introduced to the spaces being evaluated based on the occupant load and the activities being performed in the space.

No odors were detected on the day of our assessment. No water staining or discolorations were observed on some building surfaces (i.e. floors, walls, and ceilings).

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The results of the mold spore sampling indicate the total fungal counts from the indoor samples were amplified when compared to ambient conditions. The fungal spores identified as amplified are common to the environment and not typically pathogenic to healthy humans; however the type of species (Aspergillus/Penicillium, Cladosporium) identified is commonly viewed as a "water damage indicator species". Amplification was observed to be more predominate in rooms that have not had replacement resilient floor tile installation (Rooms 14, 15 and 16).

In summary, the results of the indoor air quality sampling on the day of the assessment indicate the temperature was lower than recommended, and carbon dioxide levels were elevated above the recommended consensus standards. This indicates the space was cooler than recommended with limited fresh air ventilation. There was also an amplification of mold spores within lower level rooms when compared to the ambient samples in Rooms 14, 15 and 16. The fungal spores identified as amplified are common to the environment and not typically pathogenic to healthy humans; however the type of species (Aspergillus/Penicillium, Cladosporium) identified is commonly viewed as a "water damage indicator species". These species suggest water or moisture infiltration into the space or wet materials are present with mold growth. The amplification of mold spores could also be attributed to the limited fresh air ventilation throughout the space.

The construction materials within the lower level rooms (slab on grade construction) suggest a potential lack of vapor barrier and/or insulation allowing moisture to enter from the floor surface. Replacement of the existing resilient flooring materials in Rooms 14, 15 and 16 (as well as other Rooms within the lower level that may be finished with the same, older flooring materials) is suggested. Additionally a vapor barrier and insulation should be installed to prohibit moisture from penetrating the concrete slab and allowing elevated moisture conditions within the lower level rooms.

We also recommend checking the fresh air volume into the lower level areas in an effort to improve the space for occupancy and use.

We appreciate the opportunity to provide you with these industrial hygiene services. If you have any questions, please contact our office at your convenience.

Sincerely,
O'Reilly, Talbot & Okun Associates, Inc.

Christine Arruda, CIEC
Certified Indoor Environmental Consultant

Robert F. Kirchherr, CSP
Senior Safety and Industrial Hygiene Specialist

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INDUSTRIAL HYGIENE ASSESSMENT SERVICES
WILBRAHAM MIDDLE SCHOOL
LOWER LEVEL ROOMS
WILBRAHAM, MASSACHUSETTS
December 11, 2013

INTRODUCTION

Industrial hygiene assessment services were performed on December 11, 2013 at the Wilbraham Middle School in Wilbraham, Massachusetts. Specifically, an indoor air quality evaluation was performed in response to occupant concerns regarding the quality of air within lower level rooms. The indoor air quality assessment included visual observations and industrial hygiene sampling in Rooms 5, 6, 14, 15, and 16.

The industrial hygiene assessment focused on the indoor air quality throughout the identified areas and included real-time measurements for carbon monoxide, carbon dioxide, temperature, relative humidity, and volatile organic compounds (VOCs). In addition, air sampling for mold spores was performed in each of the above classrooms, and included ambient air sampling as a control sample.

This report details the sampling methodology, monitoring results, and our observations and conclusions. The information provided in this report is subject to the Limitations as attached.

HISTORY

It has been reported to OTO that in some areas of the lower level of the Wilbraham Middle School occupants have conveyed concerns regarding the quality of air. It has been reported to OTO that the lower level has experienced minor water incursion and elevated moisture. Occupants have expressed concerns regarding the potential of mold growth associated with the elevated moisture levels and the possible impact on air quality.

AIR MONITORING METHODOLOGY & RESULTS

The following describes the indoor air quality monitoring and assessment that was performed on December 11, 2013.

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Air Monitoring

Carbon dioxide, carbon monoxide, temperature and relative humidity readings were taken in Room B120, and from ambient conditions using a Solomat MP Surveyor Pro Multimeter manufactured by Zellweger Analytics. The unit has a real-time readout in parts per million (PPM) carbon dioxide and carbon monoxide as well as real time relative humidity (%) and temperature (°F) readings.

Continuous monitoring for VOCs was conducted utilizing a MiniRAE hand held photoionization detector (PID). The unit had a real-time readout range of 1 to 1000 parts per million (PPM) total VOC.

Carbon Dioxide

Carbon dioxide levels are commonly used as a means of determining the adequacy of ventilation in occupied areas. Unless concentrations reach exceptionally high levels, such as in excess of 5,000 PPM, carbon dioxide is not considered a contaminate. Carbon dioxide monitoring is used as a surrogate for indicating elevated levels of other contaminates that are more difficult to measure. People exhale and generate carbon dioxide gas as part of normal respiration.

Outdoor ambient concentrations of carbon dioxide are typically in the 300-450 PPM range. Elevated levels of carbon dioxide that are 300 PPM above normal ambient air are usually found in urban areas. Increased levels of carbon dioxide above outdoor ambient conditions can also be related to the occupant load, various activities being performed within the space and the quantity of fresh air ventilation being introduced into the space.

The American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE) have determined that occupants are apt to experience stuffiness, headaches, fatigue, eye and respiratory tract irritation if the indoor levels of carbon dioxide levels exceed the outside ambient levels by 2-3 times. The concentration of carbon dioxide itself is not responsible for the complaints. Rather, it is an indicator that other contaminates in the building may have increased to undesirable levels. As a result, the recommended level of carbon dioxide level for indoor air quality evaluation is to maintain a differential of less than 700 PPM above outdoor ambient levels. The carbon dioxide within the monitored rooms were slightly elevated above the 700 PPM differential and averaged 1,133 PPM (ambient/outside level average of 427) on the day of our assessment and are summarized in Table 1.

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Carbon Monoxide

Carbon monoxide concentrations were recorded throughout each area of the assessment. Carbon monoxide is produced by the incomplete combustion of various fuels, such as natural gas fuel oil, and vehicle exhaust.

There was no carbon monoxide (i.e. less that 0.5 PPM) detected in the monitored areas on the day of our assessment.

Temperature & Relative Humidity

Temperature and relative humidity readings were taken throughout each space involved in the assessment. The relative humidity levels were generally within the range recommended by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) (Relative humidity 30-60%); however, temperature was slightly below the recommended range (Temperature 70-73°).

The temperature and relative humidity levels on December 11, 2013 averaged 68° F and 31% respectively. The temperature and relative humidity levels were typically uniform and representative of ambient conditions. Temperature and relative humidity values can change quickly due to occupancy level and type, the performance of the HVAC systems, ambient conditions, and other factors (i.e. solar heat gain or loss from the windows).

Volatile Organic Compounds (VOCs)

Volatile organic compounds (VOCs) are gases emitted from a wide variety of items including building materials, various furniture and contents, etc. Continuous monitoring for VOCs was conducted in Room 4105 and the lunchroom utilizing a MiniRAE hand held photoionization detector (PID). The unit had a real-time readout range of 1 to 1000 parts per million (PPM) total VOC. The unit was calibrated utilizing an isobutylene standard. No VOCs (less than 0.5 PPM) were detected in the monitored area on the day of our assessment.

Direct reading air quality parameters are summarized in Table 1 on the following page.