SHIVE-HATTERY

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Shive-Hattery, Inc.
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March 12, 2009

The University of Iowa
Business Managers Office
ATTN: Ms. Cathrine Fountain
2682 UCC
Iowa City, Iowa 52242

RE: 219 Melrose Court, Iowa City – IAQ – Revised

Dear Ms. Fountain:

Per your request and authorization, Shive-Hattery, Inc. performed indoor air quality testing for the above referenced project on January 19, 2009.

Methods and Procedures

This project was performed by a Certified Indoor Environmental Consultant (CIEC), and Certified Microbial Remediator (CMR), trained and certified by the American Indoor Air Quality Council. The review of this project was conducted by a Certified Microbial Consultant (CMC), and Certified Indoor Air Quality Consultant (CIAQC) trained and certified by the American Indoor Air Quality Council.

During the course of the indoor air quality testing, two indoor sample sets and one outdoor sample set were taken. The outdoor background sample was taken outside the front entry door on the east side of the home. Two types of mold sampling were performed, spore traps and viable. The samples were sent to an American Industrial Hygiene Associations (AIHA) accredited laboratory for analysis. The two types of samples are described below.

Spore trap samples are taken to inventory all types of mold: viable (living), dead, and dormant. Spore trap samples were performed with a high volume sample pump set at 15 L/min with a sampling time of 10 minutes for a total sample volume of 150 Liters. The sampling media for this test were Zefon brand Air-O-Cell cassettes. The results from this type of testing group all mold spores together (viable, dead, and dormant) and identify the specific type and quantity of mold found. Slides containing greater than 500 fungal spores are difficult to count accurately due to overcrowding and are therefore estimations. Similarly, excessive non-microbial particulate can mask the presence of fungal spores, thereby reducing counting accuracies. All slides are graded with a debris scale for data qualification.

Viable (living) mold samples were taken to determine what mold types of mold are living in the current environmental conditions. Viable testing was performed using the Aerotech 6 Viable Particle Sampler. This sampler is an aluminum device held together by three spring clamps and sealed with o-ring gaskets. The impactor stage contains 400 precision drilled holes. When air is drawn through the samplers, multiple jets of air go through the stage and direct any airborne particles toward the surface of the agar collection surface. Viable sampling media used was Potato Dextrose Agar (PDA).

Pertinent information for each sample has been summarized on the sample analytical results which can be found within this report.

History of Property

The property inspected for this post-remediation IAQ study was originally constructed as a single family, poured concrete foundation, wood frame structure with a brick veneer on the east side. The house is currently being utilized as rental property by the University of Iowa.

The University contacted Shive-Hattery and requested an inspection and IAQ audit of the property, which was conducted on November 14, 2008. A report of the finding was presented to the University on December 4, 2008 and a scope of work for remediation was drafted and sent to University personnel on December 12, 2008.

The affected area of the basement had been cleaned by a mold remediation firm. The scope of work for the property was given to the University personnel for distribution to the remediation contractors bidding the project. Abatement to the basement was completed on January 3, 2009 with the containment taken down on January 5, 2009.

Visual inspection and Indoor air quality testing of the property was conducted on January 19, 2009. There was a gap from the time the remediation took place and from when the indoor air quality testing was performed. This gap in time was not known at the time the initial report was issued. The original report, and its opinions and recommendations therein, were based on the understanding that a containment was still in place and remediation had just concluded.

Summary of Findings

Basement

Spore Trap Samples

The outdoor spore trap sample total (background) was 60 spores/m^3. The indoor spore trap sample was 53 spores/m^3 and was lower than the mold counts found outside for total counts and for some individual mold types. We do not consider the types and levels of the mold spores detected in this sample to be a health hazard in this area on the day testing was performed.

Viable Samples

The outdoor viable sample was less than 12 cfu/m^3. The indoor viable sample was 200 cfu/m^3 and was higher than the mold counts found outside for total counts and for some individual mold types. We do not consider the types and/or levels of mold spores detected to be a health hazard on the day testing was performed.

There were several different types of viable molds found at low levels. Most of these molds are types of molds that are typically found in soil. We are concerned that these molds are viable when the relative humidity levels are very low. Our concern is that as the spring and summer months approach and relative humidity levels rise significantly, the viable molds identified in this sample may thrive.

Living Room

Spore Trap Samples

The outdoor spore trap sample total (background) was 60 spores/m^3. The indoor spore trap sample was 27 spores/m^3 and was lower than the mold counts found outside for total counts and for some individual mold types. We do not consider the types and levels of the mold spores detected in this sample to be a health hazard in this area on the day testing was performed.

Viable Samples

The outdoor viable sample was less than 12 cfu/m^3. The indoor viable sample was 47 cfu/m^3 and was higher than the mold counts found outside for total counts and for some individual mold types. We do not consider the types and/or levels of mold spores detected in this area to be a health hazard on the day testing was performed.

Indoor Air Quality Audit

Ambient conditions (temperature, Carbon Dioxide, and Carbon Monoxide), were acceptable at the time of the inspection. The ambient relative humidity was lower than the recommended ASHRAE and OSHA ranges. There may be some concern, however, that the Carbon Dioxide levels were significantly elevated above the recommended level of 800 ppm with readings up to 1460 ppm. This indicates insufficient fresh air intake as there was only one other occupant present at the time of testing.

Ambient Conditions

Location	Time	Actual Relative Humidity (%)	OSHA Recommended RH (%)	ASHRAE Recommended RH (%)	Actual Temp. (°F)	ASHRAE Recommended Temperature (°F)	Actual CO_2 (ppm)	ASHRAE Recommended CO_2 (ppm)	Actual CO (ppm)	Recommended CO (ppm)
Basement	10:51	24.5	<60	30-60	66.9	68-79	763	<800	0.0	50
Living Room	11:11	25.1	<60	30-60	68.5	68-79	804	<800	0.0	50
Outdoor	11:26	84.0	<60	30-60	32.6	68-79	354	<800	0.0	50

Findings and Recommendations

During the indoor air quality inspection, it was apparent that most of the scope of work was followed for a majority of remediation of the structure. Due to a lack of construction observation during the construction phase of this project, it is nearly impossible to comment specifically on remediation activities performed. In addition, due to the period of time from the completion of the remediation work (January 5, 2009) and the time that the air quality testing was performed (January 19, 2009), it would be unfair to the abatement contractor to consider this testing as post-remediation testing.

Viable mold growth was identified in low quantities in the basement. The fact that these molds were detected in the viable sampling is particularly of concern as this would indicate an active reservoir was either disturbed, introduced into the area, or is an ongoing moisture intrusion problem previously contributing to active microbial growth. There is a basement window identified with an active leak that needs to be either replaced or sealed up to prevent moisture intrusions and further microbial growth.

All efforts to prevent and maintain proper moisture management in this structure should continue, keeping relative humidity levels between the OSHA and ASHRAE recommended levels of 30 and 60%, preferably below 50%. Temperatures and moisture levels should be monitored in all areas of the structure to ensure proper conditioning of spaces. Any elevated levels should be addressed in a timely and appropriate manner to help prevent mold growth/contamination of the structure. In the event that any water activity events were to occur, re-occur and persist, microbial amplifications could and likely would occur.

It is our opinion that on the day testing was performed, there were no health hazards present due to microbial growth or indoor air quality issues. We are unsure at this time if the original source of the microbial growth has been adequately remedied as there are indications that soil based molds are present and viable at low numbers.

It is our opinion that there are two possible sources of moisture contributing to the microbial growth. We recommend that the owner seal off the sump pit and either repair or replace the basement window where the moisture intrusions are occurring.

It must be stressed that all findings represent conditions at the time of sampling. These opinions are based on results from the sampling conducted at this point in time.

Please call our office if you should have any questions or comments.

Sincerely,

SHIVE-HATTERY, INC.

Chad Siems, CMC, CIAQC, CIEC
Environmental Specialist

LWS/mas

Copy: Al Wehmeyer, Americlean