



HEI Systems

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Report of Findings

**Assessment for Fungi at a Municipal Building
6130 Sunset Drive
South Miami, Florida 33143
File Number: 11-11-0803-M**

Prepared For:

The City of South Miami

Attention:

Mr. Steven P. Kulick, Central Services

**Richard H. McMonagle, Ph. D., CIE
HEI Systems
Florida License # MRSA186**



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Section I

Introduction

On November 4, 2011, HEI Systems was retained to conduct an assessment related to water damage and potential subsequent fungal (mold and yeast) growth and sampling of a Municipal Building, located at 6130 Sunset Drive, South Miami, Florida 33143. The stated purpose of the assessment was to identify and determine the location and extent of fungal growth within the interior of the Municipal Building, due to prior water intrusions into the Central Services Building. An additional concern was expressed for any potential to human health resulting from fungal exposure, should any be present.

On Tuesday, November 8, 2011, HEI Systems performed a walk-through visual assessment for any visual evidence of fungal growth on the indoor surfaces of the building. Present during the November 8, 2011 assessment was Richard H. McMonagle, Ph. D., CIE, from HEI Systems, and Mr. Steven Kulick and other employees, who granted access to the Municipal Building.

On Tuesday, November 8, 2011, indoor environmental sampling and comparison outdoor background sampling was conducted at this Municipal Building. The collected samples were submitted to a fully accredited microbiology laboratory (AEML, Inc.) for microbiological (fungi) identification and quantification. Richard H. McMonagle, Ph. D., CIE, evaluated the sampling laboratory results received from AEML, Inc.

This report is prepared for the use of The City of South Miami, and is not intended for any other purpose. The report is prepared in accordance with recognized procedures and appropriate scientific methods applicable and used by professionals in this field. This report is based upon the information available to HEI Systems at this time, as described in **Section IV, Basis of Report**. Should additional information become available, HEI Systems reserves the right to determine the impact, if any, of the new information on our opinions and conclusions, and to revise our opinions and conclusions, if necessary, as warranted by the discovery of additional information.

Section II Discussion

- This Municipal Building had reported prior water intrusion on several occasions.
- There is a strong Microbial Volatile Organic Compound (mVOC) odor in the Central Services Building.
- The windows and rear door had been open for fresh air ventilation, presenting a limitation on the actual condition of airborne fungal spores captured in the sample.
- There is a visible exterior grading issue that should be further assessed by a licensed Professional Engineer. It appears that this grading issue facilitates the water intrusion into the building and should be corrected prior to interior restoration.
- There is visible water damage and water stains along the wall bottoms in the Central Services Building. There is continued elevated moisture beneath the tile floor covering in the front fingerprint area of this building. There are openings at the edge of the tile floor covering and the adjoining wall that allows water intrusion beneath the tile floor covering. The tile floor covering should be removed under containment and disposed of. The slab should be abrasively cleaned to remove any remaining mastic and then re-sealed prior to the installation of any new floor covering.
- There is elevated moisture beneath the green tile floor covering in the Middle Room with the copy equipment. The elevated moisture ceases and is not present beneath the floor covering in the back office that is elevated by a step up. There is a distinct possibility that the green tile and mastic used beneath it contain asbestos. As such, this tile should be removed under the proper containment under negative air pressure, with appropriate HEPA filtration in place within the containment and disposed of in a legal manner pursuant to the statutes regulating asbestos. The slab should be abrasively cleaned to remove any remaining mastic and then re-sealed prior to the installation of any new floor covering.
- There is evidence of water intrusion and water staining on the plank ceiling of the Sylvia Martin Building.
- A licensed Professional Engineer should further assess the condition of the roofing system for damage, water intrusion, and sufficiency.
- The Vanity in the Women's restroom is water damaged, water stained, delaminated and separating. This Vanity should be removed and disposed of.

Hypotheses:

H₁: The fungal load of the 150 Liter aerosol sample collected from the Planning Department (Sylvia Martin Bldg.) will both exceed a fungal load of 3,000 aggregate fungal spores per cubic meter of air, and be significantly greater than the fungal load of the outdoor control sample, and therefore be considered to be in a state of elevated fungal ecology.

H₀₁: The fungal load of the 150 Liter aerosol sample collected from the Planning Department (Sylvia Martin Bldg.) will neither exceed a fungal load of 3,000 aggregate fungal spores per cubic meter of air, nor be significantly greater than the fungal load of the outdoor control sample, and therefore be considered to be in a state of normal fungal ecology.

H₂: The fungal load of the 150 Liter aerosol sample collected from Mr. Kulick's Office will both exceed a fungal load of 3,000 aggregate fungal spores per cubic meter of air, and be significantly greater than the fungal load of the outdoor control sample, and therefore be considered to be in a state of elevated fungal ecology.

H₀₂: The fungal load of the 150 Liter aerosol sample collected from Mr. Kulick's Office will neither exceed a fungal load of 3,000 aggregate fungal spores per cubic meter of air, nor be significantly greater than the fungal load of the outdoor control sample, and therefore be considered to be in a state of normal fungal ecology.

H₃: The fungal load of the 150 Liter aerosol sample collected from the Front Fingerprint Area will both exceed a fungal load of 3,000 aggregate fungal spores per cubic meter of air, and be significantly greater than the fungal load of the outdoor control sample, and therefore be considered to be in a state of elevated fungal ecology.

H₀₃: The fungal load of the 150 Liter aerosol sample collected from the Front Fingerprint Area will neither exceed a fungal load of 3,000 aggregate fungal spores per cubic meter of air, nor be significantly greater than the fungal load of the outdoor control sample, and therefore be considered to be in a state of normal fungal ecology.

H₄: The fungal load of the 150 Liter aerosol sample collected from the Middle Room Copy Area will both exceed a fungal load of 3,000 aggregate fungal spores per cubic meter of air, and be significantly greater than the fungal load of the outdoor control sample, and therefore be considered to be in a state of elevated fungal ecology.

H₀₄: The fungal load of the 150 Liter aerosol sample collected from the Middle Room Copy Area will neither exceed a fungal load of 3,000 aggregate fungal spores per cubic meter of air, nor be significantly greater than the fungal load of the outdoor control sample, and therefore be considered to be in a state of normal fungal ecology.

Sampling:

Aerosol sampling of the indoor air was conducted along with comparison outdoor background sampling at this Municipal Building.

The sampling indicated the following. The **Outdoor** air sample collected on November 8 2011 was captured with an Allergenco-D™ drawing fifteen liters of air for ten minutes, for a total of 150 liters of air. The results of this sample analysis by AEML, Inc. revealed a fungal spore count of: 53 Aspergillus/Penicillium-like spores per cubic meter of air; 127 Basidiospores per cubic meter of air; 7 Curvularia spores per cubic meter of air; 13 Ganoderma spores per cubic meter of air; 7 Nigrospora spores per cubic meter of air; 7 Oidium/Peronospora spores per cubic meter of air, and 7 Smut/Myxomyces/Periconia spores per cubic meter of air in the sample collected.

Aspergillus and Penicillium spores are often difficult to distinguish **microscopically, and are commonly grouped together in the analysis of total count samples.** All spore-trap (Allergenco-D™) samples are total count samples.

Aspergillus is found in soil, compost piles, decaying vegetation, stored grain, and other kinds of organic matter. Aspergillus can also be found indoors in water-damaged buildings. Some species are able to produce mycotoxins, depending upon the species, substrate, and/or food source.

Penicillium consists of many species that are common contaminants on a variety of substrates. Penicillium may be found indoors in air samples, carpet dust, or on wallpaper. Some species are able to produce mycotoxins depending upon the species, substrate, and/or food source.

Basidiospores are the sexual spores produced by Basidiomycetes. Basidiomycetes are a class of fungi characterized by spores formed on basidia. They include mushrooms, toadstools, boletes, wood bracket fungi, and puffballs. Some species are edible, such as *Agaricus bisporus*, the commercially cultivated mushroom. A few species cause wood brown rot, white rot, and dry rot in buildings.

Curvularia is a common saprobe found in soil, plants, cereals, and cellulosic materials such as paper and archives. Some species are plant pathogens but can also occur indoors. Curvularia is allergenic and may cause infections in immunocompromised people.

Ganoderma are large, very hard, woody bracket fungi that grow on living and dead trees.

Myxomycetes are popularly called slime molds. They are not true fungi, taxonomically. Some species are found in the soil, in decaying wood, or other organic matter, where they produce structures full of powdery resting spores.

Nigrospora are commonly found on both living and dead grasses. They are also found in seeds and soils of various climates. In their natural state, they are forcibly ejected into the air for spore dissemination. Nigrospora are associated with Type I allergens (hay fever and asthma).

Oidium is an obligate parasite on many plant varieties causing powdery mildew disease. It is sometimes found in outdoor samples and indoors it may be found on houseplants.

Periconia is found outdoors in grasses, dead herbaceous plant material, rushes and soils. It is primarily disseminated by the wind and is known to produce *Periconia circinata*, that subsequently produces Periconin A and Periconin B; both of which are biologically inactive.

Peronospora is an obligate pathogen causing Downy Mildew on many types of plants. It is sometimes seen on outdoor samples.

Smuts are pathogens of cereals crops, corn, grasses, onion, and sorghum. Smut fungi require a living plant host for growth. They are disseminated throughout the environment by wind, rain, shoes and lawnmowers. Smut fungi belong to the order Ustilaginales and there are about 4000 known species. Smuts are associated with Type I allergens (Hay Fever and Asthma).

Aerosol sampling of the indoor air was conducted in the **Planning Office** (Sylvia Martin Building), as a response to the mVOC odor and for a comparison to the outdoor control sample. This air sample was captured with an Allergenco-D™ drawing fifteen liters of air for ten minutes, for a total of 150 liters of air. The results of this sample analysis by AEML, Inc. revealed a fungal spore count of: 140 Aspergillus/Penicillium-like spores per cubic meter of air and 7 Bipolaris/Dreschlera spores per cubic meter of air in the sample collected.

Bipolaris is a plant saprophyte and pathogen of many plants, causing leaf rot, crown rot, and root rot on warm season turf grasses. Indoors, it is found in indoor plants and building materials. Bipolaris is considered to be allergenic and has been associated opportunistically with chronic invasive sinusitis. Some species produce mycotoxins.

Dreschlera is a plant pathogen known for causing leaf spot, crown rot, and root rot of various turf grass species. It is most destructive to plants during rainy weather. It is disseminated on air currents, dead grass clipping, feet, lawn movers and splashing water. In rare cases, it has been associated with corneal infections in eyes.

Aerosol sampling of the indoor air was conducted in **Mr. Kulick's Office**, as a response to the mVOC odor and for a comparison to the outdoor control sample. This air sample was captured with an Allergenco-D™ drawing fifteen liters of air for ten minutes, for a total of 150 liters of air. The results of this sample analysis by AEML, Inc. revealed a fungal spore count of: 73 Aspergillus/Penicillium-like spores per cubic meter of air; 13

Basidiospores per cubic meter of air and 13 Hyphal Fragments per cubic meter of air in the sample collected.

Aerosol sampling of the indoor air was conducted in the **Front Fingerprint Area** as a response to the mVOC odor and for a comparison to the outdoor control sample. This air sample was captured with an Allergenco-D™ drawing fifteen liters of air for ten minutes, for a total of 150 liters of air. The results of this sample analysis by AEML, Inc. revealed a fungal spore count of: 60 Aspergillus/Penicillium-like spores per cubic meter of air; 7 Curvularia spores per cubic meter of air and 20 Hyphal Fragments per cubic meter of air in the sample collected.

Aerosol sampling of the indoor air was conducted in the **Middle Copy Area** as a response to the mVOC odor and for a comparison to the outdoor control sample. This air sample was captured with an Allergenco-D™ drawing fifteen liters of air for ten minutes, for a total of 150 liters of air. The results of this sample analysis by AEML, Inc. revealed a fungal spore count of: 27 Aspergillus/Penicillium-like spores per cubic meter of air; 7 Curvularia spores per cubic meter of air and 7 Hyphal Fragments per cubic meter of air in the sample collected.

Interpretation of the Laboratory Analysis:

An interpretation of the laboratory analysis of the aerosol samples collected during this assessment results in the acceptance of the null hypothesis and a finding that these indoor areas may be said to be within a state of normal fungal ecology.

While the total spore count numbers collected in the samples were relatively low, the mitigating factors to consider are:

1. The building was under a condition of fresh air ventilation up until the time of the sample collection.
2. Both buildings are public buildings with continuous traffic in and out.
3. The consistency of the presence of Aspergillus/Penicillium-like spores in all areas is indicative of prior water damage as these genera are correlated to water damaged building materials within structures.
4. The elevated moisture present is captured beneath the tile floor covering.

Additional Information:

Descriptions of the damage and locations are indicated in Table contained in **Appendix A**. In the table, **WD** denotes water damage, **FG** denotes visible fungal growth, and **EM** denotes elevated moisture detected by a meter.

Photographs:

Photographs of water damage and visible fungal growth are presented in **Appendix A**, Photographs. Locations where indoor environmental samples were collected may be depicted.

Environmental Sample Results:

HEI Systems personnel collected indoor and outdoor environmental samples.

1. Laboratory results and the sample information logs are contained in **Appendix B, Sample Chain of Custody and Laboratory Results.**
2. Conclusions derived from the sample results are stated in **Section III, Summary and Conclusions.**

Section III

Summary and Conclusions

The condition of this Municipal Building can be said to be a state of normal fungal ecology with on-going water intrusion and water damage. As such, this building may be considered to be in a state of limited risk that is associated with elevated fungal exposure which is delineated by both the quantity of microorganisms or the fungal species present in assessing the risk to humans in the same environment.

A licensed Professional Engineer should further assess the roofing system for sufficiency and damage.

All water damage restoration should be performed pursuant to the provisions of the ANSI/IICRC S500 – 2006, 3rd Ed., *Standard and Reference Guide for Professional Water Damage Restoration*.

Section IV Basis of Report

1. Richard H. McMonagle, Ph. D., CIE, conducted the walk-through visual assessment; collected environmental samples from the Municipal Building, and evaluated the sampling laboratory results received from AEML, Inc. (**Appendix B, Sample Information Log [Chain of Custody] and Laboratory Results**).

2. The following reference materials were incorporated within the development of this report:

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Section V Appendices

- A. Photographs
- B. Sample Chain of Custody and Laboratory Results

**Section V
Appendix A**

Photographs

Photographs taken during this assessment that are not included in this report are retained in our files and are available to you upon request.

Location	WD	FG	EM	Description	Photo #
Front of Building				Photograph of the front of the building on the day of the assessment.	1



Location	WD	FG	EM	Description	Photo #
Exterior				Grading and landscaping issues allow for water intrusion.	2



Location	WD	FG	EM	Description	Photo #
Front Fingerprint Area	√		√	Separation at wall edge allows water to intrude beneath floor tile and remain captured there.	3



Location	WD	FG	EM	Description	Photo #
Front Fingerprint Area	√		√	Elevated moisture beneath floor tile when measured with a meter.	4



Location	WD	FG	EM	Description	Photo #
Middle Room	√		√	Elevated moisture in Middle Copy area does not extend into back room that is elevated.	5



Location	WD	FG	EM	Description	Photo #
Front Fingerprint Area	√			Visible water damage and water staining to cabinet bottoms.	6



Location	WD	FG	EM	Description	Photo #
Middle Copy Room	√		√	Elevated moisture beneath tile floor covering.	7



Location	WD	FG	EM	Description	Photo #
Planning Office	√			Water staining and water damage to plank ceiling.	8



Location	WD	FG	EM	Description	Photo #
Planning Office	√			Water staining and water damage to Vanity in Women's Restroom.	8



Section V
Appendix B

Sample Chain of Custody and Laboratory Results

The following Chain of Custody Reports and Laboratory Analysis Results are provided as attachments.

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Project: S. Miami City Hall
Sampled: 11/8/2011
Received: 11/8/2011
Analysis Date: 11/9/2011
Report Date: 11/9/2011
Batch: 13386

AEML Test: A001 Spore Trap Analysis

Sample ID:	111108Q007	111108Q008	111108Q009	111108Q010
Client Sample ID:	055952 Outside	055953 Planing	055925 Mr Kulick Off	055928 Front
Volume Sampled (L):	150	150	150	150
Media:	Allergenco D	Allergenco D	Allergenco D	Allergenco D
Percent of Trace Analyzed:	100% at 600X Magnification	100% at 600X Magnification	100% at 600X Magnification	100% at 600X Magnification

Spore Types	Raw Count	Count/m ³	%	Raw Count	Count/m ³	%	Raw Count	Count/m ³	%	Raw Count	Count/m ³	%
Alternaria	-	-	-	-	-	-	-	-	-	-	-	-
Arthrinium	-	-	-	-	-	-	-	-	-	-	-	-
Ascospores	-	-	-	-	-	-	-	-	-	-	-	-
Aspergillus/Penicillium-Like	8	53	24	21	140	95	11	73	79	9	60	90
Basidiospores	19	127	58	-	-	-	2	13	14	-	-	-
Bipolaris/Dreschlera	-	-	-	1	7	5	-	-	-	-	-	-
Botrytis	-	-	-	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-	-	-	-
Cladosporium	-	-	-	-	-	-	-	-	-	-	-	-
Curvularia	1	7	3	-	-	-	1	7	7	1	7	10
Epicoccum	-	-	-	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-	-	-	-
Ganoderma	2	13	6	-	-	-	-	-	-	-	-	-
Memnoniella	-	-	-	-	-	-	-	-	-	-	-	-
Nigrospora	1	7	3	-	-	-	-	-	-	-	-	-
Oidium/Peronospora	1	7	3	-	-	-	-	-	-	-	-	-
Pithomyces	-	-	-	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-	-	-	-
Smut/Myxomyces/Periconia	1	7	3	-	-	-	-	-	-	-	-	-
Stachybotrys	-	-	-	-	-	-	-	-	-	-	-	-
Torula	-	-	-	-	-	-	-	-	-	-	-	-
Ulocladium	-	-	-	-	-	-	-	-	-	-	-	-
Unidentified Spores	-	-	-	-	-	-	-	-	-	-	-	-
Total Spores	33	220		22	147		14	93		10	67	
Hypheal Fragments	-	-	-	2	13		2	13		3	20	
Pollen	-	-	-	-	-	-	-	-	-	-	-	-
Debris Rating	-	3		-	3		-	3		-	3	
Detection Limit	-	7		-	7		-	7		-	7	

Joshua Krinsky
 Joshua Krinsky
 Technical Director

Results submitted pertain only to the samples as presented on the accompanying Chain of Custody.
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Project: S. Miami City Hall
Sampled: 11/8/2011
Received: 11/8/2011
Analysis Date: 11/9/2011
Report Date: 11/9/2011
Batch: 13386

AEML Test: A001 Spore Trap Analysis

Sample ID:	111108Q011	
Client Sample ID:	055932 Middle Copy	
Volume Sampled (L):	150	
Media:	Allergenco D	
Percent of Trace Analyzed:	100% at 600X Magnification	
Spore Types	Raw Count	Count/m ³ %
Alternaria	-	-
Arthrinium	-	-
Ascospores	-	-
Aspergillus/Penicillium-Like	4	27 80
Basidiospores	-	-
Bipolaris/Dreschlera	-	-
Botrytis	-	-
Chaetomium	-	-
Cladosporium	-	-
Curvularia	1	7 20
Epicoccum	-	-
Fusarium	-	-
Ganoderma	-	-
Memnoniella	-	-
Nigrospora	-	-
Oidium/Peronospora	-	-
Pithomyces	-	-
Rust	-	-
Smut/Myxomyces/Periconia	-	-
Stachybotrys	-	-
Torula	-	-
Ulocladium	-	-
Unidentified Spores	-	-
Total Spores	5	33
Hyphal Fragments	1	7
Pollen	-	-
Debris Rating	-	3
Detection Limit	-	7

Joshua Krinsky

Joshua Krinsky
 Technical Director

Results submitted pertain only to the samples as presented on the accompanying Chain of Custody.
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CHAIN OF CUSTODY/ANALYSIS REQUEST

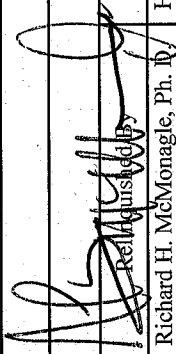

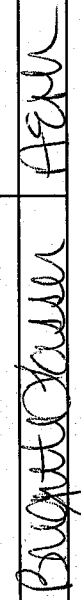
38 NE 20th Ave. Suite 6
 Pompano, FL 33060
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Project # / Job #:

111108007-01

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Company: HEI Systems		Sampled By: Richard H. McMonagle, Ph. D.		Payment Type: On Account		Credit Card		Check	
Contact Name: Richard H. McMonagle		Project/Site Name: <i>S Miami City Area</i>		Credit Card Type: Visa		Master Card		Amex Discover	
Address: 1690 N.E. 191st Street, Suite #308		Project #: <i>11-11-0803-M</i>		Credit Card #:					
City: North Miami Beach		State: FL		Zip: 33179		Name on Card (Print):			
Phone #: (786) 512-1450		Fax #: (305) 945-0755		Report (circle):		E-Mail		Fax	
E-mail: mc2@bellsouth.net		Sample Type: A = Air W = Water T = Tape S = Swab B = Bulk		Turn Around Time (Rush charges may apply) Standard Other		Analysis Requested (Enter "X" Below to indicate request)		Exp. Date: / /	
Sample #	Sample Identification	Date	Sample Type	Volume (Air)	Area (Swabs)	A001	S001	T001	Sample Numbers
1	055952 OVSINE	11/8	A	150L	<i>100</i>	X			0007
2	055953 PLANOING	11/8	A	150L	<i>100</i>	X			0008
3	055925 MR. KULLER OFF	11/8	A	150L		X			0009
4	055928 FRONT	11/8	A	150L		X			0010
5	055932 MIDDLE COPY	11/8	A	150L		X			0011
6									
7									
8									
9									
0									
Special Instructions/Requirements:									
 Requested by: Richard H. McMonagle, Ph. D. Company: HEI Systems									
Date	Time	Received By		Company		Good Condition			
11/8/11	12:55 pm			HEI Systems		Yes No		Yes No	
11/8/11	10:30			HEI Systems		Yes No		Yes No	

Section VI Recommendations

These recommendations are based upon a limited assessment of conditions existing at the time of the Municipal Building site assessment. The extent of water damage and/or fungal contamination and ecology may or may not be fully delineated. Therefore, these recommendations may change as new information is obtained, either before, or during restoration. *These recommendations are based upon the assumption that conditions that caused excessive moisture and resulting fungal growth have been corrected.*

Prior to the Start of Restoration:

1. Submit all pre-approval items (Health and Safety Plan, Environmental Protection Plan, Work Plan, MSDS sheets for any chemicals used).
2. Obtain all necessary permits from local unit of government.
3. Remove and replace the entire roof if more than 25% of the roof is damaged, pursuant to the *Florida Building Code, 2007, Chapter 6, (1)(1)* “Not more than 25% of the total roof area or roof section of any existing building or structure shall be repaired, replaced or recovered in any 12 month period unless the entire roofing system or roof section conforms to the requirement of this code.”

Additionally, the underlying structure should be inspected and brought up to the 2007 building code, including, replacement of damaged sheathing, additional deck fasteners, replacement of obsolete tin-cap fasteners and adequate wind tie downs, as required.

Florida Building Code, 2007, Chapter 6, Section 606, (3) “Roof Diaphragm” [50% Rule] “Where roofing materials are removed from more than 50 percent of the roof diaphragm of a building or section of a building where the roof diaphragm is a part of the main wind force-resisting system, the integrity of the roof diaphragm shall be evaluated and if found deficient because of

insufficient or deteriorated connections, such connections shall be provided or replaced.”

This removal and replacement must precede all other work.

4. Establish a controlled access work area.
5. Turn off air conditioning system and seal openings.
6. Establish containment. Full containment means critical barriers, airlocks, negative pressurization with HEPA-filtered exhaust, and related procedures.
7. Perform all restoration work pursuant to the provisions of the ANSI/IICRC S500 – 2006, 3rd Ed., *Standard and Reference Guide for Professional Water Damage Restoration*.

During Restoration:

8. Remove and discard all water-intruded tile floor covering. The slab should be abrasively cleaned to remove any remaining mastic and then re-sealed prior to the installation of any new floor covering.
9. In the Central Services and Sylvia Martin office zones, remove all filters and all contaminated materials in the air conditioning system that have porous surfaces, including return air ducts and supply air ducts. Clean or replace all contaminated non-porous surfaces. Disinfect the coils and condensate drain pan. The air conditioning system should be thoroughly cleaned. The coils should be acid-washed, and if the ducts are made of flexible material, and impossible to clean, then the ducts should be replaced. All HVAC work should proceed according to NADCA standards.
10. Double-bag all floor covering materials in plastic bags, and HEPA vacuum the bags prior to removal from the containment area.
11. Monitor the restoration progress by observation, testing, and sampling.

After Restoration:

12. Perform a final assessment of the work and conduct clearance sampling for compliance. Negative air machines should be operating for three to four days in filtration mode (exhaust air recycled within the building, and not exhausted outside of the building). After this air filtration step, turn off the air filtration equipment for one to two days prior to clearance sampling.
13. Prior to any restoration activities, the remediated sections of the building should be sampled to assure post-restoration clearance criteria have been achieved. Clearance sampling should be undertaken prior to any application of sealants or encapsulating medium to the remediated surfaces.