Building Health Check™

Building Health Check is a Division of Pure Air Control Services, Inc.

Building Health Check Report
Prepared for

Darryl Blair,
Energy Management Facilites Planning
Sarasota County Government
1001 Sarasota Center Blvd
Sarasota, FL 34240
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Date of Study: December 23, 2015
Date of Report: January 6, 2016

Report # 3929-19392

Sarasota County Government
Venice Library
300 S. Nokomis Ave.
Venice, FL 34285

Prepared By

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PURE AIR
CONTROL SERVICES INC.

"Indoor Environmental Diagnostics and Remediation Experts"

January 6, 2016

Darryl Blair,
Energy Management Facilites Planning
Sarasota County Government
1001 Sarasota Center Blvd
Sarasota, FL 34240

Re: Venice Public Library
Building Health Check Report 3929-19392

Darryl Blair,

It is Pure Air Control Services, Inc. (Pure Air) privilege to submit this report that describes the Building Health Check evaluation undertaken at the Venice Library, 300 S. Nokomis Ave., Venice, FL for your review. Field assessments were completed on December 23, 2015 to address concerns related to the quality of the indoor air.

Thank you for providing Pure Air this opportunity to assist you with your indoor air quality concerns. If you should have any questions regarding this report provided, please call me at 1-800-422-7873, ext. 201.

Respectfully Submitted,

PURE AIR CONTROL SERVICES, INC.

Aaron Hallam

Aaron Hallam
Building Scientist

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Building Health Check

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INTRODUCTION

This report describes the Building Health Check evaluation undertaken at Venice Library, 300 S. Nokomis Ave., Venice, FL. The assessment was completed on December 23, 2015 at the request of Mr. Darryl Blair of Sarasota County Government to address occupant concerns related to the quality of the indoor air.

BACKGROUND

Over the years the Venice Library has had numerous water intrusion events believed to be related to moisture infiltrating through the slab and/or at grade from water accumulation outside the building. Pure Air, an independent firm was called to perform a due diligence study on behalf of Sarasota County Government to ascertain the general health and quality of the indoor air. They are in the process of relocating the contents and staff with the hopes of being done in next 4-5 months. The library will stay open until that time. The results for such due diligence assessment are the subject of this report.

SCOPE OF WORK

The assays performed in this study included:

- Cultures for the assessment of viable bacterial and fungal concentrations suspended in the air.
- Spore Traps to determine the concentrations of fungal structures suspended in the air.
- Surface Tape Preparations to assess the distribution of fungal structures settled on the environment.
- Measurements of temperature and relative humidity for the assessment of comfort and conditions that might support microbial proliferation and chemical interactions.
- Measurements of carbon dioxide as a surrogate measure for ventilation adequacy.
- Particle counting of respirable-size as an indicator of air filtration efficiency and/or unusual dust levels.
- Infrared scan and direct contact moisture measurements for the detection of damp building materials.
- The assessment also included a visual inspection of the air handler and the air distribution system to address any potential sanitary conditions that may need attention.

ENVIRONMENTAL SUMMARY REPORT

Environmental assays were performed in 10 representative zones throughout the library. When pertinent, outside air samples were collected for comparative and control purposes. These environmental samples were submitted to the Environmental Diagnostics Laboratory (EDL), for analysis. The results derived from each assay were compared against the corresponding Guidelines to determine acceptability and were tabulated on the following page. Please note that the figures highlighted in yellow (if any) contain values moderately outside the recommended level and are treated as a transition gradient from a normal condition to abnormal or vice versa. Figures highlighted in red (if any) indicate with certainty that an abnormal or detrimental condition exists.

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Air Quality

Matrix	Aspect	Unit	Guideline*	Ref.	Workroom Area	Large Print Area	Information Area	Reading Area	Genealogy Area	Youth Progam Area	Outside Air
Cultures	Bacteria	CFU/m³	≤175 or 1/3 OA	3	12	36	36	95	12	36	143
	Fungi	CFU/m³	≤350 or 1/3 OA	3	24	60	24	BDL	36	60	631
Spore Traps	Opaque Particles	cts/m³	≤35,000 or 1/3 OA	3	17,500	51,400	6,520	1,070	7,930	22,800	4,810
	Skin Cell Fragments	cts/m³	≤7,500	3	222	1,780	400	66	911	1,040	44
	Insect Biodetritus	cts/m³	≤200 or 1/3 OA	3	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	Fibers	cts/m³	≤500	3	BDL	BDL	BDL	BDL	22	22	BDL
	Fiberglass fibers	cts/m³	≤5	3	BDL	BDL	BDL	BDL	BDL	22	BDL
	Pollen	cts/m³	≤15 or 1/3 OA	3	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	Fungal Elements	cts/m³	≤1000 or 1/3 OA	3	BDL	110	66	22	BDL	BDL	1,060
	Other	cts/m³	≤6000 or 1/3 OA	3	22,600	50,000	7,900		6,400	5,560	
Particle	Respirable size	p/l	≤25,000 or 1/3 OA	3	9,856	8,867	9,581	9,299	9,342	10,404	50,115
Comfort	Temperature	°F	72 to 78	1	73.4	75	73.4	74.1	74.6	71.5	74.8
	Relative Humidity	%	30 to 60	1	65.8	67	65.9	68.5	66.9	75.1	90.4
	Carbon Dioxide	ppm	700+OA	2	415	403	361	343	345	365	333

Settled Aerosols in the Occupiable Space

Matrix	Aspect	Unit	Guideline*	Ref.	Top of Cabinet	Top of Bookshelf	Bookshelf	Newspaper Stand	Red Book 3rd Edition	N/A	NA
Tape Prep	Opaque Particles	cts/cm²	≤3000	3	3,930	7,050		421	2,100		
	Skin Cell Fragments	cts/cm²	≤600	3	1,380	687		64	673		
	Insect Biodetritus	cts/cm²	≤4	3	BDL	BDL		BDL	BDL		
	Fibers	cts/cm²	≤120	3	216	176	388	84	168		
	Fibergalss Fibers	cts/cm²	≤4	3	4	4	4	4	16		
	Pollen	cts/cm²	≤4	3	8	8		BDL	BDL		
	Fungal Elements	cts/cm²	≤50	3	24	24		BDL	8		
	Other	cts/cm²	≤650	3	1,390	928		220	280		

Foot Notes

Units	Units	Reference	Notes		Notes
CFU/m³ = Colony Forming Units per Cubic Meter of Air	°F = Degrees Fahrenheit	1. ASHRAE 55 - 2010	BDL = Below Detectable Limit		NA = Not Aplicable
cts/m³ = Counts per Cubic Meter of Air	% = Percent	2. ASHRAE 62.1 - 2013	OA = Outside Air		* = See Guidelines Section
cts/cm² = Counts per square centimeter	ppm = Parts per Million	3. Pure Air Control Services, Inc.	Red =	Abnormal/Detrimental	
p/l = Particles per liter of Air		4. Molhave 1990	Yellow =	Moderately elevated	

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Air Quality

Matrix	Aspect	Unit	Guideline*	Ref.	Juvenile Non Fiction	Teen & Youth Area	Book Store	Lobby Area	Meeting Room		Outside Air
Cultures	Bacteria	CFU/m³	≤175 or 1/3 OA	3		83	48	71	24		143
	Fungi	CFU/m³	≤350 or 1/3 OA	3		36	24	36	BDL		631
Spore Traps	Opaque Particles	cts/m³	≤35,000 or 1/3 OA	3		10,700	18,100	58,900	13,200		4,810
	Skin Cell Fragments	cts/m³	≤7,500	3		667	933	267	178		44
	Insect Biodetritus	cts/m³	≤200 or 1/3 OA	3		BDL	BDL	BDL	BDL		BDL
	Fibers	cts/m³	≤500	3		44	22	22	BDL		BDL
	Fiberglass fibers	cts/m³	≤5	3		BDL	BDL	22	BDL		BDL
	Pollen	cts/m³	≤15 or 1/3 OA	3		BDL	BDL	BDL	BDL		BDL
	Fungal Elements	cts/m³	≤1000 or 1/3 OA	3		44	88	88	10,500		1,060
	Other	cts/m³	≤6000 or 1/3 OA	3		7,650	15,800	48,000	20,900		
Particle	Respirable size	p/l	≤25,000 or 1/3 OA	3		8,905	6,996	10,485	11,665		50,115
Comfort	Temperature	°F	72 to 78	1		74	74	75.2	73.4		74.8
	Relative Humidity	%	30 to 60	1		69.5	64	65.9	74.7		90.4
	Carbon Dioxide	ppm	700+OA	2		358	420	345	336		333

Settled Aerosols in the Occupiable Space

Matrix	Aspect	Unit	Guideline*	Ref.	Bookshelf	Desk Chair	Bookshelf	Bookshelf	NA		NA
Tape Prep	Opaque Particles	cts/cm²	≤3000	3	558	2,010	15,100	11,700			
	Skin Cell Fragments	cts/cm²	≤600	3	76	1,160	7,100	2,650			
	Insect Biodetritus	cts/cm²	≤4	3	BDL	BDL	BDL	BDL			
	Fibers	cts/cm²	≤120	3	16	416	332	660			
	Fibergalss Fibers	cts/cm²	≤4	3	BDL	12	8	8			
	Pollen	cts/cm²	≤4	3	BDL	8	44	60			
	Fungal Elements	cts/cm²	≤50	3	BDL	320	20	60			
	Other	cts/cm²	≤650	3	284	1,170	5,580	4,000			

Foot Notes

Units	Units	Reference	Notes	Notes
CFU/m³ = Colony Forming Units per Cubic Meter of Air	°F = Degrees Fahrenheit	1. ASHRAE 55 - 2010	BDL = Below Detectable Limit	NA = Not Aplicable
cts/m³ = Counts per Cubic Meter of Air	% = Percent	2. ASHRAE 62.1 - 2013	OA = Outside Air	* = See Guidelines Section
cts/cm² = Counts per square centimeter	ppm = Parts per Million	3. Pure Air Control Services, Inc.	Red = Abnormal/Detrimental	
p/l = Particles per liter of Air		4. Molhave 1990	Yellow = Moderately elevated	

CONCLUSIONS

Based on the results derived from the environmental samples collected no imminent health concerns were collected. However, large areas with moisture intrusion underneath the carpets and dusty environmental conditions exist throughout the library that some hypersensitive individuals may not find it suitable.

Air samples collected using the culture method for the assessment of microbial concentrations suspended in the air revealed levels of bacteria well within the recommended guideline in all of the representative zones evaluated. The levels of fungi suspended in the air were well within the recommended guidelines in all of the representative zones evaluated and raised no significant health concerns.

Air samples collected with the spore trap method (Air-O-Cell Cassettes) for the assessment of fungal structures suspended in the air revealed levels well within the recommended guideline in all zones assessed in the library. No concerns were raised by this assay method.

Surface tape preparations were collected to assess the settled distribution of fungal structures and other allergens. The analytical results for the surface tape preparations collected from all representative areas tested revealed markedly dusty conditions; however, the fungal content (settlement) was elevated only in one (1) of the nine (9) representative zones sampled.

Dust particles whose overall diameter ranges from 0.3 to 5.0 microns are recognized as respirable-size particles. Respirable-size particles are generated by a broad variety of processes and activities and there are increasingly more studies liking associations between the concentrations of particles and health effects. In this case, the respirable-size particle concentrations detected in all of the zones evaluated were well within the recommended levels, which raised no concerns at this time.

The ventilation requirement for most buildings is supplied by the HVAC system and/or by infiltration of the outside air. Carbon dioxide (CO_2) concentrations are used as surrogate measure to roughly assess the adequacy of the ventilation system. The results for the CO_2 measurements made at the time of the field evaluation were well within the recommended guideline. No concerns were raised by this assay method.

Temperature and relative humidity measurements of the ambient air were used to assess comfort, as well as an environmental factor that may increase the prevalence of indoor air quality problems (e.g. microbial activity, indoor allergens, viral infections, allergic rhinitis, asthma, ozone production, odors, etc.). There is no specific set of

CONCLUSIONS (continued)

recommended values for temperature and relative humidity; however, comfort depends principally on these two factors combined. For indoor air quality and health reasons it is recommended that the relative humidity be maintained in the range of 30 to 60%. With some exceptions the temperature in the cooling mode needs to be maintained at a set point in the range of 73 to 79 ºF and between 68 to 74 ºF during the winter (see Standard Effective Temperature and ASHRAE Comfort Zone illustration provided for details). In this assessment, the relative humidity was well above the recommended levels for comfort and the control of allergens production. The temperature readings were within comfort ranges throughout the library.

Air handlers and duct systems that contain excessive dust, debris, and moisture are places where bacteria and fungi may proliferate and release odors and potentially other contaminants into the air stream. In this case, the air handler located in the Meeting Room, AHU-2 was inspected to assess the hygienic condition. In general, the air handlers are relatively new, but are beginning to show dust impactions on the cooling coils and blower wheels which appears to be a deficiency with the air filtration. Also, air handler 2 was found with the insulation liner delaminated from the access panel which may release fiberglass fibers into the air stream.

RECOMMENDATIONS

No new recommendations to add as everything has been covered by Pure Air's prior reports, those recommendations were designed to resolve issues described in the two (2) previous reports. No prioritization was implied by this listing, however, it was anticipated all items discussed would be addressed.

General

- Set the thermostats (and any other relevant controls) to maintain the temperature and relative humidity within the ASHRAE recommended levels of 73 to 79 ºF (summer) 68 to 74 ºF (winter). Relative humidity should be maintained in the range of 30 and 60%.