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PROAC
CORPORATION
PROACTIVE BUILDING MAINTENANCE

MEMBERS OF:

GREEN BUILDING ASSOCIATION OF CENTRAL PENNSYLVANIA
PROFESSIONAL ORGANIZATION

NADCA

MEMBER OF INDOOR AIR QUALITY ASSOCIATION INC.

LIMITED MICROBIAL & IAQSURVEY CLOSING REPORT

FAWN AREA ELEMENTARY SCHOOL

07/26/13

PROJECT LOCATION:

504 MAIN STREET
FAWN GROVE, PA 17321

PROJECT CONTRACT FOR:

MR. FRANK DEHAUT JR
QUALITY ASSURANCE PLUS

Respectfully Submitted
PROAC CORPORATION

Walter Saunders, CIEC, LEED ™ GA, ASCS
Industrial Hygienist

Reviewed By:
PROAC CORPORATION

Dean R. Klopp, CIE, CMR, ASCS
President

"WE'RE RESPONSIBLE FOR OUR CLIENTS' SATISFACTION"

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LIST OF ATTACHMENTS

EXECUTIVE SUMMARY:

On July 26, 2013, a *Limited Microbial and IAQ Survey* was performed at Fawn Area Elementary School, located in Fawn Grove PA. The survey was completed by:

Walt Saunders, CIEC, Industrial Hygienist, LEED™ GA, PROAC Corporation

The baseline survey and testing was completed in selected areas throughout the school. The areas selected were based on information obtained from previous surveys. The survey was intended to document present environmental conditions in the school.

The survey included both direct reading measurements of Carbon Dioxide (CO2), Carbon Monoxide (CO), Temperature, Relative Humidity, and Particle Counts as well as air samples for total, non viable fungi. Additionally, visible indications of past or present mold, if present, were noted. The school was not occupied at the time of the survey.

An "AMPROBE" digital sling psychrometer was used to obtain temperature and relative humidity readings. Carbon Dioxide (CO2), Carbon Monoxide (CO) and Total Volatile Organic Compounds (TVOC's) were sampled using a "MultiRAE IR", PGM-54 Multi-Gas Monitor. Range of gases begins at "0" and the resolution is 10 parts per million (ppm) for CO2, 1ppm for CO. Particle Counts were obtained using a Arti HHPC-6 laser particle counter. Particle counts were recorded in five sizes of microscopic particulate including 0.3, 0.5,1.0, 2.0 and 5.0 microns (ug). No significant findings were observed.

Airborne, total, non viable fungi were sampled using a Bio Pump sampler and Allergenco D sampling cassettes as recommended by the Environmental Protection Agency (EPA) and the American Industrial Hygiene Association (AIHA). The pump was calibrated to 15 liters/minute and samples were drawn for 5 minutes. No significant findings were revealed.

SUMMARY OF FINDINGS:

A) GAS SAMPLING AND PARTICLE COUNTS

The American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) suggests optimal indoor temperatures between 68.5°F and 76°F during the heating months and between 73°F and 79 °F during the cooling season. ASHRAE also suggests RH levels should range between 30% and 60%. The outdoor temperature ranged between 82° F and 85°F. Temperatures in the school ranged between 71°F and 82°F. The RH outdoors ranged between 39% and 47%. Indoor RH levels ranged between 36% and 64%. Sustained RH above 66% could result in fungal growth.

CO readings were 0.0 ppm throughout the survey and the CO2 readings were within the American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) standard of not exceeding the outdoor levels by more than 700 ppm. Outdoor levels of C02 ranged between 540 ppm and 550 ppm while indoor levels ranged between 550 ppm and 600 ppm. It should be noted that the OSHA permissible Exposure Limit for C02 is 5000 ppm.

Total Volatile Organic Compound readings were generally low throughout the school.

Particle Counts were recorded in five sizes of microscopic particulate and counts should be lower indoors as compared to the outdoors. On the day of the survey, particle counts were lower as compared to the outdoors.

B) MICROBIOLOGICAL ANALYSIS

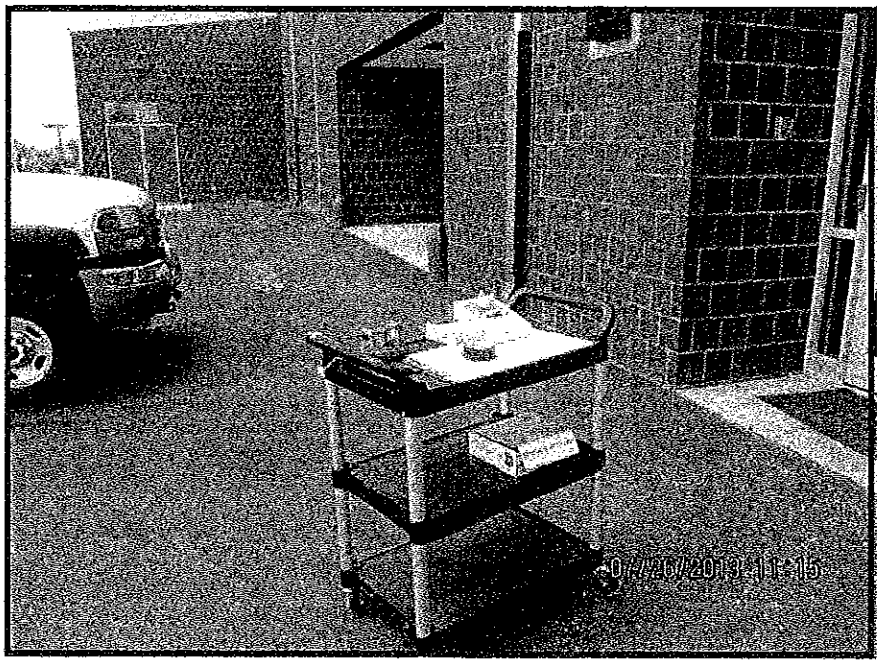
Airborne, total, non viable fungi were sampled in six (6) indoor locations and two (2) outdoors for comparison with the indoor environment. The samples were obtained using a Bio Pump and Allergenco D as recommended for IAQ studies by the *Environmental Protection Agency (EPA)* and *American Industrial Hygiene Association (AHIA).* The pump was calibrated to meet the flow rate of 15 L/minute +/- 1% and samples were drawn for five minutes.

There are currently no standards regarding the amount of fungal or bacterial (microbial) contamination on surfaces or in the air. There are, however, guidelines to assist IAQ professionals with comparing their survey data to study data. The areas where microbiological samples were obtained included:

Outside # 1	Room # 17
Library	Room # 20
Room # 1	Room # 9
Room # 4	Outside # 2

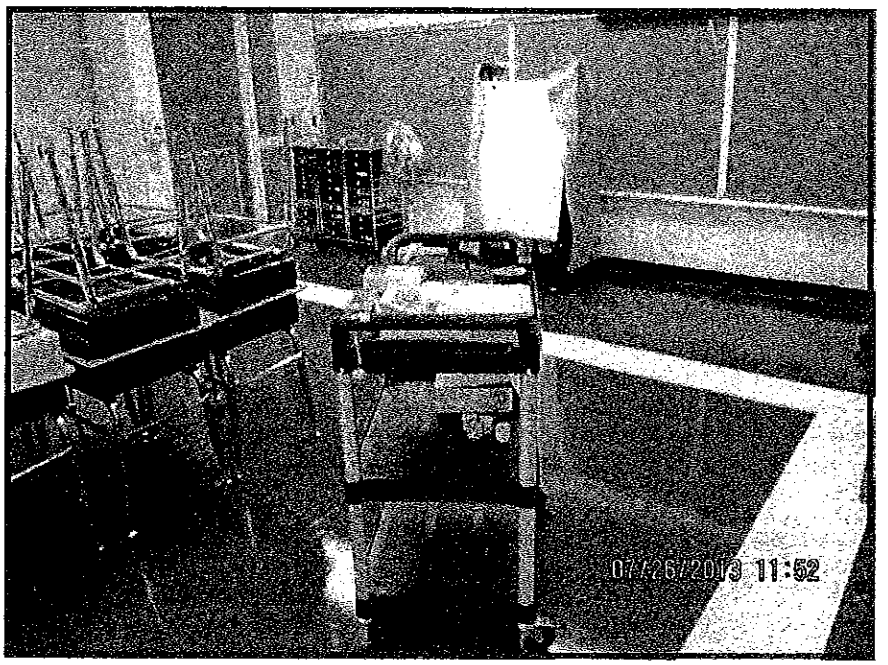
In a healthy fungal environment, fungal concentrations indoors should be of a lower concentration and of a similar rank and order to those of the outdoors.

The outdoor samples revealed seasonably moderate levels of fungal spores with *Cladosporium* and ascospores being the primary contaminant. All areas indoors revealed an overall lower fungal concentration as compared to the outdoor samples. However several fungal species were revealed indoors that were not revealed in the indoor samples including Pithomyces in Room #'s 1 and 9 and *Curvularia* in Room # 4. The concentration of these contaminants are not considered to be significant.

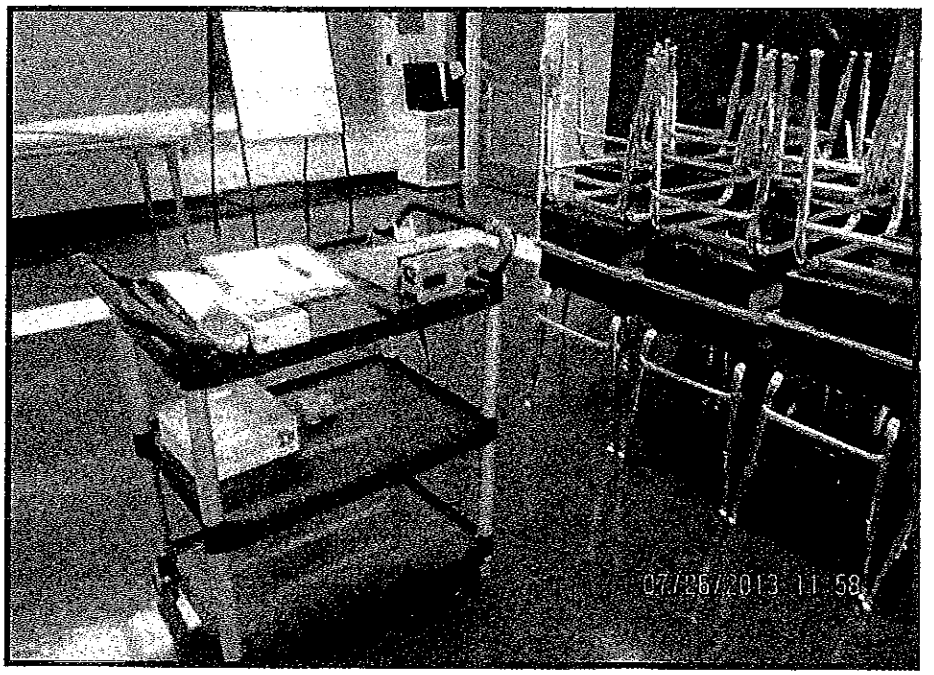


SAMPLE LOCATION-OUTDOORS # 1

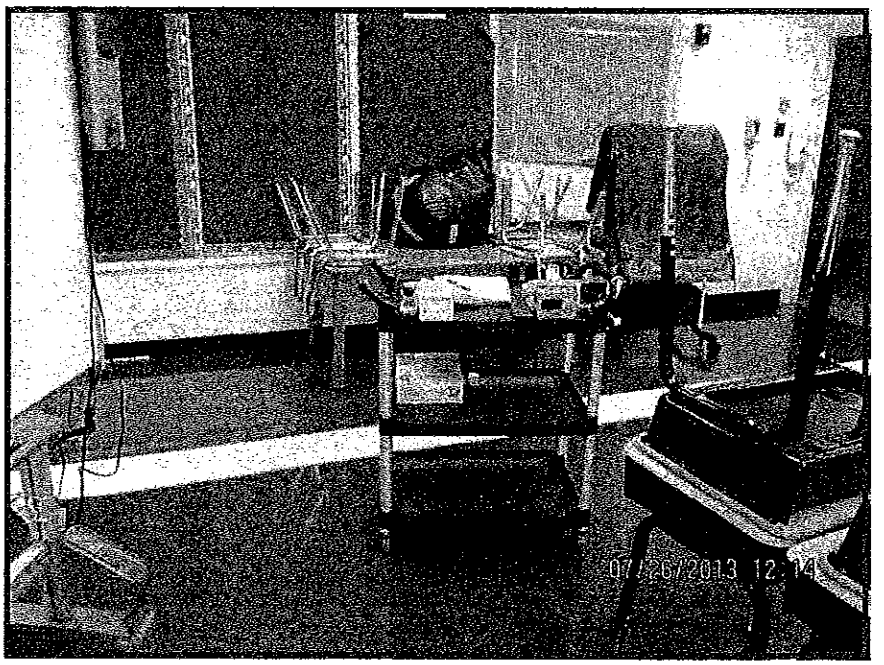
SAMPLE LOCATION-ROOM # 20



SAMPLE LOCATION-ROOM # 1



SAMPLE LOCATION-ROOM # 9



SAMPLE LOCATION-ROOM # 4

Prestige EnviroMicrobiology, Inc. Tel: 856-767-8300 Fax: 856-767-8305
242 Terrace Boulevard., Suite B-1, Voorhees, New Jersey 08043

Prestige Proj.#: 130730-05 06 #7

Chain-of-Custody and Analysis Request Form

Client name: Rose Corp Tel: _____ Client proj.#: Floral Elem School

Address: _____ Fax: _____ P.O.#: _____

_____ E-mail: _____ Date sampled: 7/26

Sample ID	Location or source	Sample type	Air vol (L)/ Area (inch²)	Water: potable or non-potable	Analysis requests code or description	Turnaround time	Notes or special instructions
#1	Outside #1	Spore Trap	75 L		Pool		
#2	Library						
#3	Rm #2						
#4	Rm #1						
#5	Rm #17						
#6	Rm #4						
#7	Rm #9						
#8	Outside #2						

Contact name: Water Services Submitted by: (sign & print) Walt Kowalski Date submitted: 7/29

Received by: (sign & print) Julia Yang Date & time received: 7/30/15 11:25 Delivered by: Fedex, UPS, USPO, in person

(For lab use only) Processed by: _____ Sample type: _____ Date: _____

Prestige EnviroMicrobiology, Inc

www.prestige-em.com

Analytical Test Report

Client: Proac Corporation, 8401 South Lancaster Ave, Bethel, PA 19507

Client Project: Fawn Elem School

Sample date: 7-26-2013

Submittal date: 7-29-2013

Samples submitted by: Walt Saunders

Date analysis completed: July 31, 2013

Prestige report number: 130730-06

Microscopic Method (P001): Analysis of Allergenco Samples for Total Fungal Structures by Optical Microscopy

Prestige # Client sample ID Location	Air vol. (m^3)	% read	Presumptive fungal ID	Counts of fungal structures	Fungal structures/m^3	Percentage	Background rating
130730-06-038	0.075	25.5	ascospores	21	1,100	31%	
#1			basidiospores	9	470	13%	
Outside #1			*Cercospora*	1	52	1%	
			Cladosporium	27	1,400	39%	
			Ganoderma	8	420	12%	
			hyphal fragments	1	52	1%	
			unknowns	2	100	3%	
					Total 3,600		1
130730-06-039	0.075	25.5	hyphal fragments	1	52	100%	
#2					Total 52		
Library							1
130730-06-040	0.075	25.5	ascospores	1	52	14%	
#3			*Cladosporium*	1	52	14%	
Rm #20			hyphal fragments	1	52	14%	
			Pithomyces	1	52	14%	
			Pen/Asp-like	2	100	28%	
			unknowns	1	52	14%	
					Total 360		1
130730-06-041	0.075	25.5	ascospores	1	52	33%	
#4			*Cladosporium*	1	52	33%	
Rm #1			*Pithomyces*	1	52	33%	
					Total 160		2
130730-06-042	0.075	25.5	ascospores	1	52	14%	
#5			*Cladosporium*	5	260	71%	
Rm #17			*Pithomyces*	1	52	14%	
					Total 360		1
130730-06-043	0.075	25.5	*Curvularia*	1	52	50%	
#6			Pen/Asp-like	1	52	50%	
Rm #4					Total 100		1
130730-06-044	0.075	25.5	*Alternaria*	1	52	20%	
#7			ascospores	1	52	20%	
Rm #9			myxomycetes	1	52	20%	
			Pithomyces	2	100	40%	
					Total 260		1

130730-06-045	0.075	25.5	*Arthrinium*	1	52	2%	
#8			ascospores	14	730	34%	
Outside #2			basidiospores	7	370	17%	
			Cladosporium	9	470	22%	
			Ganoderma	3	160	7%	
			Pen/Asp-like	6	310	14%	
			Polythrincium	1	52	2%	
					Total 2,100		1

Report approved: Theresa Lehman
Theresa Lehman, MPH, Lab Director

Quality control check:
Chin S Yang, Ph.D.

Report review: Kristen Miller

1. The samples in this report were received in good, acceptable conditions. Results relate only to the items tested.
2. Percentage is for each group of fungal structures in total population.
3. Concentrations and percentages are rounded to the nearest two significant digits. Total percentage may not add up to 100% due to rounding.
4. Background rating 1-5 (1 being the lowest and 5 the highest) indicates density of sample deposit. The higher the sample deposit is, the more likely some fungal structures are obscured.
5. The detection limit of this analysis is one fungal structure. The quantitation limits vary from analysis to analysis and by air volume. Contact us to determine your quantitation limits.

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INDOOR AIR QUALITY SURVEY

Purpose:LIMITED MICROBIAL & IAQ SURVEY **Location: FAWN ELEMENTARY SCHOOL**

Date: 07/26/13

Outside Air: % HUMIDITY °F PPM CO^2

NO.	TIME	TEMP °F	RELATIVE HUMIDITY %	CARBON DIOXIDE PPM	CO	TVOC	OCCUPANCY #PERSONS	COMMENTS
1	11:21	85	39	550	0	0	1-2	OUTSIDE # 1
2	11:31	82	36	570	0	0	1-2	LIBRARY
3	11:37	76	54	600	0	0	1-2	20
4	11:45	75	55	600	0	0	1-2	1
5	11:51	71	48	570	0	0	1-2	9
6	11:57	70	51	590	0	0	1-2	4
7	12:05	71	64	550	0	0	1-2	17
8	12:11	82	47	540	0	0	0-1	OUTSIDE # 2
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								

*Denotes areas that reached or exceeded the ASHRAE comfort standards for CO^2

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PARTICLE COUNTS *PAGE 13*

Purpose: IAQ MEASUREMENT & DOCUMENTATION **Location/No:** FAWN ELEMENTARY SCHOOL

Date: 07/26/13

NO.	.3	.5	1.0	2.0	5.0	COMMENTS
1	38995	2192	254	116	13	OUTSIDE # 1
2	18134	625	26	6	0	LIBRARY
3	22887	799	42	18	2	20
4	22622	806	31	12	2	1
5	20121	692	43	20	3	9
6	19757	653	31	9	0	4
7	23693	847	40	13	0	17
8	38931	2080	303	149	16	OUTSIDE # 2
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						

*Denotes areas that reached or exceeded the ASHRAE comfort standards for CO^2

REFERENCES

Information and excerpts may be taken from:

- Guidelines for the Assessment of Bioaerosols in the Indoor Environment, American Conference of Governmental Industrial Hygienists, 1989 (ACGIH)
- U.S. Environmental Protection Agency (EPA)
- Occupational Safety and Health Administration (OSHA)
- American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE) Standard 62-1989 and 2001, 55-1992
- Field Guide for the Determination of Biological Contaminants in Environmental Samples, American Industrial Hygiene Association, 1996 (AIHA)
- Bioaerosol Assessment and Control, American Conference of Governmental Industrial Hygienists, 1999
- Guidelines on Assessment and Remediation of Fungi in Indoor Environments, New York City Department of Health, 2000 (NYCDOH)
- Micromenaces, P & K Microbiology Services, Inc., November 1998, Volume 1, Issue 2
- National Air Duct Cleaners Association-Assessment, Cleaning, & Restoration of HVAC Systems, ACR 2002 (NADCA)