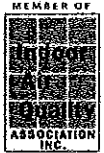


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PROAC
CORPORATION
PROACTIVE BUILDING MAINTENANCE

MEMBERS OF:



LIMITED MICROBIAL & IAQ SURVEY CLOSING REPORT

EAST MIDDLE SCHOOL

07/26/13

PROJECT LOCATION:

377 MAIN STREET
FAWN GROVE, PA 17321-9545

PROJECT CONTRACT FOR:

MR. FRANK DEHAUT JR
QUALITY ASSURANCE PLUS

Respectfully Submitted
PROAC CORPORATION

Reviewed By:
PROAC CORPORATION

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

Dean R. Klopp, CIE, CMR, ASCS
President



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EXECUTIVE SUMMARY:

On July 26, 2013, a *Limited Microbial and Indoor Air Quality Survey* was performed at East Middle 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 75°F and 77°F. Temperatures in the school ranged between 74°F and 79°F. The RH outdoors ranged between 55% and 57%. Indoor RH levels ranged between 45% and 56%. 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 CO₂ ranged between 290 ppm and 310 ppm while indoor levels ranged between 420 ppm and 540 ppm. It should be noted that the OSHA permissible Exposure Limit for CO₂ 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 generally 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 (AIHA)*. 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:

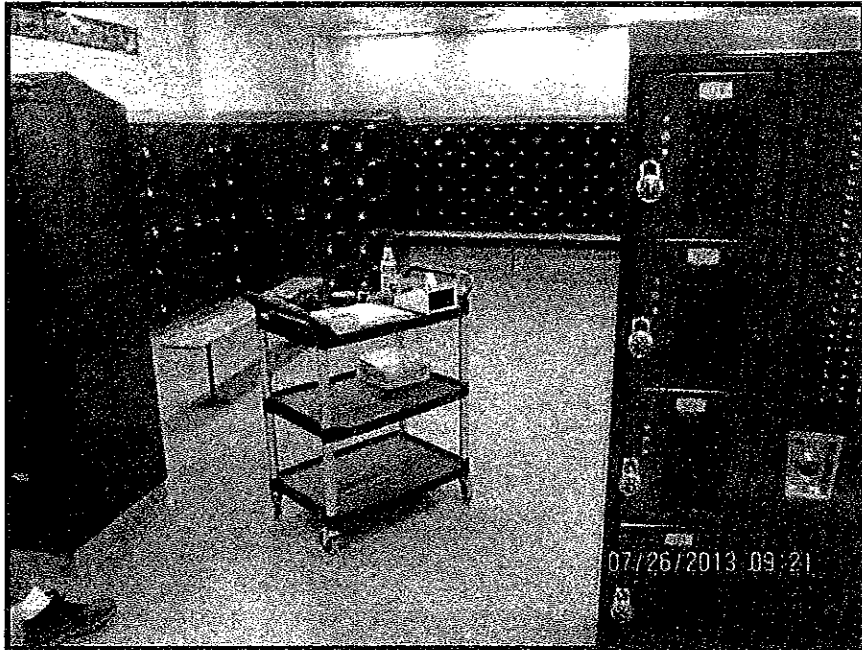
Outside # 1	Girls Locker Room
Library	Gym
Room # 127	Office
Room # 222	Outside # 2

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.

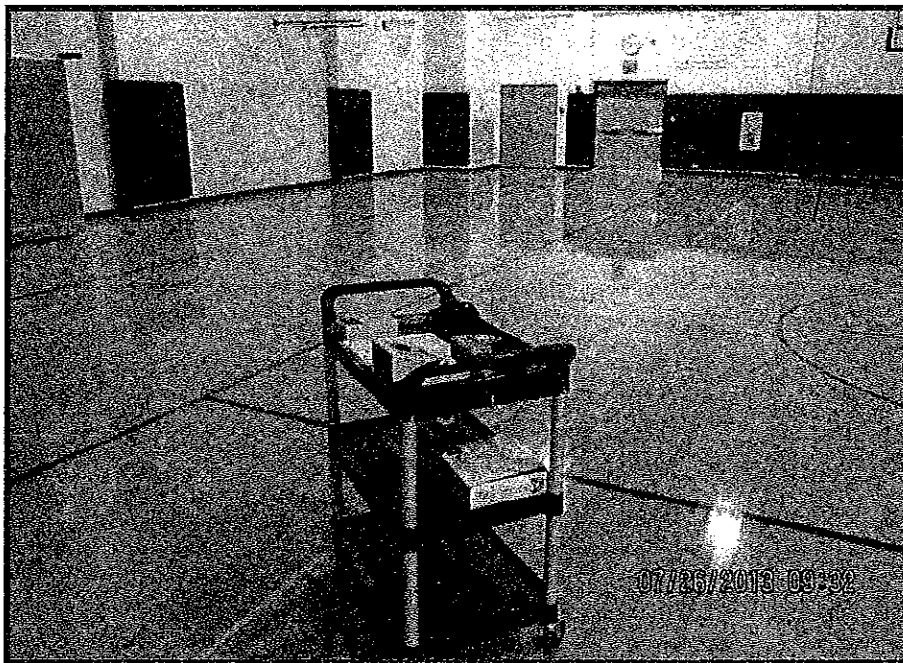
The outdoor samples revealed seasonably moderate levels of fungal spores with *Cladosporium* and ascospores being the primary contaminant. All areas indoors revealed an overall lower fungal concentration as compared to the outdoor samples, however a minimal concentration of *Curvularia* was revealed in the sample obtained in the office, and not revealed in either outdoor sample. The concentration of this contaminant is not considered to be significant.

**LIMITED MICROBIAL
& IAQ SURVEY**

EAST MIDDLE SCHOOL



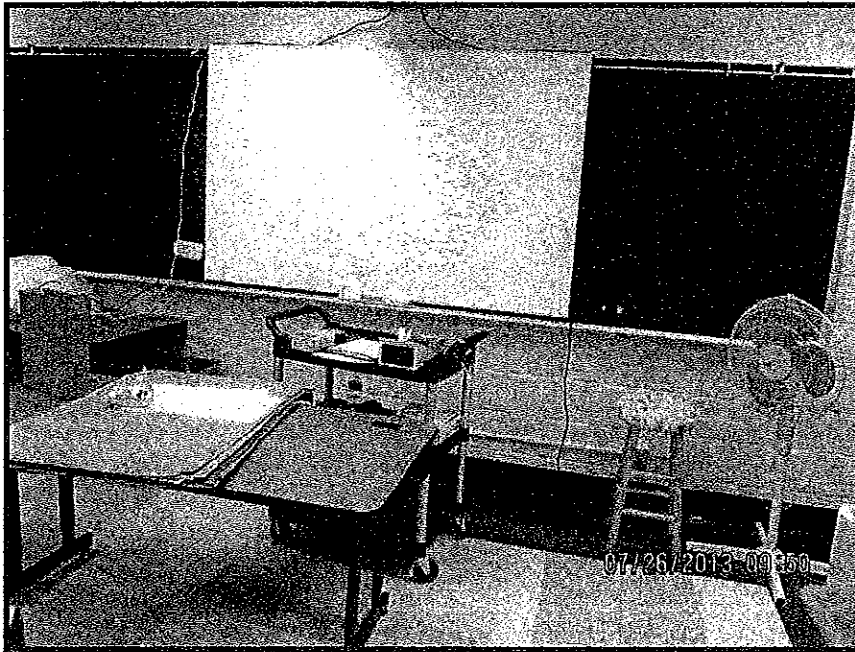
SAMPLE LOCATION-GIRLS LOCKER ROOM



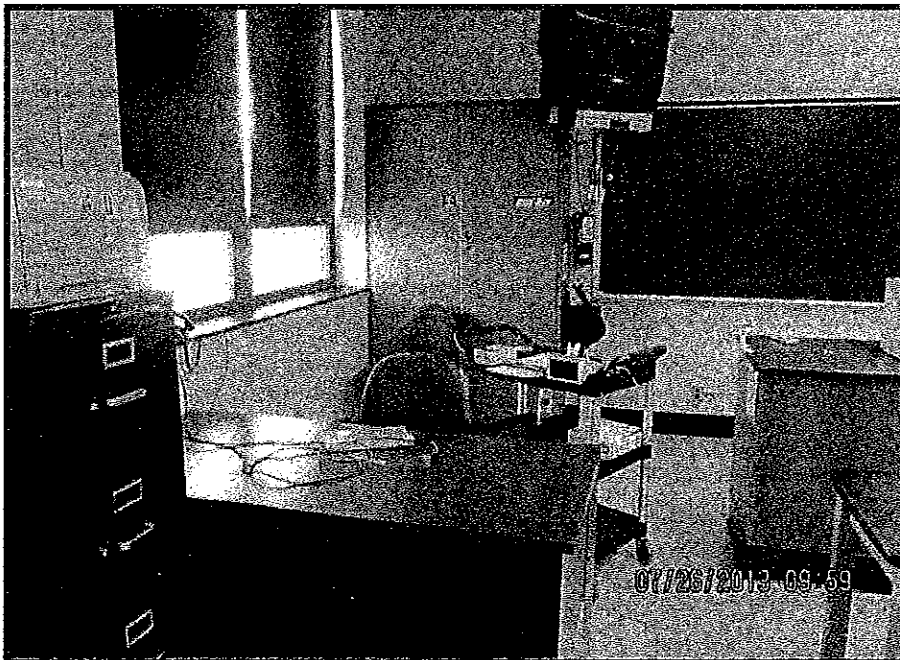
SAMPLE LOCATION-GYM

**FINAL IAQ
& HVAC INSPECTION**

EAST MIDDLE SCHOOL



SAMPLE LOCATION-ROOM # 127



SAMPLE LOCATION-ROOM 222

Prestige Proj. #. 120230-05

Prestige EnviroMicrobiology, Inc. Tel: 856-767-8300 Fax: 856-767-8305

242 Terrace Brookley and., Suite B-1, Voorhees, New Jersey 08043

Chain-of-Custody and Analysis Request Form

Client name: Pave Corp Client proj. #: East Middle School

Address: _____ P.O. #: _____

Tel: _____ Fax: _____ Date sampled: 7/26/04

Sample ID	Location of source	Sample type	Air vol (L) Area (sq ft)	Water: potable or non-potable	Analysis requests code or description	Turnaround time	Notes or special instructions
#1	OUTSIDE #1	SPEC TRAP	75L		Pool		
#2	OFFICE						
#3	LIBRARY						
#4	Gym						
#5	Rm 222						
#6	Girls Locker Room						
#7	Rm # 127						
#8	OUTSIDE #2						

Contact name: Walt Sanders Submitted by: (sign & print) Walt Sanders Date submitted: _____

Received by: (sign & print) Julie Jorg Date & time received: 7/26/04 1:45 PM Delivered by: UPS (USPS, 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: East Middle School

Sample date: 7-26-2013

Submittal date: NA

Samples submitted by: Walt Saunders

Date analysis completed: July 31, 2013

Prestige report number: 130730-05

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
130730-05-030 #1 Outside #1	0.075	25.5	<i>Alternaria</i>	1	52	1%	1
			ascospores	17	890	23%	
			basidiospores	4	210	5%	
			<i>Cercospora</i>	1	52	1%	
			<i>Cladosporium</i>	32	1,700	43%	
			<i>Curvularia</i>	1	52	1%	
			<i>Ganoderma</i>	13	680	17%	
			myxomycetes	1	52	1%	
			Pen/Asp-like	5	260	7%	
			Total				
130730-05-031 #2 office	0.075	25.5	<i>Alternaria</i>	1	52	25%	2
			<i>Curvularia</i>	1	52	25%	
			<i>Epicoccium</i>	1	52	25%	
			<i>Pithomyces</i>	1	52	25%	
			Total				
130730-05-032 #3 Library	0.075	25.5	<i>Cladosporium</i>	1	52	50%	2
			<i>Pithomyces</i>	1	52	50%	
			Total				
130730-05-033 #4 Gym	0.075	25.5	ascospores	1	52	100%	1
			Total				
130730-05-034 #5 Rm 222	0.075	25.5	<i>Pithomyces</i>	1	52	100%	1
			Total				
130730-05-035 #6 Girls Locker Room	0.075	25.5	<i>Arthrinium</i>	1	52	14%	2
			ascospores	1	52	14%	
			<i>Cladosporium</i>	1	52	14%	
			myxomycetes	1	52	14%	
			<i>Pithomyces</i>	2	100	28%	
			Pen/Asp-like	1	52	14%	
			Total				
130730-05-036 #7 Rm #127	0.075	25.5	ascospores	2	100	50%	2
			<i>Cladosporium</i>	1	52	25%	
			<i>Pithomyces</i>	1	52	25%	
			Total				

Prestige EnviroMicrobiology, Inc

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130730-05-037 #8 Outside #2	0.075	25.5	<i>Alternaria</i>	1	52	2%	1
			ascospores	12	630	30%	
			basidiospores	3	160	8%	
			<i>Cladosporium</i>	11	580	28%	
			<i>Epicoccum</i>	1	52	2%	
			<i>Ganoderma</i>	3	160	8%	
			hyphal fragments	1	52	2%	
			myxomycetes	1	52	2%	
			<i>Pithomyces</i>	1	52	2%	
			<i>Pyricularia</i>	1	52	2%	
			smuts	1	52	2%	
			<i>Torula herbarum</i>	2	100	5%	
			unknowns	2	100	5%	
					Total 2,100		

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

Quality control check: Chin S Yang
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.



INDOOR AIR QUALITY SURVEY

Purpose: LIMITED MICROBIAL & IAQ SURVEY

Location: EAST MIDDLE SCHOOL

Date: 07/26/13

Outside Air: % HUMIDITY °F PPM CO²

NO.	TIME	TEMP °F	RELATIVE HUMIDITY %	CARBON DIOXIDE PPM	CO	TVOC	OCCUPANCY #PERSONS	COMMENTS
1	9:00	75	57	290	0	0.1	0-1	OUTSIDE # 1
2	9:07	79	47	420	0	0	1-2	GIRLS LOCKER ROOM
3	9:14	78	46	420	0	0	1-2	GYM
4	9:21	74	40	450	0	0	1-2	LIBRARY
5	9:36	74	56	540	0	0	1-2	OFFICE
6	9:45	76	43	450	0	0	1-2	127
7	9:57	77	45	450	0	0	1-2	222
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								

* Denotes areas that reached or exceeded the ASHRAE comfort standards for CO²



PARTICLE COUNTS

PAGE 12

Purpose: IAQ MEASUREMENT & DOCUMENTATION

Location/No: EAST MIDDLE SCHOOL

Date: 07/26/13

NO.	.3	.5	1.0	2.0	5.0	COMMENTS
1	24672	1222	203	112	24	OUTSIDE # 1
2	25087	1274	193	128	52	GIRLS LOCKER ROOM
3	23217	984	45	984	45	GYM
4	10043	376	18	10	6	LIBRARY
5	23924	1316	205	129	45	OFFICE
6	15165	509	27	5	0	127
7	9744	432	29	9	0	222
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						

*Denotes areas that reached or exceeded the ASHRAE comfort standards for CO₂

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)