

# managing risk with responsibility

754 321-1900

754 321-1917

Aston A. Henry, Supervisor Telephone: Risk Management Department Fax:

October 2, 2009 Signature on File

TO: Dr. Theodore Toomer, Principal

**Markham Elementary School** 

FROM: Edward See, Project Manager

Risk Management Department

SUBJECT: Indoor Air Quality (IAQ) Assessment

FISH 123, 301, 302, 303, 304, 401, 402,

403, 404, 501, 502, 503 and 504

	Custodial Issues Addressed
	Custodial Issues Not Addressed
_	

On September 25, 2009, I conducted an assessment of FISH 123, 301, 302, 303, 304, 401, 402, 403, 404, 501, 502, 503 and 504 at **Markham Elementary School**. This evaluation included observations of the flooring system, ceiling tiles, false ceiling plenum, environmental surfaces, interior and exterior walls, and the accessible ventilation equipment. Additionally, environmental parameter measurements were taken to include temperature, relative humidity, and carbon dioxide. The detailed findings, along with the recommended corrective action can be found on the attached IAQ Assessment Worksheets.

The IAQ assessment did identify one or more existing conditions impacting IAQ and has generated appropriate work orders to correct deficiencies in systems and maintenance that could contribute to decreased indoor air quality. At the time of the assessment, these concerns were not an immediate health or safety concern to building occupants. However, due to individual sensitivities and predisposing health factors, it is possible that some building occupants may elicit a health response to agents and / or conditions identified during the evaluation. Therefore, to further improve IAQ, prevent development of future IAQ-related problems, and to reduce the potential for IAQ-related complaints by building occupants, the IAQ Assessment Team recommends appropriate follow up of each item identified and listed in the attached evaluation.

Please ensure that your Head Facilities Serviceperson receives a copy of this correspondence so that the recommendations requiring their attention can be addressed. In an attempt to separate IAQ issues from general maintenance items, the attached assessment may contain direction for site based staff to generate a work order through COMPASS. Within two weeks a representative from the Custodial/Grounds Department will conduct a follow-up visit to ensure that all issues have been appropriately addressed.

Should any questions arise, or if the current concerns continue after the attached recommendations have been addressed, please feel free to contact me at 754-321-1900.

cc: Sharon Airaghi, Area Superintendent

Jackie Haywood, Area Director

Jeffrey S. Moquin, Executive Director, Support Operations

Aston Henry, Supervisor, Risk Management

Gerry Devio, Project Manager, Facilities and Construction Management

Lynn Cavall, Broward Teachers Union

Roy Jarrett, Federation of Public Employees

Mark Dorsett, Manager 1, Physical Plant Operations Division, Zone 1

Roy Norton, Manager Custodial/Grounds, Physical Plant Operations Division

Robert Krickovich, Coordinator, LEA, Facilities and Construction Management

ES/tc Enc.

	Markhan	n Elementary Scho	<u>ool</u>	Evaluat	ion Requested	September 18, 2009
Time of Day	9:45 am			E	Evaluation Date	September 25, 2009
Outdoor Condition	ns Tempe	rature 89.7	Relative H	umidity 59.1	Ambier	nt CO2 391
Fish Tem 123  Noticeable Odor Ceiling Type Wall Type	72.1 72 - No 2 x 4 Lay In Drywall/Plaster	78 56.7 Visible damage / s	30% - 60% water Visib	CO2 649 ble microbial growth? No	Amount of material affect	> Ambient 3
Flooring	12 x 12 Vinyl	No		No		None
Ceiling Walls Flooring HVAC Supply Gri	No Yes Yes	/ Debris Cle	eeds eaning Yes  No  No		ctive Action Re	
LIVAC Beturn Cri	IIa Vaa	No.	No.			
HVAC Return Gri Ceiling at Supply Grills Surfaces in Room	Yes	No No	No No			
evaluate for cause.	s: enance: ace stained ceilir	ng tile in FISH 123	3. If stain returns o		-	

1671

	Marl	kham Element	tary School		Evaluation	Requested	Septemb	er 18, 2009
Time of Day	9:45 am	]			Eval	uation Date	Septemb	er 25, 2009
<b>Outdoor Condition</b>	s Tei	mperature [	89.7	Relative Humidity	59.1	Ambie	nt CO2	391
301 Noticeable Odor	70.3 No	72 - 78 d	52 Visible water amage / staining			Ran Max 700 Amount o	> Ambient f eted	Occupants
Ceiling Type	2 x 4 Lay		No	No No			None	
Wall Type	Drywall/Pla		No	No			None	
Flooring	12 x 12 V	inyl	No	No			None	
	Clean	Minor Dus / Debris	Cleaning		Correctiv	e Action Re	equired	
Ceiling	Yes	No	No					
Walls	Yes	No	No					
Flooring	Yes	No	No					
HVAC Supply Gril	Is Yes	No	No					
HVAC Return Grill	s Yes	No	No					
Ceiling at Supply Grills	Yes	No	No					
Surfaces in Room	Yes	No	No					
bservations								
Findings:								

1671

**Location Number** 

#### 0

- Temperature was low at the time of the assessment
- CO2 was slightly elevated at the time of the assessment
- Dust build up on AHU unit duct work in FISH 301B

# Recommendations:

### Site Based Maintenance:

- Adjust thermostat to increase temperature. If temperature cannot be adjusted locally contact EMS
- Continue to monitor this location for any signs of microbial growth as well as dust and debris accumulation and clean as appropriate

### Physical Plant Operation:

- Evaluate HVAC system for proper operation and repair as appropriate to lower CO2 level
- Evaluate duct work and AHU in FISH 301B and clean as appropriate

	Ma	arkham Elementa	ry School		Evaluatio	n Requested September 18, 2009
Time of Day	9:45 am				Ev	aluation Date September 25, 2009
Outdoor Condi	itions To	emperature	89.7	Relative Humidity	59.1	Ambient CO2 391
Fish	Temperature	Range Rela	tive Humidity	Range	CO2	Range # Occupants
302	68.5	72 - 78	55.2	30% - 60%	582	Max 700 > Ambient 2
Noticeable Oc	dor Yes		Visible water nage / staining	Visible micro? growth?		Amount of material affected
Ceiling Type	2 x 4 La		No	No		None
Wall Type	Drywall/F	Plaster	No	No		None
Flooring	12 x 12	Vinyl	No	No		None
	Clean	Minor Dust / Debris	Needs Cleaning		Correct	ive Action Required
Ceiling	Yes	No	No			
Walls	Yes	No	No			
Flooring	Yes	No	No			
HVAC Supply	Grills Yes	No	No			
HVAC Return	Grills Yes	No	No			
Ceiling at Sup Grills	oply Yes	No	No			
Surfaces in Ro	oom Yes	No	No			
bservations						
Findings:	was low at the	time of the asses	ssment			
		Ifunctioning A/C r		unoccupied.		
Recommendat	tions:					
Site Based Ma						5140
		•		cannot be adjusted	-	htact EMS bris accumulation and clean as
appropriate		ation for any orgin	or morobial (	growin do won do d	aot ana ao	one accumulation and clean ac

1671

	Markh	nam Elementary	<u>School</u>		Evaluation	Requested September 18, 2009
Time of Day	9:45 am				Eva	September 25, 2009
Outdoor Condi	tions Tem	perature 89	.7 R	Relative Humidity	59.1	Ambient CO2 391
Fish 303 Noticeable Od Ceiling Type Wall Type Flooring	73.1	2 - 78  Visit dama	re Humidity 54.4 3 sible water ge / staining? No No No No Needs Cleaning No	Range 50% - 60%  Visible micro growth?  No  No		Range # Occupants  Max 700 > Ambient 20  Amount of material affected  None  None  None  Ve Action Required
_						
Walls Flooring HVAC Supply	Yes Yes Grills Yes	No No	No No			
HVAC Return	Grills Yes	No	No			
Ceiling at Sup Grills	ply Yes	No	No			
Surfaces in Ro	oom Yes	No	No			
- Pest dropping:  Recommendat Site Based Mai - Install ceiling t - Contact COMF	<mark>intenance:</mark> iles properly PASS to generate	ull and floor e a work order fo			ust and det	oris accumulation and clean as

1671

		Markham Eler	mentary School		Evaluat	ion Requested	September 18, 2009		
Time of Day	Time of Day 9:45 am Evaluation Date September 25, 2009								
Outdoor Condi	tions	 Temperatur	e 89.7	Relative Hun	nidity 59.1	I Ambie	nt CO2 391		
		•							
I ———— -	Temperatur		Relative Humidity	ı Kango	CO2	Ran			
304	72.9	72 - 78	63.7	30% - 60%	719		> Ambient 4		
Noticeable Od	or N	lo	Visible water damage / stainin		microbial owth?	Amount of material affect			
Ceiling Type	2 x	4 Lay In	No		No		None		
Wall Type	Dryw	all/Plaster	No		No		None		
Flooring	12 x	12 Vinyl	No		No		None		
	Clea	ın Minor / Deb		1	Correc	ctive Action Re	equired		
Ceiling	Ye	s No							
Walls	Ye	s No	No No						
Flooring	Ye	s No	No						
HVAC Supply	Grills Ye	s No	No						
HVAC Return	Grills Ye	s No	No						
Ceiling at Sup Grills	ply Ye	s No	No						
Surfaces in Ro	oom Ye	s No	No						
Dhaamatiana									
Observations									
Findings: - Humidity level - 1 ceiling tile no	_	-	he time of the asse	essment					
Recommendations: Site Based Maintenance: - Install ceiling tile properly - Continue to monitor this location for any signs of microbial growth as well as dust and debris accumulation and clean as appropriate									
Physical Plant - Evaluate HVA			ation and repair as	appropriate to	lower humidit	y level			

1671

			IAQ As	sessment	<b>Location Number</b>	1671
	Markh	nam Elementary	School		<b>Evaluation Reques</b>	ted September 18, 2009
Time of Day	9:45 am				Evaluation D	September 25, 2009
Outdoor Condi	itions Tem	perature 89	9.7	Relative Humidity	y 59.1 Ar	mbient CO2 391
Fish	Temperature F	Range Relati	ve Humidity	Range	CO2	Range # Occupants
401	75.9 <b>7</b>	2 - 78	66.5	30% - 60%	953 <b>Max</b>	<b>700 &gt; Ambient</b> 3
Noticeable Od	lor No	= -	sible water ige / staining	Visible micro growth?		
Ceiling Type	2 x 4 Lay		No	No		None
Wall Type	Drywall/Plas	ster	No	No		None
Flooring	12 x 12 Vir	nyl	No	No		None
	Clean	Minor Dust / Debris	Needs Cleaning		Corrective Actio	n Required
Ceiling	Yes	No	No			
Walls	Yes	No	No			
Flooring	Yes	No	No			
HVAC Supply	Grills Yes	No	No			
HVAC Return	Grills Yes	No	No			
Ceiling at Sup Grills	oply Yes	No	No			
Surfaces in Ro	oom Yes	No	No			
bservations						
Findings: - Humidity level	l was slightly elev	ated at the time	of the asses	ssment		
appropriate  Physical Plant	intenance: conitor this location Coperation:			growth as well as d		mulation and clean as

1671

	Markham E	lementary School		Evaluation	on Requested	September 18, 2009			
Time of Day 9	Time of Day 9:45 am Evaluation Date September 25, 2009								
Outdoor Conditions	S Temperat	ure 89.7	Relative Humi	dity 59.1	Ambie	nt CO2 391			
Fish Tomp	oroturo –								
	erature Range 75.4 <b>72 - 78</b>		ı Kange –	<b>CO2</b> 925	Ran	ge # Occupants > Ambient 2			
		Visible water	」30% - 60%		Amount of				
Noticeable Odor	No	damage / stainin			material affec				
Ceiling Type	2 x 4 Lay In	No	No	<u> </u>		None			
Wall Type	Drywall/Plaster	No	No	<u> </u>		None			
Flooring	12 x 12 Vinyl	No	No	<u> </u>		None			
Clean Minor Dust Needs Corrective Action Required									
Ceiling	Yes	No No							
Walls	Yes	No No							
Flooring	Yes	No No							
HVAC Supply Grills	s Yes	No No							
HVAC Return Grills	s Yes	No No							
Ceiling at Supply Grills	Yes	No							
Surfaces in Room	Yes	No No							
L Observations									
		at the time of the asse, including light bulbs							
Recommendations: Site Based Maintenance: - Thoroughly clean FISH 402B and remove light bulbs (storage) - Continue to monitor this location for any signs of microbial growth as well as dust and debris accumulation and clean as appropriate									
Physical Plant Operation: - Evaluate HVAC system for proper operation and repair as appropriate to lower humidity level									

1671

		Mark	kham Elei	mentary	/ School			Evaluati	on Reques	stea S	eptemb	er 18, 2009
Time of Day	9:4	15 am	]					E	valuation I	Date S	Septemb	er 25, 2009
Outdoor Condi	tions	Ter	nperatur	e 8	9.7	Relative Hu	midit	y 59.1	Aı	mbient (	CO2	391
	Temper		Range	Relat	ive Humidity	Range		CO2	_	Range		Occupants
403	75	5.6	72 - 78		59.2	30% - 60%		803	Max	700 > A	Ambien	t 3
Noticeable Od	or [	No	]		isible water age / staining	Visible ? gı	e micr			unt of affected	k	
Ceiling Type		2 x 4 Lay	· In		Yes		No			1 ceili	ing tile	
Wall Type	D	rywall/Pla	aster		No		No	[		No	ne	
Flooring	,	12 x 12 V	inyl		No		No			No	one	
	(	Clean	Minor / Del		Needs Cleaning			Correc	tive Actio	on Requ	uired	
Ceiling		No	Ye	s	Yes			Remove a	and replac	ce ceilir	ng tile	
Walls		Yes	N	О	No							
Flooring		Yes	N	0	No							
HVAC Supply	Grills	Yes	N	D	No							
HVAC Return	Grills	Yes	N	0	No							
Ceiling at Sup Grills	ply	Yes	N	0	No							
Surfaces in Ro	om	Yes	No	<u> </u>	No							
bservations												

1671

**Location Number** 

#### 0

### Findings:

- 1 stained ceiling tile outside of FISH 403A
- 1 ceiling tile not seated properly and 1 broken ceiling tile
- Dust and debris on A/C filter in FISH 403B

#### Recommendations:

### Site Based Maintenance:

- Remove and replace stained ceiling tile out of FISH 403A. If stain returns contact COMPASS to generate a work order to evaluate for cause.
- Install ceiling tile properly and remove and replace broken tile
- Remove and replace A/C filters in FISH 403B
- Continue to monitor this location for any signs of microbial growth as well as dust and debris accumulation and clean as appropriate

Markham Elementary School	Evaluation Requested September 18, 2009
Time of Day 9:45 am	Evaluation Date September 25, 2009
Outdoor Conditions Temperature 89.7 Relative Hun	nidity 59.1 Ambient CO2 391
Ceiling Type 2 x 4 Lay In No	CO2 Range # Occupants  830 Max 700 > Ambient 3  microbial Amount of material affected  No None  No None  Corrective Action Required
Ceiling Yes No No	
Walls Yes No No	
Flooring Yes No No	
HVAC Supply Grills Yes No No	
HVAC Return Grills Yes No No	
Ceiling at Supply Yes No No Grills	
Surfaces in Room Yes No No	
bservations  Findings: - No issue identified at the time of the assessment  Recommendations: Site Based Maintenance: - Continue to monitor this location for any signs of microbial growth as well appropriate	as dust and debris accumulation and clean as

1671

			IAQ As	sessment	Location	on Number	1671	
	M	larkham Eleme	entary School		Evaluati	on Requested	Septemb	per 18, 2009
Time of Day	9:45 am				E	valuation Date	Septemb	per 25, 2009
Outdoor Condi	tions	Temperature	89.7	Relative Humidity	y 59.1	Ambie	nt CO2	391
Fish	Temperature	Range	Relative Humidity	Range	CO2	Ran	ige #	Occupants
501	75.3	72 - 78	64.2	30% - 60%	906	Max 700	> Ambien	1t 3
Noticeable Od	lor No		Visible water damage / staining	Visible micr growth		Amount of material affect		
Ceiling Type	2 x 4 L	_ay In	No	No			None	
Wall Type	Drywall	/Plaster	No	No			None	
Flooring	12 x 12	2 Vinyl	No	No			None	
	Clean	Minor Du / Debri	s Cleaning		Correc	ctive Action Re	quired	
Ceiling	Yes	No	No					
Walls	Yes	No	No					
Flooring	Yes	No	No					
HVAC Supply	Grills Yes	No	No					
HVAC Return	Grills Yes	No	No					
Ceiling at Sup Grills	ply Yes	No	No					
Surfaces in Ro	oom Yes	No	No					
bservations								
Findings: - Humidity level	was slightly	elevated at the	time of the asse	ssment				

1671

- Dust build up on AHU unit duct work in FISH 501B
- Dirt and debris in cabinet under sink

### Recommendations:

# Site Based Maintenance:

- Thoroughly clean under sink cabinet
- Continue to monitor this location for any signs of microbial growth as well as dust and debris accumulation and clean as appropriate

### Physical Plant Operation:

- Evaluate HVAC system for proper operation and repair as appropriate to lower humidity level
- Evaluate duct work and AHU in FISH 501B and clean as appropriate

	Markha	m Elementary	School	Evaluat	tion Requested	September 18, 2009
Time of Day 9:	:45 am			1	Evaluation Date	September 25, 2009
Outdoor Conditions	Tempe	erature 89	9.7	Relative Humidity 59.	1 Ambie	nt CO2 391
		nge Relati	ve Humidity	Range CO2	Ran	nge # Occupants
502 7	<b>75</b> .5 <b>72</b> -	78	68.3	<b>30% - 60%</b> 869	Max 700	> Ambient 2
Noticeable Odor	No		isible water age / staining	Visible microbial growth?	Amount of material affect	
Ceiling Type	2 x 4 Lay In		Yes	No	2 c	eiling tiles
Wall Type	Drywall/Plaste	er	No	No		None
Flooring	12 x 12 Vinyl		No	No		None
	Clean I	Minor Dust / Debris	Needs Cleaning	Corre	ective Action Re	equired
Ceiling	No	Yes	Yes	Remove	and replace cei	iling tiles
Walls	Yes	No	No			
Flooring	Yes	No	No			
HVAC Supply Grills	Yes	No	No			
HVAC Return Grills	Yes	No	No			
Ceiling at Supply Grills	Yes	No	No			
Surfaces in Room	Yes	No	No			
bservations						
Findings: - Humidity level was: - 2 stained ceiling tile - Pest carcass under	es	ed at the time	of the asses	ssment		
Recommendations: Site Based Mainten: Remove and replace Contact COMPASS	ance: e stained ceili	-	or Pest Cont	rol		

- Continue to monitor this location for any signs of microbial growth as well as dust and debris accumulation and clean as

Physical Plant Operation:
- Evaluate HVAC system for proper operation and repair as appropriate to lower humidity level

appropriate

**IAQ Assessment** 

1671

Markham Elementary School **Evaluation Requested** September 18, 2009 **Evaluation Date** September 25, 2009 Time of Day 9:45 am **Outdoor Conditions Temperature** 89.7 59.1 **Relative Humidity Ambient CO2** 391 Fish **Temperature** CO<sub>2</sub> Range **Relative Humidity** # Occupants Range Range 503 75.5 63.6 895 72 - 78 Max 700 > Ambient 3 30% - 60% Visible water Visible microbial Amount of **Noticeable Odor** No damage / staining? growth? material affected 2 x 4 Lay In None **Ceiling Type** No No **Wall Type** Drywall/Plaster None No No **Flooring** 12 x 12 Vinyl No No None **Needs** Clean **Minor Dust Corrective Action Required** / Debris Cleaning Yes No No Ceiling Walls Yes No No Yes No No **Flooring** HVAC Supply Grills Yes No No HVAC Return Grills Yes No No **Ceiling at Supply** Yes No No **Grills Surfaces in Room** Yes No No **Observations** Findings: Humidity level was slightly elevated at the time of the assessment Recommendations: Site Based Maintenance: Continue to monitor this location for any signs of microbial growth as well as dust and debris accumulation and clean as appropriate Physical Plant Operation: - Evaluate HVAC system for proper operation and repair as appropriate to lower humidity level

IAQ Assessment

1671

Markham Elementary School					on Requested	September 18, 2009
Time of Day 9:45 am Evaluation Date September 25, 2009						
Outdoor Conditions	Temperature	e 89.7	Relative Humidit	y 59.1	Ambie	nt CO2 391
	Prature Range 74.9 72 - 78	Relative Humidity	Range 30% - 60%	<b>CO2</b> 1096	Ran Max 700	ge # Occupants > Ambient 3
Noticeable Odor  No  Visible water  Visible microbial  Amount of damage / staining?  growth?  material affected						
Ceiling Type	Type 2 x 4 Lay In		Yes No		1 ceiling tile	
			No		None	
Flooring	12 x 12 Vinyl	No	No	[		None
Clean Minor Dust Needs Corrective Action Required / Debris Cleaning						
Ceiling	No	Yes	Remove and replace ceiling tiles			
Walls	Yes	No				
Flooring	Yes	No				
HVAC Supply Grills	Yes	No				
HVAC Return Grills	Yes	No				
Ceiling at Supply Grills	Yes	No				
Surfaces in Room	Yes	No				
L Observations						
Findings: - Humidity level was slightly elevated at the time of the assessment - 1 stained ceiling tile						
Recommendations: Site Based Maintenance: - Remove and replace stained ceiling tile - Continue to monitor this location for any signs of microbial growth as well as dust and debris accumulation and clean as appropriate  Physical Plant Operation: - Evaluate HVAC system for proper operation and repair as appropriate to lower humidity level						
- Evaluate HVAC sys	tem for proper opera	ation and repair as	appropriate to lowe	er humidity	level	

1671