

managing risk with responsibility

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Jeffrey S. Moquin, Director Risk Management Department

February 23, 2007 Signature on File

TO: Dr. Ricardo Garcia, Principal

Nova Middle School

FROM: Robert J. Krickovich, Coordinator, LEA

Facilities and Construction Management, Environmental Division

SUBJECT: Indoor Air Quality (IAQ) Assessment

FISH 138, 141, 143, 164A, 172, 705, 707 and 709

On February 7, 2007 Richard Rosa and I conducted an assessment of FISH 138, 141, 143, 164A, 172, 705, 707 and 709 at **Nova Middle 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. It was found that the temperature in every room of the school was set too cold. Thermostats should be set to 75 degrees by Physical Plant Operations and not changed by school staff. Lowering the temperature below 72 degrees can cause elevated humidity levels which could result in microbial growth and decreased indoor air quality. 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.

Should any questions arise, or if the current concerns continue after the attached recommendations have been addressed, please feel free to contact me at 754-321-1638.

cc: Dr. Harry LaCava, Area Superintendent
Toni Weissberg, Area Director
Jeffrey S. Moquin, Director, Risk Management
Scott Gillen, Project Manager, Facilities and Construction Management
Dane Ramson, Broward Teachers Union
Mark Dorsett, Manager 1, Physical Plant Operations Division, Zone 1
Roy Norton, Manager Custodial/Grounds, Physical Plant Operations Division

RK/tc

		Nova	Middle School		Evaluat	ion Requested	January	30, 2007
Time of Day	9:50 am		-		ı	Evaluation Date	Februar	ry 7, 2007
Outdoor Cond	itions T	emperature	70.5	Relative Humidit	у 63	Ambie	ent CO2	529
Fish	Temperature	Range	Relative Humidity	/ Range	CO2	Rar	nge #	Occupants
138	68.2	72 - 78	49.4	30% - 60%	871	Max 700	> Ambient	3
Noticeable O	dor No		Visible water damage / stainin	Visible mic g? growth		Amount of ma affected	terial	
Ceiling Type	2 x 4 L	ay In	No	No			None	
Wall Type	Plas	ter	No	No			None	
Flooring	12 x 12	Vinyl	No	No			None	
	Clean	Minor D		9	Corre	ctive Action Re	equired	
Ceiling	Yes	No	No					
Walls	Yes	No	No					
Flooring	Yes	No	No					
HVAC Supply	Grills Yes	No	No					
HVAC Return	Grills No	Yes	Yes		Clean wit	h Wexcide dis	infectant	
Ceiling at Sup Grills	oply Yes	No	No					
Surfaces in R	oom No	Yes	No		Cle	an as appropri	ate	

1311

Location Number

Observations

Findings:

- Dust and debris on HVAC return grills
- Temperature was low at the time of the assessment
- 1 ceiling tile missing at the opening of the folding wall allowing heavy dust and debris to enter the room. Ceiling plenum is dusty and has no ducted return.
- Folding wall was open to the adjacent classroom with 18 occupants
- Dust and debris on environmental surfaces throughout the room

Recommendations:

Site Based Maintenance:

- Clean HVAC return grills with Wexcide disinfectant solution
- Do not move temperature set points below 75 degrees
- Thoroughly clean all environmental surfaces throughout the room
- Continue to monitor this location for any signs of microbial growth as well as dust and debris accumulation and clean as appropriate

Physical Plant Operations:

- Evaluate HVAC system for proper operation and adjust as appropriate to increase temperature
- Replace missing ceiling tile at the opening of the folding wall

Time of Day	9:50 am				E	Evaluation Date Febr	uary 7, 2007
Outdoor Condi	tions Tem	perature 7	0.5	Relative Humi	dity 63	Ambient CO2	529
Fish	Temperature F	Range Rela	tive Humidity	Range	CO2	Range	# Occupants
141	65.5 7	2 - 78	62.3	30% - 60%	1074	Max 700 > Ambi	ent 36
Noticeable Od	or No	-	/isible water age / staining	Visible n ? grov		Amount of material affected	
Ceiling Type	2 x 4 Lay	In	No	No		None	
Wall Type	Plaster		No	No		None	
Flooring	12 x 12 Vin	yl	No	No)	None	
	Clean	Minor Dust / Debris	Needs Cleaning		Correc	ctive Action Required	
Ceiling	Yes	No	No				
Walls	Yes	No	No				
Flooring	Yes	No	No				
HVAC Supply	Grills No	Yes	Yes		Clean wit	h Wexcide disinfectar	nt
HVAC Return (Grills No	Yes	Yes		Clean wit	h Wexcide disinfectar	nt
Ceiling at Supp Grills	ply No	Yes	Yes		Clea	an as appropriate	
Surfaces in Ro	oom No	Yes	No		Clea	an as appropriate	

Nova Middle School

1311

January 30, 2007

Location Number

Evaluation Requested

Observations

Findings:

- Dust and debris on HVAC supply and return grills and on ceiling at supply grills
- Temperature was low and humidity level was slightly elevated at the time of the assessment
- Dust and debris on environmental surfaces throughout the room
- · Visible microbial growth on painted wood shelves in the back of the room

Recommendations:

Site Based Maintenance:

- Clean HVAC supply and return grills with Wexcide disinfectant solution and clean ceiling at supply grills as appropriate
- Do not move temperature set points below 75 degrees
- Thoroughly clean all environmental surfaces throughout the room
- Clean shelves in the back of the room with Wexcide disinfectant solution. If microbial growth returns contact PPO and initiate a work order to replace shelves.
- Continue to monitor this location for any signs of microbial growth as well as dust and debris accumulation and clean as appropriate

Physical Plant Operations:

- Evaluate HVAC system for proper operation and adjust as appropriate to increase temperature and lower humidity level

Time of Day	9:50 am]			Ev	valuation Date February 7, 2007
Outdoor Condi	tions Ter	mperature	70.5	Relative Humidity	63	Ambient CO2 529
Fish	Temperature	Range Rel	ative Humidity	Range	CO2	Range # Occupants
143	69.3	72 - 78	57.9	30% - 60%	1364	Max 700 > Ambient 35
Noticeable Od	or No] da	Visible water mage / staining	Visible micro g? growth?		Amount of material affected
Ceiling Type	2 x 4 Lay	[,] In	Yes	Yes		3 ceiling tiles
Wall Type	Plaste	r	No	No		None
Flooring	12 x 12 Vi	nyl	No	No		None
	Clean	Minor Dust / Debris	Needs Cleaning	ı	Correct	ive Action Required
Ceiling	No	Yes	Yes	Ro	emove ar	nd replace ceiling tiles
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 No	Yes	No		Clea	n as appropriate

Nova Middle School

1311

January 30, 2007

Location Number

Evaluation Requested

Observations

Findings:

- 2 stained ceiling tiles and 1 ceiling tile with visible microbial growth. Active roof leaks identified. Work order J228364 is open to repair roof
- Temperature was low and CO2 level was slightly elevated at the time of the assessment
- Dust and debris on elevated surfaces throughout the room

Recommendations:

Site Based Maintenance:

- Clean HVAC return grills with Wexcide disinfectant solution
- Do not move temperature set points below 75 degrees
- Thoroughly clean all surfaces throughout the room
- Continue to monitor this location for any signs of microbial growth as well as dust and debris accumulation and clean as appropriate

Physical Plant Operations:

- Evaluate and repair roof as necessary to correct water intusion and remove and replace ceiling tiles as appropriate. Expedite work order J228364 that is open to repair roof.
- Evaluate HVAC system for proper operation and adjust as appropriate to increase temperature and lower CO2 level

Project Manager:

Work with PPO to correct water intrusion from roof as necessary

		Nova I	Middle School		Evaluat	tion Requested	January	30, 2007
Time of Day	9:50 am				ı	Evaluation Date	Februar	y 7, 2007
Outdoor Cond	litions	Temperature	70.5	Relative Humid	ity 63	Ambie	nt CO2	529
Fish	Temperature	Range	Relative Humidity	Range	CO2	Ran	ige #	Occupants
164A	67.8	72 - 78	58.8	30% - 60%	1160	Max 700	> Ambient	30
Noticeable O	dor No		Visible water damage / staining	Visible mi g? growt		Amount of ma	terial	
Ceiling Type	2 x 4	Lay In	Yes	No		5 ce	eiling tiles	
Wall Type	Pla	ster	No	No			None	
Flooring	12 x 1	2 Vinyl	No	No			None	
	Clean	Minor D / Debr		ı	Corre	ctive Action Re	equired	
Ceiling	No	Yes	Yes	Rei	nove and	replace stained	d ceiling til	es
Walls	Yes	No	No					
Flooring	Yes	No	No					
HVAC Supply	Grills Yes	No	No					
HVAC Return	Grills No	Yes	Yes		Clean wit	th Wexcide disi	infectant	
Ceiling at Sup Grills	oply Yes	No	No					
Surfaces in R	oom No	Yes	No		Cle	an as appropri	ate	
) hearvations								

1311

Location Number

Observations

Findings:

- 5 stained ceiling tiles. Active roof leaks identified.
- Dust and debris on HVAC return grills
- Temperature was low at the time of the assessment
- Dust and debris on environmental surfaces throughout the room

Recommendations:

Site Based Maintenance:

- Clean HVAC return grills with Wexcide disinfectant solution
- Do not move temperature set points below 75 degrees
- Thoroughly clean all environmental surfaces throughout the room
- Continue to monitor this location for any signs of microbial growth as well as dust and debris accumulation and clean as appropriate

Physical Plant Operations:

- Evaluate and repair roof as necessary to correct water intusion and remove and replace ceiling tiles as appropriate
- Evaluate HVAC system for proper operation and adjust as appropriate to increase temperature

Project Manager:

- Work with PPO to correct water intrusion from roof as necessary

9:50 am				E	Evaluation Date February 7, 2007
tions Tem _l	perature 7	70.5	Relative Humidity	63	Ambient CO2 529
Temperature R	ange Rela	tive Humidity	Range	CO2	Range # Occupants
63.9 72	2 - 78	67.6	30% - 60%	540	Max 700 > Ambient 4
or No					Amount of material affected
2 x 4 Lay I	n	No	No		None
Plaster		No	No		None
Carpet		Yes	No		Entire Carpet
Clean	Minor Dust / Debris	Needs Cleaning	ı	Correc	ctive Action Required
Yes	No	No			
Yes	No	No			
No	Yes	Yes		Remov	e and replace carpet
Grills No	Yes	Yes	С	lean witl	h Wexcide disinfectant
Grills No	Yes	Yes	С	lean witl	h Wexcide disinfectant
oly Yes	No	No			
om No	Yes	No		Clea	an as appropriate
	ions Temperature R 63.9 72 or No 2 x 4 Lay I Plaster Carpet Clean Yes No Srills No Or No Or No Yes	ions Temperature 7 emperature Range Rela 63.9 72 - 78 or No dam 2 x 4 Lay In Plaster Carpet Clean Minor Dust / Debris Yes No No Yes Grills No Yes Or No Yes	ions Temperature 70.5 emperature Range Relative Humidity 63.9 72 - 78 67.6 Or No Visible water damage / staining 2 x 4 Lay In No Plaster No Carpet Yes Clean Minor Dust Needs / Debris Cleaning Yes No No No Yes No No No Yes Yes Grills No Yes Yes Or No Yes Yes Or No N	remperature Range Relative Humidity Range 63.9 72 - 78 67.6 30% - 60% Tor No Visible water damage / staining? Visible micro growth? 2 x 4 Lay In No No No Plaster No No Carpet Yes No Clean Minor Dust Needs / Debris Cleaning Yes No No Yes No No No Yes Yes Corills No Yes Yes Corills No Yes Yes Corills No Yes Yes Corills No	ions Temperature 70.5 Relative Humidity 63 emperature Range Relative Humidity Range CO2 63.9 72 - 78 67.6 30% - 60% 540 Or No Visible water damage / staining? Visible microbial growth? 2 x 4 Lay In No No No Plaster No No No Carpet Yes No No Yes No No Yes No No No Yes No No No Or No Yes Yes Remove Clean with No Yes Yes Clean with No

Nova Middle School

1311

January 30, 2007

Location Number

Evaluation Requested

Observations

Findings: Band Room

- Carpet is severly stained
- Heavy dust and debris on HVAC supply and return grills that are over 20 feet above the floor
- Temperature was low and humidity level was slightly elevated at the time of the assessment
- Dust and debris on environmental surfaces throughout the room

Recommendations:

Site Based Maintenance:

- Clean HVAC supply and return grills with Wexcide disinfectant solution with the assistance of PPO
- Do not move temperature set points below 75 degrees
- Thoroughly clean all environmental surfaces throughout the room
- Continue to monitor this location for any signs of microbial growth as well as dust and debris accumulation and clean as appropriate

Physical Plant Operations:

- Remove and replace carpet
- Provide assistance to site based custodial staff with cleaning of the HVAC supply and return grills. Grills are over 20 feet above the floor.
- Evaluate HVAC system for proper operation and adjust as appropriate to increase temperature and lower humidity level

Time of Day				Nova I	Middle School			Ev	valuation	Requested	Januar	y 30, 2007
Fish Temperature Range Relative Humidity Range CO2 Range #Occupants 705 65 72 - 78 60.1 30% - 60% 1693 Max 700 > Ambient 25 Noticeable Odor No Visible water damage / staining? Visible microbial growth? Amount of material affected Ceiling Type 2 × 4 Lay In No No None Wall Type Plaster No No No None Flooring 12 × 12 Vinyl No No No None Clean Minor Dust / Debris Cleaning Ceiling Yes No No No No Flooring Yes No No No Corrective Action Required HVAC Supply Grills No Yes Yes Clean with Wexcide disinfectant HVAC Return Grills Yes No No No Clean as appropriate	Time of Day	9:50	am						Eva	luation Date	Februa	ry 7, 2007
Total Tota	Outdoor Cond	itions	Те	mperature	70.5	Rel	ative Hum	idity	63	Ambie	nt CO2	529
Noticeable Odor No Visible water damage / staining? Ceiling Type	Fish	Tempera	ture	Range	Relative Hum	dity	Range	C	O2	Ran	ge #	# Occupants
Ceiling Type	705	65		72 - 78	60.1	309	% - 60%	16	693	Max 700	> Ambien	t 25
Wall Type Plaster No No No None Clean Minor Dust / Debris Cleaning Ceiling Yes No No No No No Plooring Walls Yes No No No No Plooring HVAC Supply Grills No Yes Yes Clean with Wexcide disinfectant HVAC Return Grills Yes No No No Clean as appropriate	Noticeable Oc	dor	No						al A		terial	
Flooring 12 x 12 Vinyl No No No None Clean Minor Dust / Debris Cleaning Corrective Action Required Ceiling Yes No No No So	Ceiling Type	2	x 4 La	y In	No		N	lo			None	
Clean Minor Dust / Debris Cleaning Corrective Action Required Ceiling Yes No No No So	Wall Type		Plaste	er	No		N	lo			None	
Ceiling Yes No No No Walls Yes No No No No HVAC Supply Grills No No No Ceiling at Supply Grills No Yes Yes Yes Clean as appropriate Corrective Action Required Corrective Action Requir	Flooring	12	2 x 12 \	'inyl	No		N	lo			None	
Walls Yes No No No Flooring Yes No No No HVAC Supply Grills No Yes Yes Clean with Wexcide disinfectant HVAC Return Grills Yes No No Ceiling at Supply Grills No Yes Yes Clean as appropriate Grills		CI	lean					C	Correctiv	e Action Re	equired	
Flooring Yes No No No HVAC Supply Grills No Yes Yes Clean with Wexcide disinfectant HVAC Return Grills Yes No No Ceiling at Supply Grills Yes Yes Clean as appropriate Grills	Ceiling		Yes	No	No)						
HVAC Supply Grills No Yes Yes Clean with Wexcide disinfectant HVAC Return Grills Yes No No Ceiling at Supply Grills Yes Yes Clean as appropriate Grills	Walls		Yes	No	No	•						
HVAC Return Grills Yes No No Ceiling at Supply Grills Yes Yes Clean as appropriate	Flooring		Yes	No	No)						
Ceiling at Supply No Yes Yes Clean as appropriate Grills	HVAC Supply	Grills [No	Yes	Ye	s		Clea	an with V	Vexcide disi	nfectant	
Grills	HVAC Return	Grills [Yes	No	No)						
Surfaces in Room No Yes No Clean as appropriate		pply [No	Yes	Ye	s			Clean	as appropri	ate	
	Surfaces in Ro	oom [No	Yes	No	<u> </u>			Clean	as appropri	ate	

1311

Location Number

Observations

Findings: Science Lab

- Dust and debris on HVAC supply grills and on ceiling at supply grills
- Sinks are not being used and several are covered with books and papers. All traps are full of debris.
- Temperature was low and CO2 level was elevated at the time of the assessment
- Dust and debris on environmental surfaces throughout the room. Room is too cluttered to be cleaned properly by custodial staff.
- 6 live plants in the room

Recommendations:

Site Based Maintenance:

- Clean HVAC supply grills with Wexcide disinfectant solution and clean ceiling at supply grills as appropriate
- Ensure that water is run in the sinks at least once a week and remove books and papers
- Do not move temperature set points below 75 degrees
- Advise occupant to reduce clutter and thoroughly clean all environmental surfaces throughout the room
- Remove live plants
- Continue to monitor this location for any signs of microbial growth as well as dust and debris accumulation and clean as appropriate

Physical Plant Operations:

- Evaluate HVAC system for proper operation and adjust as appropriate to increase temperature and lower CO2 level

Time of Day	9:50 am]			E	February 7, 2007
Outdoor Condi	tions Ter	mperature	70.5	Relative Humidity	63	Ambient CO2 529
Fish []]	Temperature	Range Rel	ative Humidity	Range	CO2	Range # Occupants
707	69.3	72 - 78	61.1	30% - 60%	623	Max 700 > Ambient 4
Noticeable Od	or No		Visible water nage / staining	Visible micro growth?		Amount of material affected
Ceiling Type	2 x 4 Lay	' In	No	No	[None
Wall Type	Plaste	•	No	No	[None
Flooring	12 x 12 Vi	nyl	No	No		None
	Clean	Minor Dust / Debris	Needs Cleaning	1	Correc	tive Action Required
Ceiling	Yes	No	No			
Walls	Yes	No	No			
Flooring	Yes	No	No			
HVAC Supply	Grills No	Yes	Yes	C	lean witl	n Wexcide disinfectant
HVAC Return (Grills No	Yes	Yes	С	lean witl	n Wexcide disinfectant
Ceiling at Support Grills	ply No	Yes	Yes		Clea	n as appropriate
Surfaces in Ro	oom No	Yes	No		Clea	n as appropriate

Nova Middle School

1311

January 30, 2007

Location Number

Evaluation Requested

Observations

Findings: Science Lab

- Dust and debris on HVAC supply and return grills and on ceiling at supply grills
- Sinks are not being used and traps are dry and full of debris.
- Temperature was low and humidity level was slightly elevated at the time of the assessment
- Dust and debris on environmental surfaces throughout the room. Room is too cluttered to be cleaned properly by custodial staff. All horizontal surfaces are being used for storage.

Recommendations:

Site Based Maintenance:

- Clean HVAC supply and return grills with Wexcide disinfectant solution and clean ceiling at supply grills as appropriate
- Ensure that water is run in the sinks at least once a week
- Do not move temperature set points below 75 degrees
- Advise occupant to reduce clutter and thoroughly clean all environmental surfaces throughout the room
- Continue to monitor this location for any signs of microbial growth as well as dust and debris accumulation and clean as appropriate

Physical Plant Operations:

- Evaluate HVAC system for proper operation and adjust as appropriate to increase temperature and lower humidity level

			Nova	Middle School		Evalua	tion Requested	January 3	50, Z007
Time of Day	9:50	am					Evaluation Date	February	7, 2007
Outdoor Condi	itions	Te	emperature	70.5	Relative Hu	midity 63	Ambie	nt CO2	529
l	Tempera	ture	Range	Relative Humic	^{lity} Range	CO2	Ran	ige # C	Occupants
709	67		72 - 78	56.6	30% - 60%	2103	Max 700	> Ambient	36
Noticeable Od	dor	No		Visible wate damage / stain		e microbial rowth?	Amount of ma affected	terial	
Ceiling Type	2	x 4 La	y In	No		No		None	
Wall Type		Plaste	er	No		No		None	
Flooring	12	2 x 12 \	/inyl	No		No		None	
	Cl	ean	Minor D		_	Corre	ctive Action Re	equired	
Ceiling		Yes	No	No					
Walls		Yes	No	No					
Flooring		Yes	No	No					
HVAC Supply	Grills [No	Yes	Yes		Clean wi	th Wexcide dis	infectant	
HVAC Return	Grills [No	Yes	Yes		Clean wi	th Wexcide dis	infectant	
Ceiling at Sup Grills	ply	No	Yes	Yes		Cle	an as appropri	ate	
Surfaces in Ro	oom [No	Yes	No		Cle	an as appropri	ate	

1311

Location Number

Observations

Findings: Science Lab

- Dust and debris on HVAC supply and return grills and on ceiling at supply grills
- Sinks are not being used and traps are dry and full of debris.
- Temperature was low and CO2 level was elevated at the time of the assessment
- Dust and debris on environmental surfaces throughout the room

Recommendations:

Site Based Maintenance:

- Clean HVAC supply and return grills with Wexcide disinfectant solution and clean ceiling at supply grills as appropriate
- Ensure that water is run in the sinks at least once a week
- Do not move temperature set points below 75 degrees
- Thoroughly clean all environmental surfaces throughout the room
- Continue to monitor this location for any signs of microbial growth as well as dust and debris accumulation and clean as appropriate

Physical Plant Operations:

- Evaluate HVAC system for proper operation and adjust as appropriate to increase temperature and lower humidity level