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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

IAQ Assessment

Location Number
 Evaluation Requested
 Evaluation Date

Nova Middle School

Time of Day

Outdoor Conditions Temperature Relative Humidity Ambient CO2

Fish	Temperature	Range	Relative Humidity	Range	CO2	Range	# Occupants
<input type="text" value="138"/>	<input type="text" value="68.2"/>	<input type="text" value="72 - 78"/>	<input type="text" value="49.4"/>	<input type="text" value="30% - 60%"/>	<input type="text" value="871"/>	<input type="text" value="Max 700 > Ambient"/>	<input type="text" value="3"/>
Noticeable Odor		Visible water damage / staining?		Visible microbial growth?		Amount of material affected	
<input type="text" value="No"/>		<input type="text" value="No"/>		<input type="text" value="No"/>		<input type="text" value="None"/>	
Ceiling Type	<input type="text" value="2 x 4 Lay In"/>		<input type="text" value="No"/>	<input type="text" value="No"/>	<input type="text" value="None"/>		
Wall Type	<input type="text" value="Plaster"/>		<input type="text" value="No"/>	<input type="text" value="No"/>	<input type="text" value="None"/>		
Flooring	<input type="text" value="12 x 12 Vinyl"/>		<input type="text" value="No"/>	<input type="text" value="No"/>	<input type="text" value="None"/>		

	Clean	Minor Dust / Debris	Needs Cleaning	Corrective Action Required
Ceiling	<input type="text" value="Yes"/>	<input type="text" value="No"/>	<input type="text" value="No"/>	<input type="text"/>
Walls	<input type="text" value="Yes"/>	<input type="text" value="No"/>	<input type="text" value="No"/>	<input type="text"/>
Flooring	<input type="text" value="Yes"/>	<input type="text" value="No"/>	<input type="text" value="No"/>	<input type="text"/>
HVAC Supply Grills	<input type="text" value="Yes"/>	<input type="text" value="No"/>	<input type="text" value="No"/>	<input type="text"/>
HVAC Return Grills	<input type="text" value="No"/>	<input type="text" value="Yes"/>	<input type="text" value="Yes"/>	<input type="text" value="Clean with Wexcide disinfectant"/>
Ceiling at Supply Grills	<input type="text" value="Yes"/>	<input type="text" value="No"/>	<input type="text" value="No"/>	<input type="text"/>
Surfaces in Room	<input type="text" value="No"/>	<input type="text" value="Yes"/>	<input type="text" value="No"/>	<input type="text" value="Clean as appropriate"/>

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

IAQ Assessment

Location Number
 Evaluation Requested
 Evaluation Date

Nova Middle School

Time of Day

Outdoor Conditions Temperature Relative Humidity Ambient CO2

Fish	Temperature	Range	Relative Humidity	Range	CO2	Range	# Occupants
<input type="text" value="141"/>	<input type="text" value="65.5"/>	<input type="text" value="72 - 78"/>	<input type="text" value="62.3"/>	<input type="text" value="30% - 60%"/>	<input type="text" value="1074"/>	<input type="text" value="Max 700 > Ambient"/>	<input type="text" value="36"/>
Noticeable Odor	<input type="text" value="No"/>		Visible water damage / staining?		Visible microbial growth?		Amount of material affected
Ceiling Type	<input type="text" value="2 x 4 Lay In"/>		<input type="text" value="No"/>		<input type="text" value="No"/>		<input type="text" value="None"/>
Wall Type	<input type="text" value="Plaster"/>		<input type="text" value="No"/>		<input type="text" value="No"/>		<input type="text" value="None"/>
Flooring	<input type="text" value="12 x 12 Vinyl"/>		<input type="text" value="No"/>		<input type="text" value="No"/>		<input type="text" value="None"/>

	Clean	Minor Dust / Debris	Needs Cleaning	Corrective Action Required
Ceiling	<input type="text" value="Yes"/>	<input type="text" value="No"/>	<input type="text" value="No"/>	<input type="text"/>
Walls	<input type="text" value="Yes"/>	<input type="text" value="No"/>	<input type="text" value="No"/>	<input type="text"/>
Flooring	<input type="text" value="Yes"/>	<input type="text" value="No"/>	<input type="text" value="No"/>	<input type="text"/>
HVAC Supply Grills	<input type="text" value="No"/>	<input type="text" value="Yes"/>	<input type="text" value="Yes"/>	<input type="text" value="Clean with Wexcide disinfectant"/>
HVAC Return Grills	<input type="text" value="No"/>	<input type="text" value="Yes"/>	<input type="text" value="Yes"/>	<input type="text" value="Clean with Wexcide disinfectant"/>
Ceiling at Supply Grills	<input type="text" value="No"/>	<input type="text" value="Yes"/>	<input type="text" value="Yes"/>	<input type="text" value="Clean as appropriate"/>
Surfaces in Room	<input type="text" value="No"/>	<input type="text" value="Yes"/>	<input type="text" value="No"/>	<input type="text" value="Clean as appropriate"/>

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

IAQ Assessment

Location Number 1311
 Evaluation Requested January 30, 2007
 Evaluation Date February 7, 2007

Nova Middle School

Time of Day 9:50 am

Outdoor Conditions Temperature 70.5 Relative Humidity 63 Ambient CO2 529

Fish	Temperature	Range	Relative Humidity	Range	CO2	Range	# Occupants
143	69.3	72 - 78	57.9	30% - 60%	1364	Max 700 > Ambient	35
Noticeable Odor		Visible water damage / staining?		Visible microbial growth?		Amount of material affected	
No		Yes		Yes		3 ceiling tiles	
Ceiling Type		Yes		Yes		3 ceiling tiles	
2 x 4 Lay In		No		No		None	
Wall Type		No		No		None	
Plaster		No		No		None	
Flooring		No		No		None	
12 x 12 Vinyl		No		No		None	

	Clean	Minor Dust / Debris	Needs Cleaning	Corrective Action Required
Ceiling	No	Yes	Yes	Remove and 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 Supply Grills	Yes	No	No	
Surfaces in Room	No	Yes	No	Clean as appropriate

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

IAQ Assessment

Location Number
 Evaluation Requested
 Evaluation Date

Nova Middle School

Time of Day

Outdoor Conditions Temperature Relative Humidity Ambient CO2

Fish	Temperature	Range	Relative Humidity	Range	CO2	Range	# Occupants
<input type="text" value="164A"/>	<input type="text" value="67.8"/>	<input type="text" value="72 - 78"/>	<input type="text" value="58.8"/>	<input type="text" value="30% - 60%"/>	<input type="text" value="1160"/>	<input type="text" value="Max 700 > Ambient"/>	<input type="text" value="30"/>
Noticeable Odor		Visible water damage / staining?		Visible microbial growth?		Amount of material affected	
<input type="text" value="No"/>		<input type="text" value="Yes"/>		<input type="text" value="No"/>		<input type="text" value="5 ceiling tiles"/>	
Ceiling Type	<input type="text" value="2 x 4 Lay In"/>		<input type="text" value="Yes"/>	<input type="text" value="No"/>		<input type="text" value="5 ceiling tiles"/>	
Wall Type	<input type="text" value="Plaster"/>		<input type="text" value="No"/>	<input type="text" value="No"/>		<input type="text" value="None"/>	
Flooring	<input type="text" value="12 x 12 Vinyl"/>		<input type="text" value="No"/>	<input type="text" value="No"/>		<input type="text" value="None"/>	

	Clean	Minor Dust / Debris	Needs Cleaning	Corrective Action Required
Ceiling	<input type="text" value="No"/>	<input type="text" value="Yes"/>	<input type="text" value="Yes"/>	<input type="text" value="Remove and replace stained ceiling tiles"/>
Walls	<input type="text" value="Yes"/>	<input type="text" value="No"/>	<input type="text" value="No"/>	<input type="text" value=""/>
Flooring	<input type="text" value="Yes"/>	<input type="text" value="No"/>	<input type="text" value="No"/>	<input type="text" value=""/>
HVAC Supply Grills	<input type="text" value="Yes"/>	<input type="text" value="No"/>	<input type="text" value="No"/>	<input type="text" value=""/>
HVAC Return Grills	<input type="text" value="No"/>	<input type="text" value="Yes"/>	<input type="text" value="Yes"/>	<input type="text" value="Clean with Wexcide disinfectant"/>
Ceiling at Supply Grills	<input type="text" value="Yes"/>	<input type="text" value="No"/>	<input type="text" value="No"/>	<input type="text" value=""/>
Surfaces in Room	<input type="text" value="No"/>	<input type="text" value="Yes"/>	<input type="text" value="No"/>	<input type="text" value="Clean as appropriate"/>

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 intrusion 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

IAQ Assessment

Location Number 1311
 Evaluation Requested January 30, 2007
 Evaluation Date February 7, 2007

Nova Middle School

Time of Day 9:50 am

Outdoor Conditions Temperature 70.5 Relative Humidity 63 Ambient CO2 529

Fish	Temperature	Range	Relative Humidity	Range	CO2	Range	# Occupants
172	63.9	72 - 78	67.6	30% - 60%	540	Max 700 > Ambient	4
Noticeable Odor		Visible water damage / staining?		Visible microbial growth?		Amount of material affected	
Ceiling Type		No		No		None	
Wall Type		No		No		None	
Flooring		Yes		No		Entire Carpet	

	Clean	Minor Dust / Debris	Needs Cleaning	Corrective Action Required
Ceiling	Yes	No	No	
Walls	Yes	No	No	
Flooring	No	Yes	Yes	Remove and replace carpet
HVAC Supply Grills	No	Yes	Yes	Clean with Wexcide disinfectant
HVAC Return Grills	No	Yes	Yes	Clean with Wexcide disinfectant
Ceiling at Supply Grills	Yes	No	No	
Surfaces in Room	No	Yes	No	Clean as appropriate

Observations

Findings: Band Room

- Carpet is severely 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

IAQ Assessment

Location Number 1311
 Evaluation Requested January 30, 2007
 Evaluation Date February 7, 2007

Nova Middle School

Time of Day 9:50 am

Outdoor Conditions Temperature 70.5 Relative Humidity 63 Ambient CO2 529

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 x 4 Lay In		No	No	None		
Wall Type	Plaster		No	No	None		
Flooring	12 x 12 Vinyl		No	No	None		

	Clean	Minor Dust / Debris	Needs Cleaning	Corrective Action Required
Ceiling	Yes	No	No	
Walls	Yes	No	No	
Flooring	Yes	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
Surfaces in Room	No	Yes	No	Clean as appropriate

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

IAQ Assessment

Location Number 1311
 Evaluation Requested January 30, 2007
 Evaluation Date February 7, 2007

Nova Middle School

Time of Day 9:50 am

Outdoor Conditions Temperature 70.5 Relative Humidity 63 Ambient CO2 529

Fish	Temperature	Range	Relative Humidity	Range	CO2	Range	# Occupants
707	69.3	72 - 78	61.1	30% - 60%	623	Max 700 > Ambient	4
Noticeable Odor		Visible water damage / staining?		Visible microbial growth?		Amount of material affected	
Ceiling Type		No		No		None	
Wall Type		No		No		None	
Flooring		No		No		None	

	Clean	Minor Dust / Debris	Needs Cleaning	Corrective Action Required
Ceiling	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> No	
Walls	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> No	
Flooring	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> No	
HVAC Supply Grills	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	Clean with Wexcide disinfectant
HVAC Return Grills	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	Clean with Wexcide disinfectant
Ceiling at Supply Grills	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	Clean as appropriate
Surfaces in Room	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Clean as appropriate

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

IAQ Assessment

Location Number
 Evaluation Requested
 Evaluation Date

Nova Middle School

Time of Day

Outdoor Conditions Temperature Relative Humidity Ambient CO2

Fish	Temperature	Range	Relative Humidity	Range	CO2	Range	# Occupants
<input type="text" value="709"/>	<input type="text" value="67"/>	<input type="text" value="72 - 78"/>	<input type="text" value="56.6"/>	<input type="text" value="30% - 60%"/>	<input type="text" value="2103"/>	<input type="text" value="Max 700 > Ambient"/>	<input type="text" value="36"/>
Noticeable Odor		Visible water damage / staining?		Visible microbial growth?		Amount of material affected	
<input type="text" value="No"/>		<input type="text" value="No"/>		<input type="text" value="No"/>		<input type="text" value="None"/>	
Ceiling Type	<input type="text" value="2 x 4 Lay In"/>		<input type="text" value="No"/>	<input type="text" value="No"/>	<input type="text" value="None"/>		
Wall Type	<input type="text" value="Plaster"/>		<input type="text" value="No"/>	<input type="text" value="No"/>	<input type="text" value="None"/>		
Flooring	<input type="text" value="12 x 12 Vinyl"/>		<input type="text" value="No"/>	<input type="text" value="No"/>	<input type="text" value="None"/>		

	Clean	Minor Dust / Debris	Needs Cleaning	Corrective Action Required
Ceiling	<input type="text" value="Yes"/>	<input type="text" value="No"/>	<input type="text" value="No"/>	<input type="text"/>
Walls	<input type="text" value="Yes"/>	<input type="text" value="No"/>	<input type="text" value="No"/>	<input type="text"/>
Flooring	<input type="text" value="Yes"/>	<input type="text" value="No"/>	<input type="text" value="No"/>	<input type="text"/>
HVAC Supply Grills	<input type="text" value="No"/>	<input type="text" value="Yes"/>	<input type="text" value="Yes"/>	<input type="text" value="Clean with Wexcide disinfectant"/>
HVAC Return Grills	<input type="text" value="No"/>	<input type="text" value="Yes"/>	<input type="text" value="Yes"/>	<input type="text" value="Clean with Wexcide disinfectant"/>
Ceiling at Supply Grills	<input type="text" value="No"/>	<input type="text" value="Yes"/>	<input type="text" value="Yes"/>	<input type="text" value="Clean as appropriate"/>
Surfaces in Room	<input type="text" value="No"/>	<input type="text" value="Yes"/>	<input type="text" value="No"/>	<input type="text" value="Clean as appropriate"/>

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